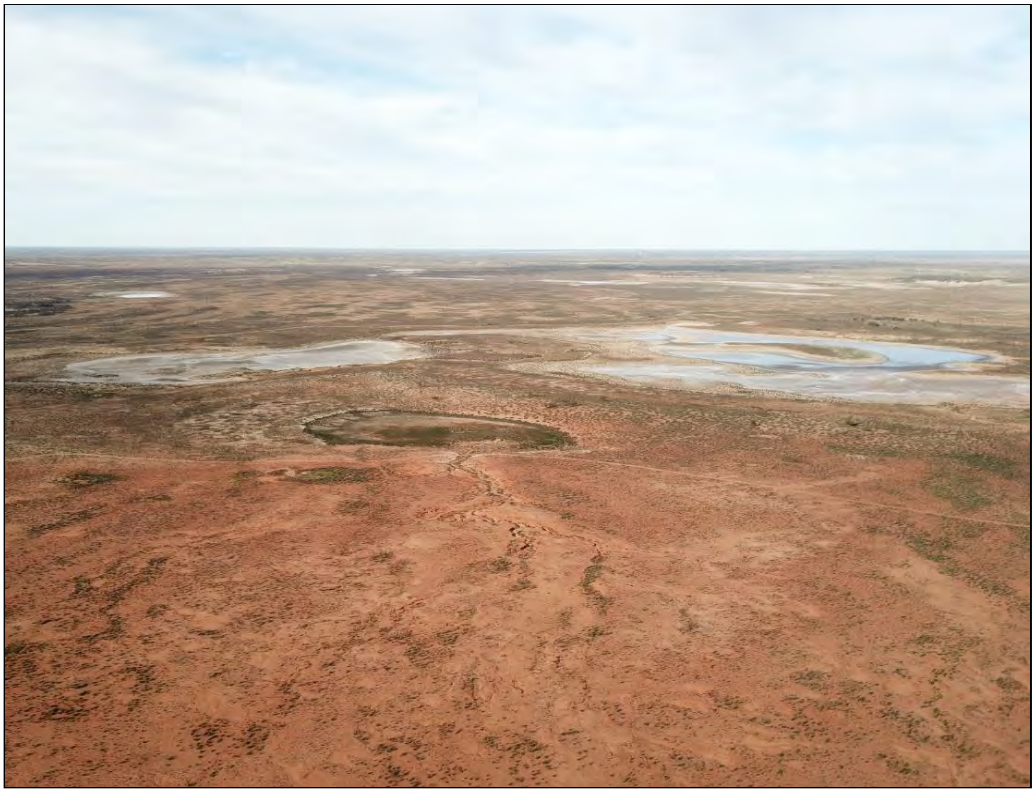
Appendix 8

Aboriginal Cultural Heritage Assessment Report

prepared by

OzArk Environment & Heritage

(Total No. of pages including blank pages = 749)



Aerial image across the eastern salt pan in the central portion of the Heritage Assessment Area.

REVISION 2 ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT

COPI MINERAL SANDS PROJECT

WENTWORTH SHIRE LOCAL GOVERNMENT AREA

APRIL 2024

Report prepared by

OzArk Environment & Heritage

for RZ Resources Limited

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ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT COVER SHEET

Report Title	Revision 2 Aboriginal Cultural Heritage Assessment Report: Copi Mineral Sands Project, Wentworth Shire LGA.
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Address of Subject Area	Address: Belmore, Huntingfield, Nulla Nulla and Warwick Stations. Title Reference: Lot 1 DP 1255308, Lot 1 DP 756199, Lot 1907 DP 763791, Lot 1940 DP763792, Lot 4068 DP766543, Lot 4117 DP 766622 Local Government Area: Wentworth Shire Local Government Area
Report prepared for	Company Name: RZ Resources Limited Contact Person: Paul Smith Address: GPO Box 2367, Brisbane QLD 4000 Email: psmith@rzresources.com.au
Date of Report	April 2024
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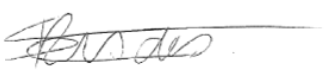

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Acknowledgement

OzArk acknowledge the traditional custodians of the area, the Barkandji people, on which this assessment took place and pay respect to their beliefs, cultural heritage, and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the Elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

ABBREVIATIONS AND GLOSSARY

ACHAR	Aboriginal Cultural Heritage Assessment Report. As set out in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*, all developments where harm to Aboriginal objects is likely must be assessed in an ACHAR
ACHCRs	*Aboriginal Cultural Heritage Consultation Requirements for Applicants.* Guidelines for conducting Aboriginal community consultation for developments where harm to Aboriginal objects is likely
AHIMS	Aboriginal Heritage Information Management System. AHIMS is the central register of all Aboriginal sites within NSW
AHIP	Aboriginal Heritage Impact Permit
Assemblage:	All artefacts recorded at a location. In this report, assemblage generally refers to stone artefacts
BCD	Biodiversity and Conservation Division. Former government department tasked with ensuring compliance with the NPW Act. Formerly OEH, now Heritage NSW
BP	Years before present
Code of Practice	*Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* under Part 6 NPW Act. Issued by the former NSW Department of Environment, Climate Change and Water (DECCW) in 2010, the Code of Practice is a set of guidelines that allows limited test excavation without the need to apply for an AHIP. The test excavation program for this assessment was conducted under the Code of Practice
Debitage:	The term debitage refers to all the waste material produced during lithic reduction and the production of stone tools. Therefore, technically, all artefacts other than reworked tools are debitage. However, in this report debitage is used in its other common meaning being the small flakes and chips produced purely as a by-product of knapping. This distinguishes these small flakes from the larger flakes that were removed (while technically 'debitage', a non-retouched flake can be used as a tool and therefore could have been the intended end point for a knapping event)
DCCEEW (Commonwealth)	Commonwealth Department of Climate Change, Energy, the Environment and Water. Department responsible for administering the EPBC Act

DCCEEW (state)	NSW Department of Climate Change, Energy, the Environment and Water. DCCEEW contains the Environment and Heritage Group which, in turn, contains Heritage NSW and AHIMS
DPE	NSW Department of Planning and Environment. Former NSW department responsible for planning approvals. Now DPHI.
DPHI	NSW Department of Planning, Housing and Infrastructure. DPHI contains the Planning agency and administers the EP&A Act.
EIS	Environmental Impact Statement. A required document for major projects documenting all potential impacts to the environment, including heritage, that may arise due to the development
EP&A Act	*Environmental Planning and Assessment Act 1979*. Act that institutes a system of environmental planning and assessment for the State of New South Wales
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*. Commonwealth legislation that governs matters of national and world heritage significance
GSE	Ground surface exposure. Denotes the amount of land that has potential to reveal the ground surface.
GSV	Ground surface visibility. Denotes the amount of ground surface that is visible within exposures.
Heritage NSW	Government department tasked with ensuring compliance with the Heritage Act and administration of the AHIMS register
HMP	Heritage Management Plan
Holocene:	Geological epoch which lasted from around 12,000 years ago (10,000 BCE) to the present. This period is generally warmer and wetter than the preceding Pleistocene period
Limit of Disturbance	Areas within the Heritage Assessment Area subject to physical disturbance as a result of the proposed mining operations and ancillary activities
Heritage Assessment Area	Area within the Mine Site subject to the Aboriginal cultural heritage assessment
Mine Site	Area within which all mining activities will be contained. The Mine Site includes the Heritage Assessment Area except for a portion of the Heritage Assessment Area along the access road from Anabranch Mail Road (Mine Site Access Road). The Mine Site covers approximately 5,622 hectares

Mine Site Access Road	29.6 km access road between the Anabranch Mail Road and the Mine Site
NPW Act	*National Parks and Wildlife Act 1974*. Primary legislation governing Aboriginal cultural heritage within NSW
OEH	Office of the Environment and Heritage. Former government department tasked with ensuring compliance with the NPW Act. Now Heritage NSW
PAD	Potential archaeological deposit. Indicates that a particular location has potential to contain subsurface archaeological deposits
Pleistocene:	Geological epoch which lasted from about 2.5 million years ago to 10,000 BCE. This period spans the world's recent period of repeated glaciations. Aboriginal occupation of Australia occurs during the upper Pleistocene
RAP	Registered Aboriginal Party. An individual or group who have indicated through the ACHCR process that they wish to be consulted regarding the project
SEARs	Secretary's Environmental Assessment Requirements
Spit	An arbitrary measure of depth (commonly 5 or 10 cm) used in archaeological excavations where stratigraphy is absent
Sq	Square (synonymous with TU)
SSD	State Significant Development. Projects that seek approval under Section 4.7 of the EP&A Act
The Applicant	RZ Resources Limited
Tr	Transect
TU	Test unit

EXECUTIVE SUMMARY

RZ Resources Limited is seeking approval for the proposed Copi Mineral Sands Project (the Project).

The Project is located 75 kilometres (km) northwest of Wentworth and 180 km south of Broken Hill in the Murray Basin region of southwestern NSW within the Wentworth Shire Local Government Area.

RZ Resources Limited seeks State Significant Development (SSD) Consent approval under Division 4.7 of Part 4 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) for the Project (SSD-41294067).

OzArk Environment & Heritage (OzArk) has been engaged by RW Corkery & Co on behalf of RZ Resources Limited to provide the specialist Aboriginal heritage assessment for the Project.

This *Aboriginal Cultural Heritage Assessment Report* (ACHAR) has been undertaken in accordance with the *Secretary's Environmental Assessment Requirements* (SEARs) the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (the Guide) and the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (the Code of Practice). The Aboriginal cultural heritage assessment for the Project has followed the *Aboriginal Cultural Heritage Consultation Requirements for Applicants 2010*.

Investigation of the Heritage Assessment Area took place with the assistance of Registered Aboriginal Parties (RAPs) from Barkandji #8 Native Title Determinants and the Dareton Local Aboriginal Land Council.

Three phases of investigations have been completed for the Project since commencement in 2020.

The fieldwork component of this assessment was undertaken on:

- Phase 1:
    - Survey: 25 to 29 February 2020 (5 days) and 2 March to 4 March 2020 (3 days).
    - Test excavation: 12 to 18 May 2020 (7 days).
- Phase 2:
    - Survey: 1 to 4 February 2022 (4 days) and 1 to 5 March 2022 (5 days).
    - Test excavation: 1 March 2022 (1 day).
- Phase 3:
    - Survey: 20 to 23 November 2023 (4 days).
    - Test excavation: 30 January to 2 February 2024 (4 days).

A total of 143 Aboriginal sites were recorded during the assessment, including:

- 84 isolated finds
- 52 artefact scatters (including one potential archaeological deposit [PAD] with a confirmed low-density subsurface scatter)
- Six artefact scatters with hearth/s
- One artefact scatter and a scarred tree.

As a result of information gained during the surveys and test excavations, most sites within the Heritage Assessment Area (n=136; 95 per cent) have been assessed as having low scientific significance. In most cases this is because the sites are low density artefact scatters or isolated finds located in landforms with deflated surfaces where further subsurface archaeological deposits are unlikely, or test excavation has found that only a background scatter of subsurface material is present. The remaining six sites within the Heritage Assessment Area were assessed as having moderate significance due to the presence of hearths or a scarred tree. No sites have been assessed as having a high scientific significance (see **Section 13.2** for further details).

Undertaking the impact assessment (**Section 14.2**) concluded that there are 65 Aboriginal sites that will be harmed by the Project. Of these sites, 62 will be totally harmed and three will be partially harmed. Copi OS-1 is partially located within the Limit of Disturbance however the Applicant has committed to avoiding the site.

The loss of the 65 sites, should the Project be approved, contributes to the cumulative harm to Aboriginal cultural heritage values in the region, but as the impacted sites are neither remarkable in their manifestation nor contain artefacts or features that are not commonly represented in the region, this loss of heritage value is manageable and the intergenerational loss arising from the Project is minimal at a regional level.

A series of management options are advanced in this ACHAR to manage the Project impacts. Should the Project be approved, three sites (Copi OS-6, Copi OS-12, and Copi OS-20) are recommended for further subsurface investigation which will be limited to the excavation of hearths for dating purposes, and all sites will be salvaged through surface collection (see **Section 15.3** for further details).

It is envisaged that the archaeological management strategy proposed by this ACHAR will ensure that artefacts are not only removed from direct harm but, within a research framework, the understanding of the archaeological record within the Limit of Disturbance will be enhanced.

If development approval for the Project is consented, and because of the proposed impacts to Aboriginal cultural heritage sites within the Limit of Disturbance, the following recommendations are made to responsibly mitigate the potential harm to cultural heritage in the Limit of Disturbance:

1. A *Heritage Management Plan* (HMP) will be prepared in consultation with the RAPs and the NSW Department of Planning, Housing and Infrastructure (DPHI) (with input from Heritage NSW). The archaeological management recommendations within this ACHAR should be incorporated into the HMP. Works cannot commence until the HMP has been approved by the DPHI.
2. The Aboriginal sites within the Limit of Disturbance that will be harmed by the Project are recommended to be salvaged through artefact collection. The protocol for this collection is set out in **Section 15.3.1** and **Section 15.3.2**.
3. Three Aboriginal sites within the Limit of Disturbance (Copi OS-6, Copi OS-12 and Copi OS-20) are also recommended to be salvaged through a program of limited archaeological salvage of the identified hearths. The protocol for this salvage is set out in **Section 15.3.3**.
4. Eight Aboriginal sites (see **Table 15-2**) as set out in **Section 15.3.4** require fencing and signage to prevent inadvertent harm from the Project.
5. Following the completion of analysis and reporting, the location and type of final repository for the salvaged artefacts will be the subject of further consultation with the RAPs, DPHI, and Heritage NSW. This may include the requirement for a Care Agreement to be submitted and endorsed by Heritage NSW for final artefact care arrangements or artefacts being reburied or relocated within the Heritage Assessment Area.

CONTENTS

FIGURES

TABLES

1 INTRODUCTION

1.1 PREAMBLE

OzArk Environment & Heritage (OzArk) has been engaged by RW Corkery & Co on behalf of RZ Resources Limited (the Applicant) to complete an *Aboriginal Cultural Heritage Assessment Report* (ACHAR) for the proposed Copi Mineral Sands Project (the Project).

The Project is located within the Mine Site, approximately 75 kilometres (km) northwest of Wentworth and approximately 180 km south of Broken Hill in the Murray Basin region of south-western NSW within the Wentworth Shire Local Government Area (**Figure 1-1**).

The purpose of the assessment is to form part of an *Environmental Impact Statement* (EIS) being prepared by RW Corkery & Co to accompany an application for development consent under Division 4.7 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the Project.

1.2 BACKGROUND

In February 2020 and May 2020, OzArk and the Registered Aboriginal Parties (RAPs) completed a survey and test excavation program, respectively, for the Project as per the *Secretary's Environmental Assessment Requirements* (SEARs). The initial Heritage Assessment Area in 2020 encompassed 5,235.6 hectares (ha) of land (herein referred to as the Phase 1 Assessment Area) (**Figure 1-2**). Following the survey and test excavation program, OzArk prepared an ACHAR which was distributed to all RAPs in July 2020 for review as per Stage 4 of the *Aboriginal Cultural Heritage Consultation Requirements for Applicants 2010* (ACHCRs) (DECCW 2010a).

During the preparation of the EIS for the Project, the Applicant identified a larger resource area and subsequently withdrew the application to assess the larger area.

In late 2021, the Applicant re-engaged OzArk to complete investigations of the increased resource area which included an additional 9,205.9 ha of land (herein referred to as the Phase 2 Assessment Area) (**Figure 1-2**). Additional survey and test excavation was undertaken by OzArk and the RAPs in February and March 2022. Following the survey and test excavation OzArk prepared a revised ACHAR titled *Revised Aboriginal Cultural Heritage Assessment: Copi Mineral Sands Project, Wentworth LGA* (OzArk 2022). The revised ACHAR was distributed to all RAPs in November 2022 for review as per Stage 4 of the ACHCRs.

The EIS for the Project was submitted to the then Department of Planning and Environment (DPE; now the Department of Planning, Housing and Infrastructure [DPHI]) in May 2023. Since the submission of the EIS, there have been several developments to the Project as follows:

- Additional high-grade resource has been discovered on the Warwick property. This additional resource, together with other factors such as tenure of Springfield Road and

landowner considerations, has resulted in a re-optimisation of the mine plan, with mining now proposed on the Warwick property

- The mine camp and other infrastructure has also been relocated to the Warwick property
- The site will now be accessed from the east via a new site access road from Anabranch Mail Road. This road is largely consistent with that proposed for the Project in 2020
- The Mine Site has been expanded to include a section of “Nulla Station” to the south of the Warwick property.

These developments have resulted in an additional 2,131.5 ha of land being added to the Project (herein referred to as the Phase 3 Assessment Area).

Combined, the Phase 1 to 3 Assessment Areas include approximately 16,573 ha of land (collectively, these areas are herein referred to as the Heritage Assessment Area).

The Applicant re-engaged OzArk to complete investigations of the Phase 3 Assessment Area and complete a Revision 2 of the ACHAR.

The archaeological investigations (survey and test excavation) completed for the Phase 1 Assessment Area are presented in **Sections 6** and **7**, respectively.

The archaeological investigations (survey and test excavation) completed for the Phase 2 Assessment Area are presented in **Sections 8** and **9**, respectively.

The archaeological investigations (survey and test excavation) completed for the Phase 3 Assessment Area are presented in **Sections 10** and **11**, respectively.

Figure 1-1: Map showing the location of the Mine Site.

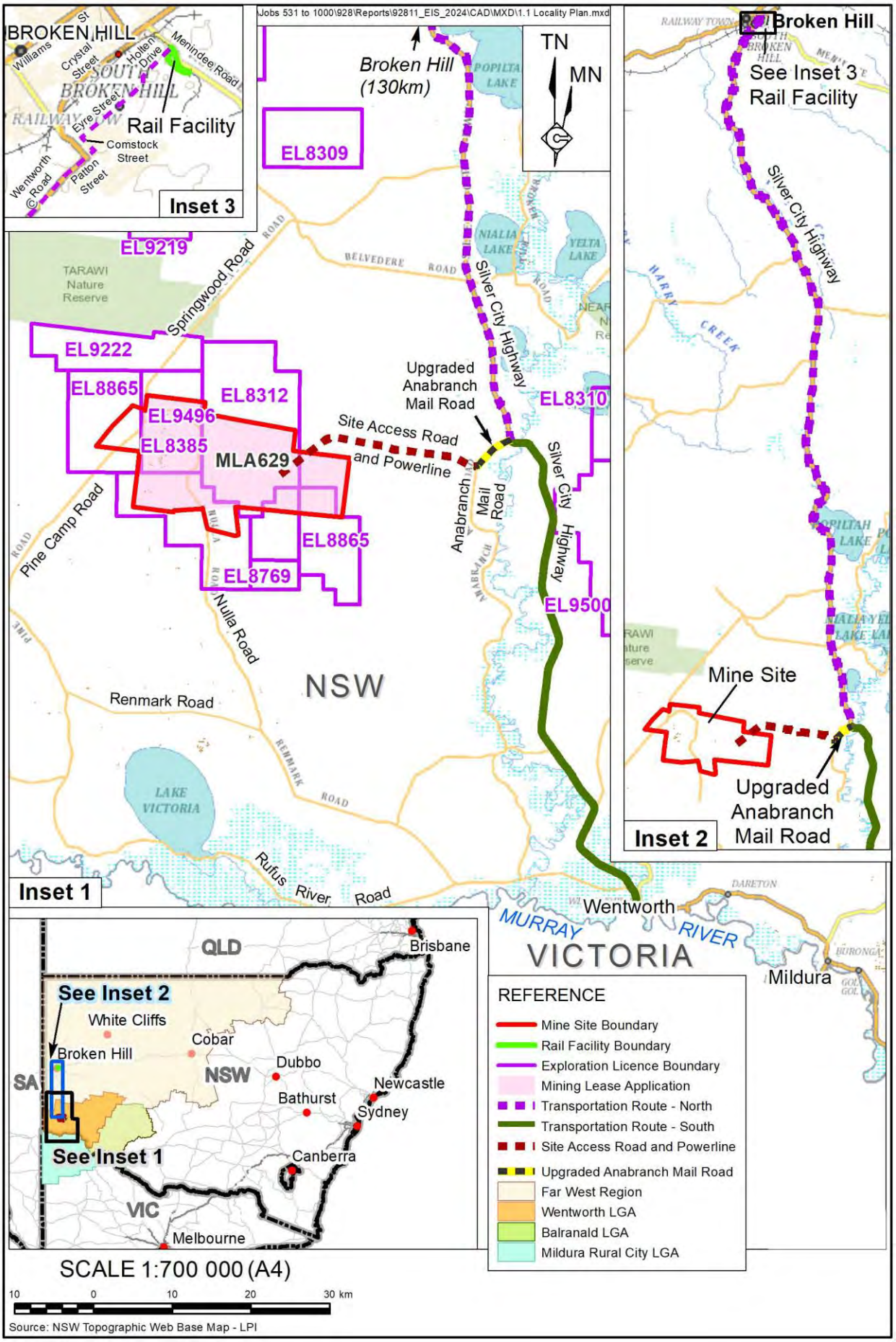
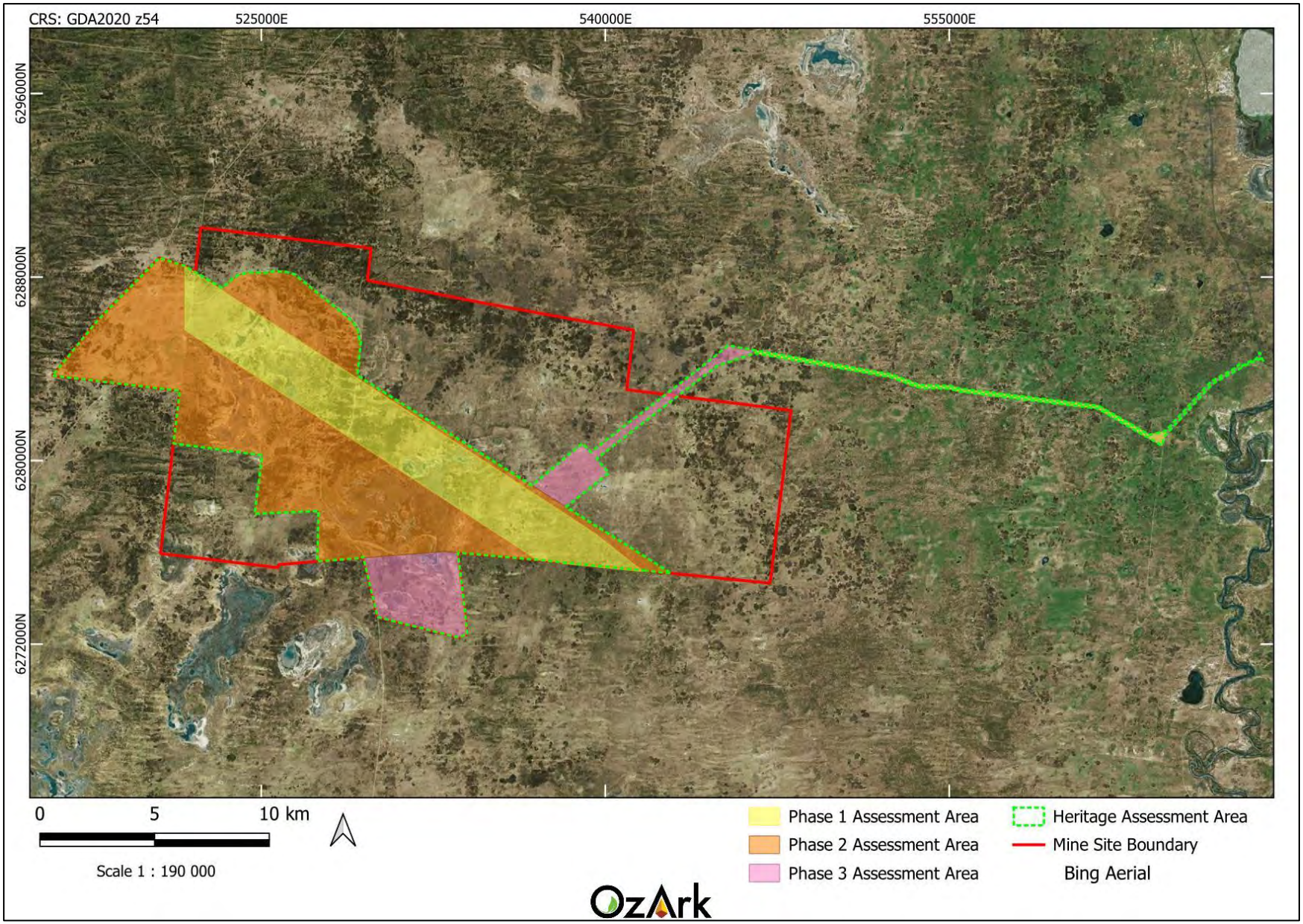


Figure 1-2: Aerial of the revised Heritage Assessment Area encompassing the Phase 1 to 3 Assessment Areas.



1.3 PROJECT OVERVIEW

Table 1-1 presents an overview of the Project and **Figure 1-3** presents the proposed layout of the Project.

Table 1-1: Project overview.

Project Element	Summary of the Project
Mining Method	• Dredge mining from an Extraction Area approximately 17km long and up to approximately 3.3km wide. • Mining would commence with a starter pond at the at the southwestern extent of the deposit. The starter pond would be extracted using conventional free dig, load and haul mining techniques. Extracted overburden, namely material located above the water table with no heavy mineral, would be used to construct infrastructure within the Mine Site or stockpiled for later use during rehabilitation operations. • Following establishment of the starter pond, the dredges would be installed, followed by the floating Wet Concentration Plant. • Interburden, namely material located below the water table with uneconomic heavy mineral, would be extracted using floating dredges. Interburden would initially be transferred to the Off Path Storage Facility. Once the dredge pond has achieved its full operational size, extracted interburden would be used to backfill completed sections of the Extraction Area. • Ore, namely material with sufficient heavy mineral to justify processing, would be extracted using a floating dredge. The ore would be transferred to the floating Wet Concentration Plant for processing. • Reject from the Wet Concentration Plant would initially be transferred to the Off Path Storage Facility. Once the dredge pond has achieved its full operational size, reject would be combined with the extracted interburden to backfill completed sections of the Extraction Area. • The placed reject and interburden would be covered by overburden and soil before being rehabilitated.
Mineral Resource	• Heavy mineral sand deposit approximately 23km long and up to 5km wide. • Indicated and Inferred JORC-compliant resource (September 2023) – 2.54Mt at 1.2% heavy mineral comprising ilmenite, leucoxene, rutile, zircon, monazite and xenotime.
Annual Production	• Ore: up to approximately 27.7 million tonnes per annum (Mtpa) • Interburden: up to approximately 48 Mtpa • Overburden: up to approximately 28.2 Mtpa
Mine Life	• Project life: approximately 26 years, comprising - Construction: approximately 2 years - Mining: approximately 17 years - Post-mining Rehabilitation: approximately 7 years post mining Note: Construction and mining operations would be partially undertaken concurrently
Total Resource Recovered	• Ore mined: up to 406.4Mt
Disturbance Area	• Mine Site: approximately 5,622 ha • Rail Facility: approximately 3.0 ha (existing), nil additional Note: No additional disturbance proposed within the Rail Facility.
Processing	• Processing operations would involve the following. - Wet screening and gravity separation of approximately 27.7 Mtpa of ore within the Wet Concentration Plant. - Dewatering and transfer of the Heavy Mineral Concentrate to the Concentrate Upgrade Plant to produce up to 511,000 tpa of the following. ▪ a primary and secondary ilmenite product. ▪ a monazite product. ▪ a non-magnetic concentrate.

Project Element	Summary of the Project
Management of Mining Waste	• Overburden - Extracted using dry mining techniques. - Initially used to construct infrastructure within the Mine Site or stockpiled for later use, after which it would be transferred directly to completed sections of the Extraction Area to reestablish the final landform. • Oversize - Screened and transferred directly to completed sections of the Extraction Area. • Interburden and Wet Concentration Plant reject and slimes - Initially transferred to the Off Path Storage Facility. Once the dredge pond has achieved its full operational size, reject would be combined with the extracted interburden to backfill completed sections of the Extraction Area. • Rare Earth Concentrate Plant reject. - Placed within completed sections of the Extraction Area. • General wastes and recyclables - Collected from site and transferred to a licenced waste management facility.
Transportation Operations	• Internal transportation - Mine Site Access Road (approximately 27 km) – would be constructed from Anabranch Mail Road to the Infrastructure Area. - Other light and heavy vehicle internal roads would be constructed within the proposed area of disturbance and would be relocated as required. • Transportation routes. - Realigned Anabranch Mail Road (approximately 6.1km) – from the Site Access Road to the Silver City Highway - Transportation Route - North (to Broken Hill) – Silver City Highway, Patton, Comstock and Eyre Streets and Holton Drive. - Transportation Route - South (to Wentworth) – Silver City Highway. - Other routes – use of other routes would be prohibited for Applicant-controlled vehicles and discouraged for all other vehicles. • Public road upgrades to accommodate Project generated traffic. - Realigned and upgraded section of Anabranch Mail Road from the intersection with the Mine Site Access Road to the Silver City Highway (approximately 6.1km). - Upgraded intersection of Anabranch Mail Road and the Silver City Highway. - Upgraded intersection of Patton and Comstock Streets. - Upgraded intersection of Comstock and Eyre Streets. - Upgraded intersection of Holten Drive and the Rail Facility Access Road. • Public road closure and realignment - Nulla Road between the “Huntingfield” homestead and the “Wenba” Station access road would be closed indicatively during Years 11, 12 and 13 when the Project would mine through the road. - The road would be reinstated in a realigned location as soon as practicable once mining has progressed through that section of the road. • Product/concentrate transportation - Route: via Transport Route North to the Rail Facility - Vehicle type: AB-triple (Type 1) or AB-quad (Type 2) road trains - Material classification (under Australian Code for the Transport of Dangerous Goods by Road & Rail) ▪ a primary and secondary ilmenite product. Ilmenite products and non-magnetic concentrate: Not classified ▪ Monazite product: Class 7 (Radioactive Material) - Traffic level ▪ AB-triple (Type 1) road trains: up to 16 laden movements per day ▪ AB-quad (Type 2) road trains: up to 12 laden movements per day - Onward transportation from Broken Hill (under separate approval) ▪ Ilmenite product and non-magnetic concentrate: by rail ▪ Monazite product: by road or rail Note: ..... AB-quad road trains would be used only once the required road permits have been obtained • All other deliveries/consumables - Route ▪ Transport Route South: approximately 90% of movements ▪ Transportation Route North: approximately 10% of movements - Vehicle type: up to B-double - Traffic level: up to 11 laden movements per day
General Infrastructure	On-site infrastructure not addressed above would include the following. • Mine Camp associated infrastructure for up to 200 personnel. • A 66kV transmission line from the 220kV Buronga to Broken Hill transmission line. The transmission line would be located adjacent to the Mine Site Access Road.

Project Element	Summary of the Project		
	• Solar Farm and associated infrastructure. • A power station comprising modular, silenced, diesel generators and associated infrastructure for use during construction and for emergency power requirement during operations. • Offices and Administration Area. • Workshops, Stores and Laydown Areas.		
Power	• Power for the Project would be provided by a combination of: - diesel generated power during construction operations - solar power from an approximately 35MW solar farm (if required); - mains power sourced via the above 66kV powerline. • Power distribution infrastructure, including substations and overhead, buried, and floating transmissions lines. • A minimum 30% of the Project's power would be sourced from renewable sources, including the onsite solar farm and/or externally contracted and certified renewable sources.		
Water Management	• Groundwater within the target Loxton Parilla Sands is highly saline, with limited to no beneficial use. • Dredging operations would be reliant on groundwater inflows to the Extraction Area to form the pond upon which the dredges and Wet Concentration Plant would be floated. • Production bores would be installed within the Loxton-Parilla Sands to provide water for initial construction operations and feed for one or more reverse osmosis plants. - Treated water would be used for camp amenities, concentrate washing, dust suppression (in conjunction with polymer-based dust suppressants) and other purposes as required. - Brine from the reverse osmosis plant would initially be placed within a pond within the Extraction Area footprint, after which it would be transferred to the dredge pond. • Production bores and the Water Storage Dam would be used to manage the water level within the Starter Pond to allow construction and floating of the dredges and Wet Concentration Plant. • Sediment laden (dirty) water would be retained on site and used for mining-related purposes. • Water from undisturbed sections of the Mine Site (clean water) would be prevented from entering disturbed sections of the Mine Site. Where clean water accumulates adjacent to the clean water exclusion bunds, that water would be used for mining-related purposes.		
Workforce	• Construction: up to approximately 480 persons • Operations: up to approximately 240 persons • Rehabilitation: up to approximately 40 persons Note: Work and fatigue management rosters would result in not all personnel being on site at the same time		
Hours of operation	**Activity**	**Proposed Days of Operation**	**Proposed Hours of Operation**
	Land preparation	7 days per week	7:00am to 6:00pm
	Construction operations • Road construction within Broken Hill LGA • All other construction	 7 days per week 7 days per week	 7:00am to 10:00pm 24 hours per day
	Mining operations	7 days per week	24 hours per day
	Processing operations	7 days per week	24 hours per day
	Transportation operations • Mine product transportation within Broken Hill LGA • All other transportation	 7 days per week 7 days per weeks	 7:00am to 10:00pm 24 hours per day
	Maintenance operations	7 days per week	24 hours per day
	Rehabilitation operations	7 days per week	7:00am to 10:00pm
Capital Investment Value	• AUD $940 million		
Final Landform	• All infrastructure not required for the final land use removed or reduced in size • A backfilled, shaped, and revegetated Extraction Area with no final void • Nulla Road reinstated • Upgraded public infrastructure retained for public use.		
Final Land Use	• Native ecosystem, with active investigation of alternative post-mining land uses, including renewable energy generation.		
Rehabilitation	• Rehabilitation would occur progressively throughout the life of the Project, with the Extraction Area progressively backfilled, shaped, and rehabilitated.		

1.4 HERITAGE ASSESSMENT AREA

The Heritage Assessment Area encompasses approximately 16,573 ha of land. The main components of the Project are located within Lot 1 DP1255308, Lot 1 DP756199, Lot 1907 DP763791, Lot 1940 DP763792, Lot 4068 DP766543, and Lot 4117 DP766622, while ancillary infrastructure such as the Mine Site Access Road and powerline extend through Lot 3421 to 3423 DP765712, Lot 1908 DP763764, and Lot 1910 DP763766 (**Figure 1-4**).

The Heritage Assessment Area is located within four pastoral stations: Warwick, Huntingfield, Nulla Nulla, and Belmore.

Nulla Road intersects the central portion of the Heritage Assessment Area and the intersection of Nulla Road, Pine Camp Road, and Springwood Road is in the western portion of the Heritage Assessment Area.

The Heritage Assessment Area is zoned RU1 – Primary Production under the Wentworth Shire Local Environmental Plan (LEP) 2011 and is currently used for grazing. The principal portion of the Heritage Assessment Area consists of flat to gently undulating sand plains and dunes surrounding two salt pans, termed herein the eastern and western salt pans.

Figure 1-3: Proposed Project components.

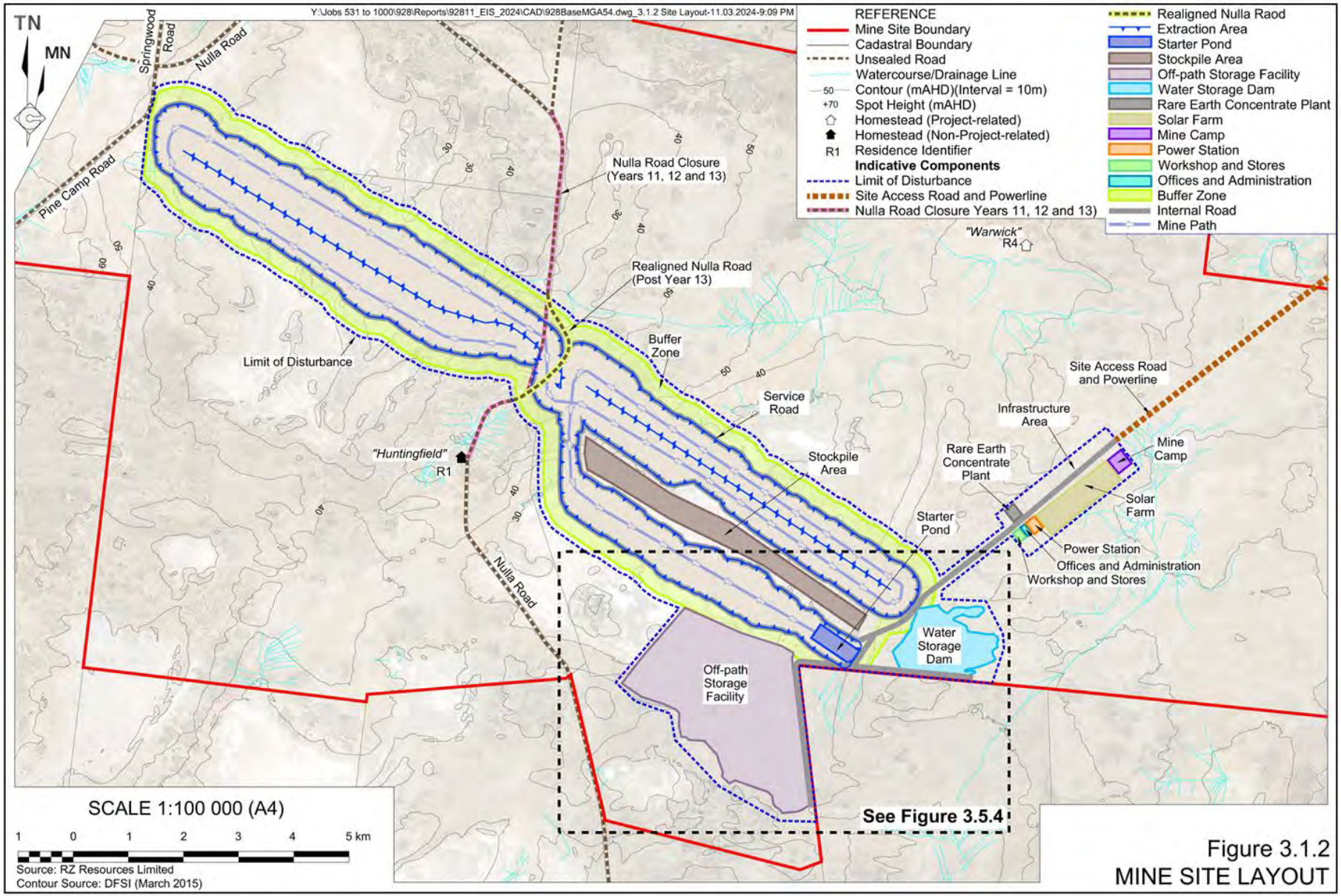
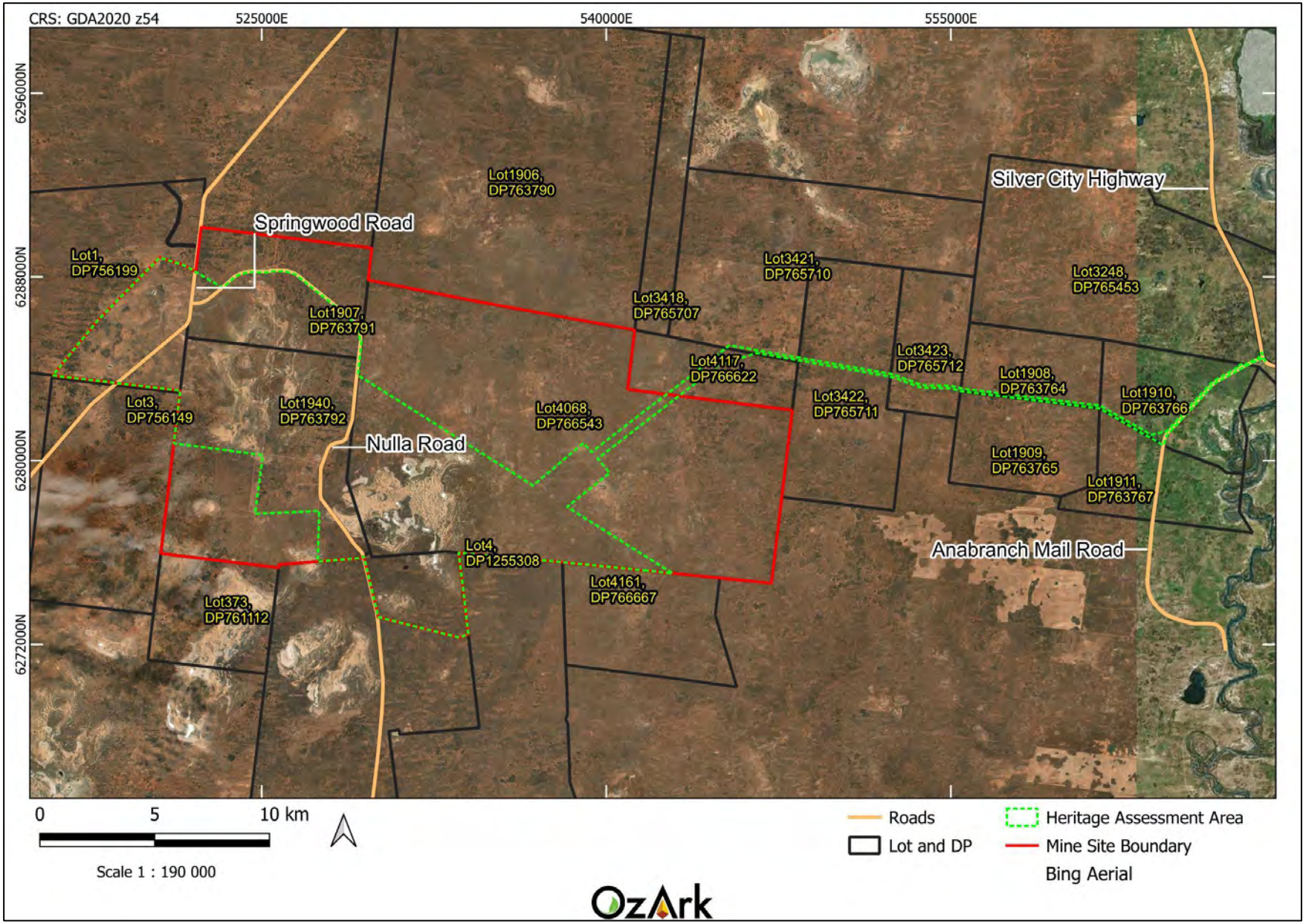


Figure 1-4: Aerial showing cadastral details of the Heritage Assessment Area and Mine Site.



1.5 RELEVANT LEGISLATION

Cultural heritage is managed by several state and national Acts. Baseline principles for the conservation of heritage places and relics can be found in the *Burra Charter* (Burra Charter 2013). The *Burra Charter* has become the standard of best practice in the conservation of heritage places in Australia, and heritage organisations and local government authorities have incorporated the inherent principles and logic into guidelines and other conservation planning documents. The *Burra Charter* generally advocates a cautious approach to changing places of heritage significance. This conservative notion embodies the basic premise behind legislation designed to protect our heritage, which operates primarily at a state level.

Several Acts of parliament provide for the protection of heritage at various levels of government.

1.5.1 Commonwealth legislation

1.5.1.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), administered by the Commonwealth Department of Climate Change, Energy, the Environment and Water, provides a framework to protect nationally significant flora, fauna, ecological communities, and heritage places. The EPBC Act establishes both a National Heritage List and Commonwealth Heritage List of protected places. These lists may include Aboriginal cultural sites or sites in which Aboriginal people have interests. The assessment and permitting processes of the EPBC Act are triggered when a proposed activity or development could potentially have an impact on one of the matters of national environment significance listed by the Act. Ministerial approval is required under the EPBC Act for proposals involving significant impacts to national/commonwealth heritage places.

1.5.1.1 Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* is aimed at the protection from injury and desecration of areas and objects that are of significance to Aboriginal Australians. This legislation has usually been invoked in emergency and conflicted situations.

Applicability to the Project

It is noted there are no Commonwealth or National heritage listed places within the Heritage Assessment Area and as such, the heritage provisions of the EPBC Act and other Commonwealth Acts do not apply (**Section 5.3.1**).

1.5.2 State legislation

1.5.2.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) established requirements relating to land use and planning. The main parts of the EP&A Act that relate to development assessment and approval are Part 4 (development assessment) and Part 5 (environmental assessment). The Minister responsible for the Act is the Minister for Planning and Public Spaces.

The EP&A Act currently provides the primary legislative basis for planning and environmental assessment in NSW. The objects of the EP&A Act include encouragement of:

- The proper management, development, and conservation of natural resources
- The provision and coordination of the orderly and economic use and development of land
- Protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats
- Ecologically sustainable development.

The objects also provide for increased opportunity for public involvement and participation in environmental planning and assessment.

The EP&A Act includes provisions to ensure that the potential environmental impacts of a development or activity are rigorously assessed and considered in the decision-making process.

The framework governing environmental and heritage assessment in NSW is contained within the following parts of the EP&A Act:

- Part 4: Local government development assessments, including heritage. May include schedules of heritage items
    - Division 4.7: Approvals process for state significant development.

Applicability to the Project

The current Project will be assessed under Part 4.7 of the EP&A Act.

As the Project is a State Significant Development (SSD), if approved, Section 4.41 of the EP&A Act would apply and therefore an Aboriginal Heritage Impact Permit (AHIP) under section 90 of the NPW Act to harm Aboriginal objects would not be required. Instead, all management related to Aboriginal cultural heritage within the Heritage Assessment Area would be governed by the policies within an approved *Heritage Management Plan* (HMP).

1.5.2.2 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act) provides for the protection of Aboriginal objects (sites, objects, and cultural material) and Aboriginal places. Under the Act (Part 6), an Aboriginal object is defined as: any deposit, object, or material evidence (not being a handicraft for sale) relating to Aboriginal habitation of the area that comprises NSW, being habitation both prior to and concurrent with the occupation of that area by persons of European extraction and includes Aboriginal remains.

An Aboriginal place is defined under the NPW Act as an area which has been declared by the Minister administering the Act as a place of special significance for Aboriginal culture. It may or may not contain physical Aboriginal objects.

It is an offence under Section 86 of the NPW Act to 'harm or desecrate an object the person knows is an Aboriginal object'. It is also a strict liability offence to 'harm an Aboriginal object' or to 'harm or desecrate an Aboriginal place', whether knowingly or unknowingly. Section 87 of the Act provides a series of defences against the offences listed in Section 86, such as:

- The harm was authorised by and conducted in accordance with the requirements of an AHIP under Section 90 of the Act
- The defendant exercised 'due diligence' to determine whether the action would harm an Aboriginal object
- The harm to the Aboriginal object occurred during the undertaking of a 'low impact activity' (as defined in the regulations).

Under Section 89A of the Act, it is a requirement to notify the Secretary of the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) of the location of an Aboriginal object. Identified Aboriginal items and sites are registered on Aboriginal Heritage Information Management System (AHIMS) that is administered by Heritage NSW.

Applicability to the Project

Under Section 89A of the Act, it is a requirement to notify the Secretary of DCCEEW of the location of an Aboriginal object. Identified Aboriginal items and sites are registered on AHIMS that is administered by Heritage NSW.

Any Aboriginal sites within the Heritage Assessment Area are afforded legislative protection under the NPW Act.

1.5.2.3 Secretary's Environmental Assessment Requirements

SEARs were issued for the Project (SSD-41294067) on 18 December 2023.

Table 1-2 addresses the general requirements in the SEARs for SSD-41294067 regarding Aboriginal heritage.

An email from Heritage NSW dated 2 May 2022 regarding the initial SEARs issued on 19 May 2022 stated that Heritage NSW has reviewed the draft SEARs with respect to Aboriginal cultural heritage and had no additional comments or recommendations.

Table 1-2: SEARs General Requirements.

SEARs requirement	Where addressed in the ACHAR
An assessment of the potential impacts of the development on Aboriginal heritage (cultural values and archaeological), including adequate consultation with relevant Aboriginal stakeholders having regard to the *Aboriginal Cultural Heritage Consultation Requirements for Applicants (DECCW 2010)* and documented in an *Aboriginal Cultural Heritage Assessment Report (ACHAR)* including the significance of cultural heritage values for Aboriginal people who have a cultural association with the land	The assessment has followed the applicable codes and guidelines. Consultation with the Aboriginal stakeholders is presented in **Section 3**.
Results of a surface survey (and test excavations, if required) undertaken by a qualified archaeologist to inform the need for targeted test excavation to better assess the integrity, extent, distribution, nature and overall significance of the archaeological record	The project has undertaken an extensive pedestrian survey and test excavation across the Heritage Assessment Area as reported in this ACHAR. **Sections 6**, **8** and **10** present the results of the survey across the three phases of the assessment. **Sections 7**, **9** and **11** present the results of the test excavation program across the three phases of the assessment.
Avoiding and mitigating impacts on cultural heritage values and identify any conservation outcomes, including mitigation measures and procedures for accidental finds at any stage of the development	**Sections 14** to **16**.

2 THE ARCHAEOLOGICAL ASSESSMENT AND ABORIGINAL CULTURAL HERITAGE VALUES ASSESSMENT

2.1 ASSESSMENT APPROACH

The field survey and test excavation followed the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010b).

The Aboriginal cultural heritage assessment followed the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (the Guide; OEH 2011) and the ACHCRs.

2.2 PURPOSE AND OBJECTIVES

The purpose of the current assessment is to identify and assess heritage constraints relevant to the proposed works.

2.2.1 Aboriginal archaeological and cultural heritage values assessment objectives

The current assessment will apply the Code of Practice and the ACHCRs to complete an Aboriginal cultural heritage assessment, to meet the following objectives:

Objective one: Undertake background research on the Heritage Assessment Area to formulate a predicative model for site location

Objective two: Identify and record Aboriginal objects or sites within the Heritage Assessment Area as well as any landforms likely to contain further archaeological deposits

Objective three: Undertake an Aboriginal cultural values assessment in consultation with RAPs of any tangible and intangible cultural heritage values that have potential to be harmed by the Project

Objective four: Assess the significance of any recorded Aboriginal sites, objects, or places likely to be harmed by the Project, in consultation with RAPs

Objective five: Assess the likely impacts of the Project to any recorded Aboriginal objects, places, or intangible values and to develop management recommendations, in consultation with the RAPs.

2.3 DATE OF ARCHAEOLOGICAL ASSESSMENT

The field investigations for Phase 1 of the Project were completed on the following dates:

- Survey:
    - 25 to 29 February 2020 (5 days)
    - 2 March to 4 March 2020 (3 days)

- Test excavation:
    - 12 to 18 May 2020 (7 days).

The field investigations for Phase 2 of the Project were completed on the following dates:

- Survey:
    - 1 to 4 February 2022 (4 days)
    - 1 to 5 March 2022 (5 days)
- Test excavation:
    - 1 March 2022 (1 day).

The field investigations for Phase 3 of the Project were completed on the following dates:

- Survey:
    - 20 to 23 November 2023 (4 days).
- Test excavation:
    - 30 January to 2 February 2024 (4 days).

2.4 OZARK INVOLVEMENT

2.4.1 Field assessment

The fieldwork component of the heritage assessment for Phase 1 was undertaken by:

- Fieldwork director: Stephanie Rusden (OzArk Senior Archaeologist, BSc, University of Wollongong, BA, University of New England)
- Fieldwork director: Ben Churcher (OzArk Principal Archaeologist, BA [Hons], University of Queensland; Dip Ed, University of Sydney)
- Archaeologist: Dr Alyce Cameron (OzArk Project Archaeologist, BA [Hons] and PhD [Archaeology & palaeoanthropology] Australian National University)
- Archaeologist: Dr Jodie Benton (OzArk Director and Principal Archaeologist, PhD University of Sydney)
- Archaeologist: Kirwan Williams (OzArk Project Archaeologist, BA University of Queensland)
- Archaeologist: Adelia Gower (OzArk Project Archaeologist, BS [Hons], University of Queensland)
- Archaeologist: Harrison Rochford: (OzArk Heritage Officer, Masters Philosophy (Arts and Social Sciences) and Bachelor of Liberal Studies [Hons], University of Sydney).

The fieldwork component of the heritage assessment for Phase 2 was undertaken by:

- Fieldwork director: Ben Churcher
- Fieldwork director: Dr Jodie Benton
- Archaeologist: Roger Mehr (BA, MA, RePL)
- Archaeologist: Brendan Fisher (OzArk Project Archaeologist, BA (Archaeology) University of Sydney)
- Archaeologist: Dr Yekun Zhang (OzArk Project Archaeologist, B Arts Archaeology & Anthropology, M.Sc Archaeological Science, PhD Archaeology)
- Archaeologist: Barry Kerton (OzArk Project Archaeologist, BA, BSc and MA [advanced] Australian National University).

The fieldwork component of the heritage assessment for Phase 3 was undertaken by:

- Fieldwork director: Stephanie Rusden
- Fieldwork director: Ben Churcher
- Fieldwork director: Dr Jodie Benton
- Archaeologist: Tenae Robertson (OzArk Project Archaeologist, B Archaeological Practices, Australian National University)
- Archaeologist: Eleanore Martin (OzArk Archaeologist, B. Science, University of Adelaide)
- Archaeologist: Jordan Henshaw (OzArk Archaeologist, B. Ancient History, Macquarie University)
- Archaeologist: Sophia Grubnic (OzArk Archaeologist, BA Ancient History [Hons], University of Queensland, BA Ancient History/Art History, University of Melbourne)
- Archaeologist: Imogen Crome (OzArk Archaeologist, B Science Biological Anthropology, B Arts Archaeology, Australian National University and Master of Arts (Archaeology) [in progress] University of New England)
- Archaeologist: Martyn Poyitt (B Arts Ancient History Macquarie University, Bachelor of Theology Honours [in progress] Australian Catholic University).

2.4.2 Reporting

The reporting component of the heritage assessment was undertaken by:

- Report author: Stephanie Rusden
- Contributors: Dr Alyce Cameron, Dr Yekun Zhang, and Sophia Grubnic
- Reviewer: Ben Churcher.

2.5 REPORT COMPLIANCE WITH THE CODE OF PRACTICE

The Code of Practice establishes requirements that should be followed by all archaeological investigations where harm to Aboriginal objects may be possible. **Table 2-1** tabulates the compliance of this report with the requirements established by the Code of Practice.

Table 2-1: Report compliance with the Code of Practice.

Code of Practice Requirement	Context of the Requirement	Concordance in this report
Requirement 1	Review previous archaeological work	*see subsections below*
Requirement 1a	Previous archaeological work	**Section 5.2**
Requirement 1b	AHIMS searches	**Section 5.3.1**
Requirement 2	Review the landscape context	**Section 4**
Requirement 3	Summarise and discuss the local and regional character of Aboriginal land use and its material traces	**Section 5.2** and **Section 5.3**
Requirement 4	Predict the nature and distribution of evidence	*see subsections below*
Requirement 4a	Predictive model	**Section 5.4**
Requirement 4b	Predictive model results	**Section 5.4.6**
Requirement 5	Archaeological survey	*see subsections below*
Requirement 5a	Survey sampling strategy	**Section 6.1**, **Section 8.1** and **Section 10.1**
Requirement 5b	Survey requirements	This Requirement was fulfilled during the undertaking of the survey
Requirement 5c	Survey units	**Section 6.3**, **Section 8.2** and **Section 10.2**
Requirement 6	Site definition	**Section 6.4**, **Section 8.3** and **Section 10.3**
Requirement 7	Site recording	*see subsections below*
Requirement 7a	Information to be recorded	All site information is recorded in GDA20 zone 54.
Requirement 7b	Scales for photography	All artefact photographs employed a centimetre scale bar.
Requirement 8	Location information and geographic reporting	*see subsections below*
Requirement 8a	Geospatial information	All artefact locations were logged using a non-differential handheld GPS.
Requirement 8b	Datum and grid coordinates	All coordinates are provided in GDA Zone 54.
Requirement 9	Record survey coverage data	**Section 6.1**, **Section 6.3**, **Section 8.1, Section 8.2** and **Section 10.2**
Requirement 10	Analyse survey coverage	**Section 6.3**, **Section 8.2** and **Section 10.2**
Requirement 11	Archaeological Report content and format	This report adheres to this Requirement.
Requirement 12	Records	OzArk undertakes to maintain all survey records for at least five years.
Requirement 13	Notifying OEH and reporting	*see subsections below*
Requirement 13a	Notification of breaches	Not applicable
Requirement 13b	Provision of information	Not applicable
Requirement 14	Test excavation which is not excluded from the definition of harm	The test excavation did not take place in any of the landforms identified in Requirement 14.
Requirement 15	Pre-conditions to carrying out test excavation	*see subsections below*
Requirement 15a	Consultation	Consultation has followed the ACHCRs, see **Section 3**.

Code of Practice Requirement	Context of the Requirement	Concordance in this report
Requirement 15b	Test excavation sampling strategy	A test excavation methodology was produced for each phase of the assessment (**Appendix 5**, **Appendix 6** and **Appendix 8**) and issued to RAPs for their information (see **Section 3**).
Requirement 15c	Notification	Phase 1: BCD South West branch (now Heritage NSW) was provided with a copy of the test excavation methodology for the Phase 1 assessment on 15 April 2020. Phase 2: Heritage NSW was provided with a copy on the test excavation methodology for the Phase 2 assessment on 24 January 2022. Phase 3: Heritage NSW was provided with a copy on the test excavation methodology for the Phase 3 assessment on 8 January 2024.
Requirement 16	Test excavation that can be carried out in accordance with this Code	*see subsections below*
Requirement 16a	Test excavations	The test excavation program complied with this requirement; see **Section 7**, **Section 9**, **Section 11**, **Appendix 5**, **Appendix 6**, and **Appendix 8**.
Requirement 16b	Objects recovered during test excavations	All test excavation methodologies established that any artefacts recovered from the excavations would be temporary stored at the OzArk office (145 Wingewarra Street, Dubbo, NSW) in a locked cupboard.
Requirement 17	When to stop test excavations	The methodology of the test excavation adhered to this requirement; see **Appendix 5**, **Appendix 6** and **Appendix 8**.
Requirements 18–20	Artefact recording	Requirements 18–20 were followed during the recording or artefacts during the survey.

3 ABORIGINAL COMMUNITY CONSULTATION

3.1 INTRODUCTION TO CULTURAL VALUES

> *No matter who you are, we all have culture. Each person's culture is important; it's part of what makes us who we are.*
>
> Australianstogether.org.au

Many Aboriginal people in Australia have a unique view of the world that's distinct from the mainstream. Land, family, law, ceremony, and language are five key interconnected elements of Aboriginal culture. For example, families are connected to the land through the kinship system, and this connection to land comes with specific roles and responsibilities which are enshrined in the law and observed through ceremony. In this way, the five elements combine to create a way of seeing and being in the world that is distinctly Aboriginal.

Aboriginal and Torres Strait Islander peoples are connected to Country through lines of descent (paternal and maternal), as well as clan and language groups. Territory is defined by spiritual as well as physical links. Landforms have deep meaning, recorded in art, stories, songs, and dance. Songlines or Dreaming Tracks as well as kinship structures link Aboriginal peoples to the territories of other groups. In the past, these links were also used for trade.

Living on this land for more than 50,000 years, Aboriginal and Torres Strait Islanders established effective ways to use and sustain resources. One important aspect is the right of certain people to control the use of resources in a particular area, as well as cultural and spiritual values like totemism that were fundamental in resource management. There was a wide range of traditional methods for gathering food including fish traps, subsistence agriculture, hunting and harvesting a wide range of natural fruits and vegetables. Some groups of people would stay in one place, while others moved around the land according to the seasons, to ensure sustainable and rich food supplies, and to fulfil their spiritual and cultural obligations.

In much of eastern Australia, Aboriginal communities live their lives like most Australians. However, in certain crucial areas, particularly associated with family, leadership roles and caring for Country, Aboriginal lore continues, even in the most urbanised communities.

3.2 ABORIGINAL COMMUNITY CONSULTATION

The Aboriginal cultural heritage assessment of the Project has followed the ACHCRs.

A log and copies of correspondence with Aboriginal community stakeholders is presented in **Appendix 1**.

The ACHCRs include four main stages, and these are detailed in the following sections.

3.2.1 Phase 1

3.2.1.1 Stage 1

The aim of Stage 1 is to identify the RAPs who wish to be consulted about the Project.

On 4 August 2018, an advertisement was placed in the *Sunraysia Daily* requesting expressions of interest in being consulted about the Project (**Appendix 1 Figure 1**). In addition, the following agencies were contacted to identify potential stakeholders for the area: Office of Environment and Heritage (OEH, now Heritage NSW); Dareton Local Aboriginal Land Council (LALC); Office of The Registrar *Aboriginal Land Rights Act 1983*; National Native Title Tribunal; NTSCORP; Wentworth Shire Council; and Western Local Land Services (**Appendix 1 Figure 2**). Groups or individuals identified by the agencies were contacted on seeking expressions of interest (**Appendix 1 Figure 3**).

As a result, the following groups or individuals registered to be consulted about the Project:

- Dareton LALC
- Barkindji-Maraura Elders Council
- Barkandji #8 Native Title Determinants [Part A]
- Maraura / Thangkaali (Pooncarie) First Nations Owners Association.

These groups or individuals constitute the RAPs for the Project.

Following Stage 1, the Project was placed on hold for over 12 months as the Limit of Disturbance was being revised and finalised. Updates were sent to the RAPs every six months (**Appendix 1 Figure 4** [19 February 2019] and **Appendix 1 Figure 5** [15 August 2019]), however, when the Project recommenced in December 2019, an additional advertisement was placed in the *Sunraysia Daily* on 18 December 2019 (**Appendix 1 Figure 6**) and Heritage NSW was contacted for a list of stakeholders for new registrations (**Appendix 1 Figure 7**). All new stakeholders were written to on 9 January 2020 (**Appendix 1 Figure 8**). The following individuals and/or groups also registered interest and were added to the existing list of RAPs:

- Barkandji Maraura Environmental Team (c/Arthur Kirby)
- Clair Bates
- Amanda Whitton.

3.2.1.2 Stage 2

The aim of Stage 2 is to provide information about the Project to the RAPs.

Detailed Project information was provided in the assessment methodology that was issued to all RAPs for their consideration on 16 January 2020 (**Appendix 1 Figure 9** and **Appendix 4**).

3.2.1.3 Stage 3

The aim of Stage 3 is to acquire information regarding Aboriginal cultural values associated with the Project through RAP consultation and field work.

On 16 January 2020, all RAPs were sent information about the Project and a draft of the assessment methodology (**Appendix 1 Figure 9** and **Appendix 4**). RAPs were provided the stipulated 28 days in which to review and comment on these documents as per Stage 3 of the ACHCRs. The closing date for comment was 13 February 2020.

No comments were received from the RAPs on the assessment methodology.

Following the completion of the survey, several locations were identified across the Heritage Assessment Area which warranted test excavation. The test excavation methodology was distributed to all RAPs on 9 April 2020 (**Appendix 1 Figure 10** and **Appendix 5**). The closing date for comment was 8 May 2020.

No comments were received from the RAPs on the test excavation methodology.

3.2.1.4 Stage 4

Stage 4 involves the production of a draft ACHAR that is issued to all RAPs for their consideration. The ACHAR documents the results of the assessment, outline opportunities for the conservation of Aboriginal cultural values, and suggest recommendations for the management of Aboriginal objects should impacts to these objects be unavoidable.

A copy of the draft ACHAR was sent to all RAPs on 27 July 2020 with a 28-day review period closing 26 August 2020 (**Appendix 1 Figure 11**).

No comments were received on the draft ACHAR from any of the RAPs.

3.2.1.5 Project updates

Following the end of Stage 4, the Project was placed on hold again for over 12 months as the Applicant assessed a revised area for the Project.

Updates were sent to all RAPs every six months to ensure they were kept up to date. The first update letter was sent to all RAPs on 23 March 2021 (**Appendix 1 Figure 12**) and a second update letter sent on 28 September 2021 (**Appendix 1 Figure 13**).

3.2.2 Phase 2

3.2.2.1 Stage 1

Following recommencement of the Project, OzArk wrote to Heritage NSW to request a new stakeholder list to see whether any additional stakeholders were listed within the Wentworth Shire LGA since the last stakeholder list was provided on 9 January 2020 (**Appendix 1 Figure 14**). No

additional stakeholders were listed on the stakeholder list provided on 1 December 2021, as such, no letters seeking registrations of interest were sent as all stakeholders had been previously provided the opportunity to register for the Project.

3.2.2.2 Stages 2 and 3

On 21 December 2021, all RAPs were sent information about the Project and a draft of the assessment methodology for the revised Heritage Assessment Area (**Appendix 1 Figure 15** and **Appendix 6**). RAPs were provided the stipulated 28 days in which to review and comment on these documents as per Stage 3 of the ACHCRs. The closing date for comment was 24 January 2022.

No comments were received from the RAPs on the assessment methodology.

3.2.2.3 Project update

On 22 July 2022, OzArk sent an update letter to all RAPs advising them that the Applicant was finalising the Project components and once finalised, a copy of the ACHAR would be provided for review (**Appendix 1 Figure 16**).

3.2.2.4 Stage 4

A copy of the revised draft ACHAR was sent to all RAPs on 17 November 2022 with a 28-day review period closing 16 December 2022 (**Appendix 1 Figure 17**).

No comments were received on the revised draft ACHAR from any of the RAPs.

3.2.3 Phase 3

3.2.3.1 Project update

On 22 September 2023, OzArk sent an update to the RAPs advising that further assessment was going to be completed due to an increase in the size of the Project. The email advised that an assessment methodology would be prepared and distributed for review once complete (**Appendix 1 Figure 18**).

3.2.3.2 Stage 1

Consultation for the Phase 3 assessment continued from the ACHCRs completed for the first two phases of the Project which ended on 16 December 2022 following Stage 4 review of the revised ACHAR. However, due to the increased size of the Project, a new stakeholder list for the Wentworth Shire LGA was requested from Heritage NSW on 24 September 2023 to ensure there were no additional stakeholders who had not been previous sent an expression of interest. Five additional Aboriginal stakeholders were on the list received from Heritage NSW on

28 September 2023 (**Appendix 1 Figure 19**). OzArk wrote to these stakeholders on 3 October 2023 (**Appendix 1 Figure 20**).

The following individuals/groups form the RAPs for the Project:

- Dareton LALC
- Barkindji-Maraura Elders Council
- Barkandji #8 Native title Determinants
- Barkandji Maraura Environmental Team (c/Arthur Kirby)
- Clair Bates
- Amanda Whitton.
- Maraura / Thangkaali (Pooncarie) First Nations Owners Association
- Koori Digs Services.

3.2.3.3 Stages 2 and 3

On 19 October 2023, all RAPs were sent information about the Project and a draft of the assessment methodology for the Phase 3 Assessment Area (**Appendix 1 Figure 21** and **Appendix 7**). RAPs were provided the stipulated 28 days in which to review and comment on these documents as per Stage 3 of the ACHCRs. The closing date for comment was 16 November 2023.

A response was received from Koori Digs Services on 22 October 2023 noting they agree with the methodology (**Appendix 1 Figure 22**). No additional comments were received from the RAPs on the assessment methodology.

Following the completion of the survey, an area was identified in the Phase 3 Assessment Area warranting test excavation. The test excavation methodology was distributed to all RAPs on 20 December 2023 (**Appendix 1 Figure 23** and **Appendix 8**). The closing date for comment was 23 January 2024.

A response was received from Koori Digs Services on 26 December 2023 noting they agree with the methodology (**Appendix 1 Figure 24**).

No additional comments were received from the RAPs on the test excavation methodology.

3.2.3.4 Stage 4

A copy of the second revised draft ACHAR was sent to all RAPs on 18 March 2024 with a 28-day review period closing 19 April 2024 (**Appendix 1 Figure 25**).

No comments were received on the second revised draft ACHAR from any of the RAPs.

3.3 ABORIGINAL COMMUNITY INVOLVEMENT

3.3.1 Phase 1

3.3.1.1 Field survey

A total of six site officers, including at least four site officers for each of the eight days, were present during the Phase 1 field survey.

Site officers included:

- DLALC: Ernest Mitchell, Jason Smith, Rexy Smith, and Russell Taylor
- Barkandji #8 Native Title Determinants: Owen Whyman and Jamin Jones.

3.3.1.2 Test excavation

A total of five site officers, including at least four site officers for each of the seven days, were present during the Phase 1 test excavation.

Site officers included:

- DLALC: Ernest Mitchell, Rexy Smith, and Russell Taylor
- Barkandji #8 Native Title Determinants: Owen Whyman and Jamin Jones.

3.3.2 Phase 2

3.3.2.1 Field survey

A total of nine site officers, including at least four site officers for each of the nine days, were present during the Phase 2 field survey.

Site officers included:

- DLALC: Jason Smith, James Toomey, Ernest Mitchell, Brendan Harris, and Russell Taylor
- Barkandji #8 Native Title Determinants: Hector Hudson, Talan Brown, Tarrant Lihou, and Robert Kennedy.

3.3.2.2 Test excavation

A total of four site officers were present during the Phase 2 test excavation.

Site officers included:

- DLALC: Ernest Mitchell and Russell Taylor
- Barkandji #8 Native Title Determinants: Tarrant Lihou and Robert Kennedy.

3.3.3 Phase 3

3.3.3.1 Field survey

A total of nine site officers, including at least four site officers for each of the nine days, were present during the Phase 3 field survey.

Site officers included:

- DLALC: Damien Kennedy and Hector Hudson
- Barkandji #8 Native Title Determinants: Calvin O'Donnell, Michael Young, Marshall Johnson-Roberts, and Josephine Johnson.

3.3.3.2 Test excavation

A total of four site officers were present during the Phase 3 test excavation.

Site officers included:

- DLALC: Damien Kennedy and Jason Smith
- Barkandji #8 Native Title Determinants: Calvin O'Donnell and Michael Young.

3.4 COMMENTS ARISING FROM THE ASSESSMENT

Two requests were made by site officers from both RAP groups participating in the fieldwork in relation to Aboriginal cultural heritage should the Project be approved. These are as follows:

- If any hearths are to be impacted by the Project, they be subject to radiocarbon (C14) dating so that as much information about the history of occupation in the area is known
- An area be set aside within the Heritage Assessment Area to serve as a reburial location for any Aboriginal objects salvaged.

During the Phase 1 assessment, site officers RAPs noted that the gypsum present across the Heritage Assessment Area may have been collected and used in antiquity as a source of paint for ceremonies and/or art.

4 LANDSCAPE CONTEXT

An understanding of the environmental contexts of an area is requisite in any Aboriginal archaeological investigation (DECCW 2010b). It is a particularly important consideration in the development and implementation of survey strategies for the detection of archaeological sites. In addition, natural geomorphic processes of erosion and/or deposition, as well as humanly activated landscape processes, influence the degree to which these material culture remains are retained in the landscape as archaeological sites; and the degree to which they are preserved, revealed and/or conserved in present environmental settings.

According to the Interim Biogeographic Regionalisation of Australia (IBRA) described by NSW National Parks and Wildlife Service (NPWS) the Heritage Assessment Area falls within Murray Darling Depression bioregion and the South Olary Plain subregion (NPWS 2003:79–90).

4.1 TOPOGRAPHY

The Murray Darling Depression bioregion lies in the Murray Basin on Tertiary and Quaternary sediments deposited from a shallow sea, lakes, and rivers. The landscape is characterised by dune fields, sandplains, and undulating plains. There is very little structured drainage, but numerous lakes, swamps and depressions are present, some of which are driven by saline groundwater (NPWS 2003). The landscape of the South Olary Plain is characterised by dune fields, sandplains, dry lakes, and groundwater basins (NPWS 2003:83).

In most arid lands, geomorphic processes and resultant landforms are dominated by wind action on unconsolidated surfaces (Thomas 1989). Therefore, depressions/basins and their lakes are likely to have their basins and shorelines modified by wind. This is demonstrated by the landforms present within the Heritage Assessment Area that consists of small, sub-circular to irregular relict lakes or groundwater basins in the central portions, termed throughout this ACHAR as the ‘eastern’ and ‘western’ salt pans. The salt pans are generally flat, but they contain raised gypsite crests or islands and gypsum-rich lunettes located to the east of the salt pans (Hulme 2020). Footslopes, which consist of long gentle slopes, are present on the western sides of the lake floors. Landforms surrounding the remainder of the groundwater basins are extensive sandplains, dunes, and swales with little topographic variation. The average slope across the Heritage Assessment Area is about 2%, with a local relief up to 10 m.

For the purposes of this assessment, this landscape has been divided into four survey units based on topographic zones which inform an archaeological characterisation of its landforms (**Figure 4-1** and **Figure 4-2**). These can be briefly characterised as follows:

- Lake Footslopes: Approximately 2,290 ha or 13.5 per cent of the Heritage Assessment Area consists of long, gentle slopes on the western sides of the salt pans

- Sandplains and Dunes: Approximately 7,583 ha or 46 per cent of the Heritage Assessment Area consists of undulating plains to dunes and swales
- Lunettes and Islands: Approximately 3,839 ha or 23 per cent of the Heritage Assessment Area consists of aeolian landforms which have generally built up on the eastern side of the salt pans. These landforms are variable throughout the Heritage Assessment Area and include irregular lunettes, raised gypsum crests or islands, and gypsite flats
- Salt Pans: Approximately 2,861 ha or 17.5 per cent of the Heritage Assessment Area consists of the eastern and western salt pans as well as the gypsite flats which are part of groundwater discharge basins.

Figure 4-1: Aerial showing the survey units within the Heritage Assessment Area.

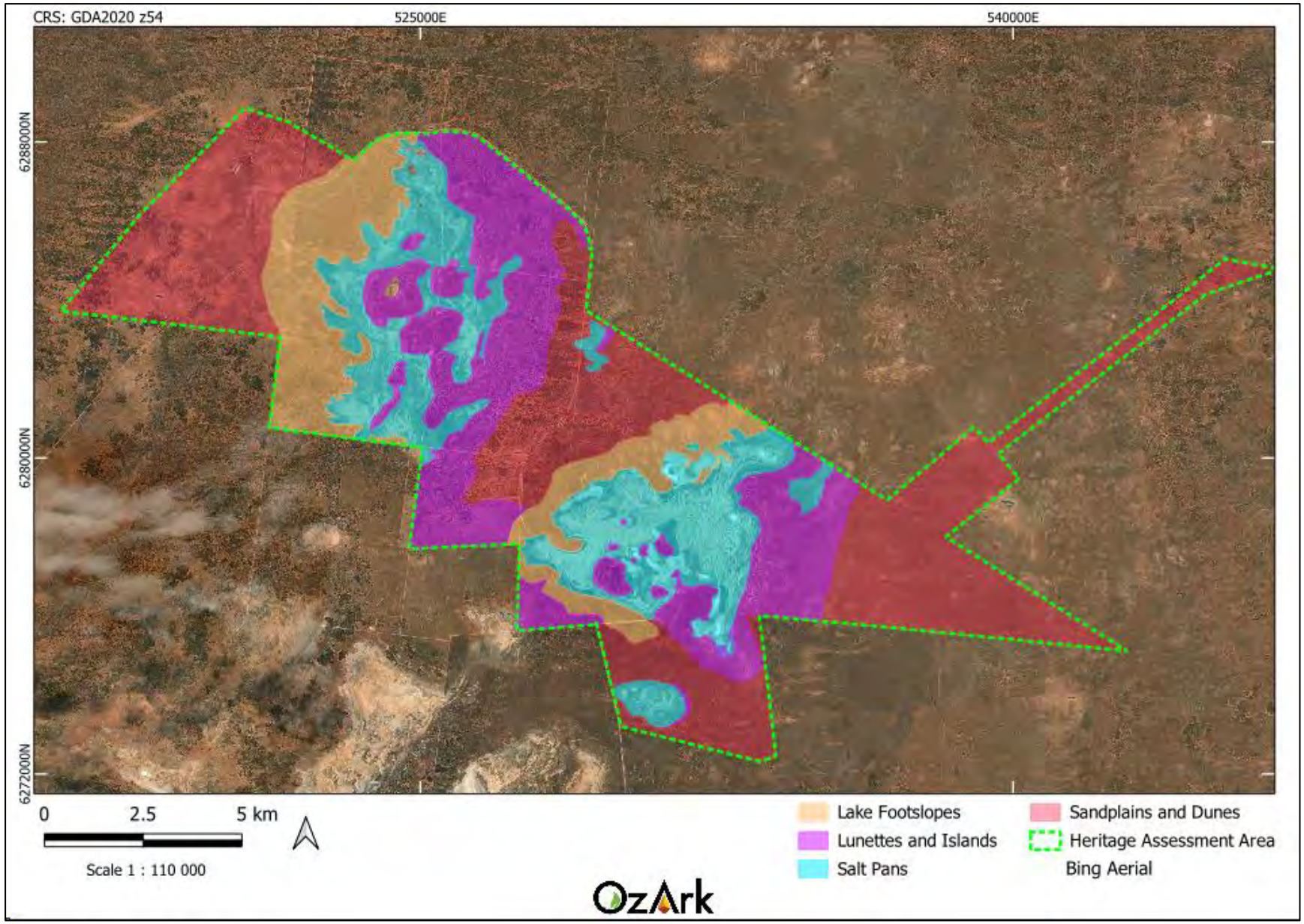


Figure 4-2: Examples of the survey units across the Heritage Assessment Area.

1. View south across the Lake Footslopes landform to the north of the eastern salt pan.

2. View west across the Lake Footslopes around the western salt pan.

3. View across the Sandplains and Dunes in the east of the Heritage Assessment Area.

4. View across the Sandplains and Dunes in the southwest of the Heritage Assessment Area.

5. View north across a lunette bordering the eastern salt pan.

6. View north across a lunette bordering the western salt pan.

7. View of the eastern salt pan.

8. View west across the vegetated western salt pan.

4.2 HYDROLOGY

Around two-and-a-half million years ago a large freshwater mega-lake, known as Lake Bungunnia, covered an area in the Murray Basin of more than 50,000 km^2 which encompassed the Heritage Assessment Area (Stephenson 1986, McLaren and Wallace 2010; **Figure 4-3**). Increasing climatic aridity and windiness around one million years ago is considered most likely to have caused the mega-lake to dry out during episodes of fluctuating wet and dry conditions corresponding with glaciation and inter-glacial periods (McLaren and Wallace 2010). This caused the mega-lake to shrink into smaller lakes and became 'hydrologically closed', which subsequently led to increased salinity (Stephenson 1986, McLaren et al. 2009, McLaren and Wallace 2010). These salt-lake sediments are known as the Yamba Formation (Firman 1966), with examples in the central portions of the Heritage Assessment Area (**Figure 4-1** and **Figure 4-4**).

These systems differ from the 'overflow lakes' such as the Willandra Lakes which consist of a connected series of lakes along a fluvial channel (i.e. Willandra Creek) which fill successively as each basin overflows along the chain (Bowler et al. 2012) and 'flood-out lakes' on the Anabranch Lakes on the Great Darling Anabranch which are flooded by river floods higher than the feeder channel levels. At its closest, the Great Darling Anabranch is located approximately 700 m to the east of the easternmost extent of the Heritage Assessment Area (including the Mine Site Access Road). According to Balme (1995), the Darling River (also referred to as the *Paaka* or the *Parka*) transitioned from what is now the Great Darling Anabranch to its current alignment approximately 7,000 to 9,000 years ago.

While previously the 'overflow lakes' and 'flood-out lakes' would have held more water, changes in hydrology and climatic conditions meant the lakes filled less frequently (Balme 1995). Subsequent drying of the landscape resulted in more aeolian activity with prevailing westerly and southerly winds leading to the formation of source bordering dunes or lunettes on lake shorelines just north of east, tapering in both directions. As such, the size of lunettes appears to reflect the

size of the initial basin, age, and local hydrology. Lakes provide favourable locations for human occupation, with lunettes aiding in the preservation of cultural deposits (Pardoe and Martin 2011:18–19).

Neither the 'overflow lakes' or the 'flood-out lakes' systems are 'hydrologically closed' and do not have shallow saline groundwater pools. In addition, landforms associated with the salt pans in the Heritage Assessment Area contain a large proportion of gypsum that has been blown out of the salt pans. Further, as the salt pans are irregularly shaped, they are often associated with islands as opposed to crescent-like lunettes associated with the 'overflow lakes' or the 'flood-out lakes'. As such, the 'overflow lakes' and the 'flood-out lakes' would have provided a more abundant freshwater sources and resources in antiquity as opposed to the eastern and western salt pans within the Heritage Assessment Area.

Figure 4-3: Location of the Heritage Assessment Area in relation to the extent of Lake Bungunnia (source: Brown and Stephenson 1991).

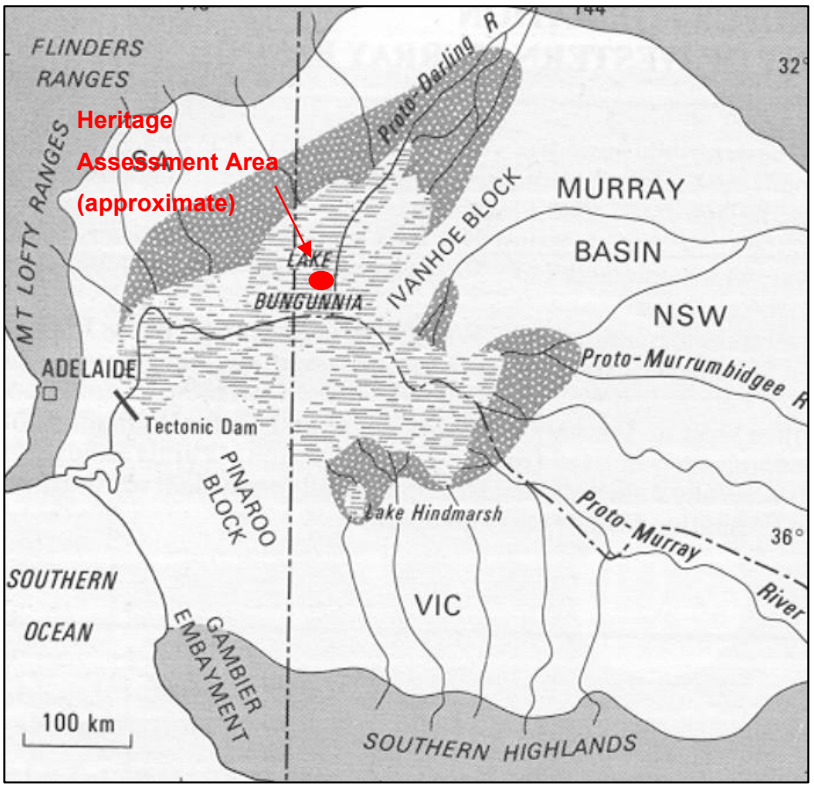


Figure 4-4: Aerial image of the eastern salt pan.

4.3 GEOLOGY AND SOILS

The Murray Darling Depression lies in the Murray Basin, a shallow crustal depression filled with marine and terrestrial sediments up to 60 m deep over the last 50 to 60 million years. Over that time, shallow seas moved back-and-forth across the plains, leaving traces of parallel beach ridges and limestone sediments under the dune fields. Sandy surface sediments were reworked into dunes and sandplains, and streams cut through these sands, constructing numerous flow lakes, including the abandoned Pleistocene channels and basins of the Willandra Lakes complex (NPWS 2003:80). The South Olary Plain is composed of Quaternary aeolian sands and lake sediments. Soils are composed of deep siliceous and calcareous red to yellow sands, sandy earths, with brown texture contrast soils on dunes and sandplains. Lake beds are composed of saline gypseous and calcareous clays, with mixed sands and pelleted clays in lunettes (NPWS 2003:83).

Hulme 2020 maps six Soil Associations within the Mine Site. These are described below:

- Dunes and Sandplains has profiles of red sandy topsoil over sand to sandy clay loam subsoil
- Lunettes contain a large proportion of material (gypsum) that has been blown out of the salt pans

- Lake Footslopes have been formed by deposition of sand that has come from the surrounding sandplains over subsoil that has been exposed by erosion as the relict lake floors (salt pans) have become lower
- Lake Floor East appears to be dominated by chloride and sulphate
- Lake Floor West to be dominated by sulphate
- Gypsite Flats have relatively low salinity topsoil.

4.4 VEGETATION

Cupper et al. (2000), analysed fossil pollen preserved within small salt-lake basins to reconstruct mid- to late Holocene vegetation in the arid and semi-arid ecosystems of Australia. The study focussed on two salt pans (Warrananga and Tooperoopna), located approximately 35 km southeast of the Heritage Assessment Area. The study found that arid and semi-arid consisted of a dense cover of *Casuarinaceae* woodlands over 4,500 years ago with the subhumid zone species *Allocasuarina luehmannii* potentially comprising some of the *Casuarinaceae* element. In the late Holocene, *A. luehmannii* disappeared from the record, likely due to increasing aridity or greater seasonal variation and salinization around basins likely resulted in chenopodiaceous low shrublands expanding. About 2,000 years ago, *Callitris* representation decreased, and further woodland contraction occurred after colonial settlement.

Vegetation within the Heritage Assessment Area currently consists of lake floors with chenopods, canegrass, and forbs; lake floor margins with belah, white cypress pine, yarran, and black bluebush; lunettes with mallee, spinifex, and porcupine grass and locally dense bluebush; and sandplains with bladder saltbush, belah, rosewood, sugarwood, and mallee plus abundant grasses and forbs (Mitchell 2002:42).

Saltbush seeds and the seeds of native grasses were used in bread baking, but this was labour intensive and was not used as a basis for subsistence. Other limited resources were available in the environment of the Heritage Assessment Area such as the roots of mallee that provided a small source of water, could have the root bark roasted and pounded for food, and the root/leaf extract used for medicinal purposes (Local Land Services 2016).

4.5 CLIMATE

The Murray Darling Depression bioregion is dominated by a warm semi-arid climate with hot summers and cool winters. Climate statistics from Lake Victoria, located 34 km south of the Heritage Assessment Area indicate that temperatures range from a monthly mean maximum of 32.3°C in January to a monthly mean minimum of 5.2°C in July. Average annual precipitation is 259.4 millimetres (mm) distributed evenly throughout the year, with the highest rainfall occurring in the winter and spring months, and the driest month being March (BOM 2024).

4.6 LAND USE HISTORY AND EXISTING LEVELS OF DISTURBANCE

Aboriginal people have sustainably harvested resources within the Murray-Darling basin for around 50,000 years (Allen and Holdaway 2009:99; Bowler et al. 2003). Within the Murray Darling Depression bioregion, European graziers began to displace Aboriginal traditional custodians as early as the 1830s. In the interim, the bioregion has been subjected to a variety of landscape disturbances due to pastoralism, vegetation clearance, erosion, feral animal introductions, river regulation, plant cultivation, and irrigation (NPWS 2003).

Pastoral runs were established within and surrounding the Heritage Assessment Area including Warwick, Huntingfield, Nulla, and Belmore Stations, which predominately graze sheep and goats.

Land use over the last 150 years has altered the distribution and condition of vegetation cover, fauna, and soils. Grazing and vegetation clearance have modified the sandplains and Witter (2004:146) identified the main erosional factors affecting open campsites in western NSW:

- Scalding leaves artefacts lagging on hard surfaces and hearths as pedestals
- Deflating margins of clay pans lag artefacts on compact surfaces, and runoff sorts them, carrying smaller artefacts to the centre and covering larger ones with sediment
- Deflation by blowouts in dunes lags artefacts and tumbles them down the sides, concentrating them at the bottom
- Gullying and rilling removes artefact-bearing sediment and hill slope erosion by sheet wash carries artefacts down slope and buries them.

The introduction of exotic grazing animals (predominately sheep and goats) has greatly accelerated these processes and has severely impacted the archaeological record, while rabbits have burrowed intensely through soft, sandy deposits, obliterating much of their stratigraphy (Witter 2004:147).

4.7 CONCLUSION

The review of the environmental factors associated with the study area allows the following conclusions to be drawn in terms of past Aboriginal occupation:

- Topography: the Heritage Assessment Area consists of relatively undifferentiated low-gradient undulating sandplains and dunes. There are no particular topographic features that would have attracted occupation in the past apart from those elevated landforms (lunettes and islands and footslopes) bordering sources the salt pans
- Geology and soils: the underlying geology offers little potential to provide raw materials for stone tool manufacture. The soils are generally an infertile, gritty texture-contrast soil (sandy) that is prone to erosion. The implication is that the soil of the Heritage Assessment Area would not have supported abundant resources in the past due to its infertility. Due to the soil's erodibility, a lot of soil has been lost, primarily the A1 Horizon, because of

grazing and vegetation clearing. Archaeological deposits are often associated with the A1 and uppermost A2 Horizons and therefore archaeological deposits may have been dispersed or removed because of this erosion. The other dominant soil type within the Heritage Assessment Area is powdery gypsum which has blown out from the salt pans and would also not have supported abundant resources in the past due to its infertility.

- Hydrology: The Heritage Assessment Area offers little in terms of hydrological resources. Two discharge basins are present in the central portion of the Heritage Assessment Area (the eastern and western salt pans) which are only likely to have only held water seasonally following periods of heavy rainfall, if any at all.
- Vegetation: The Heritage Assessment Area once supported an open woodland that would have provided some resources for Aboriginal subsistence in the past, however, the resources were limited and would have only supported sporadic or short-term visitation.
- Climate: relatively low levels of rainfall in conjunction with a lack of semi- or permanent water sources indicates that the Heritage Assessment Area would not have allowed year-round occupation by Aboriginal people in the past.
- Land use: The primary impacts to the Heritage Assessment Area have been grazing and vegetation clearance as both activities have caused soil erosion and soil loss. This soil movement causes archaeological deposits to be exposed through loss of A Horizon soils and they are subsequently either dispersed across the landscape or have become deflated coming to rest on lower soil strata. The implication is that much of the archaeological material within the Heritage Assessment Area is in a secondary context.

5 ABORIGINAL ARCHAEOLOGY BACKGROUND

5.1 ETHNO-HISTORIC SOURCES OF REGIONAL ABORIGINAL CULTURE

According to tribal maps (Tindale 1974) Aboriginal people of the Baakindji (Paakantji) language group inhabited the Lower Darling region at the time of first contact with colonial settlers. This language group comprised people who spoke the sub-dialects Barindji, Barkindji, Danggali, Maraura and Wiljakali. These tribes shared similar language and kinship systems, notably the division of members into matrilineal moieties (two-part social classification) known as Mukwara (wedge-tailed eagle) and Kilpara (raven) (Blows 1995 as cited in Cupper 2003).

The name Baakantji derives from the word "*Paaka*" meaning that the Baakantji people are those 'belonging' to the Darling River. Baakantji language country extends along the Darling River from approximately Bourke, further south to Wentworth, and the lower end of the Paroo and Warrego Rivers, as well as country spanning out to the west and east of the Darling River (Martin 2001:8).

From early European accounts and archaeological evidence, it appears that Baakindji were hunter-fisher-gatherers living a semi-sedentary lifestyle. Gerard Kreft (1865), an early explorer of the area, suggest that the Barkindji lived along the Lower Darling and Murray Rivers during the warmest months of the year, with people moving away from the rivers into the dune fields to collect food after winter rains (Cupper 2007). Bonney (1881) recorded the lives of the Aboriginal people which included aspects of hunting and collecting food, and the common diet of the Baakantji people. Seeds were often ground and were procured from several types of grasses, portulacca, gum tree, pigweed, nardoo, mulga, and small-leaved saltbush. Vegetable and fruit resources included portulacca roots, Paddy melon, fruits and stalks and leaves, cress, clover, wild spinach, marshmallow leaves and flowers, stems of the large rush, wild banana leaves, flowers, fruits, and leaves, the quandong, wild orange, mulga apple and wild tomato, mistletoe fruits, and various gums. Animal foods recorded by Bonney included rock wallaby, wild cats, dingo, echidna, wild turkey, broglas, ducks, emu, eggs, frogs, and grubs (Martin 2001:23). Extensive use of traps, weirs, and dams dramatically increased the availability of food resources including fish, yabbies, mussels, shrimps, waterfowl, and aquatic plants. Stone fish traps can still be found today along the Darling River in areas with suitable rock outcropping (Martin 2001:23).

Harry Nanya (c. 1835–1895), a Maraura of the Lower Darling and his family, were the last of the Barkindji to live by traditional hunting techniques, ranging from around Lake Victoria and along the Great Anabranch of the Darling (ANU ADB online; Cupper 2007:B14). Nanya's childhood through 1839–46, coincided with the incursions of European explorers, which were accompanied by expeditions that killed most of his people, notably in the 1841 Rufus River massacre by South Australian police led by Thomas O'Halloran. Around 1860 Nanya left his camp at Popiltah station, 60 km north of Pooncarie, with two women and a steel axe, he went into the waterless mallee country between the Darling Anabranch and the South Australian border, where he lived for over

thirty years. Notes from amateur ethnographers suggest Nanya's self-imposed exile may have been due to having eloped with a woman of his own Makwarra moiety, an offence considered incestuous and meriting death (ANU ADB online).

Although Nanya's mob kept themselves well hidden, by the early 1890s the press reported more frequent sightings of the 'wild tribe' and tracks left around water holes showed that Nanya's family was increasing in numbers, causing anxiety and fear amongst the white settlers (ANU ADB online). In 1893 Aboriginal stockmen tracked down the family and persuaded them to return to the river. The twelve men, eight women, and ten children, all in good physical condition, arrived at Popiltah Station and Nanya still had his steel axe, now worn wafer-thin. The Aboriginal Protection Board selected a site at Travellers Lake, near Wentworth, for them to settle, but Nanya's people preferred hunting-camps in the vicinity of Pooncarie.

The story for most of the Barkindji tribe, however, was that within about ten years of the advance of pioneering colonial settlement, they were living adjacent to pastoral homesteads, often working as shepherds or in other labouring activities (Lans et al. 1988 and Withers 1989 in Cupper 2007:B-14). By the turn of the nineteenth century many Barkindji resided on the Darling River near Pooncarie where an Aboriginal mission had been set up in 1911.

5.2 REGIONAL ARCHAEOLOGICAL CONTEXT

The Darling River, the Darling River Anabranch, and lake systems in southwestern NSW have been the subject of several heritage assessments, archaeological excavations and detailed academic studies. Some of the earliest evidence of human occupation of Australia comes from south-western NSW (Cupper 2007:B-14). The site of Lake Mungo contains archaeological evidence including human remains and stone tools that date to between 46,000 and 50,000 years before present (BP) (Bowler et al. 2003). Evidence for human occupation has also been found at Menindee Lake from 45,000 BP (Cupper and Duncan 2006 as reported in Cupper 2007:B14) along the Darling River and at Lake Victoria on the Murray River by around 21,000 BP. Archaeological evidence from Willandra Lakes suggests that Aboriginal occupation in the Murray-Darling basin dates from between 46,000 and 50,000 BP (Allen and Holdaway 2009:99; Bowler et al. 2003).

Previous archaeological studies undertaken within the vicinity of the Heritage Assessment Area provide information to obtain an understanding of the nature and distribution of archaeological sites within the area.

Clark 1983a

In 1983, Clark completed an archaeological assessment of a proposed drill hole (Nulla Nulla 1) with a 350 metres (m) radius, 40 km north of Lake Victoria. The study area was located on a tree-less low-lying landform. The only potential Aboriginal object identified included a piece of baked

clay. The absence of archaeological sites was attributed to the scarcity of water resources and was concluded as being more likely occupied briefly during the wet season, or when specific resources were present.

Clark 1983b

Clark (1983) completed an archaeological assessment along three proposed seismic lines in south-western NSW. The Aboriginal sites were identified within the corridor of R83A-1 seismic line corridor which traversed a variety of landforms including longitudinal dunes in the east through to gently undulating sandplains and low-lying lake basins in the west. All three sites consisted of campfire or hearth remnants, two of which were identified near basins. No stone artefacts were found in association with the hearths or as discrete scatters.

Seismic line R33A-2 traversed the edge of the Darling River floodplain, then undulating sandplains comprised of degraded linear sand dunes and numerous low-lying lake basins. 15 sites were identified within the corridor. 14 of the 15 sites contained campfire remnants, seven of which were associated with stone artefacts. The largest of the sites identified was located adjacent to a billabong and extended 1,000 x 400 m and comprised at least twenty hearths. Silcrete flakes were present across much of the site, with several dense knapping floors identified. Retouched artefacts present include scrapers and adzes. Cores, hammerstones and fragments of grinding dishes were also present.

Seismic line R83A-3 traversed mostly mixed woodland covered linear dunes. No water sources were present in the general vicinity of the assessed corridor and was concluded as the main contributing factor to the absence of Aboriginal sites.

Clark concluded that the hearths identified were likely only used once or twice when Aboriginal people were camping in areas away from rivers and that the location and frequency of sites so far recorded in the Lower Darling region suggests that Aboriginal people lived for most of the time along rivers, lakes, and creeks. Brief visits were made into the relatively waterless hinterland area during hunting and gathering forays, however, this subsistence pattern probably became modified following heavy periods of rain when the landscape away from the rivers became flooded.

Martin 1985

Martin (1985) conducted a survey for a proposed seismic line to the west of Lake Popiltah and included a sample of lakes, lunettes and dune field landforms in the west region and undulating sandplains, sub parabolic dunes with palaeochannels, source bordering dunes, swampy depressions, and clay pan landforms located 70 km northeast of the Heritage Assessment Area. A large number of sites were recorded predominately near formerly permanent water sources. Sites included low density silcrete and quartz artefact scatters of backed flakes, cores, pounders, tula adzes, scarpers, grindstone fragments, mortars, and top stones. Hearths were also located, as were middens.

Martin 1986

An archaeological survey was completed by Martin (1986) at two sites in Hay, two at Wentworth, and one at Balranald and forms the original archaeological survey of the Wentworth Pump Station located 200 m from the junction of the Murray and Darling Rivers, 80 km southeast of the Heritage Assessment Area. Two middens, an open campsite, and a scarred tree were recorded. One of the midden sites was identified as containing freshwater mussel shells, freshwater snail shell, baked clay, bird bone, and fragments of mammal bone. The hearth was also identified with fragments of shell as well as silcrete flakes.

Bonhomme 1990

Bonhomme (1990) examined the distribution of burials on the Riverine Plain and the Murray Mallee Sandplain to the west and found that burial distributions were related to geomorphology. Bonhomme categorised burials as: isolated individuals occurring randomly; locations with large numbers of burials apparently unrelated in space and time; and cemeteries with large numbers of burials associated in space and time. Cemeteries were not found on the eastern Riverine Plain, but increased in number in the west and southwest, toward the Mallee Sandplain. Sand bodies tended to contain burials, including lunettes, lunette fragments, source bordering dunes, modern riverbank levees, palaeochannel levees and channels, alluvial fan remnants, sandplain remnants, and reworked dune sets (Bonhomme 1990:146–148).

Craib 1992

Craib (1992) undertook a study of 625 ha of land across the Darling River margins on Kelso and Burtundy Station and the Murray River margins upstream of Wentworth.

Dune fields, sandplains and elevated alluvial terraces were associated with artefact scatters, and scarred trees. Sites were sparse in the sand hills, but source bordering dunes were associated with burials, stone artefacts, and scarred trees.

Riparian areas near margins and floodplains of flowing rivers and creeks were correlated with middens, scarred trees and artefact scatters were more abundant on the Darling River than the Murray River System. Lake deposits, swamps and billabongs were found to have a higher density of middens, scarred trees, and burials than riparian landscapes.

Johnston and Witter 1996

Johnston and Witter (1996) developed a predictive model for Aboriginal archaeological site locations in western NSW. Expert system forecasts, archaeographic modelling (based on groups of land systems and their margins) and in-field reliability testing were employed to assess and characterise the distribution of Aboriginal archaeological material across the landscape. According to the predictive model for the semi-arid to arid landscapes in NSW:

- Occupation is expected near water, with the abundance of archaeological evidence proportional to the quality of the water source, including reliability, salinity, and vegetation
- Occupation is expected to focus on ecotonal boundaries. Preferences exist for certain environmental types, which are ranked according to factors like: the presence of ephemeral water, food resource abundance, and food resource diversity
- Where a stone source exists, artefacts can be expected to have increased numbers within a radius of 20 km, with extreme abundance within a radius of 2 km.

Bonhomme 1999

Bonhomme, Craib and Associates 1999 (Bonhomme 1999) completed the Murray Darling Water Management Action Plan (MDWMAP) largely via desktop review for an area of 900,000 ha extending 5 km either side of the Darling River from Wentworth to the Murrumbidgee confluence in the east. The study was a response to problems regarding the location and disturbance of Aboriginal sites.

The study found a general increase in the number and range of sites occurring from east to west. Mound sites, with some containing burials, began to appear around 4,000 BP and were strongly associated with the lower Darling River, the central and lower Murray, and Wakool River systems.

Large shell middens were found in association with human burials along the Murray River dating between 13,000 and 10,000 BP. Isolated individual burials were most common of the Riverine plain. Many burials were located within the sand dunes along the Murray River, also with their occurrence in floodplain clays, prior stream sediment, mounds, and lunettes. Multiple human burials were most common on lunettes and in source bordering dunes near stream channels. Burial grounds were most commonly recorded on source bordering dunes, prior stream levees and on the point bar sediment of rivers and lake outlet channels.

Edmunds 1999

Edmunds (1999) completed an archaeological assessment for the bridge replacement across the Great Darling Anabranch along Main Road 68 (MR68), located 50 km south of the Heritage Assessment Area. Three land systems were identified within the study area, all of which were assessed as having moderate archaeological sensitivity. These land systems include:

- Anabranch – elevated sandy lunettes, elevated plains, and channel margins
- Hatfield – margins of swamps and depressions; and margins of lacustrine and riparian land systems
- Wentworth – elevated sandy rises; elevated back plains close to water sources; margins of elevated floodplain adjacent to lower floodplains; and channel margins.

Six Aboriginal sites were identified during the survey, including an artefact scatter with heat retainers from hearths, two middens, and two middens with stone artefacts. Sites were identified

on the immediate bank of the Great Darling Anabranch, sand dunes along the riverbank, or elevated sandplains adjacent to the floodplain. The artefacts identified were predominately made from silcrete. Edmunds (1999) notes that silcrete occurs locally from pedogenic rocks which outcrop at Berribee on the Lindsay River in Victoria, and silcrete seams are widespread between Wentworth and Broken Hill but the seams are generally small and widespread. Artefacts consisted mostly of unmodified flakes, although a grindstone was also recorded.

Holdaway et al. 2002

Holdaway et al. (2002) have attempted to resolve questions relating to the chronology of Aboriginal occupation in the arid margins of south-eastern Australia in areas well away from major rivers and lakes. In an area to the north of Broken Hill, Holdaway dated charcoal deposits found in 28 heat retainer hearths in Sturt National Park. The charcoal dates demonstrated hearths were used in the area for at least the past 1,700 years, but with a gap of 200–400 years between 820 ± 50 and 1170 ± 130 years BP. This finding was interpreted as demonstrating a hiatus in occupation of the area. However, while Holdaway suggests the possibility palaeo-environmental fluctuations resulted in this discontinuity of occupation, the authors nevertheless advised caution in postulating causes until further research had been conducted.

Witter 2004

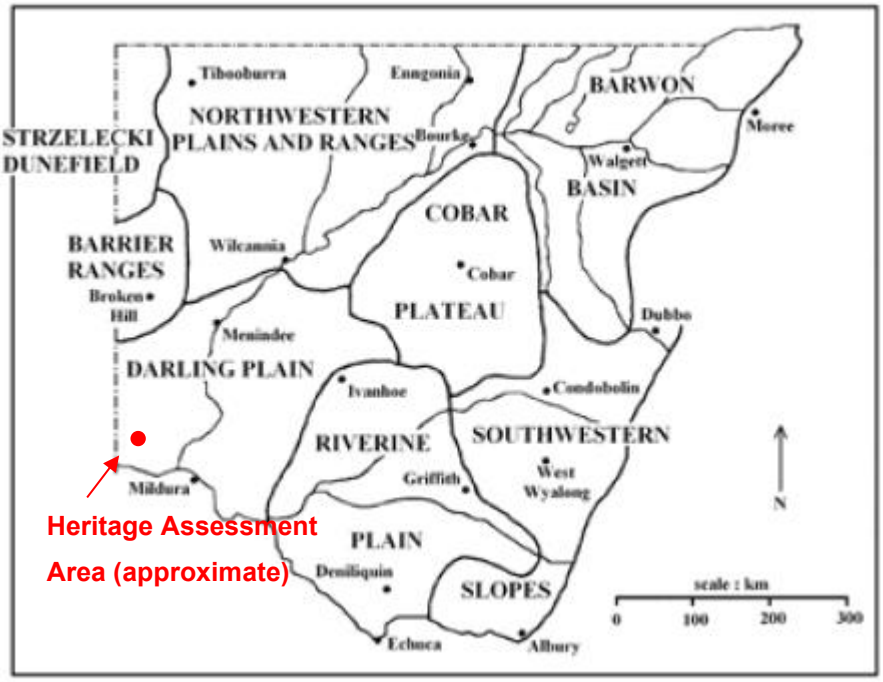
In 2004 Witter investigated the variation of archaeology within the different regions of western NSW. Witter proposed eight archaeological regions in western NSW based on the differences in site types and materials present. According to Witter, the Heritage Assessment Area is located within the 'Darling plain' (**Figure 5-1**). The archaeological features of this region are summarised below:

- Darling plains:
    - Camps are common along rivers, stream channels, swamps, and lakes, but rare on sandplains and in mallee dunes except around box swamps
    - Quarries are very rare but if present consist of silcrete
    - Burials are frequent along riverbanks and lake shores, as well as in source-bordering dunes and lunettes
    - Scarred trees are frequent along riverbanks
    - Hearths are common and mostly comprised of termite clay, but some clay lumps and calcrete nodules were also utilised
    - Middens are generally present along riverbeds, lakeshores, and some lunettes.

Witter noted that most of the archaeology in western NSW is found as surface sites, with specialised technologies frequently present, suggesting they date to within the last 5,000 years.

However, Witter highlighted that a few areas within western NSW, such as the Darling region, are conspicuous for their Pleistocene deposits.

Figure 5-1: Archaeological regions of western NSW (source: Witter 2004:134).



Shiner 2006

Shiner (2006) found a discontinuity in landscape occupation for the past 2,000 years when dating 16 hearths in conjunction with an analysis of the surface stone artefact assemblage from Pine Point and Langwell Stations, located just to the south of the foothills of the Barrier Range. Shiner (2006) found the different artefact assemblages he examined represented unique occupational histories, but these were punctuated by long periods with scant evidence of Aboriginal presence or activity.

Fanning et al. 2007

Fanning et al. (2007) completed an archaeological research program in the Peery Lake area of Paroo Darling National Park in western NSW, located 380 km northeast of the Heritage Assessment Area. Fanning et al. undertook the third progress report of the project which commenced in 2005, and it focused on results of heat-retainer hearth excavation and dating carried out in 2006 and 2007. The project methods were to document stone artefact deposits and associated heat-retainer hearths produced and discarded by Aboriginal people. The aim was to understand how people lived and the variation in the characteristics of the objects left behind over many thousands of years of occupation. The project was conducted to comprehensively assess the significance of an archaeological record under threat of destruction through erosion. The research focussed on a 60 km^2 catchment area of Rutherfords Creek, located in the Peery Hills on the western side of Peery Lake. These areas were chosen based on:

- The large number of stone artefacts and hearths on the valley floor
- The accessibility of the catchment area
- The location being entirely contained within the national park.

The field methods used erosion features commonly referred to as 'scalds' as sampling methods for survey and excavation, as stone artefacts were often the lag remaining behind on the scald surface and were generally highly visible. Surface scalds were also used as good locators for the remains of heat-retainer hearths or earth ovens. Hearth remains were commonly clustered near to creeks and waterholes, and the aim was to extract, where possible, charcoal samples that could be analysed in a laboratory to determine how long ago the hearth was used. The three-year period of the project (2005–2007) identified the remains of 1,054 hearths in the Rutherfords Creek catchment. It was considered likely that more existed but only those visible on the surface were recorded. Consent was approved to partially excavate 156 hearths in 2006 and 100 in 2007 with an aim to extract charcoal samples for radiocarbon dating. Additionally, up to four hearth stones from each hearth were collected to conduct a trial of a new dating technique (optically stimulated luminescence, or OSL). Over 300 hearth stones were analysed. Approximately one third of the hearths excavated contained enough charcoal for radiocarbon dating. The rest either contained no charcoal or were too disturbed by processes of bioturbation, erosion, and/or the effects of grazing animals. Of all the hearths that were excavated, all dated to be less than 2,500 years old, and thus illustrate a pattern of repeated return of people to the valley. The age range of the hearths was related to the geomorphic environment, with those areas near the creek, that were considered most susceptible to erosion, having a shorter record than more stable areas at some distance from the creek. This was a similar pattern identified by the authors in other areas of western NSW.

Cupper 2007

In 2007, Landskape completed an archaeological assessment for the Snapper Mineral Sands Project, located between the Darling River and the Great Darling Anabranch, approximately 45 km east of the Heritage Assessment Area. Land systems identified within the study area are:

- Trelega – slightly undulating sandplains and swales
- Overnewton – slightly undulating sandplains with isolated sandy hummocks and depressions
- Hatfield - slightly undulating sandplains with isolated depressions
- Arumpo – parallel dunes.

22 Aboriginal sites were identified during the survey. Sites included two hearths, two isolated finds, two artefact scatters with associated hearths, four quarries with associated artefacts, and 12 artefact scatters. In relation to the land systems, two sites were recorded within the Hatfield

land system, five within the Trelega land system, and the remaining 15 within the Overnewton land system. All these land systems are represented within the Heritage Assessment Area and generally correlate to the 'Sandplains and Dunes' survey unit.

OzArk 2009

In 2009, OzArk completed an Aboriginal cultural heritage assessment for proposed shoulder widening along the Silver City Highway, near Lake Commbah, located 97 km northeast of the Heritage Assessment Area. The archaeological survey assessed dunefields, undulating sandplains, playa and basins, lunettes, feeder channels, and depressions. Six Aboriginal sites were recorded including artefact scatters, hearths, and an isolated find. The assessment concluded that there may be potential for human burials to be located at depth in the dunes adjacent to the highway, though such occurrences would be rare. Intact subsurface deposits were assessed to be less likely due to the level of disturbance, but areas of potential archaeological deposits (PAD) were also identified.

Niche 2017 and 2019

Throughout 2016 and 2017, Niche Environment and Heritage (Niche) completed an archaeological survey for a 270 km pipeline extending from the Murray River at Wentworth to Broken Hill (W2BH), largely adjacent to the Silver City Highway and traversing the river and creek floodplains, sandplains, dune fields, playa and basins, lowlands, and Barrier Range land systems. As a result of the survey, 240 Aboriginal sites were identified, six previously recorded sites were found to have a larger extent than originally recorded, and an additional 12 previously recorded sites were located.

Of the recorded sites, 107 were stone artefact sites, 20 were hearths, five were artefact scatters with hearths, and four contained artefacts, hearths, animal bone, shell, and PAD. The remaining sites were stone artefacts with PAD, stone artefacts with shell, and scarred trees.

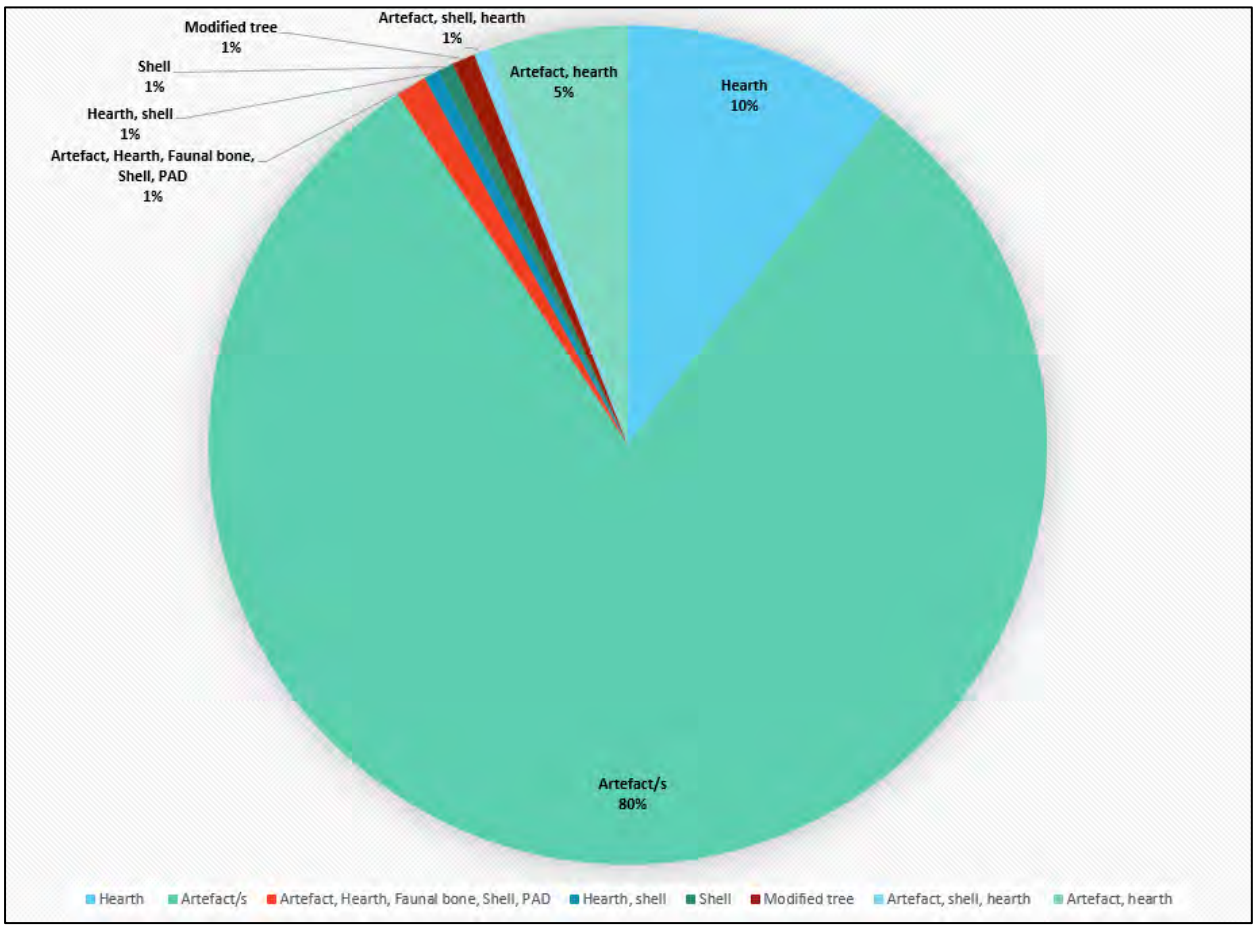
The Fowlers, Conservation, Darling, Barrier, Nine Mile, Oakvale and Kars land systems had the greatest number and density of artefacts recorded, reflective of the availability of raw material sources for manufacture and the availability of temporary water in these systems. Visibility of hearths was more common in the alluvial plains and sandplains than in the ranges and rolling downs and lowlands. Most sites were located within 600 m of water and where sites were located further away, they tended to be associated with stone sources.

Between December 2017 and July 2018, Niche completed salvage excavations for the W2BH pipeline (Niche 2019).

The salvage followed the completion of the archaeological survey and a test excavation program. Aboriginal sites consisting solely of stone artefacts at varying densities comprised 80% of the

recorded site types. At other locations, stone artefacts were recorded in association with shell, faunal bones, hearths, and/or PAD (**Figure 5-2**).

Figure 5-2: Recorded site types across the pipeline alignment.



The surface collection and salvage excavations were completed in accordance with the conditions of the respective AHIPs listed in **Table 5-1**. **Table 5-1** also summarises the number of sites impacted and the overall area of excavated material.

Table 5-1: W2BH pipeline: Project components and AHIP areas.

Kilometres along pipeline (KP)	Project component	AHIP number	Number of sites impacted (partially or totally)	Number of sites determined not to be a site.	Area excavated
0-111.5 km	Stream 2A	C0003217	24	12	46 m^2
3.5 to 4.5 km	Darling River Crossing	C0003772	2	-	10 m^2
111.5 to 157 km	Stream 2B	C0003333	54	1	201 m^2
157 to 221.75 km	Stream 2C	C0003451	85	-	5 m^2
221.75 to 270 km	Stream 1	C0003153	102	-	10 m^2

Niche 2019 results

The results of the overall assemblages of materials recovered during the salvage are summarised below:

- 8,211 stone artefacts were retrieved during the W2BH pipeline salvage. This included 4,614 stone artefacts collected across the surface and 3,597 recovered from excavations. An additional 800 non-diagnostic stone objects which were also collected. Salient characteristics of the artefact assemblage were:
    - The dominant material in the excavation assemblage was silcrete of varying grain size, comprising 48.51% of the overall assemblage, followed by quartz (both milky and crystal) with 28.74%, and quartzite comprising 11.9%. Overall, both locally procured and non-local sources of materials were utilised
    - The most common artefact type was broken flakes (35.31%) followed by complete flakes (17.51%). Angular fragments made up 15.93% of the assemblage while formal tools accounted for less than 6%
    - Preference of finer grained materials for retouched tools, i.e. scrapers, backed blades was observed.
- Residue analysis on stone tools showed evidence of processing starchy and non-starchy plants, processing plants for medicinal purposes, and processing of animals
- Eleven Aboriginal sites were associated with the remains of several types of shellfish, however, only two sites (both located adjacent to the Great Darling Anabranch) contained enough samples for analysis. Both sites displayed some evidence of cultural discard, i.e. heterogenous species composition and some burnt shell, however, there was not enough evidence to rule out that potential of the accumulations being from natural causes.
    - Shells recovered at depths between 20 to 60 centimetres (cm) from LTWP AFT HTH 103/MBHP AFT 5 on a rise dated between 2750 and 14064 cal BP[1] indicating a small volume of accumulated shell over a long period of time
    - Shell collected from MBHP AFT 7 on the floodplain dated to 266–47 cal BP and 910–790 cal BP. This was much more recent than the fish bone recovered at similar depths; therefore, indicating mixed and inverted deposits.
- Fish otoliths were identified at one Aboriginal site which comprised stone artefacts and a potential midden (MBHP AFT 7) located on the floodplain of the Great Darling Anabranch. 19 otoliths were analysed, all from golden perch. Analysis found that the fish died at different times throughout the seasons and experienced fluctuating environmental conditions induced by seasonal environmental changes. Radiocarbon dates obtained range from 2750–2490 to 540–500 cal BP. Two distinct clusters of dates are evident, one from ca. 500–910 cal BP, and another from ca. 2000–2750 cal BP

[1] The cal prefix indicates that the dates are the result of radiocarbon calibration using tree ring data. These values should correspond exactly to normal historical years BCE and CE. The term cal BP means the number of years before 1950 and can be directly compared to calendar years.

- Faunal bones comprised only a small percentage of recovered material from excavations and most of the recovered bone was small, fragmentary, and non-diagnostic. Where identifications could be made, they included, rabbit, rodent, yabby, sheep or goat, reptiles, golden perch, macropod, crayfish, gastropod, and various mammals. The assemblages and presence of certain species provide indications of the degree of disturbance at some of the sites. No bone displayed any indication of cultural modifications, and none was burnt

- 13 hearths which were identified during the survey were further investigated during the salvage and were determined to be remnants of natural, burnt termite mounds and /or attributed to land clearance practices

- Pleistocene occupation was confirmed at Lake Popiltah and possible terminal Pleistocene/early Holocene occupation at Pine Creek, in addition to Holocene occupation and Mid-late Holocene occupation was identified at Twin Lake[2].

    - Pine Creek

        - Optically Stimulated Luminescence (OSL) dating at LTWP AFT HTH 75 from test pit 159 provided dates of 14700 ± 500 BP for spit 10 and 15900 ± 1200 for spit 12. A third sample from test pit 161, spit 13, suggested early Holocene sediment deposit accruing on a Last Glacial Maximum (LGM[3]) feature with significant bioturbation episodes introducing earlier sand grains to the deposit. The dominant sand grain dating was 10800 ± 500 BP.

    - Lake Popiltah

        - Dating results indicate possible Aboriginal occupation dating back to 42,000 years ago

        - Artefact numbers peaked at Open Area 9 at 130–135 cm, 160–170 cm and 190–205 cm. No artefacts were identified below 205 cm. The results indicate that multiple phases of occupation took place at MBHP AFT 48/46/45 during the Pleistocene Period

        - Only 25 artefacts were found in the top 100 cm during the test excavation at MBHP AFT 48/46/45. These included debitage fragments with no tools, indicating that there was a change in the way people occupied the location, possibly as a result of changing environmental conditions i.e. the transition of the Darling River from the anabranch around 7000–9000 BP meaning Lake Popiltah would fill less frequently.

[2] In terms of human occupation in Australia, the Pleistocene is associated with the ice ages that resulted in cooler temperatures and drier conditions. Around 12000 BP in the Holocene Period, conditions began to warm, and rainfall increased. Generally Aboriginal occupation becomes more widespread in the Holocene as conditions allowed a greater distribution of the resources required for sustenance.

[3] In Australia, the LGM is from 25000–16000 BP.

Biosis 2020

In 2020, Biosis completed archaeological investigations for the Pooncarie Menindee Road Upgrade project.

The survey identified 82 Aboriginal sites, most of which consisted of stone artefact sites (isolated finds or scatters) and hearths. A small number of scarred trees and one burial were also recorded. Two previously recorded sites were unable to be located. Most recorded Aboriginal sites were located on or at the fringe of sand dune and floodplain landforms, near to the Darling River, its paleochannels, and ancient lake systems. Given the high number of sites recorded on the eroding edges of the sand dune landforms along the assessed alignment, these landforms were considered to have moderate to high potential to contain *in-situ* subsurface deposits.

Flaked artefacts were the most recorded artefact type identified during the Biosis survey, comprising 71.4% of the total surface assemblage. These flaked artefacts were made up of several artefact types including 24 (28.6%) complete flakes, 10 (11.9%) angular fragments, six (7.1%) multiplatform cores, seven tools (8.3%), four proximal flake fragments (4.8%), and three (3.6%) each of distal flake fragments, medial flake fragments, and single platform cores. In addition to the flaked artefacts, six hammerstones making up 7.1% of the artefact assemblage and 18 grindstone implements (21.4%), consisting of 15 grinding stones (17.9%) and three mullers (3.6%) were recorded. The tool assemblage consisted of three round edged scrapers (42.8%), two steep-edged scrapers (28.6%), and one each (14.3%) of a unifacial point and an edge ground implement.

The assemblage was dominated by silcrete, making up 52.4% of the assemblage, with quartzite the next most dominant raw material recorded, making up 33.3% of the assemblage. Several other raw materials were identified in much smaller amounts, with quartz making up 6% of the assemblage, chert, and sandstone each representing 2.4%, and glass, greenstone, and rhyolite each recorded once.

Following the survey, Biosis undertook subsurface testing within a floodplain landform where surface artefacts were identified but was considered to have low archaeological subsurface potential. The objective of the test excavation was to determine whether subsurface artefacts were present within the floodplain landform at the site location. Two 0.5 x 0.5 m test units (TU) were excavated adjacent to site MPR58. Both were excavated to a depth of 60 cm and no artefacts were identified. Excavation ceased at 60 cm as soils were culturally sterile due to the lack of cultural material, high compaction due to calcrete cementation, and the soil's alluvial depositional nature.

Landskape 2021

In 2021, Landskape completed the Aboriginal heritage assessment for the Burgona Landfill expansion project located approximately 25 km east of Wentworth and 5 km north of Buronga.

The assessment area included undifferentiated sandplains with an intersecting swale in the central portion. Vegetation includes Black and Pearl Bluebush and Belah open woodlands. The assessment area had been utilised for grazing purposes and displayed disturbances from past soil stripping and quarrying. One previously recorded site, an isolated sandstone core, recorded near the assessment area could not be located. An additional three isolated finds were recorded, including a silcrete flake, silcrete debitage, and a broken sandstone muller.

OzArk 2022

In 2022, OzArk completed a test excavation program along the Pooncarie Road realignment route near Karoola Station. The test excavation focused on the dune landforms previously assessed by Biosis (2020) as having high archaeological potential.

During the test excavation, 26 TUs (0.5 x 0.5 m) were excavated at four separate localities. No artefacts were recovered from any of the four localities confirming that the dunes across the study area are unlikely to be associated with subsurface deposits as they have been heavily impacted by erosion. A possible hearth was recorded in Tr2 Sq1 at Area 1.

5.3 LOCAL ARCHAEOLOGICAL CONTEXT

5.3.1 Desktop database searches conducted

A desktop search was conducted on the following databases to identify any potential previously recorded heritage within the Heritage Assessment Area. The results of this search are summarised in **Table 5-2** and presented in detail in **Appendix 2**.

Table 5-2: Aboriginal cultural heritage: desktop-database search results.

Name of Database Searched	Date of Search	Type of Search	Comment
Commonwealth Heritage Listings	12/01/2020, 11/1/2022 and 24/10/2023	Wentworth Shire LGA	No places listed on either the National or Commonwealth heritage lists are located within the Heritage Assessment Area
National Native Title Claims Search	12/01/2020, 11/1/2022 and 24/10/2023	NSW	One determined Native Title Claim (NC1997/032; NSD6084/1998 Barkandji Traditional Owners #8 [Part A]) is present within the Wentworth Shire LGA.
AHIMS	12/01/2020	GDA Zone 54 Eastings: 499143–559143; Northings: 6251420–6311420	12/01/2020 results: 16 AHIMS sites within the designated search area. None are located within the Heritage Assessment Area.
	11/1/2022	GDA Zone 54 Eastings: 99162-579162 Northings: 6273649.0 - 6293649.0	11/1/2022 results: 110 AHIMS sites within the designated search area. Sites located on AHIMS within the Heritage Assessment Area are those recorded as part of the Phase 1 assessment (**Section 6**).
	26/3/2023	GDA Zone 54 Eastings: 529162 - 579162, Northings: 6273649 – 6293649 and Eastings: 499162 - 529161, Northings: 6273649 – 6293649	26/3/2023 results: 151 AHIMS sites within the designated search area. Sites located on AHIMS within the Heritage Assessment Area are those recorded as part of the Phase 1 and 2 assessments (**Section 6** and **Section 8**).

Name of Database Searched	Date of Search	Type of Search	Comment
	22/4/2024	GDA Zone 54 Eastings: 529162 - 579162, Northings: 6273649 – 6293649 and Eastings: 499162 - 529161, Northings: 6273649 – 6293649	22/4/2024 results: 173 AHIMS sites within the designated search area. Sites located on AHIMS within the Heritage Assessment Area are those recorded as part of the Phase 1 to 3 assessments (**Section 6**, **Section 8** and **Section 10**).
Local Environmental Plan (LEP)	12/01/2020, 11/1/2022 and 24/10/2023	Wentworth Shire LEP of 2011	None of the Aboriginal places noted occur within or near the Heritage Assessment Area.

As per **Table 5-2**, it is noted that the Heritage Assessment Area is situated on land of a determined Native Title Claim (NC1997/032; NSD6084/1998 Barkandji Traditional Owners #8 [Part A]). However, the Heritage Assessment Area is situated within leasehold land (Western Lands Leases) which were issued by the Crown in perpetuity under the *Western Lands Act* (1901) or acquired as freehold under the *Crown Lands Management Act* (2016). As such, the High Court of Australia has extinguished native title over all lands that were the subject of Western Lands Leases.

Four searches of the AHIMS database have been completed across the three phases of assessment for the Project. These searches have returned 45 previously recorded Aboriginal sites, excluding those recorded by OzArk as part of this Project, within approximately 20 km of the Heritage Assessment Area. None of the 45 previously recorded sites are located within the Heritage Assessment Area (**Figure 5-3** and **Figure 5-4**).

Figure 5-3 shows the location of the AHIMS sites, excluding those recorded by OzArk as part of this Project, that have been recorded near the Heritage Assessment Area and **Table 5-3** lists the site types and frequencies.

Overall, stone artefact sites (including artefact scatters and isolated artefacts) are the most recorded site type on AHIMS in the search area (77.5 per cent; **Table 5-3**). Most other recorded sites include a combination of stone artefacts as well as hearths, middens and / or a burial. Two culturally modified trees have also been recorded. It should be noted that recordings of ‘earth’ as a single site generally contain a greater complex with multiple hearths.

Sites are generally recorded on lunettes or source-bordering dunes or within a few hundred metres of water sources or along the Great Darling Anabranch.

Table 5-3: Site types and frequencies of AHIMS sites near the Heritage Assessment Area.

Site Type	Number	% Frequency
Stone artefact sites (scatters and isolated finds)	35	77.5
Midden and artefact scatters	3	7
Hearth and artefact scatters	3	7
Modified tree	2	4.5
Hearths, artefact scatter and midden	1	2
Burials; artefact/s	1	2
Total	**45**	**100%**

Figure 5-3: Location of previously recorded AHIMS sites in relation to the Heritage Assessment Area.

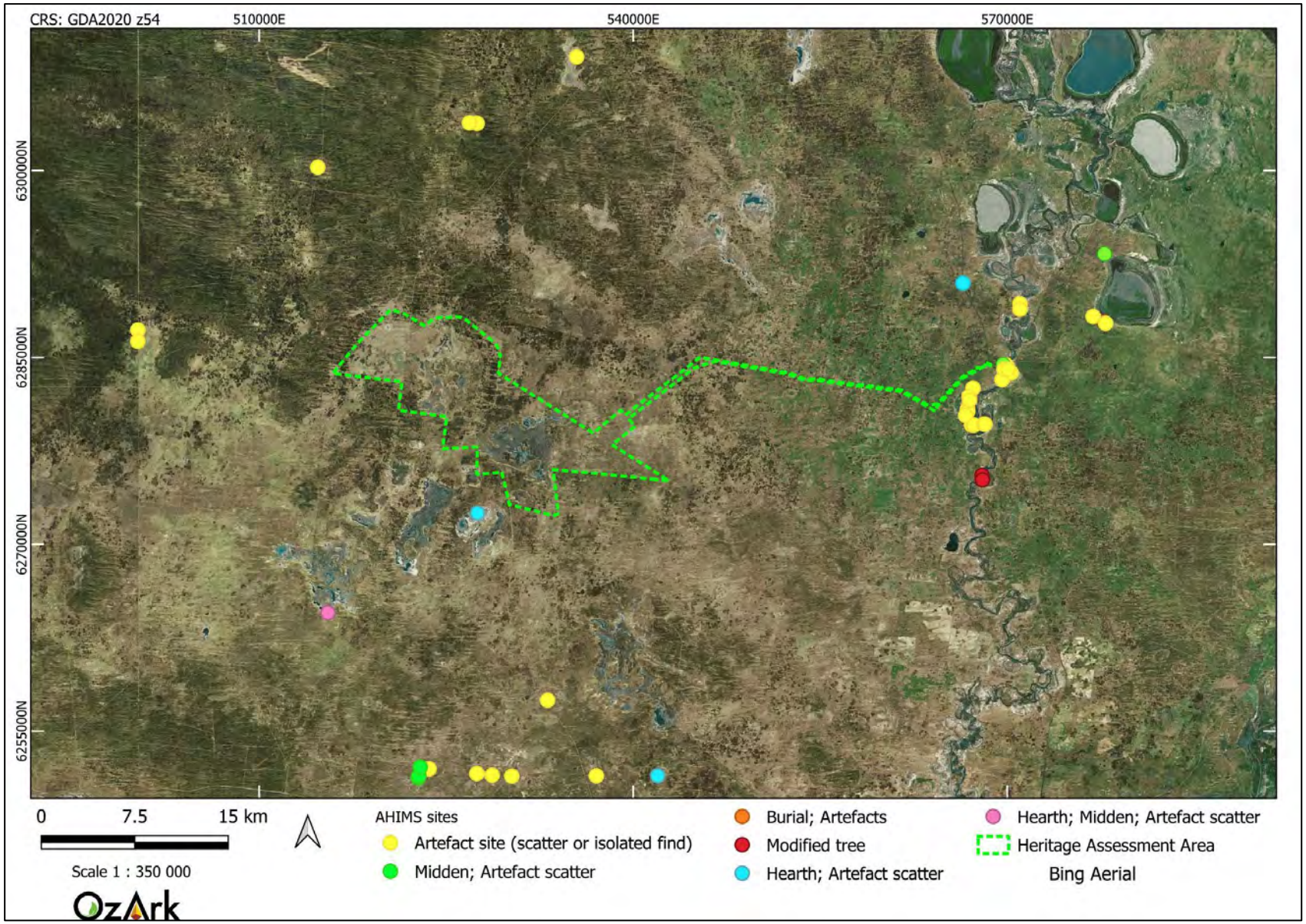
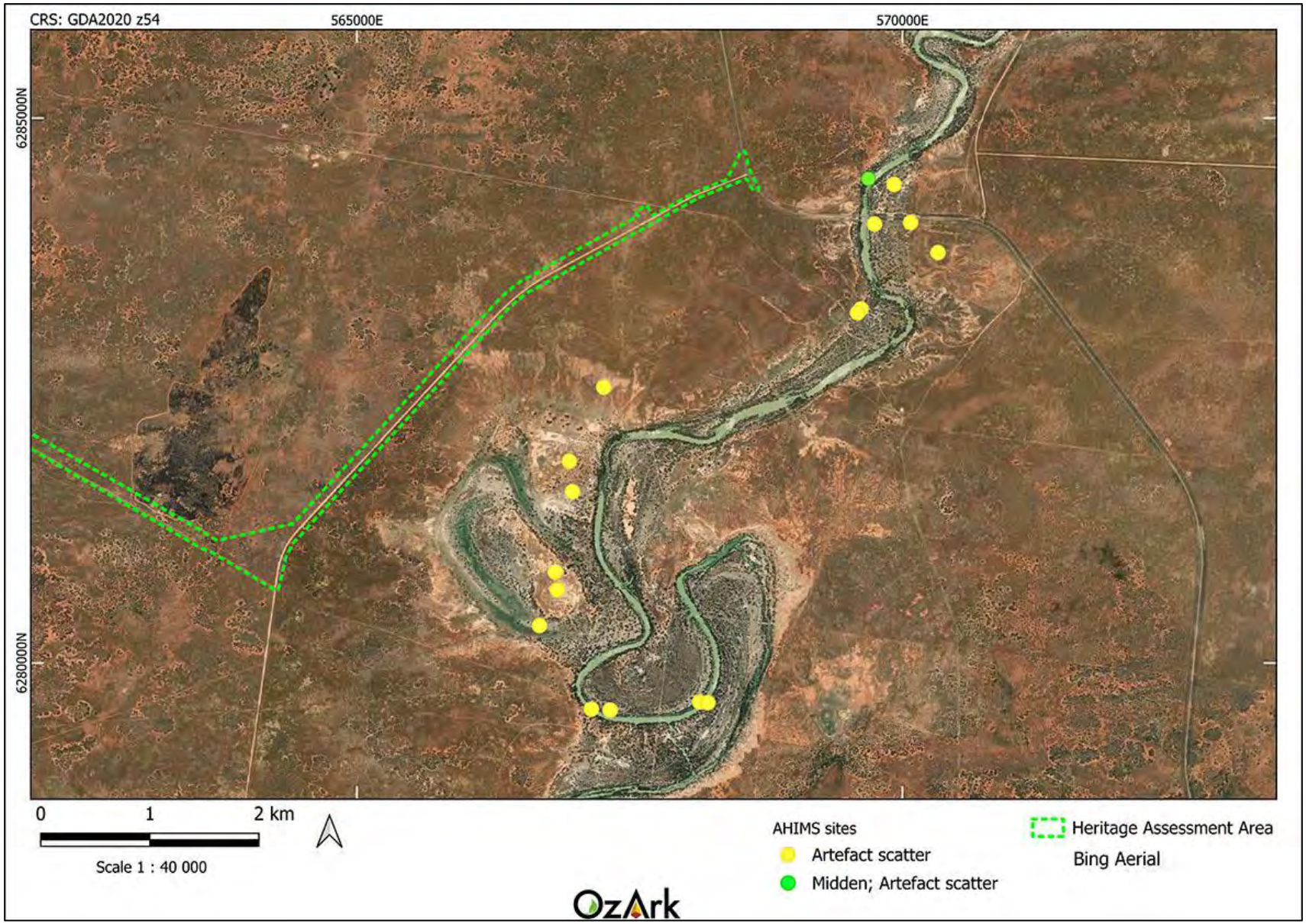


Figure 5-4: Detail of previously recorded AHIMS sites to the east Heritage Assessment Area.



5.3.2 Previous archaeological assessment within the Heritage Assessment Area

In 2015, Landskape completed a due diligence assessment of eight proposed air-core drilling locations within the Phase 1 assessment area. Survey of the assessed area occurred over one day and included full pedestrian survey of the impact areas. Site types predicted most likely to occur within the impact areas included artefact scatters, scarred trees, middens, and burials. No Aboriginal archaeological sites were located within the impact areas despite high ground surface visibility (GSV). The absence of sites was attributed to a lack of landforms with increased archaeological potential such as lunettes or source-bordering dunes. In addition, no trees of suitable type and age to possess cultural modifications were present.

5.4 PREDICTIVE MODEL FOR SITE LOCATION

Across Australia, numerous archaeological studies in widely varying environmental zones and contexts have demonstrated a high correlation between the permanence of a water source and the permanence and/or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including plant and animal foods, stone and ochre resources, and rock shelters, as well as by their general proximity to other sites/places of cultural/mythological significance. Consequently, sites tend to be found along permanent and ephemeral water sources, along access or trade routes or in areas that have good flora/fauna resources and appropriate shelter.

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally, it is the more durable materials such as stone artefacts, stone hearths, shells, and some bones that remain preserved in the current landscape. Even these, however, may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport—both over short- and long-time scales—or (b) the historical impacts associated with the introduction of European farming practices including grazing and cropping, land degradation, and farm related infrastructure. Scarred trees, due to their nature, may survive for up to several hundred years but rarely beyond.

5.4.1 Settlement strategies

Previous archaeological investigations completed across south-western NSW in the Murray and Lower Darling region highlight that distance to water is a significant predictor of site location. The greatest site concentrations occur near permanent and semi-permanent water sources suggesting that Aboriginal people lived for most of the time along rivers, lakes, and creeks (Clarke 1983a). Evidence of occupation falls away exponentially with distance from permanent and semi-

permanent water across the sandplains and dunefields. Although sites are present at locations at a greater distance from water across the sandplains and dunefields, these sites are generally limited in terms of both number, size, and complexity, constituting lower density sites and (Johnston and Witter 1996).

Such areas (including the Mine Site) are likely to have been occupied briefly during wet seasons when rivers became flooded and specific resources were present for hunting and gathering forays, as suggested by explorer Gerard Kreft (1865). Furthermore, hearths identified were likely only used once or twice when Aboriginal people were camping in areas away from rivers (Clarke 1983a). Other investigations within semi-arid NSW have found that occupation away from permanent water was sporadic and demonstrated a hiatus in occupation of such landforms most likely occurring during palaeo-environmental fluctuations (Holdaway et al. 2002 and Shiner 2006).

5.4.2 Past land use

Crucial for the preservation of archaeological deposits is the history of past land use in an area. Primary use of the Heritage Assessment Area is for sheep and goat grazing, and the Heritage Assessment Area has also been impacted by widespread vegetation clearance. As highlighted in **Section 4.6**, both activities promote soil erosion and soil loss. As such, soils throughout most of the Heritage Assessment Area are degraded. Such widespread impacts have undoubtedly affected the archaeological landscape in that many tens of centimetres of soils have been removed from many areas within the Heritage Assessment Area thereby disturbing or deflating any archaeological deposits they may have contained. With such widespread soil movement, it is also important to remember that accumulations of artefacts that may be termed a ‘site’ today may have, in fact, been washed into that location during the historic period and bear no relationship to past Aboriginal occupation patterns in the area (Holdaway and Fanning 2008).

5.4.3 Previously recorded sites

The results of previous investigations (**Section 5.2**) would suggest that:

- The most common site type will be stone artefact sites; either low density artefact scatters or isolated finds (Johnston and Witter 1996; Witter 2004)
- Stone artefact sites have increased likelihood of being associated with hearths and/or middens (Witter 2004)
- Culturally modified trees will be extremely rare in areas distant to semi- or permanent water sources due to a lack of suitable vegetation across the sandplains and dunes and the fact that they are a regionally rare site type (Craib 1992; Witter 2004)
- Quarries are unlikely to be located but if present will be located on outcrops and consist of silcrete (Witter 2004)

- Burials are most likely to be present within sand bodies such as lunettes (Bonhomme 1990:146–148). However, the Heritage Assessment Area does not contain typical lunettes.

5.4.4 Landform modelling

5.4.4.1 Aboriginal Sites Decision Support Tool

OEH (2014) have produced a series of 'pre-1750' predictive models termed the Aboriginal Sites Decision Support Tool (ASDST) which combines data derived from AHIMS with a series of spatial variables that describe the landscape such as elevation, geology, and proximity to water. The ASDST outputs GIS raster layers composed of one hectare cells that predict the likelihood of Aboriginal sites (e.g. mounds, artefacts, modified trees, grinding grooves, burials and hearths) occurring in the landscape prior to European settlement. These models do not account for land use disturbance in the intervening period, or local conditions leading to differential preservation of features. However, the ASDST includes an 'accumulated impacts' model that indicates impacts of post-European settlement land-use and its impact upon Aboriginal site features in the landscape. In combination, these models are used to predict the likelihood of encountering different Aboriginal site types prior to European settlement, and how the distribution of Aboriginal sites are likely to have been affected since this time.

According to the pre-1750 models shown in **Appendix 3**:

- Stone quarries have a generally low potential to occur within the Heritage Assessment Area although the western edge of the eastern salt pan holds some potential for identifying this site type

- Modified (scarred) trees are very unlikely to occur within the Heritage Assessment Area most likely due to a lack of suitable tree species present. Greatest potential for this site type occurs in the very east closer to the Great Darling Anabranch where more suitable eucalypt species will be present

- The Heritage Assessment Area models as a moderate to high potential to contain burial sites, especially along the edges of the former ephemeral lake systems on raised sandy lunettes

- There is a very high potential for hearths to be located over most of the Heritage Assessment Area except within the eastern salt pan and along the western boundary of the Mine Site

- The Heritage Assessment Area models as an area with moderate potential to contain stone artefact sites, similarly with hearths, these have increased potential to be located along the edges of the former lake systems

- Grinding groove sites have a generally low potential of being located within the Heritage Assessment Area although there are some areas with moderate potential

- The ASDST accumulated impacts model indicates very low levels of disturbance throughout the Heritage Assessment Area. However, it is unlikely that the model

accounts for natural disturbances such as aeolian deflation that has impacted the integrity of archaeological deposits in landforms such as those in the Heritage Assessment Area.

Preliminary predictive modelling, based upon numerous archaeological studies in various environmental zones and contexts throughout Australia and the ASDST models shown in **Appendix 3**, indicates a high correlation between the permanence of a water source and the permanence and / or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including plant and animal foods, stone and ochre resources, and rock shelters, as well as by their general proximity to other sites/places of cultural significance. Consequently, sites tend to be found along permanent and ephemeral water sources, along access or trade routes, and in areas that have good flora/fauna resources and appropriate topography (i.e. flat or gently sloping landforms or those providing shelter).

5.4.5 Previous studies

Previous archaeological studies indicate that sandplains and dunes of the Lower Darling have an overall low density of cultural heritage places, while sites are significantly over-represented on lunettes around lakes and riverine source bordering dunes.

The most frequently recorded Aboriginal sites in these landforms are stone artefact scatters with or without hearth / ground oven materials (Martin 1985; Cupper 2007). Other Aboriginal cultural heritage site types previously identified over the more extensive Lower Darling region which comprise more abundant resources include shell middens, stone quarries, ceremonial and dreaming sites, scarred trees, burials, earth mounds, and stone arrangements (Cupper 2007:B-20).

Surface sites across these landforms generally display specialised technologies (the 'Australian small tool tradition') suggesting they date from within the last 5,000 years (Witter 2004). However, western NSW, such as the Darling region, are conspicuous for their well-preserved Pleistocene deposits generally encountered at depth with lake lunettes and riverine source bordering dunes (Martin 1985:15).

5.4.6 Conclusion

Based on knowledge of the environmental contexts of the Heritage Assessment Area and a desktop review of the known local and regional archaeological record, the following predictions are made concerning the probability of those site types being recorded within the Mine Site:

- Isolated finds may be indicative of random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or subsurface artefact scatter. They may occur anywhere within the landscape but are more likely to occur in topographies where open artefact scatters typically occur.

- Isolated finds may occur anywhere but are more likely to be located along the Sandplains and Dunes; Lake Footslopes, and Lunettes. They may also be washed into areas of depression such as the salt pans.

- Open artefact scatters are defined as two or more artefacts, not located within a rock shelter, and located no more than 50 m away from any other constituent artefact. This site type may occur almost anywhere that Aboriginal people have travelled and may be associated with hunting and gathering activities, short- or long-term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or subsurface distributions of flaked stone discarded during the manufacture of tools but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations which relate to activity areas. Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of a background scatter rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'.

  Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands. Larger sites may be expected in association with permanent water sources.

  Topographies which afford effective through-access across, and relative to, the surrounding landscape, such as the open basal valley slopes and the valleys of creeks, will tend to contain more and larger sites, mostly camp sites evidenced by open artefact scatters.

  - One of the most likely site types to be encountered and are predicted to be located within the Heritage Assessment Area particularly along Lunettes and Islands and Lake Footslopes. Sites within the Sandplains and Dunes are likely to be sparse and of low-density (Craib 1992) while higher density scatters are likely to be located on the Lunettes and Islands and Lake Footslopes due to their proximity to the salt pans. Sites on these landforms may be associated with larger, complex features including hearths, ovens, and middens. Recorded artefacts are likely to be comprised of silcrete, quartz, chert, or quartzite and may include a higher percentage of tools.

  - Artefact scatters are likely to be identified within ‘scalds’ across the landscape (Fanning et al. 2007) as stone artefacts are often the lag remaining behind on the scald surface and they contain high GSV.

  - It would be expected that most sites located would date to the late Holocene (i.e. less than 4,000–5,000 BP), the age attributed to the A-Horizon artefact bearing deposits. Although Pleistocene sites contained within B-Horizon sediments may also occur, there have been only one or two instances of Pleistocene deposits being identified in the region in a source-bordering dune and a lunette (Niche 2019).

- Hearth / ground oven sites typically consist of exposures of burnt clay nodules and stained soils, some may be lined with stones and have stone artefacts associated with

them. The presence of hearth/oven sites is dependent on the level of ground surface disturbances and erosion which may have affected an area and the availability of reliable resources to support Aboriginal occupation.

  - Hearths are also one of the most likely site types to be recorded and are predicted to occur particularly along landforms adjacent to lake systems. Evidence for both hearths and heat retainer ground ovens has already been recorded within the region with 20 hearths recorded within 20 km of the Heritage Assessment Area and are likely to be identified alongside stone artefacts (**Section 5.2**). Hearths in the Darling Plains are most likely to be comprised of termite clay but may also consist of clay lumps and calcrete nodules (Witter 2004).

  - Identification of this site type, similarly with stone artefacts, may, however, be dependent on levels of erosion. Previous investigations have shown that hearths in semi-arid NSW have been heavily disturbed by processes of bioturbation, erosion and/or the effects of grazing animals (Fanning et al. 2007). Identification of hearths can be difficult and sometimes only be confirmed through subsurface excavations. As found by Niche (2019), several hearths investigated were determined to be remnants of natural, burnt termite mounds and /or attributed to land clearance practices.

- Aboriginal scarred trees contain evidence of the removal of bark (and sometimes wood) in the past by Aboriginal people, in the form of a scar. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels, and commodities such as string, water containers, roofing for shelters, shields, and canoes. Bark was also removed because of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginal people for both their own purposes and for roofing on early European houses. Consequently, the distinction between European and Aboriginal scarred trees may not be clear.

  - Less likely to occur throughout the Heritage Assessment Area due to the dominance of mallee and belah vegetation, however, they may be present if Black Box species are identified of a suitable age. Black Box species are confined to areas that experience inundation and therefore will likely be in depressions bordering the ephemeral lakes.

- Quarry sites and stone procurement sites typically consist of exposures of stone material where evidence for human collection, extraction and/or preliminary processing has survived. Typically, these involve the extraction of siliceous or fine grained igneous and meta-sedimentary rock types for the manufacture of artefacts. The presence of quarry/extraction sites is dependent on the availability of suitable rock formations.

- This site type is unlikely to be recorded within the Heritage Assessment Area but if present will be on crests and consist of silcrete (Witter 2004 and Landskape 2006).

- Middens result from Aboriginal exploitation and consumption of shellfish, in marine, estuarine or freshwater contexts. Middens may also include faunal remains such as fish or mammal bone, stone artefacts, hearths, charcoal and occasionally, burials. They are usually located on elevated dry ground close to the aquatic environment from which the shellfish has been exploited and where freshwater resources are available. Deeper, more compacted, midden sites are often found in areas containing the greatest diversity of resources, such as river estuaries and coastal lagoons.

    - Across the Darling plains as described by Witter (2004), middens are most likely to be identified along rivers, lakeshores, and some lunettes. As such, middens are most likely to occur on Lunettes and Islands and Lake Footslopes given their proximity to the salt pans, however overall, these landforms did not have high potential for the presence of middens. Middens are likely to be recorded in conjunction with stone artefacts.

    - Identification of middens, similarly to hearths, can be difficult. During their investigations, Niche (2019) identified several middens however, while sites associated with the middens displayed some evidence of cultural discard (i.e. heterogenous species composition and some burnt shell), they concluded there was not enough evidence to rule out that potential of the accumulations being from natural causes.

- Burials are generally found in soft sediments such as aeolian sand, alluvial silts, and rock shelter deposits. In valley floor and plains contexts, burials may occur in locally elevated topographies rather than poorly drained sedimentary contexts. Burials are also known to have occurred on rocky hilltops in some limited areas. Burials are generally only visible where there has been some disturbance of subsurface sediments or where some erosional process has exposed them.

    - Burials within south-western NSW have predominately been identified in source bordering dunes along the rivers and stream channels, in floodplain clays, prior stream sediment, mounds and lunettes (Martin 1985; Bonhomme 1999; Witter 2004). Landforms within the Heritage Assessment Area with increased potential to contain burials are the Lunettes and Islands, which comprise softer soil, bordering the salt pans in well-drained areas. However, the Heritage Assessment Area lacks true source bordering dunes and lunettes where this site type has been associated with elsewhere.

- Bora/Ceremonial sites are places which have ceremonial or spiritual connections. Ceremonial sites may comprise of natural landscapes or have archaeological material. Bora sites are ceremonial sites which consist of a cleared area and earthen rings.

    - This site type does not necessarily follow landform predictability and are, overall, a rare site type with a low likelihood of being present and remaining extant.

6 PHASE 1 - SURVEY RESULTS

This section documents the results of the survey within the Phase 1 assessment area. The Phase 1 survey was completed in February and March 2020 (see **Section 1.2**).

6.1 SAMPLING STRATEGY AND FIELD METHODS

The archaeological methods utilised in the Aboriginal archaeological assessment followed the Code of Practice. Standard archaeological field survey and recording methods were employed (Burke and Smith 2004).

It should be noted that the aim of any archaeological survey is not to locate each artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within the Phase 1 assessment area are known. Therefore, the aims of the survey were to:

- Conduct pedestrian transects across all landforms in the Phase 1 assessment area so that their archaeological potential could be determined
- Evaluate whether the predictive model set out in **Section 5.4** is valid
- Determine if any portions of the Phase 1 assessment area require test excavation to understand the archaeological potential at a particular location.

Variable levels of pedestrian survey were completed across the Phase 1 assessment area as set out in the survey methodology (**Appendix 4**). The survey methodology also describes the zoning of the assessment area, namely:

- Full survey areas: These areas include all landforms with greater archaeological potential such as the Lake Footslopes and portions of the Lunettes and Islands. Across these landforms, transects were completed in pairs spaced 100 m apart, with 200 m between pairs of transects. Where it was deemed necessary, additional transects were completed to 'fill in' the space between pairs
- Sample landform surveys: These areas include portions of the Sandplains and Dunes which are distant from the salt pans as well as depressions within the salt pans. Survey of these areas were spaced across 500 x 500 m to investigate landforms with lower archaeological potential. ASDST modelling (**Appendix 3**) indicates that these landforms have very low archaeological potential, and this sampling regime is designed to test this predictive model. The location of the sample squares was selected to cover areas supporting greater vegetation cover (hence potentially more stable soil profiles) or areas within the depression basins that aerial photography indicates may contain elevated landforms
- Mine Site Access Road[4]: The Mine Site Access Road consists of three portions: the 39.5 km route of the access road extending from the Heritage Assessment Area to Anabranch Mail Road that is largely along existing farm tracks and an approximate

[4] The Mine Site Access Road assessed for Phase 1 now only forms part of the Project. The current Mine Site Access Road is approximately 29.6 km in length.

38 ha area at the junction of the access road with Anabranch Mail Road to provide the proponent with some flexibility with regards to the location of the actual junction. All portions of the Mine Site Access Road and the junction are outside of the Heritage Assessment Area and are in the 'Sandplains and Dunes' survey unit that has a low archaeological potential. A sample of approximately every kilometre was completed along the Mine Site Access Road, however there was some variation to this, where greater distances were surveyed where it was deemed necessary. All sample areas were assessed on foot.

6.2 PROJECT CONSTRAINTS

There were no significant constraints in completing the archaeological assessment. Wet conditions on the last day of survey (Thursday 5 March 2020) prevented access to some of the proposed Mine Site Access Road. As a result, the survey of the remainder of the Mine Site Access Road was completed during the May 2020 test excavation program.

6.3 EFFECTIVE SURVEY COVERAGE

Two of the key factors influencing the effectiveness of archaeological survey are GSV and ground surface exposure (GSE). These factors are quantified to ensure that the survey data provides adequate evidence for the evaluation of the archaeological materials across the landscape. For the purposes of the current assessment, these terms are used in accordance with the definitions provided in the Code of Practice.

GSV is defined as:

> *… the amount of bare ground (or visibility) on the exposures which might reveal artefacts or other archaeological materials. It is important to note that visibility, on its own, is not a reliable indicator of the detectability of buried archaeological material. Things like vegetation, plant or leaf litter, loose sand, stone ground or introduced materials will affect the visibility. Put another way, visibility refers to 'what conceals'* (DECCW 2010b:39).

GSE is defined as:

> *… different to visibility because it estimates the area with a likelihood of revealing buried artefacts or deposits rather than just being an observation of the amount of bare ground. It is the percentage of land for which erosion and exposure was sufficient to reveal archaeological evidence on the surface of the ground. Put another way, exposure refers to 'what reveals'* (DECCW 2010b:37).

These factors are quantified to ensure that the survey data provides adequate evidence for the evaluation of the archaeological evidence across the Phase 1 assessment area. For the purposes of the current assessment, these terms are used in accordance with the definitions provided in the Code of Practice (DECCW 2010b).

Table 6-1 calculates the effective survey coverage within the Phase 1 assessment area. In general, **Table 6-1** presents an approximation of the amount of ground surface able to be seen at any location within particular survey units. For example, at any one location within the Sandplains and Dunes survey unit of the Phase 1 assessment area approximately 56% of the ground surface could be seen.

The effective survey coverage over the Phase 1 assessment area was relatively consistent, averaging 50% across the landforms present. Exposures within these landforms were afforded by existing access tracks, animal trails, rabbit burrows, sparse shrub cover, and extensive areas of sheet wash erosion. Salt Pans and the Lunettes and Islands survey units had only slightly lower areas of exposure and GSV as they contained greater shrub cover and generally more trees, consequently generating more leaf litter cover.

Table 6-1: Effective survey coverage within the Phase 1 assessment area.

Survey Unit	Landform	Survey Unit Area (sq m)	Visibility %	Exposure %	Effective Coverage Area (sq m) (= Survey Unit Area x Visibility % x Exposure %)	Effective Coverage % (= Effective Coverage Area / Survey Unit Area x 100)
1	Sandplains and Dunes	24,053,000	80	70	13,469,680	56%
2	Lunettes and Islands	11,930,000	70	65	5,428,150	45.5%
3	Lake Footslopes	4,030,000	85	70	2,397,850	59.5%
4	Salt Pans	10,100,000	70	60	4,242,000	42%

Table 6-2 demonstrates that although the survey efficacy within Lunettes and Islands landforms was the lowest at 23.7 per cent, this landform comprised the second greatest amount of land within the Phase 1 assessment area. Despite this, the highest number of sites was recorded within the Lunettes and Islands landforms with 35 sites. While the Lake Footslopes landforms recorded the second lowest number of sites (n=12), it comprised the greatest number of artefacts and features (hearths) (**Figure 6-4**).

Table 6-2: Effective survey coverage and incidences of site recording within the Phase 1 assessment area.

Landform	Landform area (sq m)	Area Effectively Surveyed (sq m) (= Effective Coverage Area)	% of Landform Effectively Surveyed (= Area Effectively Surveyed / Landform x 100)	Number of Sites	Number of artefacts and features
Sandplains and Dunes	24,053,000	13,469,680	56%	21	66
Lunettes and Islands	11,930,000	5,428,150	23.7%	35	96
Lake Footslopes	4,030,000	2,397,850	50.5%	12	221
Salt Pans	10,100,000	4,242,000	51%	13	42

Figure 6-1 shows representative examples of GSV across the Phase 1 assessment area.

Figure 6-2 and **Figure 6-3** illustrate the Phase 1 assessment area showing pedestrian transects and landforms. **Figure 6-4** shows the locations of all recorded artefacts and features in relation to the landforms.

Figure 6-1: Examples of GSV throughout the landforms of the Phase 1 assessment area.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>1. Example of GSV across the Footslopes landform in the northern/central portion of the Phase 1 assessment area.</td><td>2. GSV in part of the Salt Pan landform (eastern salt pan).</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>3. GSV in part of the Salt Pan landform (western salt pan).</td><td>4. Example of GSV on the Lunettes and Islands landform. Location is an island in the west of the Phase 1 assessment area.</td></tr>
</table>

	
5. Example of GSV on the Lunettes and Islands landform. Location is a lunette in the west of the Phase 1 assessment area.	6. Example of GSV on the Sandplains and Dunes landform in the eastern portion of the Phase 1 assessment area.

Figure 6-2: Pedestrian transects across the Phase 1 assessment area.

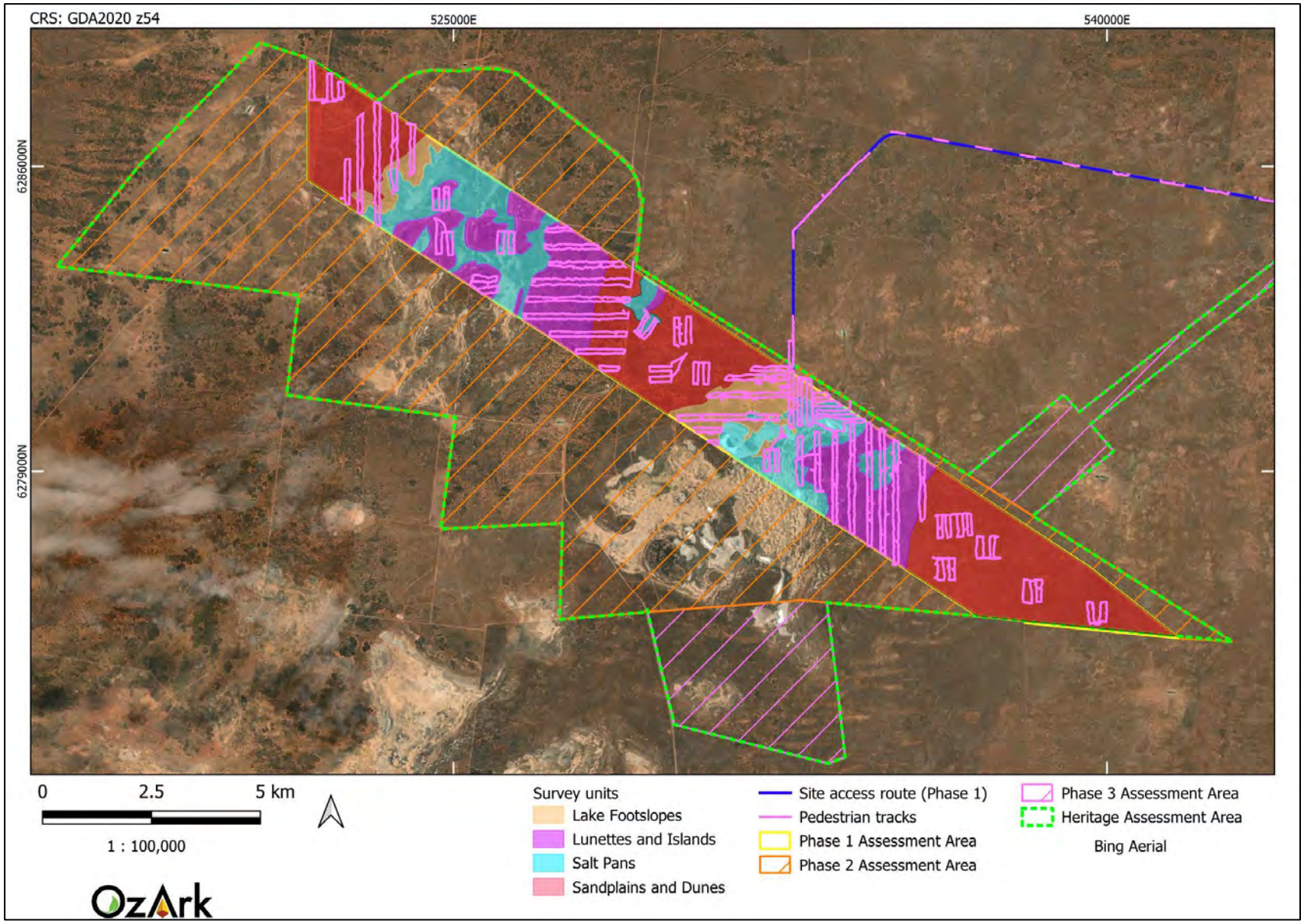


Figure 6-3: Pedestrian transects on the Mine Site Access Road.

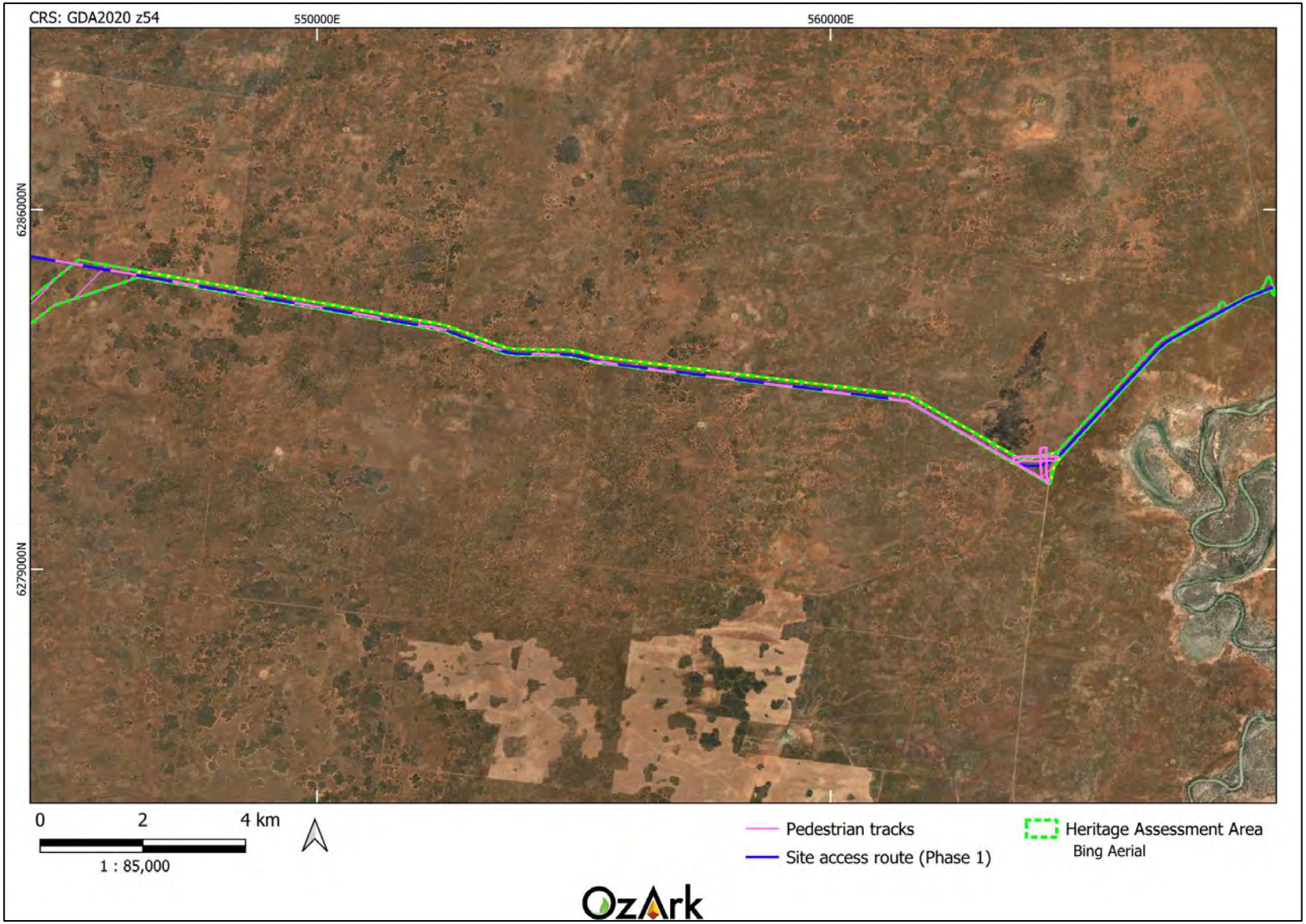
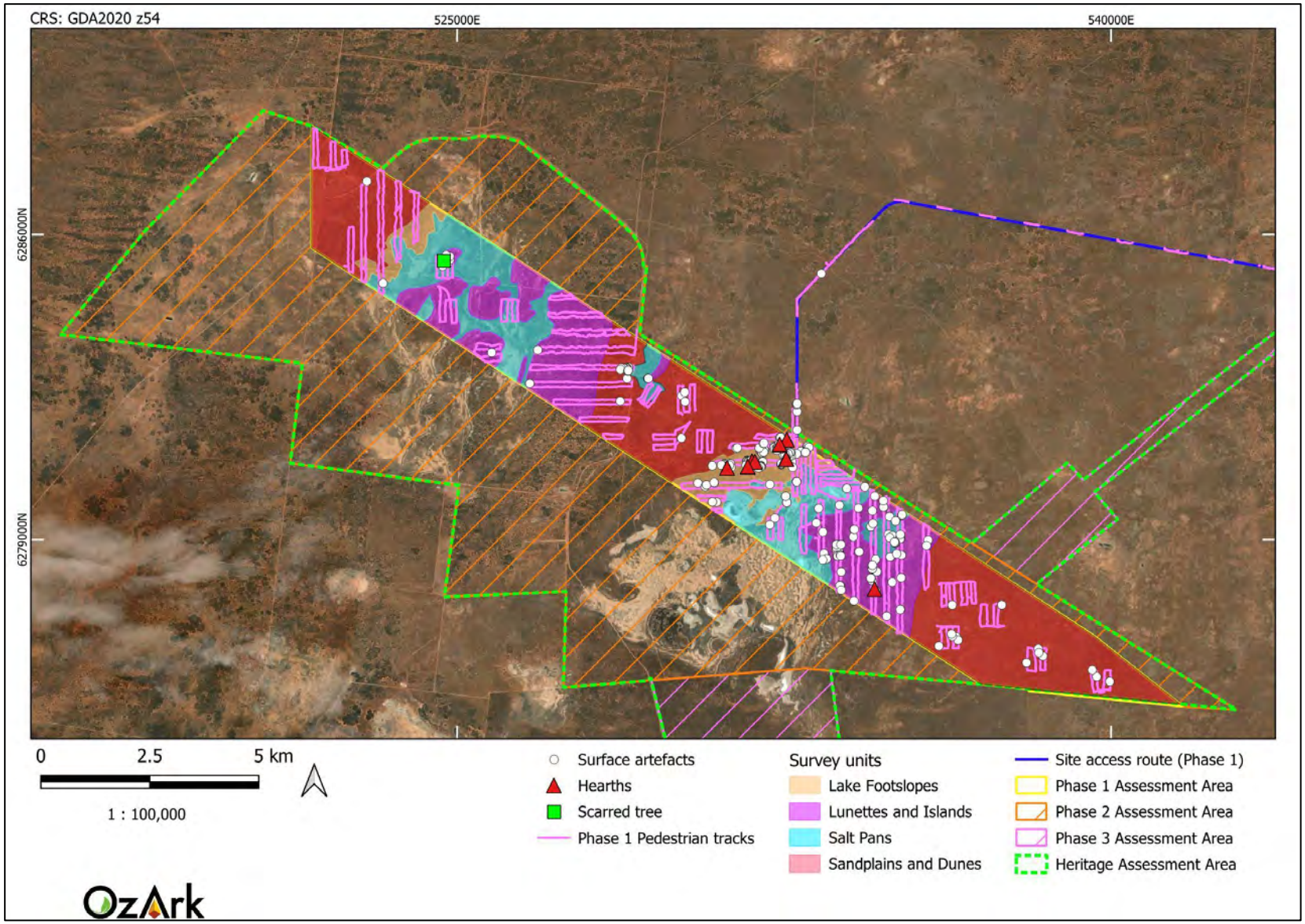


Figure 6-4: Location of recorded artefacts and features in relation to the survey units within the Phase 1 assessment area.



6.4 ABORIGINAL SITES RECORDED

Table 6-3 summarises the Aboriginal cultural heritage sites recorded during the survey of the Phase 1 assessment area. Further details on each site follow.

It is noted that all sites recorded are open sites, however, the site name differentiates 'IF' (isolated find) sites, from 'OS' sites (open sites, includes artefact scatters sometimes in association with hearths, scarred trees, and/or PAD).

Table 6-3: Aboriginal cultural heritage sites recorded during the Phase 1 survey.

ID	AHIMS ID	Site name	GDA Zone 54 Easting	GDA Zone 54 Northing	Feature(s)	Landform
Isolated finds						
1	39-4-0653	Copi IF-1	522927	6287219	Isolated find	Sandplains and Dunes
2	39-4-0652	Copi IF-2	523297	6284883	Isolated find	Salt Pans
3	39-4-0651	Copi IF-3	525790	6283287	Isolated find	Lunettes and Islands
4	39-4-0650	Copi IF-4	526665	6282582	Isolated find	Lunettes and Islands
5	39-4-0649	Copi IF-5	526848	6283350	Isolated find	Lunettes and Islands
6	39-4-0648	Copi IF-6	528740	6282175	Isolated find	Sandplains and Dunes
7	39-4-0647	Copi IF-7	528899	6282693	Isolated find	Sandplains and Dunes
8	39-4-0646	Copi IF-8	530220	6282380	Isolated find	Sandplains and Dunes
9	39-4-0645	Copi IF-9	530145	6281327	Isolated find	Sandplains and Dunes
10	39-4-0644	Copi IF-10	530852	6280691	Isolated find	Lake Footslopes
11	39-4-0643	Copi IF-11	530522	6280298	Isolated find	Lake Footslopes
12	39-4-0642	Copi IF-12	532177	6280266	Isolated find	Lake Footslopes
13	39-4-0641	Copi IF-13	532171	6279339	Isolated find	Salt Pans
14	39-4-0640	Copi IF-14	532290	6279495	Isolated find	Salt Pans
15	39-4-0639	Copi IF-15	532698	6280656	Isolated find	Lake Footslopes
16	39-4-0638	Copi IF-16	533294	6279713	Isolated find	Lunettes and Islands
17	39-4-0637	Copi IF-17	533240	6279382	Isolated find	Lunettes and Islands
18	39-4-0636	Copi IF-18	533390	6279172	Isolated find	Lunettes and Islands
19	39-4-0634	CopiI IF-19	533771	6279791	Isolated find	Lunettes and Islands
20	39-4-0633	Copi IF-20	533939	6280173	Isolated find	Salt Pans
21	39-4-0632	Copi IF-21	534354	6280207	Isolated find	Lunettes and Islands
22	39-4-0635	Copi IF-22	534206	6279718	Isolated find	Lunettes and Islands
23	39-4-0631	Copi IF-23	534582	6279994	Isolated find	Lunettes and Islands
24	39-4-0630	Copi IF-24	534525	6279662	Isolated find	Lunettes and Islands
25	39-4-0629	Copi IF-25	534778	6279892	Isolated find	Lunettes and Islands
26	39-4-0628	Copi IF-26	534920	6279529	Isolated find	Islands and Lunettes
27	39-4-0627	Copi IF-27	534089	6279060	Isolated find	Islands and Lunettes
28	39-4-0626	Copi IF-28	534223	6278718	Isolated find	Islands and Lunettes
29	39-4-0625	Copi IF-29	533811	6278257	Isolated find	Islands and Lunettes
30	39-4-0624	Copi IF-30	533810	6277838	Isolated find	Islands and Lunettes
31	39-4-0623	Copi IF-31	534104	6277593	Isolated find	Islands and Lunettes
32	39-4-0622	Copi IF-32	534853	6277242	Isolated find	Islands and Lunettes
33	39-4-0621	Copi IF-33	534980	6278021	Isolated find	Islands and Lunettes

ID	AHIMS ID	Site name	GDA Zone 54 Easting	GDA Zone 54 Northing	Feature(s)	Landform
34	39-4-0620	Copi IF-34	535186	6278123	Isolated find	Islands and Lunettes
35	39-4-0619	Copi IF-35	534935	6278600	Isolated find	Islands and Lunettes
36	39-4-0618	Copi IF-36	535084	6278670	Isolated find	Islands and Lunettes
37	39-4-0617	Copi IF-37	535195	6278642	Isolated find	Islands and Lunettes
38	39-4-0616	Copi IF-38	535768	6278859	Isolated find	Islands and Lunettes
39	39-4-0615	Copi IF-39	535805	6278986	Isolated find	Islands and Lunettes
40	39-4-0614	Copi IF-40	536358	6277498	Isolated find	Sandplains and Dunes
41	39-4-0599	Copi IF-41	536052	6276554	Isolated find	Sandplains and Dunes
42	39-4-0600	Copi IF-42	537495	6277500	Isolated find	Sandplains and Dunes
43	39-4-0601	Copi IF-43	538064	6276172	Isolated find	Sandplains and Dunes
44	39-4-0602	Copi IF-44	539571	6276007	Isolated find	Sandplains and Dunes
45	39-4-0604	Copi IF-45	539674	6275851	Isolated find	Sandplains and Dunes
46	39-4-0603	Copi IF-46	539974	6275741	Isolated find	Sandplains and Dunes
47	39-4-0605	Copi IF-47	532800	6281510	Isolated find	Sandplains and Dunes
48	39-4-0606	Copi IF-48	532799	6281935	Isolated find	Sandplains and Dunes
49	39-4-0607	Copi IF-49	533355	6285101	Isolated find	Sandplains and Dunes
Open sites						
50	39-4-0608	Copi OS-1	524782	6285450	Artefact scatter; scarred tree; PAD	Lunettes and Islands
51	39-4-0609	Copi OS-2	528872	6282931	Artefact scatter; PAD	Sandplains and Dunes
52	39-4-0610	Copi OS-3	529378	6282701	Artefact scatter	Salt Pan
53	39-4-0611	Copi OS-4	530187	6282240	Artefact scatter	Sandplains and Dunes
54	39-4-0612	Copi OS-5	531418	6281097	Artefact scatter	Sandplains and Dunes
55	39-4-0613	Copi OS-6	531190	6280699	Artefact scatter; hearth; PAD	Lake Footslopes
56	39-4-0579	Copi OS-7	530899	6280307	Artefact scatter	Lake Footslopes
57	39-4-0580	Copi OS-8	530700	6280238	Artefact scatter	Lake Footslopes
58	39-4-0581	Copi OS-9	530918	6279863	Artefact scatter	Lake Footslopes
59	39-4-0582	Copi OS-10	532560	6279916	Artefact scatter	Lake Footslopes
60	39-4-0583	Copi OS-11	532787	6280327	Artefact scatter; PAD	Lake Footslopes
61	39-4-0584	Copi OS-12	532186	6280930	Artefact scatter; hearths; PAD	Lake Footslopes
62	39-4-0585	Copi OS-13	532996	6281057	Artefact scatter	Lake Footslopes
63	39-4-0586	Copi OS-14	534105	6279230	Artefact scatter	Lunettes and Islands
64	39-4-0587	Copi OS-15	534515	6279332	Artefact scatter	Salt Pan
65	39-4-0588	Copi OS-16	534790	6279744	Artefact scatter	Lunettes and Islands
66	39-4-0589	Copi OS-17	533416	6278591	Artefact scatter	Lunettes and Islands
67	39-4-0590	Copi OS-18	533741	6278697	Artefact scatter; PAD	Lunettes and Islands
68	39-4-0591	Copi OS-19	533788	6277941	Artefact scatter	Lunettes and Islands
69	39-4-0592	Copi OS-20	534595	6277843	Artefact scatter, hearth	Islands and Lunettes
70	39-4-0593	Copi OS-21	534507	6278085	Artefact scatter	Islands and Lunettes
71	39-4-0595	Copi OS-22	534566	6278385	Artefact scatter	Islands and Lunettes

ID	AHIMS ID	Site name	GDA Zone 54 Easting	GDA Zone 54 Northing	Feature(s)	Landform
72	39-4-0594	Copi OS-23	535045	6278925	Artefact scatter; PAD	Salt Pan
73	39-4-0596	Copi OS-24	534929	6279086	Artefact scatter	Salt Pan
74	39-4-0597	Copi OS-25	535170	6279050	Artefact scatter	Islands and Lunettes
75	39-4-0598	Copi OS-26	535059	6279426	Artefact scatter	Salt Pan
76	39-4-0578	Copi OS-27	535206	6279561	Artefact scatter	Salt Pan
77	39-4-0577	Copi OS-28	535170	6277392	Artefact scatter	Islands and Lunettes
78	39-4-0576	Copi OS-29	536416	6276759	Artefact scatter; PAD	Sandplains and Dunes
79	39-4-0575	Copi OS-30	538359	6276402	Artefact scatter	Sandplains and Dunes
80	39-4-0574	Copi OS-31	532794	6282105	Artefact scatter; PAD	Sandplains and Dunes
81	39-4-0573	Copi OS-32	527299	6283831	PAD	Lunettes and Islands

6.4.1 Isolated finds

Forty-nine isolated finds were recorded during the Phase 1 survey. These are listed in **Table 6-4** and shown on **Figure 6-5** and **Figure 6-6**. Full details of each isolated find follow.

Table 6-4: Isolated finds recorded during the Phase 1 survey: artefact attributes.

Site name	AHIMS ID	GDA Zone 54 Easting	GDA Zone 54 Northing	Artefact type	Material	Size (LxWxD) mm	Additional detail
Copi IF-1	39-4-0653	522927	6287219	Flaked piece	Quartzite	35x25x18	Tertiary
Copi IF-2	39-4-0652	523297	6284883	Flake	Quartz	32x20x2	Tertiary; complete
Copi IF-3	39-4-0651	525790	6283287	Flake	Chert	20x20x20	Tertiary; complete
Copi IF-4	39-4-0650	526665	6282582	Flake	Chert	15x14x5	Tertiary; complete
Copi IF-5	39-4-0649	526848	6283350	Flake	Quartzite	28x30x10	Tertiary; complete
Copi IF-6	39-4-0648	528740	6282175	Flake	Quartzite	34x34x8	Tertiary; complete
Copi IF-7	39-4-0647	528899	6282693	Shatter	Chert	16x12x12	Tertiary
Copi IF-8	39-4-0646	530220	6282380	Flaked piece	Chert	22x32x15	Tertiary
Copi IF-9	39-4-0645	530145	6281327	Flake	Chert	15x10x5	Tertiary; proximal fragment
Copi IF-10	39-4-0644	530852	6280691	Shatter	Chert	25x30x15	Secondary
Copi IF-11	39-4-0643	530522	6280298	Flake	Quartzite	15x15x5	Tertiary; proximal fragment
Copi IF-12	39-4-0642	532177	6280266	Flaked piece	Quartz	22x15x12	Tertiary
Copi IF-13	39-4-0641	532171	6279339	Flake	Chert	10x15x5	Tertiary; proximal fragment
Copi IF-14	39-4-0640	532290	6279495	Flake	Quartz	32x20x8	Secondary, complete
Copi IF-15	39-4-0639	532698	6280656	Flake	Quartzite	34x25x8	Tertiary; complete
Copi IF-16	39-4-0638	533294	6279713	Flake	Quartz	22x42x10	Tertiary; distal fragment
Copi IF-17	39-4-0637	533240	6279382	Flake	Quartzite	32x32x12	Tertiary; complete
Copi IF-18	39-4-0636	533390	6279172	Flaked piece	Chalcedony	24x18x5	Tertiary

Site name	AHIMS ID	GDA Zone 54 Easting	GDA Zone 54 Northing	Artefact type	Material	Size (LxWxD) mm	Additional detail
Copi IF-19	39-4-0634	533771	6279791	Flake	Quartzite	24x15x8	Tertiary; longitudinal break
Copi IF-20	39-4-0633	533939	6280173	Flake	Quartz	40x30x15	Secondary; complete
Copi IF-21	39-4-0632	534354	6280207	Flake	Quartzite	13x20x5	Tertiary; complete
Copi IF-22	39-4-0635	534206	6279718	Flake	Quartzite	20x12x5	Tertiary; longitudinal break
Copi IF-23	39-4-0631	534582	6279994	Flake	Quartzite	34x16x5	Tertiary; complete
Copi IF-24	39-4-0630	534525	6279662	Flake	Quartz	30x22x10	Tertiary; complete
Copi IF-25	39-4-0629	534778	6279892	Core	Chert	38	Tertiary; multi-directional; 7 flake scars
Copi IF-26	39-4-0628	534920	6279529	Flake	Chert	50x35x15	Tertiary; complete
Copi IF-27	39-4-0627	534089	6279060	Flake	Quartzite	50x20x15	Tertiary; complete
Copi IF-28	39-4-0626	534223	6278718	Flake	Quartzite	24x12x10	Tertiary; distal fragment
Copi IF-29	39-4-0625	533811	6278257	Flake	Quartzite	20x15x5	Tertiary; distal fragment
Copi IF-30	39-4-0624	533810	6277838	Flake	Quartz	20x12x5	Tertiary; complete
Copi IF-31	39-4-0623	534104	6277593	Side scraper	Quartzite	38x28x18	Tertiary; invasive, steep retouch on margin
Copi IF-32	39-4-0622	534853	6277242	Flake	Chert	12x22x5	Secondary; complete
Copi IF-33	39-4-0621	534980	6278021	Flake	Quartzite	32x33x5	Secondary; complete
Copi IF-34	39-4-0620	535186	6278123	Flake	Quartz	18x15x5	Tertiary; complete
Copi IF-35	39-4-0619	534935	6278600	Backed flake	Chert	22x12x5	Tertiary; complete; very fine retouch on margin
Copi IF-36	39-4-0618	535084	6278670	Flake	Quartzite	40x25x15	Tertiary; complete
Copi IF-37	39-4-0617	535195	6278642	Flake	Quartzite	30x25x5	Tertiary; complete
Copi IF-38	39-4-0616	535768	6278859	Flake	Quartzite	18x20x5	Tertiary; complete
Copi IF-39	39-4-0615	535805	6278986	Flake	Quartz	20x15x5	Tertiary; complete
Copi IF-40	39-4-0614	536358	6277498	Tested cobble /manuport	Quartz	45x35x20	
Copi IF-41	39-4-0599	536052	6276554	Core	Quartzite	50	Multidirectional; 4 flake scars; 20% cortex
Copi IF-42	39-4-0600	537495	6277500	Flake	Quartzite	30x25x5	Tertiary; complete
Copi IF-43	39-4-0601	538064	6276172	Flake	Quartzite	20x10x4	Tertiary; complete
Copi IF-44	39-4-0602	539571	6276007	Flake	Quartzite	25x20x5	Tertiary; complete
Copi IF-45	39-4-0604	539674	6275851	Shatter	Quartz	15x5x3	Tertiary
Copi IF-46	39-4-0603	539974	6275741	Flake	Chert	15x15x5	Secondary; complete
Copi IF-47	39-4-0605	532800	6281510	Backed flake	Chert	18x30x8	Tertiary; complete; distal retouch
Copi IF-48	39-4-0606	532799	6281935	Flake	Quartzite	20x22x8	Tertiary; complete
Copi IF-49	39-4-0607	533355	6285101	Flake	Chalcedony	14x8x5	Tertiary; complete

Figure 6-5: Overview of the location of all recorded isolated finds within the western portion of the Phase 1 assessment area.

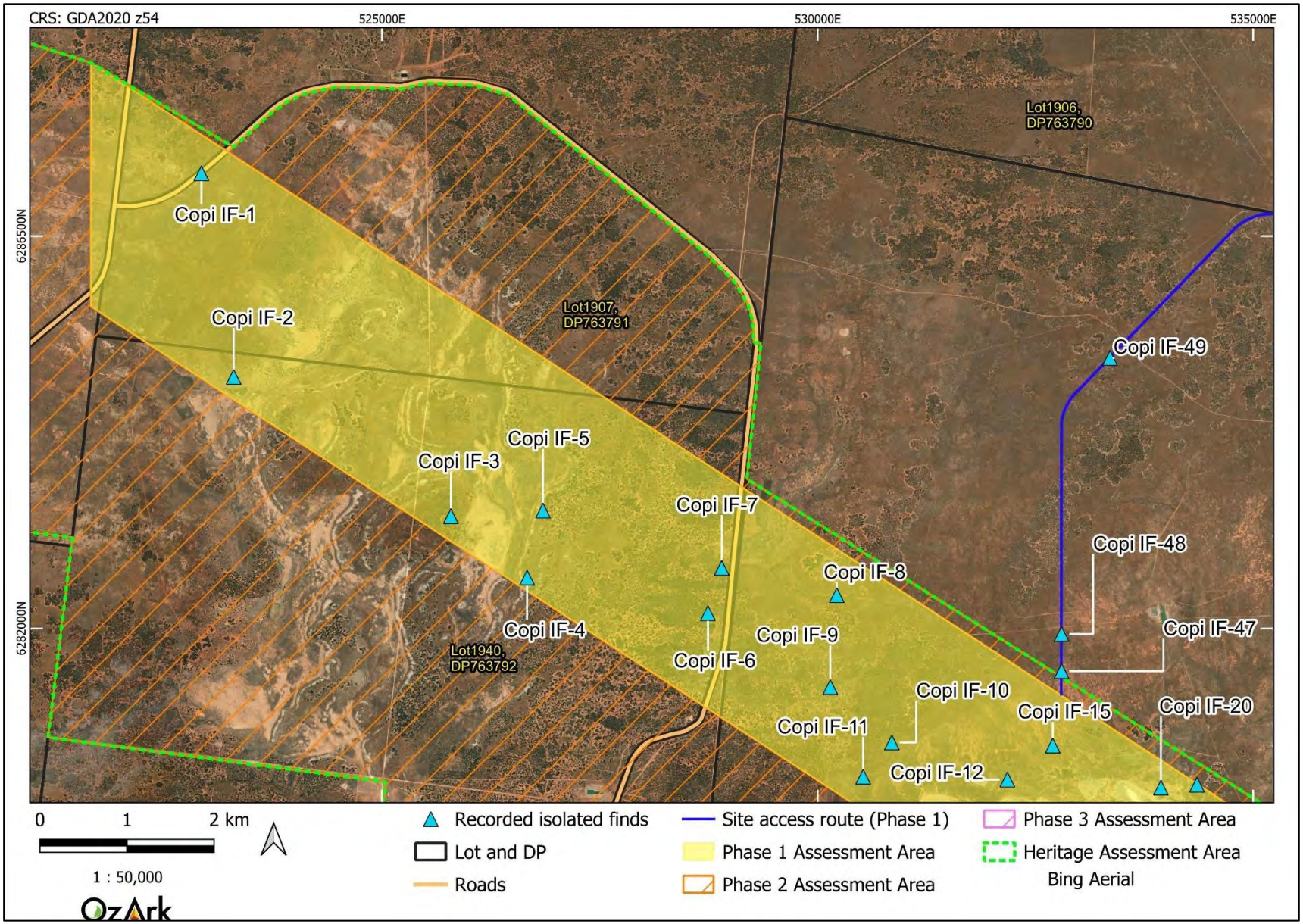
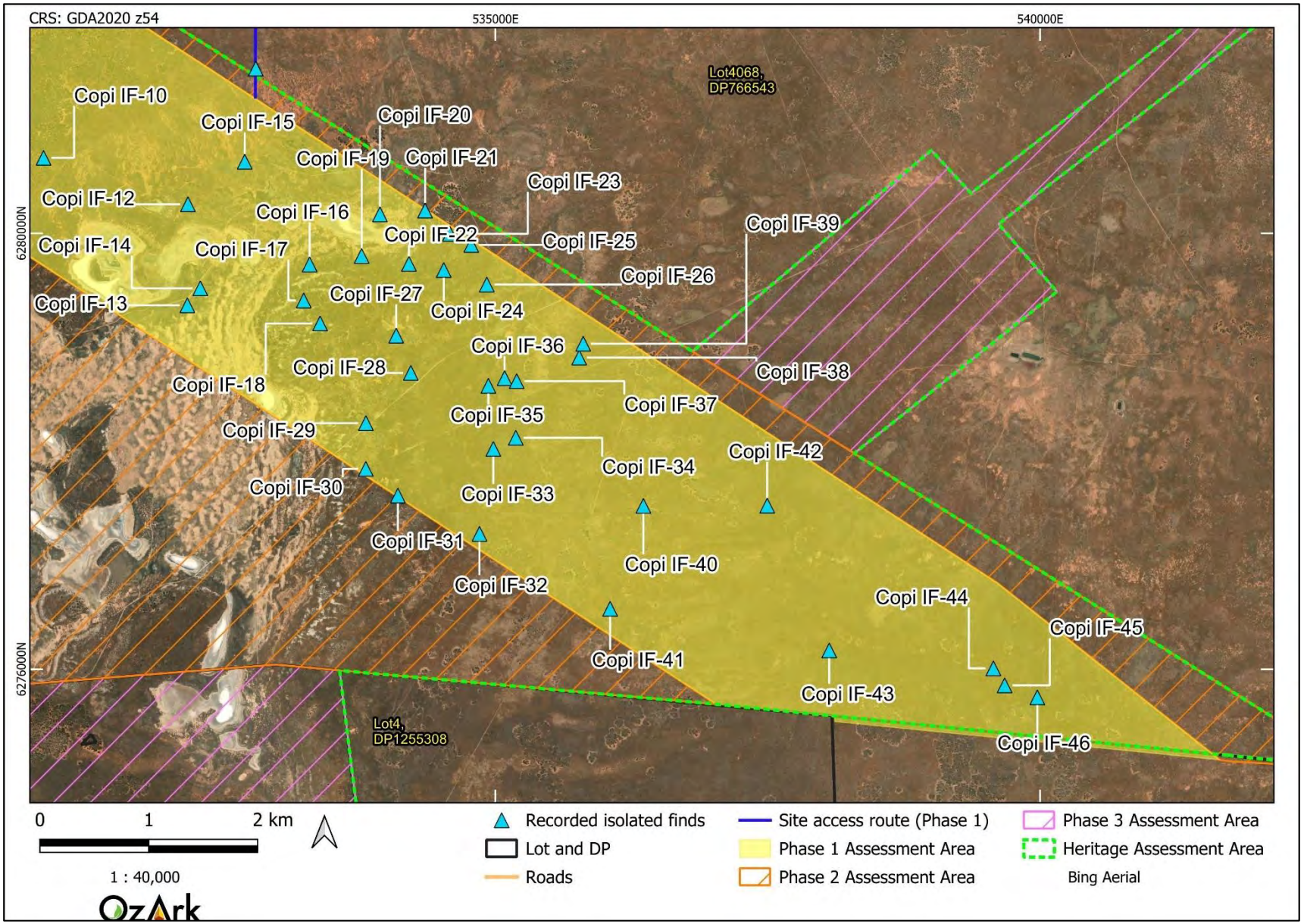


Figure 6-6: Overview of the location of all recorded isolated finds within the eastern portion of the Phase 1 assessment area.



Copi IF-1

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 522927E 6287219N

Location of Site: Copi IF-1 is in the southern cutting of Nulla Road, approximately 1 km east along Nulla Road from the intersection of Springwood Road/Pine Camp Road and Nulla Road (**Figure 6-7**). The site is between the northern and southern portions of Lot 1907 DP763971 on the Huntingfield property.

Description of Site: Copi IF-1 is a single quartzite flaked piece located on a sand plain (**Figure 6-8**). The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange/red sand. Surrounding vegetation at the site comprises isolated trees and shrubs including saltbush. The GSE at the time of recording was high (80%) with a GSV of 60% within the large area of exposure. Identified disturbances include the construction of Nulla Road and grazing.

Copi IF-1 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 6-7: Location of Copi IF-1 and Copi IF-2.

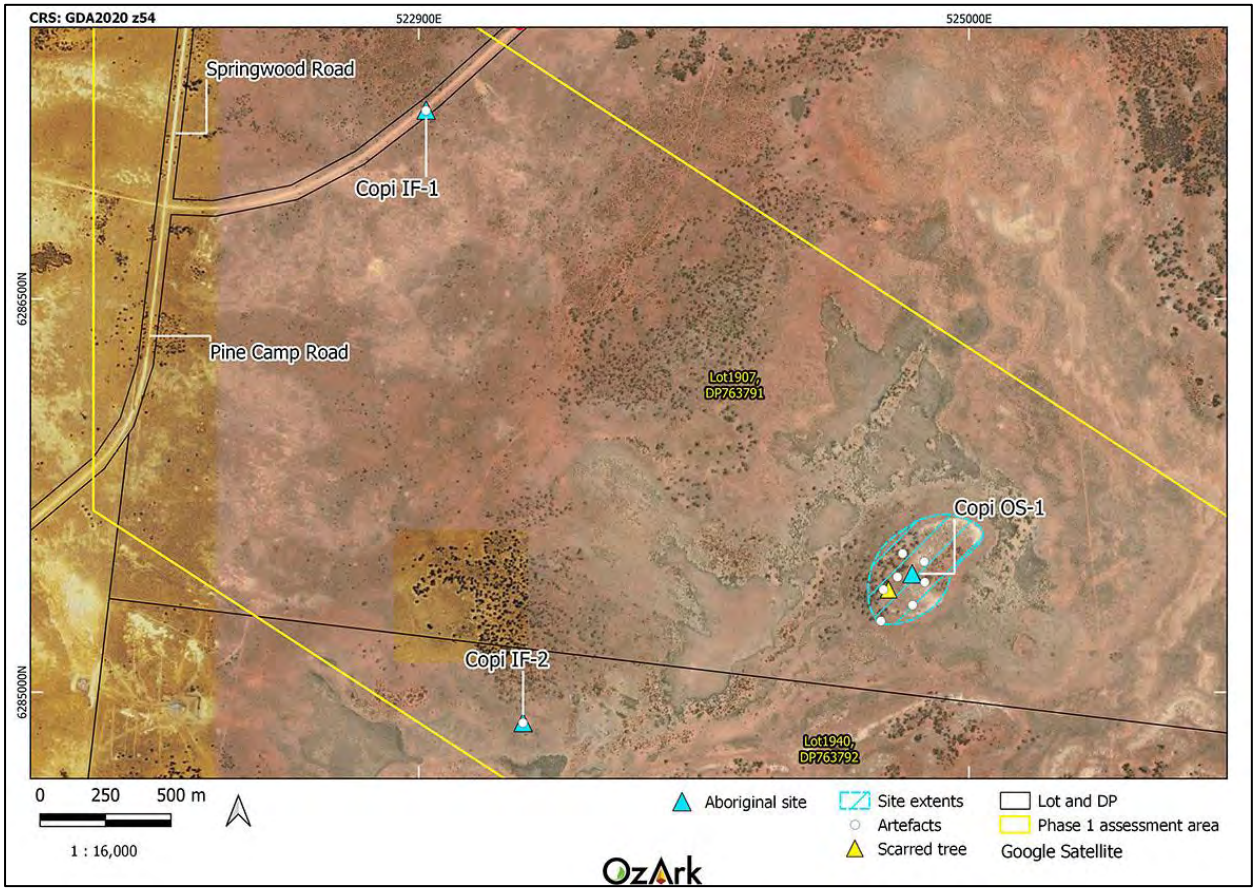


Figure 6-8: Copi IF-1. View of site and recorded artefact.

	
1. View southwest to the location of Copi IF-1 located on the southern corridor of Nulla Road.	2. Copi IF-1 artefact: a quartzite flaked piece.

Copi IF-2

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 523297E 6284883N

Location of Site: Copi IF-2 is in the north-western portion of Lot 1940 DP763972 on the Huntingfield property (**Figure 6-7**). The site is 2.7 km directly east of Pine Camp Road and 2.4 km southeast of the intersection of Springwood Road/Pine Camp Road and Nulla Road.

Description of Site: Copi IF-2 is a single quartz flake located on a low sandy rise on the edge of a salt pan (**Figure 6-9**). The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of light brown sand. Surrounding vegetation at the site comprises isolated trees and shrubs including saltbush. The GSE at the time of recording was high (90%) with a GSV of 70% within the large area of exposure. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-2 is assessed as negligible.

Figure 6-9: Copi IF-2. View of site and recorded artefact.

	
1. View east to the location of Copi IF-2 on a low sandy rise.	2. Copi IF-2 artefact: a quartz flake (dorsal surface).

Copi IF-3

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 525790E 6283287N

Location of Site: Copi IF-3 is in the northern portion of Lot 1940 DP763972 on the Huntingfield property (**Figure 6-10**). The site is 3.3 km directly west of Nulla Road and 3.9 km northwest of the Huntingfield homestead.

Description of Site: Copi IF-3 is a single chert flake located on the eastern side of a low rise (**Figure 6-11**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of light brown silty sand overlying a light brown to grey silty sand. Surrounding vegetation at the site comprises isolated trees and sparse grass cover. The GSE at the time of recording was high (80%) with a GSV of 60% within the large area of exposure. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-3 is assessed as negligible.

Figure 6-10: Location of Copi IF-3 to Copi IF-5.

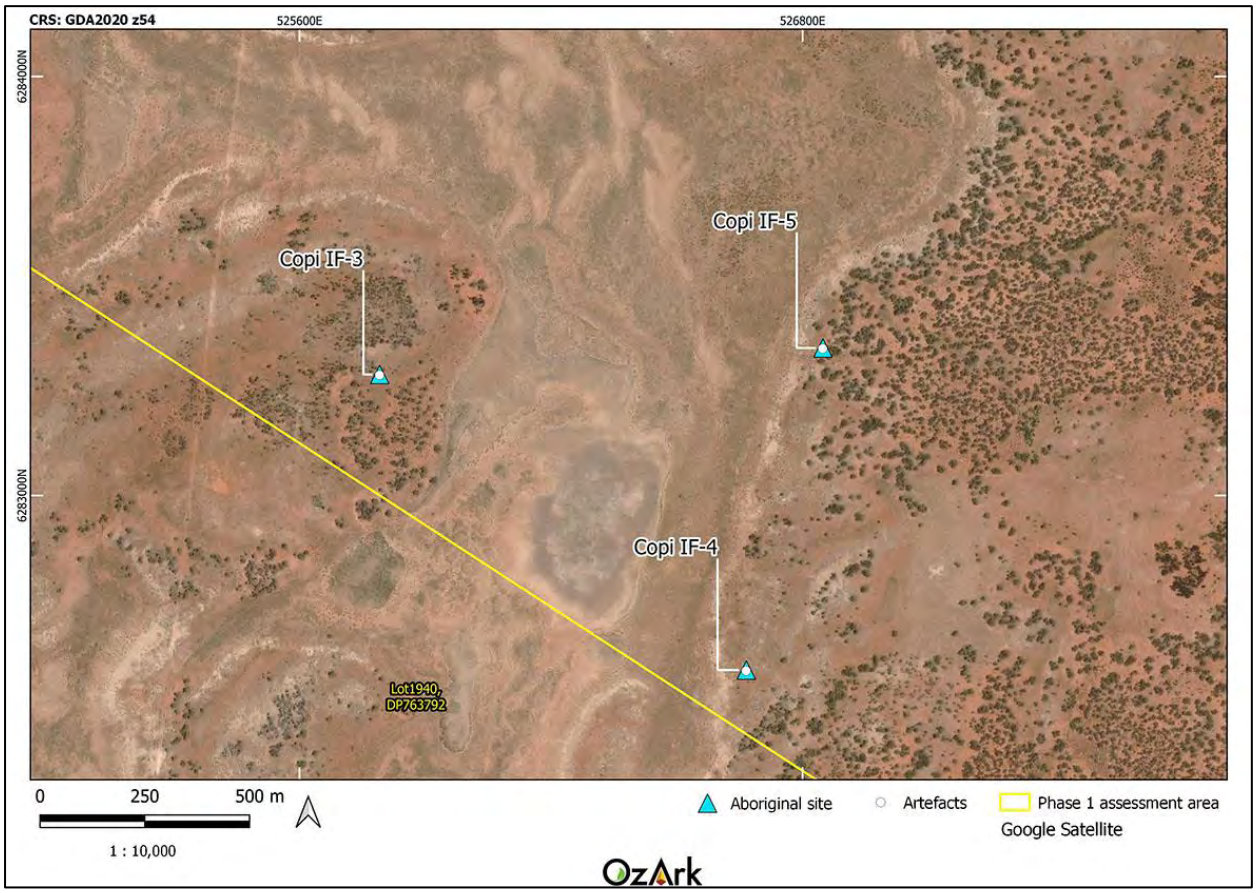


Figure 6-11: Copi IF-3. View of site and recorded artefact.

1. View east to the location of Copi IF-3 located on a low-rise overlooking part of the western salt pan.

2. Copi IF-3 artefact: a chert flake (ventral surface).

Copi IF-4

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 526665E 6282582N

Location of Site: Copi IF-4 is in the north-eastern portion of Lot 1940 DP763972 on the Huntingfield property (**Figure 6-10**). The site is 2.3 km directly west of Nulla Road and 2.9 km northwest of the Huntingfield homestead.

Description of Site: Copi IF-4 is a single chert flake located on the western side of a low rise (**Figure 6-12**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of light brown silty sand overlying with pockets of powdery gypsum. Surrounding vegetation at the site comprises isolated trees and shrubs. The GSE at the time of recording was moderate (60%) with a GSV of 50%. Identified disturbances include erosion, rabbit burrows and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-4 is assessed as negligible.

Figure 6-12: Copi IF-4. View of site and recorded artefact.

1. View northwest to the location of Copi IF-4 located on a low-rise overlooking part of the western salt pan.

2. Copi IF-4 artefact: a chert flake (dorsal surface).

Copi IF-5

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 526848E 6283350N

Location of Site: Copi IF-5 is in the north-eastern portion of Lot 1940 DP763972 on the Huntingfield property (**Figure 6-10**). The site is 2.2 km directly west of Nulla Road and 3.6 km north of the Huntingfield homestead.

Description of Site: Copi IF-5 is a single quartzite flake located on the western side of a low rise (**Figure 6-13**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of light brown silty sand overlying with pockets of powdery gypsum. Surrounding vegetation at the site comprises isolated trees and shrubs. The GSE at the time of recording was moderate (60%) with a GSV of 40%. Identified disturbances include erosion, rabbit burrows and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-5 is assessed as negligible.

Figure 6-13: Copi IF-5. View of site and recorded artefact.

<table>
<tr><td>  </td><td> 
</td></tr>
<tr><td>1. View south to the location of Copi IF-5 located on the western side of a low rise on the edge of the western salt pan.</td><td>2. Copi IF-5 artefact: a quartzite flake (ventral surface).</td></tr>
</table>

Copi IF-6

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 528740E 6282175N

Location of Site: Copi IF-6 is in the north-eastern portion of Lot 1940 DP763972 on the Huntingfield property (**Figure 6-14**). The site is 230 m directly west of Nulla Road and 2.7 km northeast of the Huntingfield homestead.

Description of Site: Copi IF-6 is a single quartzite flake located on a flat sandplain (**Figure 6-15**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of orange/red sand. Surrounding vegetation at the site comprises open woodland of trees and shrubs. The GSE at the time of recording was high (80%) with a GSV of 70%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-6 is assessed as negligible.

Figure 6-14: Location of Copi IF-6 to IF-8 and Copi OS-2 to OS-4.

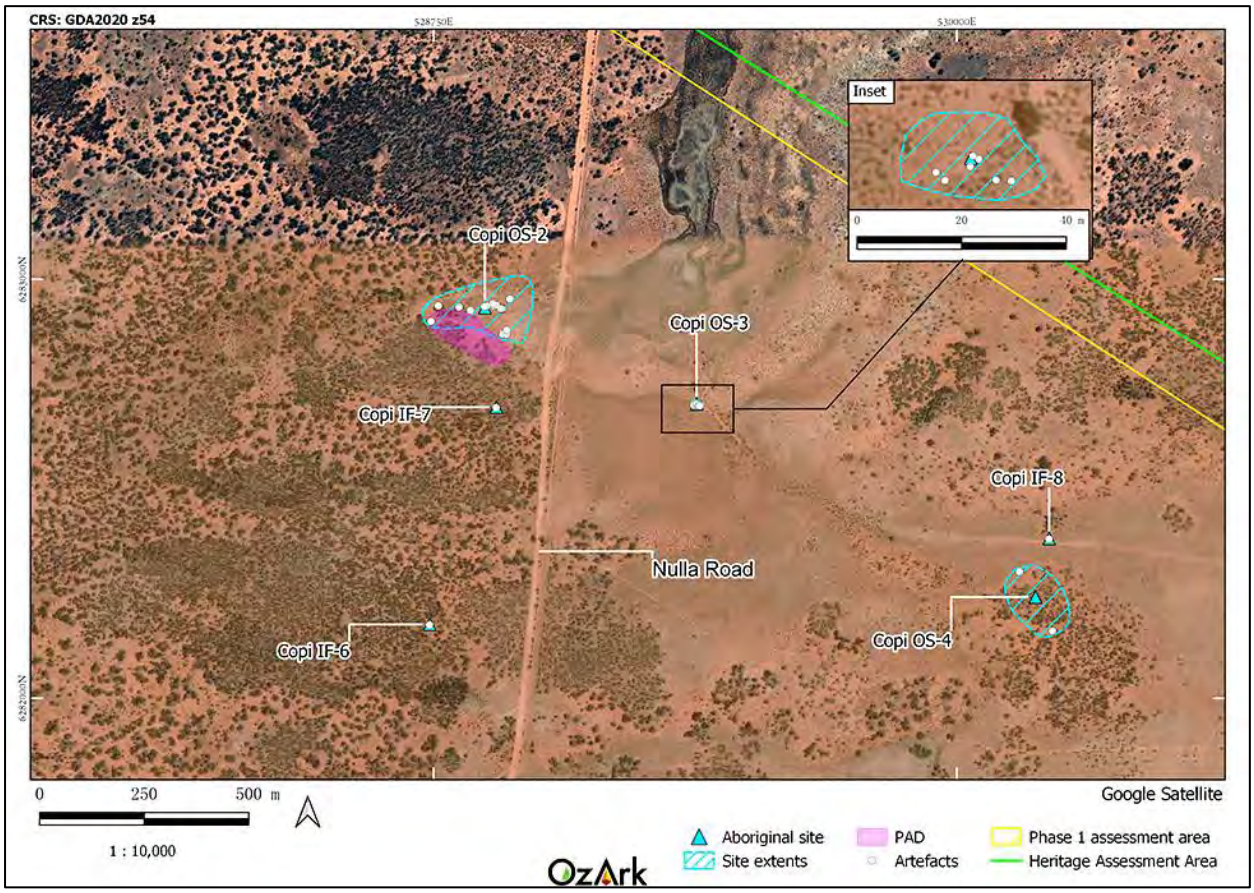


Figure 6-15: Copi IF-6. View of site and recorded artefact.

1. View west to the location of Copi IF-6 located on a sandplain.

2. Copi IF-6 artefact: a quartzite flake (dorsal surface).

Copi IF-7

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 528899E 6282693N

Location of Site: Copi IF-7 is in the north-eastern portion of Lot 1940 DP763972 on the Huntingfield property (**Figure 6-14**). The site is 105 m directly west of Nulla Road and 3.2 km northeast of the Huntingfield homestead.

Description of Site: Copi IF-7 is a piece of chert shatter located on a flat sandplain (**Figure 6-16**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of orange/red sand. Surrounding vegetation at the site comprises open woodland of trees and shrubs. The GSE at the time of recording was high (80%) with a GSV of 60%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-7 is assessed as negligible.

Figure 6-16: Copi IF-7. View of site and recorded artefact.

1. View south to the location of Copi IF-7 located on a sandplain.

2. Copi IF-7 artefact: a piece of chert shatter.

Copi IF-8

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 530220E 6282380N

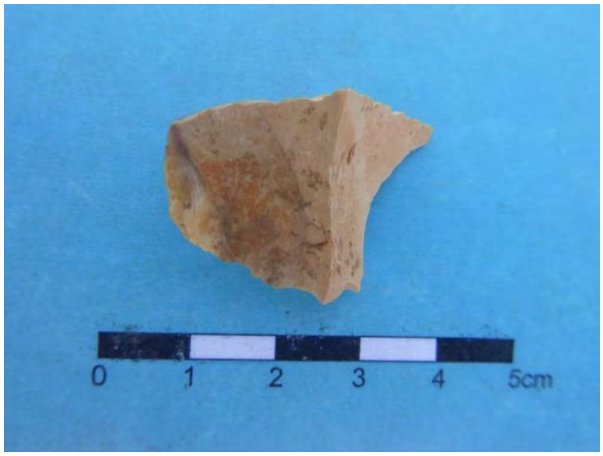
Location of Site: Copi IF-8 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-14**). The site is 1.2 km directly east of Nulla Road and 3.8 km northeast of the Huntingfield homestead.

Description of Site: Copi IF-8 is a chert flaked piece located on the northern bank of an ephemeral drainage line (**Figure 6-17**). The extent of the site is defined by a 5 m buffer

around the artefact. Soils at the site consist of orange/red sand. Surrounding vegetation at the site consists of shrubs and scattered trees. The GSE at the time of recording was high (80%) with a GSV of 70%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-8 is assessed as negligible.

Figure 6-17: Copi IF-8. View of site and recorded artefact.

	
1. View west to the location of Copi IF-8 located to the north of a drainage line.	2. Copi IF-8 artefact: a chert flaked piece.

Copi IF-9

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 530145E 6281327N

Location of Site: Copi IF-9 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-18**). The site is 1.3 km directly east of Nulla Road and 3.1 km northeast of the Huntingfield homestead.

Description of Site: Copi IF-9 is a chert flake located on a flat sandplain (**Figure 6-19**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of orange/red sand. Surrounding vegetation at the site consist of shrubs and scattered trees. The GSE at the time of recording was high (70%) with a GSV of 60%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-9 is assessed as negligible.

Figure 6-18: Location of Copi IF-9 to IF-11 and Copi OS-5 to OS-9.

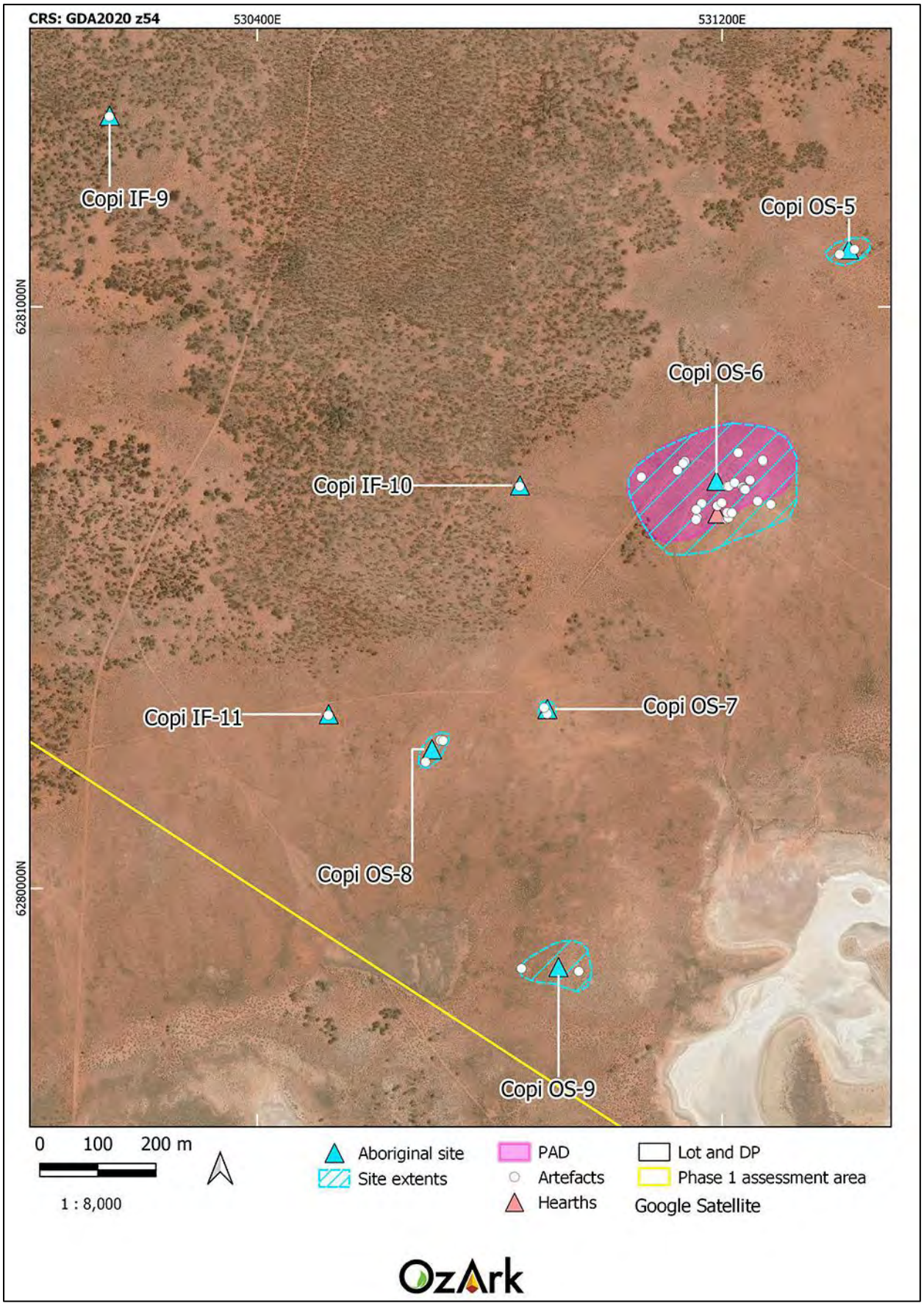


Figure 6-19: Copi IF-9. View of site and recorded artefact.

1. View southwest to the location of Copi IF-9 located on a sandplain.

2. Copi IF-9 artefact: a chert flake.

Copi IF-10

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 530852E 6280691N

Location of Site: Copi IF-10 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-18**). The site is 2.3 km directly east of Nulla Road and 3.5 km northeast of the Huntingfield homestead.

Description of Site: Copi IF-10 is a piece of chert shatter located on a flat sandplain (**Figure 6-20**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of orange/red sand. Surrounding vegetation at the site consist of shrubs and open woodland to the west and north. The GSE at the time of recording was high (70%) with a GSV of 60%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-10 is assessed as negligible.

Figure 6-20: Copi IF-10. View of site and recorded artefact.

1. View southeast to the location of Copi IF-10 showing the eastern salt pan in the background.

2. Copi IF-10 artefact: a piece of chert shatter.

Copi IF-11

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 530522E 6280298N

Location of Site: Copi IF-11 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-18**). The site is 2.7 km directly east of Nulla Road and 3.1 km east of the Huntingfield homestead.

Description of Site: Copi IF-11 is a quartzite flake located in an erosion scald on a gentle slope (**Figure 6-21**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of orange/red sand. Surrounding vegetation at the site consist of shrubs with open woodland located to the north of the site. The GSE at the time of recording was high (90%) with a GSV of 70%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-11 is assessed as negligible.

Figure 6-21: Copi IF-11. View of site and recorded artefact.

1. View south to the location of Copi IF-11 showing the eastern salt pan in the background.

2. Copi IF-11 artefact: a quartzite flake (dorsal surface).

Copi IF-12

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 532177E 6280266N

Location of Site: Copi IF-12 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-22**). The site is 4.3 km directly east of Nulla Road and 4.7 km east of the Huntingfield homestead.

Description of Site: Copi IF-12 is a quartz flake located in an erosion scald on a long, gentle slope (**Figure 6-23**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of orange sand. Surrounding vegetation at the site consist of shrubs. The GSE at the time of recording was high (80%) with a GSV of 70%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-12 is assessed as negligible.

Figure 6-22: Location of Copi IF-12 and IF-15 and Copi OS-10 to OS-11.

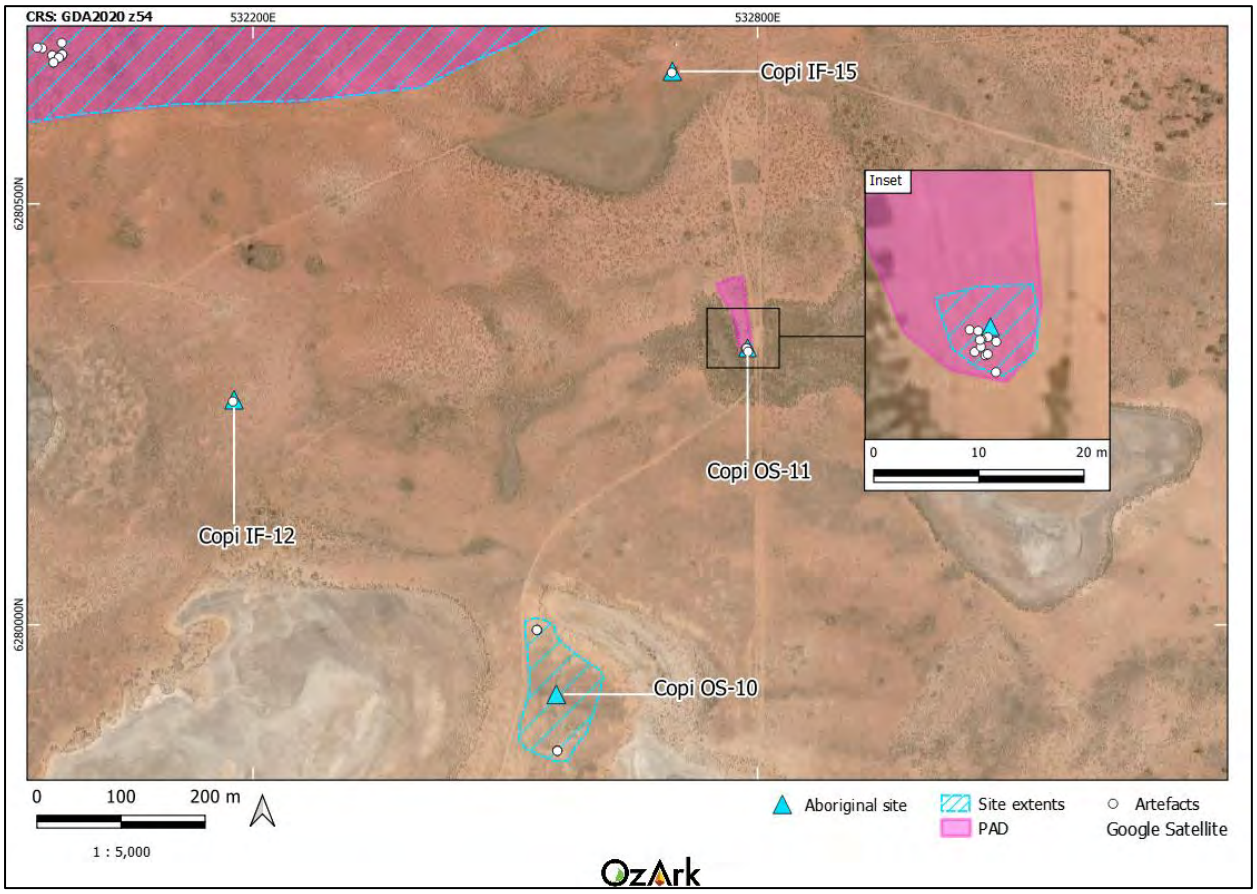


Figure 6-23: Copi IF-12. View of site and recorded artefact.

1. View south to the location of Copi IF-12 showing the eastern salt pan in the background.

2. Copi IF-12 artefact: a quartz flake (dorsal surface).

Copi IF-13

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 532171E 6279339N

Location of Site: Copi IF-13 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-24**). The site is 4.6 km directly east of Nulla Road and 4.7 km east of the Huntingfield homestead.

Description of Site: Copi IF-13 is a chert flake located within the eastern salt pan (**Figure 6-25**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of a thin layer of yellow sand overlying light brown silt and pockets of powdery gypsum. Surrounding vegetation at the site consist of shrubs. The GSE at the time of recording was moderate (60%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-13 is assessed as negligible.

Figure 6-24: Location of Copi IF-13 to IF-14 and Copi IF-16 to IF-19.

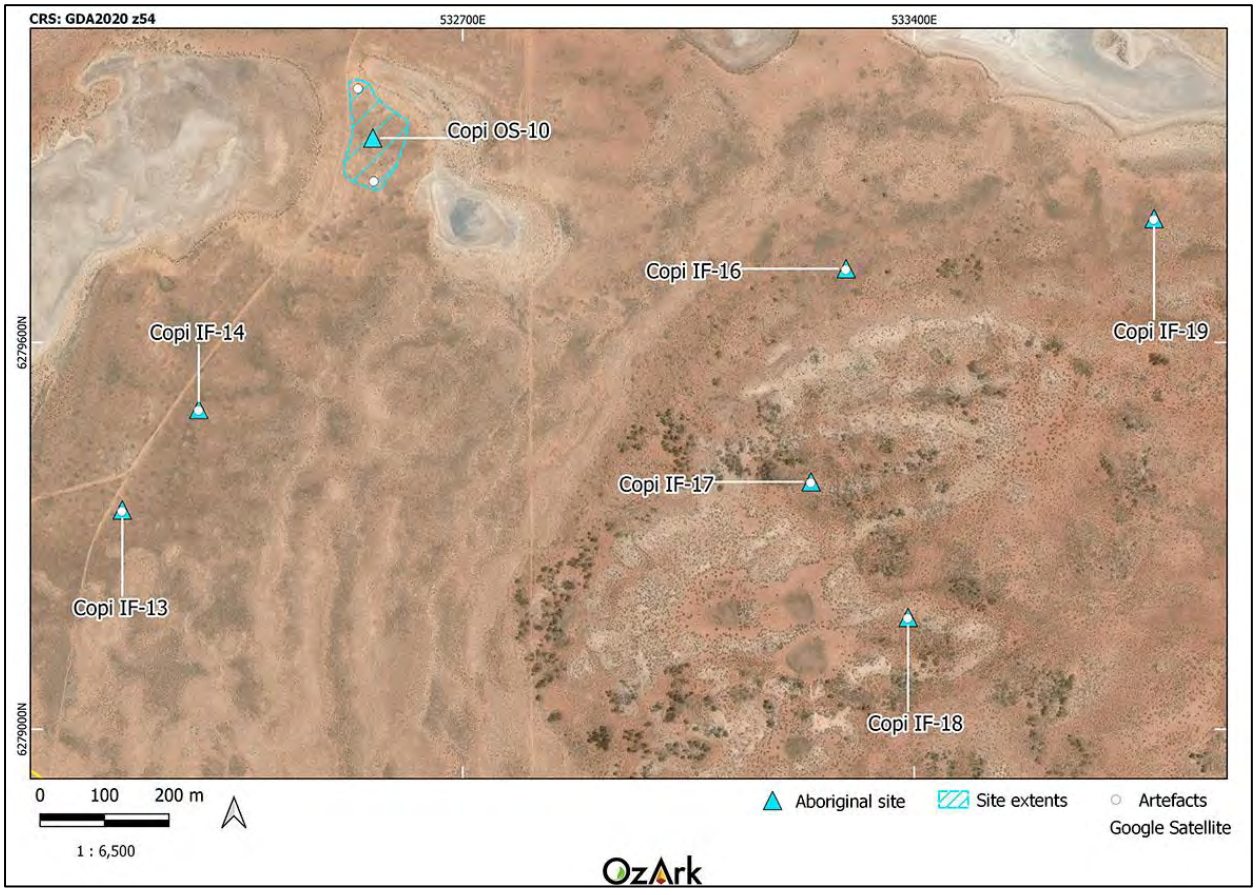


Figure 6-25: Copi IF-13. View of site and recorded artefact.

1. View east to the location of Copi IF-13.

2. Copi IF-13 artefact: a chert flake (dorsal surface).

Copi IF-14

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 532290E 6279495N

Location of Site: Copi IF-14 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-24**). The site is 4.7 km directly east of Nulla Road and 4.8 km east of the Huntingfield homestead.

Description of Site: Copi IF-14 is a quartz flake located within the eastern salt pan (**Figure 6-26**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of a thin layer of yellow sand overlying light brown silt and pockets of powdery gypsum. Surrounding vegetation at the site consist of shrubs. The GSE at the time of recording was moderate (60%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-14 is assessed as negligible.

Figure 6-26: Copi IF-14. View of site and recorded artefact.

	
1. View east to the location of Copi IF-14.	2. Copi IF-14 artefact: a quartz flake (dorsal surface).

Copi IF-15

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 532698E 6280656N

Location of Site: Copi IF-15 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-22**). The site is to the south of two water tanks: 4.7 km directly east of Nulla Road and 5.2 km northeast of the Huntingfield homestead.

Description of Site: Copi IF-15 is a quartzite flake located within a depression associated with the eastern salt pan (**Figure 6-27**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of red sand. Surrounding vegetation at the site consist of shrubs. The GSE at the time of recording was high (80%) with a GSV of 90%. Identified disturbances include the installation of tanks and troughs, erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-15 is assessed as negligible.

Figure 6-27: Copi IF-15. View of site and recorded artefact.

	
1. View east to the location of Copi IF-15 within a depression and near to water tanks.	2. Copi IF-15 artefact: a quartzite flake (dorsal surface).

Copi IF-16

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 533294E 6279713N

Location of Site: Copi IF-16 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-24**). The site is 5.7 km directly east of Nulla Road and 5.9 km southwest of the Warwick homestead.

Description of Site: Copi IF-16 is a quartz flake located on a gentle slope along the edge of the eastern salt pan (**Figure 6-28**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Surrounding vegetation at the site consist of shrubs with scattered trees. The GSE at the time of recording was high (70%) with a GSV of 90%. Identified disturbances include erosion, rabbit burrows and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-16 is assessed as negligible.

Figure 6-28: Copi IF-16. View of site and recorded artefact.

	
1. View south to the location of Copi IF-16 showing a gypsum crest in the background.	2. Copi IF-16 artefact: a quartz flake (dorsal surface).

Copi IF-17

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 533240E 6279382N

Location of Site: Copi IF-17 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-24**). The site is 5.6 km directly east of Nulla Road and 6.1 km southwest of the Warwick homestead.

Description of Site: Copi IF-17 is a quartzite flake located on a gently undulating plain with gypsum crests (**Figure 6-29**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of light brown clayey sand. Surrounding vegetation at the site consist of shrubs with scattered trees. The GSE at the time of recording was moderate (60%) with a GSV of 90%. Identified disturbances include erosion, rabbit burrows, and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-17 is assessed as negligible.

Figure 6-29: Copi IF-17. View of site and recorded artefact.

	
1. View north to the location of Copi IF-17.	2. Copi IF-17 artefact: a quartzite flake (dorsal surface).

Copi IF-18

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 533390E 6279172N

Location of Site: Copi IF-18 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-24**). The site is 5.8 km directly east of Nulla Road and 6.1 km southwest of the Warwick homestead.

Description of Site: Copi IF-18 is a chalcedony flake located on a gently undulating plain to the north of a small depression (**Figure 6-30**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Surrounding vegetation at the site consist of shrubs with scattered trees. The GSE at the time of recording was high (70%) with a GSV of 80%. Identified disturbances include erosion, rabbit burrows and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-18 is assessed as negligible.

Figure 6-30: Copi IF-18. View of site and recorded artefact.

1. View southwest to the location of Copi IF-18 showing a depression in the background.

2. Copi IF-18 artefact: a chalcedony flake (dorsal surface).

Copi IF-19

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 533771E 6279791N

Location of Site: Copi IF-19 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-24**). The site is 6.2 km directly east of Nulla Road and 5.5 km southwest of the Warwick homestead.

Description of Site: Copi IF-19 is a quartzite flake located on the side of a low rise (**Figure 6-31**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Surrounding vegetation at the site consist of shrubs. The GSE at the time of recording was high (80%) with a GSV of 90%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-19 is assessed as negligible.

Figure 6-31: Copi IF-19. View of site and recorded artefact.

	
1. View north to the location of Copi IF-19 showing part of the eastern salt pan in the background (left).	2. Copi IF-19 artefact: a quartzite flake (dorsal surface).

Copi IF-20

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 533939E 6280173N

Location of Site: Copi IF-20 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-32**). The site is 6.1 km directly east of Nulla Road and 5 km southwest of the Warwick homestead.

Description of Site: Copi IF-20 is a quartzite flake located on an elevated portion of the eastern salt pan (**Figure 6-33**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Surrounding vegetation at the site consist of shrubs. The GSE at the time of recording was high (80%) with a GSV of 90%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-20 is assessed as negligible.

Figure 6-32: Location of Copi IF-20 to IF-25 and Copi OS-16.

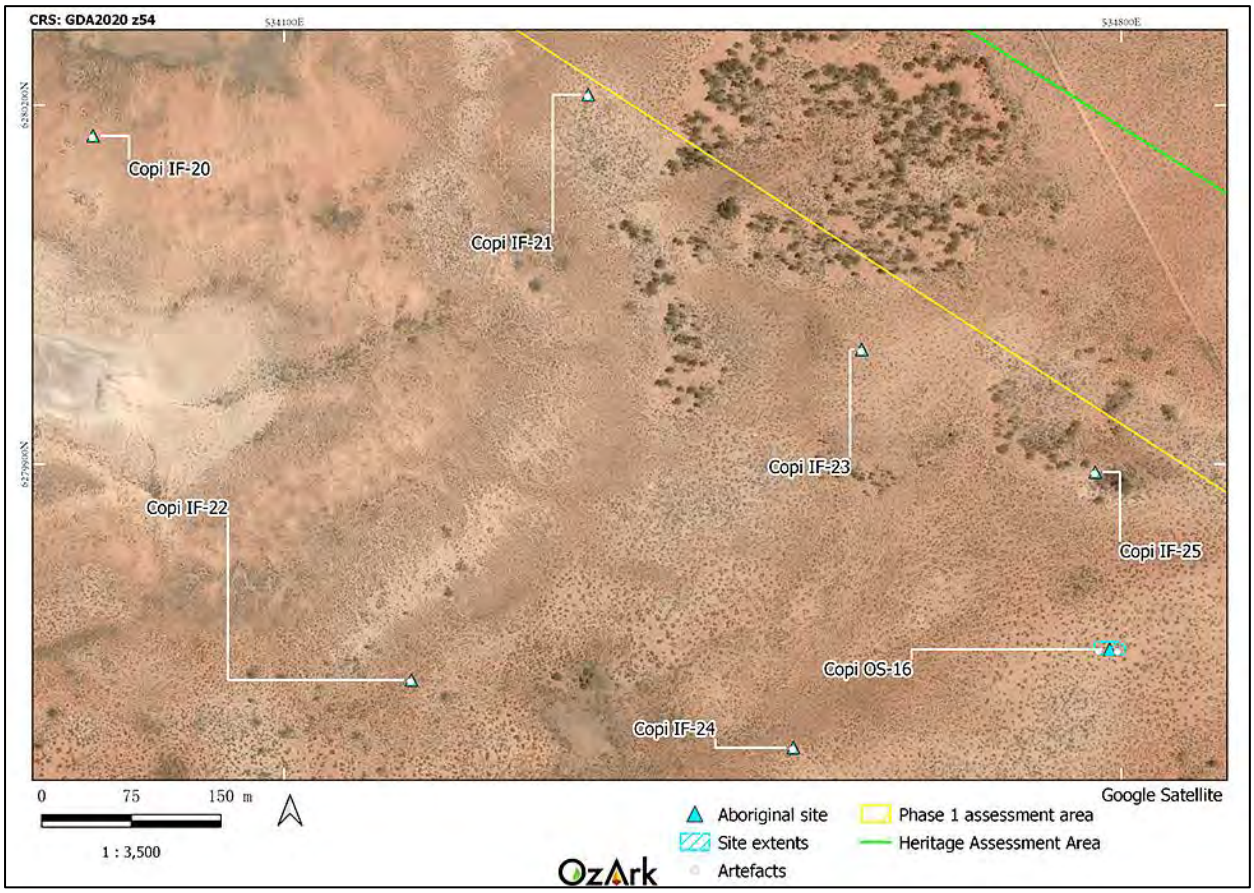


Figure 6-33: Copi IF-20. View of site and recorded artefact.

1. View east to the location of Copi IF-20.

2. Copi IF-20 artefact: a quartzite flake (dorsal surface).

Copi IF-21

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 534354E 6280207N

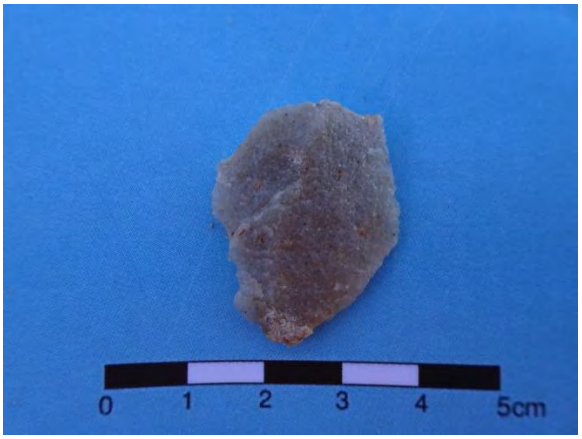
Location of Site: Copi IF-21 is in the central portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-32**). The site is 6.5 km directly east of Nulla Road and 4.7 km southwest of the Warwick homestead.

Description of Site: Copi IF-21 is a quartzite flake located on the edge of a rise adjacent to the eastern salt pan (**Figure 6-34**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of light brown clayey sand. Surrounding vegetation at the site consist of shrubs with an area of open woodland to the east. The GSE at the time of recording was high (70%) with a GSV of 90%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-21 is assessed as negligible.

Figure 6-34: Copi IF-21. View of site and recorded artefact.

1. View west to the location of Copi IF-21 overlooking the eastern salt pan.



2. Copi IF-21 artefact: a quartzite flake (dorsal surface).

Copi IF-22

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 534206E 6279718N

Location of Site: Copi IF-22 is in the central portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-32**). The site is 6.6 km directly east of Nulla Road and 5.2 km southwest of the Warwick homestead.

Description of Site: Copi IF-22 is a quartzite flake located on the side of a gentle rise (**Figure 6-35**). The extent of the site is defined by a 5 m buffer around the artefact. Soils

at the site consists of orange clayey sand. Surrounding vegetation at the site consist of shrubs. The GSE at the time of recording was high (70%) with a GSV of 90%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-22 is assessed as negligible.

Figure 6-35: Copi IF-22. View of site and recorded artefact.

<table>
<tr><td>  </td><td> 
</td></tr>
<tr><td>1. View northeast to the location of Copi IF-22.</td><td>2. Copi IF-22 artefact: a quartzite flake (dorsal surface).</td></tr>
</table>

Copi IF-23

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 534582E 6279994N

Location of Site: Copi IF-23 is in the central portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-32**). The site is 6.9 km directly east of Nulla Road and 4.7 km southwest of the Warwick homestead.

Description of Site: Copi IF-23 is a quartzite flake located on the side of a gentle rise (**Figure 6-36**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consist of shrubs with open woodland surrounding the site in all directions. The GSE at the time of recording was high (80%) with a GSV of 90%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-23 is assessed as negligible.

Figure 6-36: Copi IF-23. View of site and recorded artefact.

	
1. View east to the location of Copi IF-23.	2. Copi IF-23 artefact: a quartzite flake (dorsal surface).

Copi IF-24

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 534525E 6279662N

Location of Site: Copi IF-24 is in the central portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-32**). The site is 6.9 km directly east of Nulla Road and 5 km southwest of the Warwick homestead.

Description of Site: Copi IF-24 is a quartz flake located on a gentle slope across a sandplain (**Figure 6-37**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consist of shrubs. The GSE at the time of recording was high (80%) with a GSV of 90%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-24 is assessed as negligible.

Figure 6-37: Copi IF-24. View of site and recorded artefact.

1. View northeast to the location of Copi IF-24.

2. Copi IF-24 artefact: a quartz flake (dorsal surface).

Copi IF-25

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 534778E 6279892N

Location of Site: Copi IF-25 is in the central portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-32**). The site is 7.1 km directly east of Nulla Road and 4.7 km southwest of the Warwick homestead.

Description of Site: Copi IF-25 is a silcrete core located on the crest of a low rise (**Figure 6-38**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consist of shrubs with patches of trees. The GSE at the time of recording was high (70%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-25 is assessed as negligible.

Figure 6-38: Copi IF-25. View of site and recorded artefact.

1. View south to the location of Copi IF-25.

2. Copi IF-25 artefact: a silcrete core.

Copi IF-26

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 534920E 6279529N

Location of Site: Copi IF-26 is in the central portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-39**). The site is 7.3 km directly east of Nulla Road and 4.8 km southwest of the Warwick homestead.

Description of Site: Copi IF-26 is a chert flake located on a sandplain (**Figure 6-40**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs. The GSE at the time of recording was high (80%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-26 is assessed as negligible.

Figure 6-39: Location of Copi IF-26 and Copi OS-26 to OS-27.

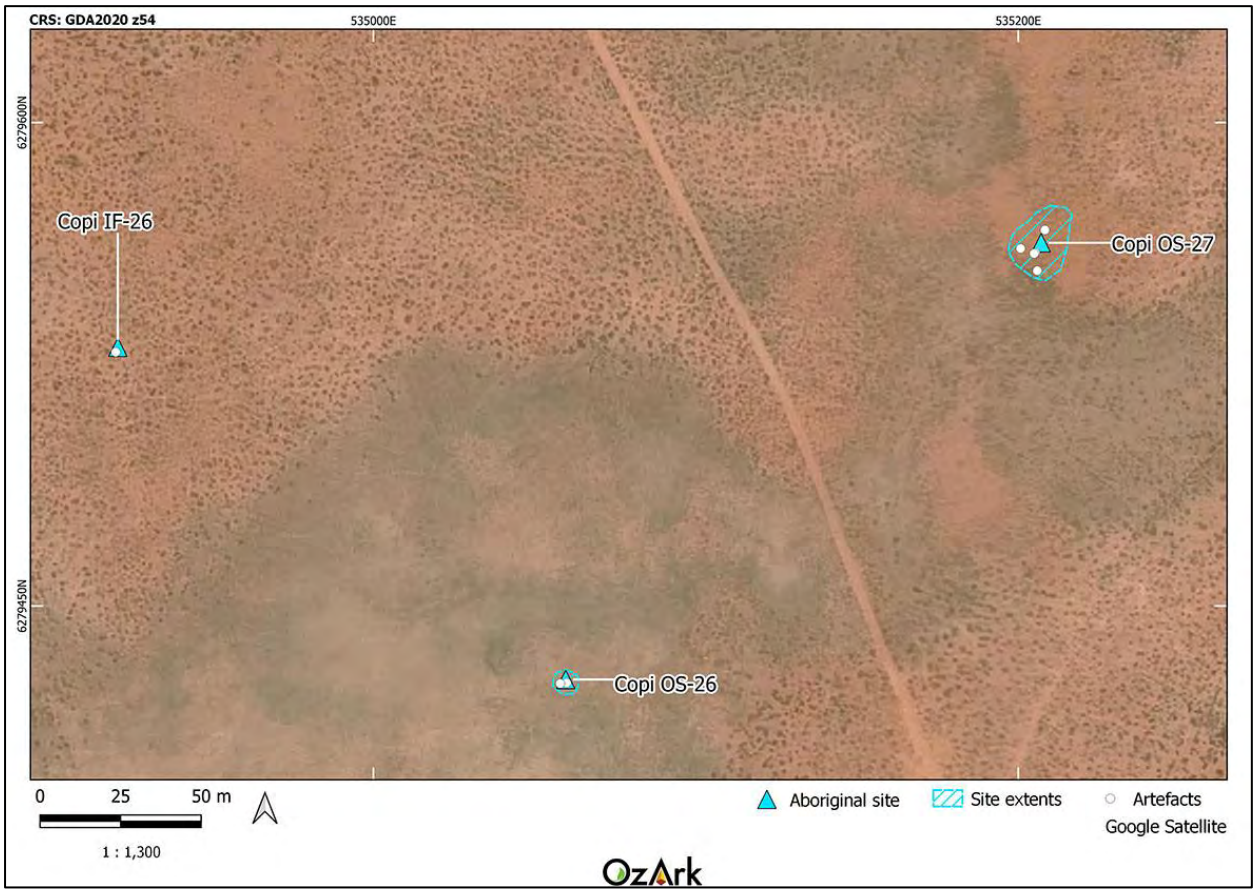


Figure 6-40: Copi IF-26. View of site and recorded artefact.

1. View southwest to the location of Copi IF-26.

2. Copi IF-26 artefact: a chert flake (dorsal surface).

Copi IF-27

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 534089E 6279060N

Location of Site: Copi IF-27 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-41**). The site is 6.5 km directly east of Nulla Road and 5.7 km southwest of the Warwick homestead.

Description of Site: Copi IF-27 is a quartzite flake on a sandplain (**Figure 6-42**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs with isolated stands of trees to the south. The GSE at the time of recording was high (80%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-27 is assessed as negligible.

Figure 6-41: Location of Copi IF-27 to IF-28 and Copi OS-14 and OS-18.

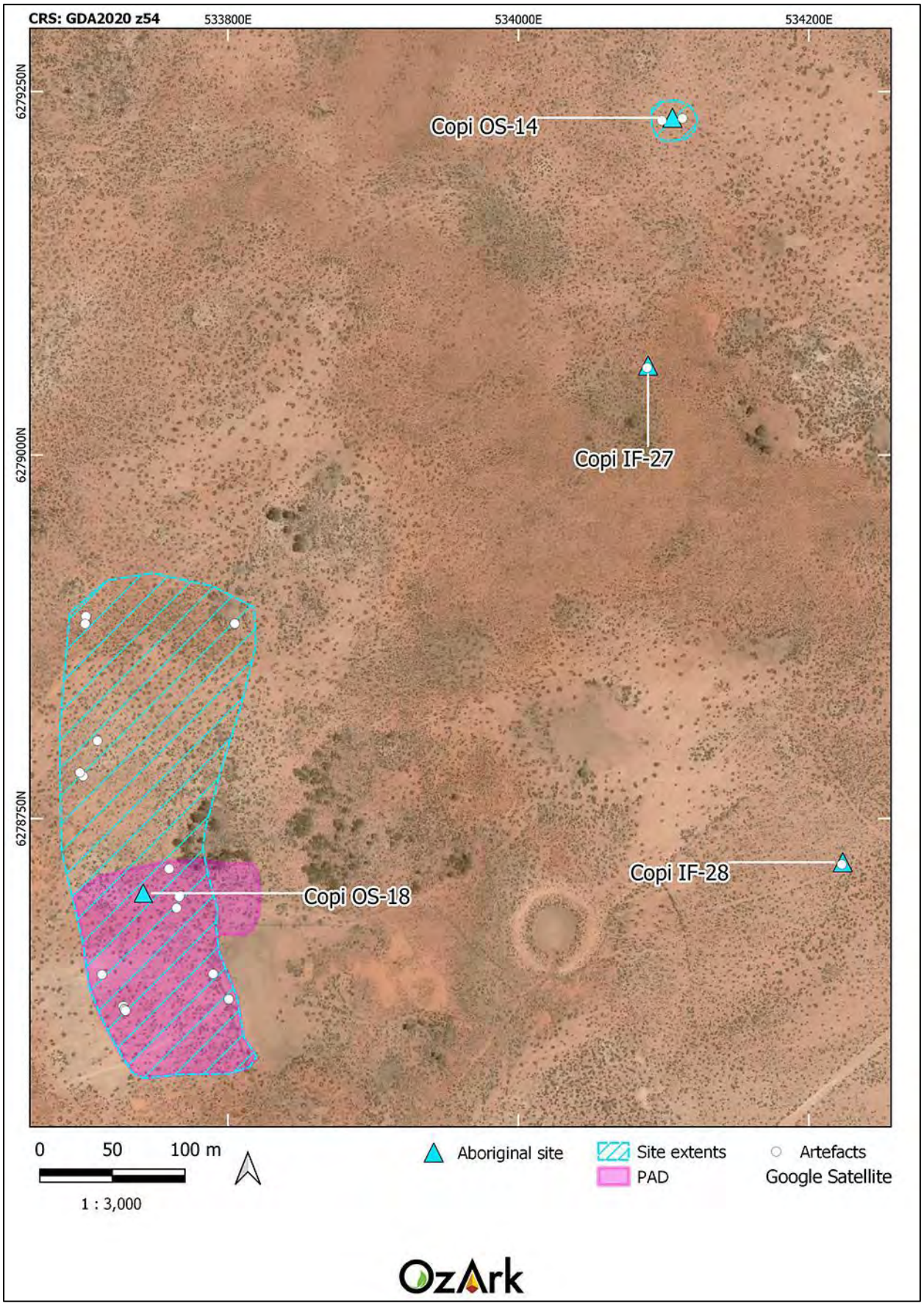


Figure 6-42: Copi IF-27. View of site and recorded artefact.

1. View east to the location of Copi IF-27.

2. Copi IF-27 artefact: a quartzite flake (dorsal surface).

Copi IF-28

Site Type: Isolated find

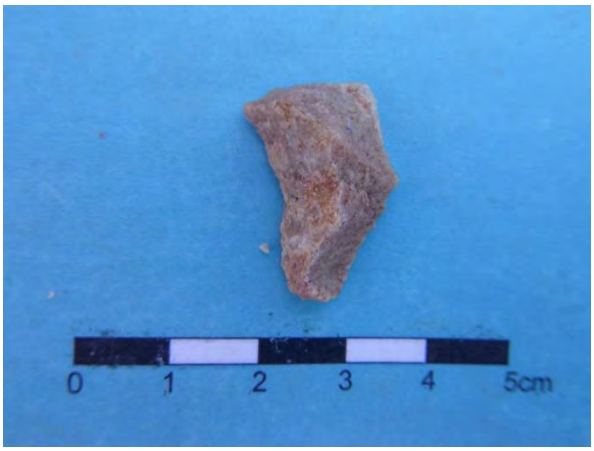
GPS Coordinates: GDA Zone 54 534223E 6278718N

Location of Site: Copi IF-28 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-41**). The site is 6.7 km directly east of Nulla Road and 6.1 km southwest of the Warwick homestead.

Description of Site: Copi IF-28 is a quartzite flake on a sandplain (**Figure 6-43**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs. The GSE at the time of recording was high (80%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-28 is assessed as negligible.

Figure 6-43: Copi IF-28. View of site and recorded artefact.

	
1. View east to the location of Copi IF-28.	2. Copi IF-28 artefact: a quartzite flake (dorsal surface).

Copi IF-29

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 533811E 6278257N

Location of Site: Copi IF-29 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-44**). The site is 6 km directly east of Nulla Road and 6.5 km southwest of the Warwick homestead.

Description of Site: Copi IF-29 is a quartzite flake on a sandplain (**Figure 6-45**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs with isolated stands of trees to the north. The GSE at the time of recording was high (80%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-29 is assessed as negligible.

Figure 6-44: Location of Copi IF-29 to IF-31 and Copi OS-19.

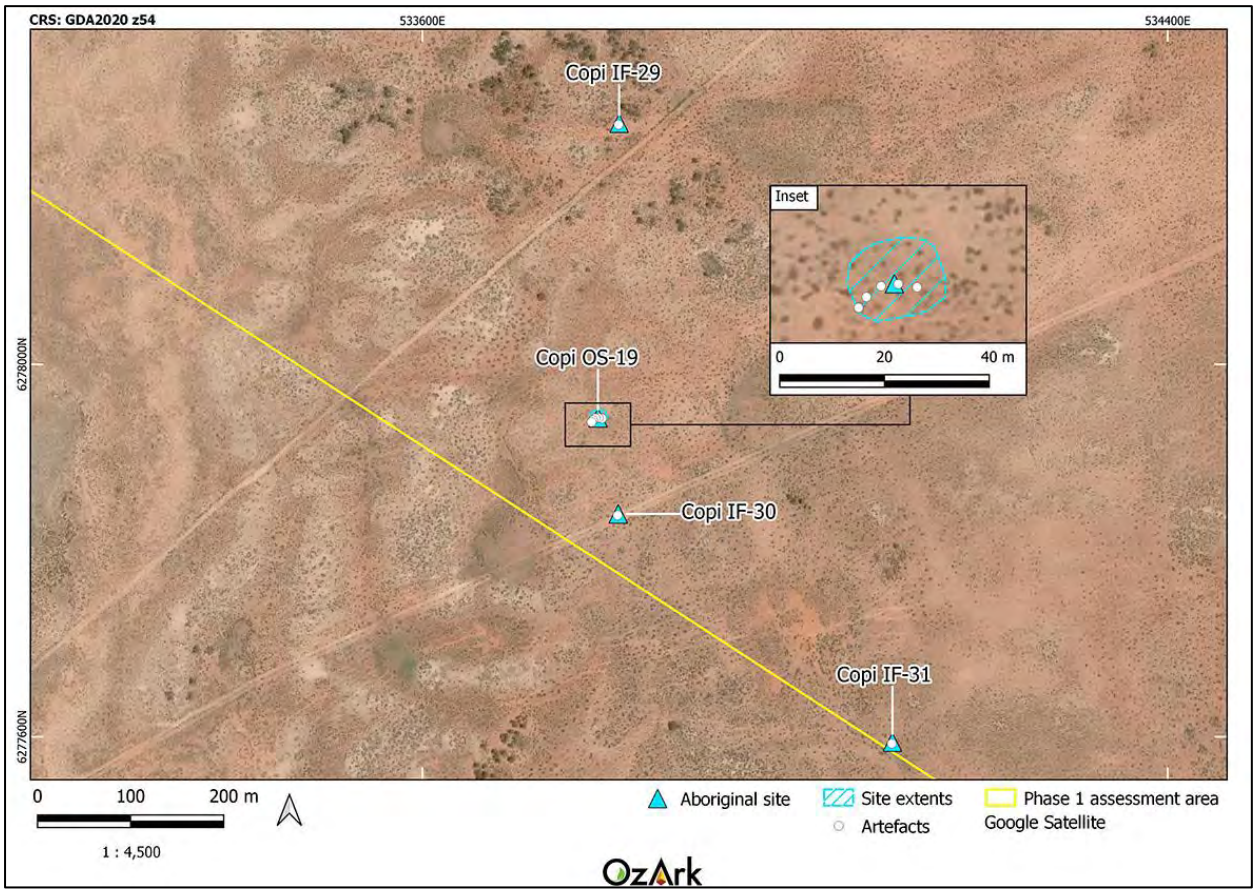


Figure 6-45: Copi IF-29. View of site and recorded artefact.

1. View northeast to the location of Copi IF-29.

2. Copi IF-29 artefact: a quartzite flake (dorsal surface).

Copi IF-30

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 533810E 6277838N

Location of Site: Copi IF-30 is in the southwestern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-44**). The site is located along a vehicle track adjacent to

a property fence; 5.6 km directly east of Nulla Road and 7 km southwest of the Warwick homestead.

Description of Site: Copi IF-30 is a quartz flake on a flat plain (**Figure 6-46**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand with pockets of powdery gypsum. Vegetation at the site consists of shrubs. The GSE at the time of recording was high (80%) with a GSV of 80%. Identified disturbances include vehicle movement, erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-30 is assessed as negligible.

Figure 6-46: Copi IF-30. View of site and recorded artefact.

1. View southwest to the location of Copi IF-30 along a vehicle track.

2. Copi IF-30 artefact: a quartz flake (dorsal surface).

Copi IF-31

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 534104E 6277593N

Location of Site: Copi IF-31 is in the southwestern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-44**). The site is located 5.9 km directly east of Nulla Road and 7 km southwest of the Warwick homestead.

Description of Site: Copi IF-31 is a quartzite side scraper on a sandplain (**Figure 6-47**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs. The GSE at the time of recording was high (80%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-31 is assessed as negligible.

Figure 6-47: Copi IF-31. View of site and recorded artefact.

	
1. View north to the location of Copi IF-31.	2. Copi IF-31 artefact: a quartzite side scraper (dorsal surface).

Copi IF-32

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 534853E 6277242N

Location of Site: Copi IF-32 is in the southwestern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-48**). The site is located 6.5 km directly east of Nulla Road and 7 km southwest of the Warwick homestead.

Description of Site: Copi IF-32 is a chert flake on a sandplain (**Figure 6-49**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs. The GSE at the time of recording was high (90%) with a GSV of 90%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-32 is assessed as negligible.

Figure 6-48: Location of Copi IF-32 to IF-37 and Copi OS20 to OS22 and Copi OS-28.

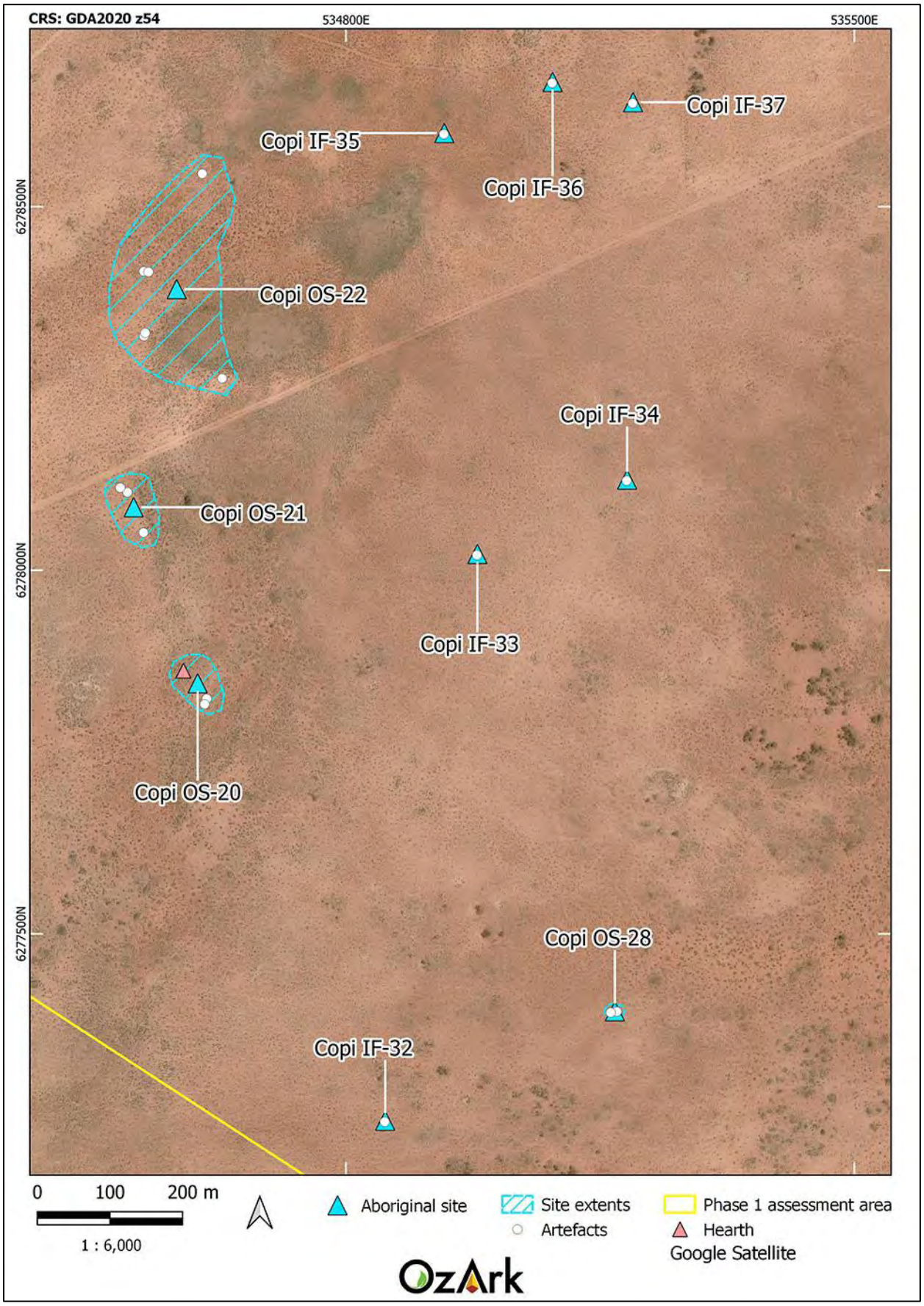


Figure 6-49: Copi IF-32. View of site and recorded artefact.

	
1. View east to the location of Copi IF-32.	2. Copi IF-32 artefact: a chert flake (dorsal surface).

Copi IF-33

Site Type: Isolated find

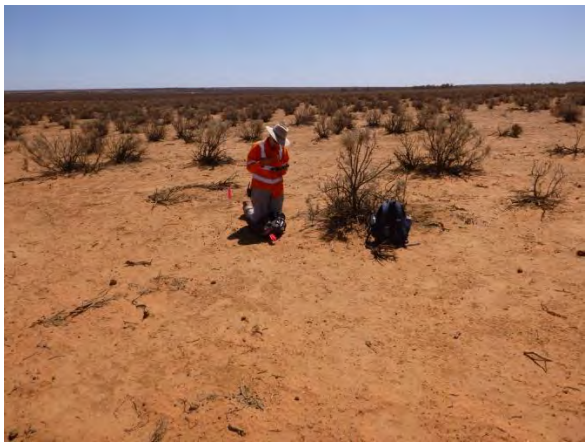
GPS Coordinates: GDA Zone 54 534980E 6278021N

Location of Site: Copi IF-33 is in the southwestern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-48**). The site is located 7.1 km directly east of Nulla Road and 6.2 km southwest of the Warwick homestead.

Description of Site: Copi IF-33 is a quartzite flake on a gentle slope across a sandplain (**Figure 6-50**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs. The GSE at the time of recording was high (80%) with a GSV of 90%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-33 is assessed as negligible.

Figure 6-50: Copi IF-33. View of site and recorded artefact.

	
1. View north to the location of Copi IF-33.	2. Copi IF-33 artefact: a quartzite flake (dorsal surface).

Copi IF-34

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 535186E 6278123N

Location of Site: Copi IF-34 is in the southwestern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-48**). The site is located 7.3 km directly east of Nulla Road and 6 km southwest of the Warwick homestead.

Description of Site: Copi IF-34 is a quartz flake on a gentle slope across a sandplain (**Figure 6-51**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs. The GSE at the time of recording was high (80%) with a GSV of 90%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-34 is assessed as negligible.

Figure 6-51: Copi IF-34. View of site location[5].

1. View east to the location of Copi IF-34.

Copi IF-35

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 534935E 6278600N

Location of Site: Copi IF-35 is in the southwestern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-48**). The site is located 7.3 km directly east of Nulla Road and 5.6 km southwest of the Warwick homestead.

Description of Site: Copi IF-35 is a chert flake with use-wear on the margin (**Figure 6-52**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs. The GSE at the time of recording was high (80%) with a GSV of 90%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-35 is assessed as negligible.

[5] Artefact photo not available.

Figure 6-52: Copi IF-35. View of site and recorded artefact.

	
1. View north to the location of Copi IF-35.	2. Copi IF-35 artefact: a chert flake (dorsal surface).

Copi IF-36

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 535084E 6278670N

Location of Site: Copi IF-36 is in the southwestern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-48**). The site is located 7.5 km directly east of Nulla Road and 5.5 km southwest of the Warwick homestead.

Description of Site: Copi IF-36 is a quartzite flake located on a sandplain (**Figure 6-53**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs. The GSE at the time of recording was high (80%) with a GSV of 90%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-36 is assessed as negligible.

Figure 6-53: Copi IF-36. View of site and recorded artefact.

	
1. View west to the location of Copi IF-36.	2. Copi IF-36 artefact: a quartzite flake (dorsal surface).

Copi IF-37

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 535195E 6278642N

Location of Site: Copi IF-37 is in the southwestern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-48**). The site is located 7.6 km directly east of Nulla Road and 5.5 km southwest of the Warwick homestead.

Description of Site: Copi IF-37 is a quartzite flake located on a sandplain (**Figure 6-54**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs with a remnant stand of trees located to the east. The GSE at the time of recording was high (70%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-37 is assessed as negligible.

Figure 6-54: Copi IF-37. View of site and recorded artefact.

	
1. View north to the location of Copi IF-37.	2. Copi IF-37 artefact: a quartzite flake (dorsal surface).

Copi IF-38

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 535768E 6278859N

Location of Site: Copi IF-38 is in the central portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-55**). The site is located 8.2 km directly east of Nulla Road and 5.1 km southwest of the Warwick homestead.

Description of Site: Copi IF-38 is a quartzite flake located on the edge of a vehicle track on a sandplain (**Figure 6-56**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs. The GSE at the time of recording was high (80%) with a GSV of 80%. Identified disturbances include vehicle movement, erosion, and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-38 is assessed as negligible.

Figure 6-55: Location of Copi IF-38 and Copi IF-39.

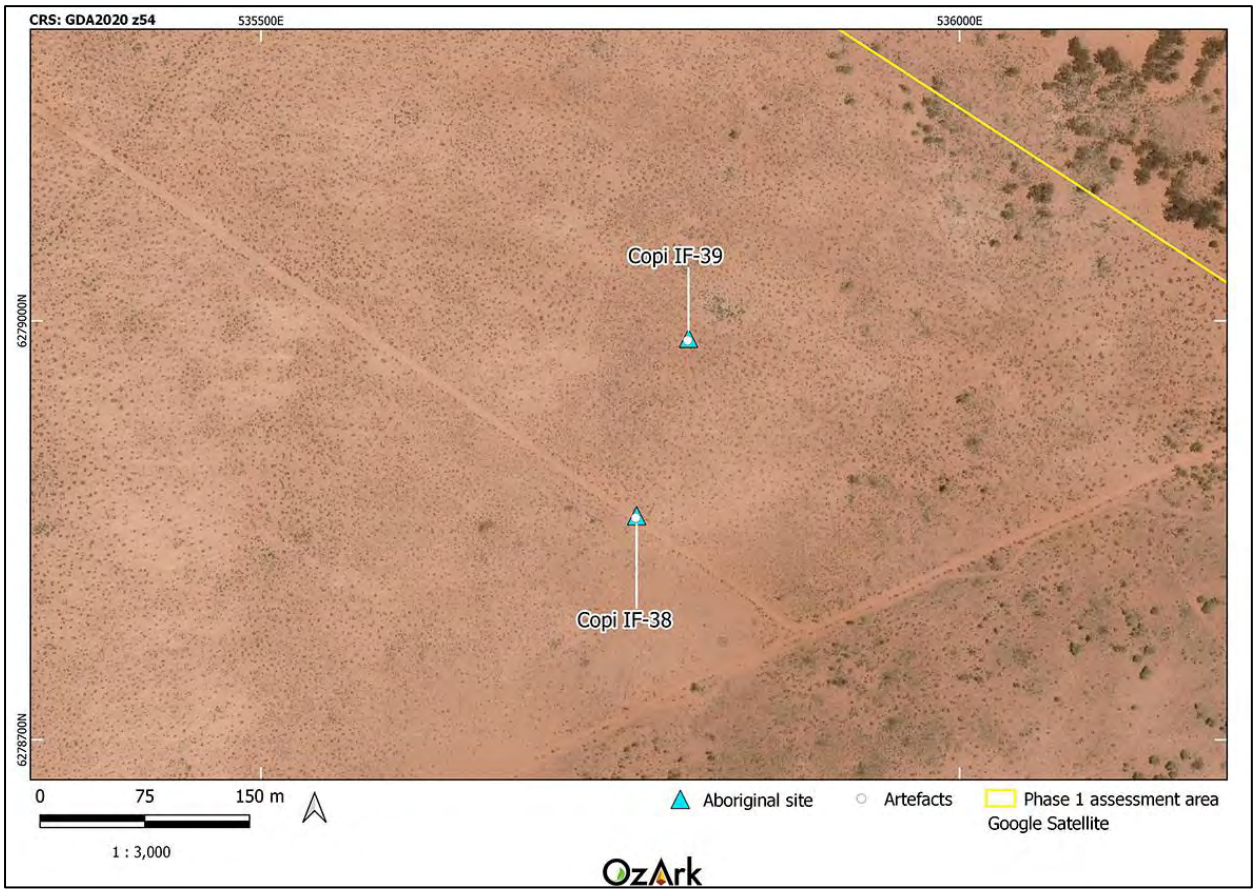


Figure 6-56: Copi IF-38. View of site and recorded artefact.

1. View southeast to the location of Copi IF-38 on the edge of a track.

2. Copi IF-38 artefact: a quartzite flake (dorsal surface).

Copi IF-39

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 535805E 6278986N

Location of Site: Copi IF-39 is in the central portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-55**). The site is located 8.2 km directly east of Nulla Road and 4.9 km southwest of the Warwick homestead.

Description of Site: Copi IF-39 is a quartz flake located on a sandplain (**Figure 6-57**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs. The GSE at the time of recording was high (80%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-39 is assessed as negligible.

Figure 6-57: Copi IF-39. View of site and recorded artefact.

1. View south to the location of Copi IF-39.

2. Copi IF-39 artefact: a quartz flake (dorsal surface).

Copi IF-40

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 536358E 6277498N

Location of Site: Copi IF-40 is in the central portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-58**). The site is located 8 km directly east of Nulla Road and 6.2 km south of the Warwick homestead.

Description of Site: Copi IF-40 is a quartz tested cobble with a potential flake scar located on a sandplain (**Figure 6-59**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site

consists of shrubs with surrounding stands of trees. The GSE at the time of recording was high (80%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-40 is assessed as negligible.

Figure 6-58: Location of Copi IF-40 to IF-42 and Copi OS-29.

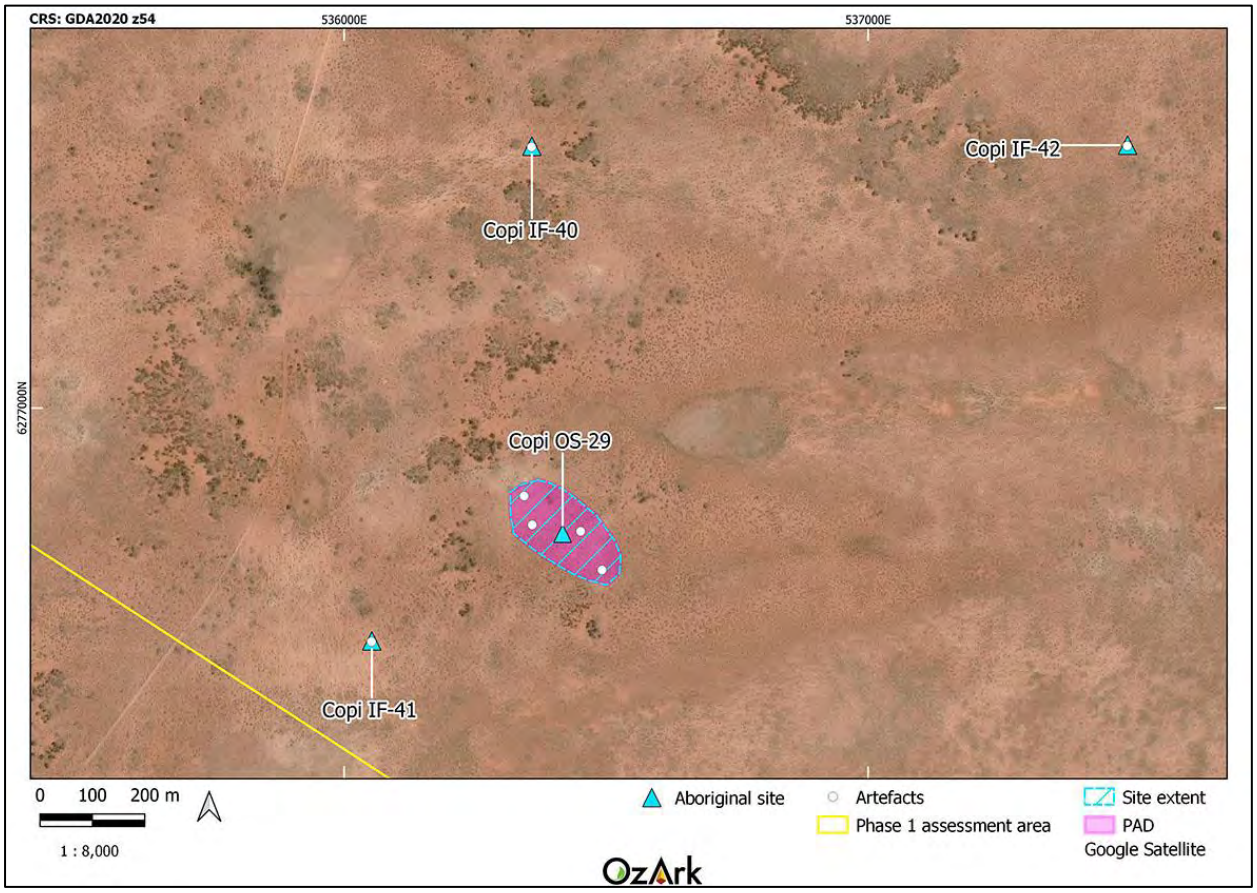


Figure 6-59: Copi IF-40. View of site and recorded artefact.

1. View west to the location of Copi IF-40.

2. Copi IF-40 artefact: a quartz tested cobble.

Copi IF-41

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 536052E 6276554N

Location of Site: Copi IF-41 is in the central/southern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-58**). The site is located 7.1 km directly east of Nulla Road and 7.2 km south of the Warwick homestead.

Description of Site: Copi IF-41 is a quartzite core located on a sandplain (**Figure 6-60**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs with surrounding stands of trees to the north. The GSE at the time of recording was high (90%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-41 is assessed as negligible.

Figure 6-60: Copi IF-41. View of site and recorded artefact.

1. View west to the location of Copi IF-41.

2. Copi IF-41 artefact: a quartzite core.

Copi IF-42

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 537495E 6277500N

Location of Site: Copi IF-42 is in the central/southern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-58**). The site is located 7.1 km directly east of Nulla Road and 9 km south of the Warwick homestead.

Description of Site: Copi IF-42 is a quartzite flake located on a sandplain (**Figure 6-61**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs with a large stand

of trees to the west. The GSE at the time of recording was high (90%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-42 is assessed as negligible.

Figure 6-61: Copi IF-42. View of site and recorded artefact.

	
1. View east to the location of Copi IF-42.	2. Copi IF-42 artefact: a quartzite flake (dorsal surface).

Copi IF-43

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 538064E 6276172N

Location of Site: Copi IF-43 is in the central/southern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-62**). The site is located 8.6 km directly east of Nulla Road and 7.5 km south of the Warwick homestead.

Description of Site: Copi IF-43 is a quartzite flake located on a sandplain (**Figure 6-63**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs with a stand of trees to the northeast. The GSE at the time of recording was high (90%) with a GSV of 90%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-43 is assessed as negligible.

Figure 6-62: Location of Copi IF-43 to IF-46 and Copi OS-30.

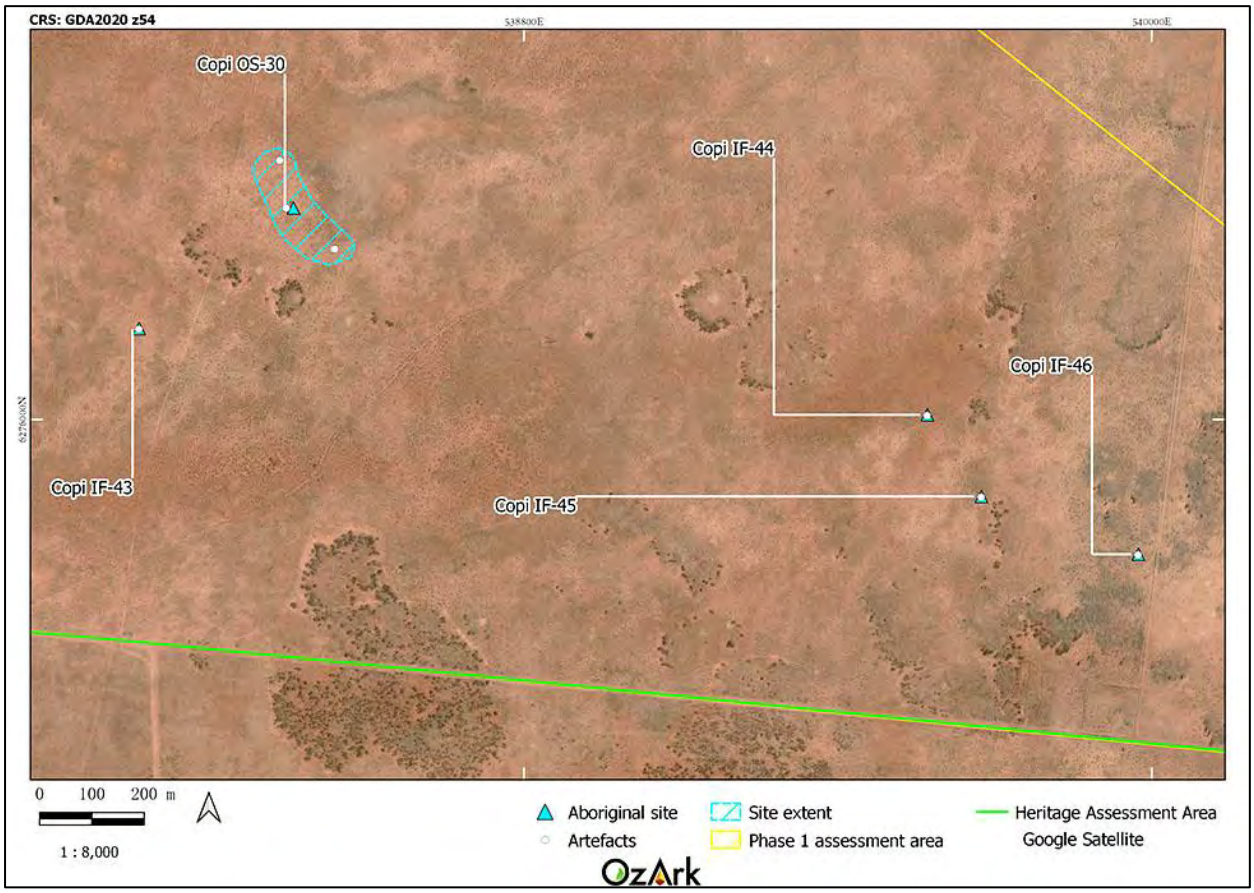


Figure 6-63: Copi IF-43. View of site and recorded artefact.

1. View west to the location of Copi IF-43.

2. Copi IF-43 artefact: a quartzite flake (dorsal surface).

Copi IF-44

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 539571E 6276007N

Location of Site: Copi IF-44 is in the central/southern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-62**). The site is located 10.2 km directly east of Nulla Road and 7.8 km southeast of the Warwick homestead.

Description of Site: Copi IF-44 is a quartzite flake located on a sandplain (**Figure 6-64**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs with a stand of trees to the east. The GSE at the time of recording was high (90%) with a GSV of 90%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-44 is assessed as negligible.

Figure 6-64: Copi IF-44. View of site and recorded artefact.

1. View south to the location of Copi IF-44.

2. Copi IF-44 artefact: a quartzite flake (dorsal surface).

Copi IF-45

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 539674E 6275851N

Location of Site: Copi IF-45 is in the central/southern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-62**). The site is located 10.2 km directly east of Nulla Road and 7.9 km southeast of the Warwick homestead.

Description of Site: Copi IF-45 is a quartz flake located on a sandplain (**Figure 6-65**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs with a stand of

trees to the southeast. The GSE at the time of recording was high (90%) with a GSV of 90%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-45 is assessed as negligible.

Figure 6-65: Copi IF-45. View of site and recorded artefact.

	
1. View southeast to the location of Copi IF-45.	2. Copi IF-45 artefact: a quartz flake (dorsal surface).

Copi IF-46

Site Type: Isolated find

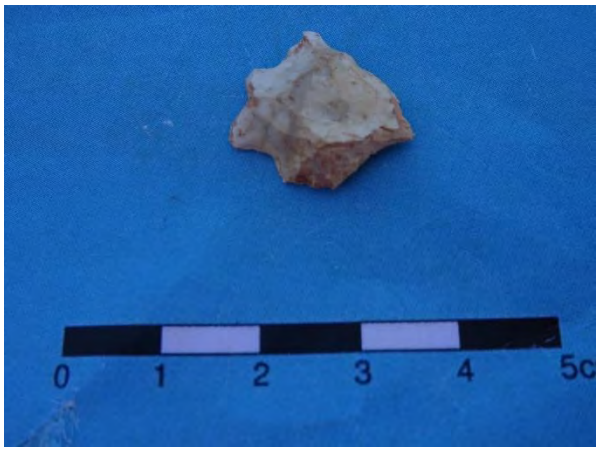
GPS Coordinates: GDA Zone 54 539974E 6275741N

Location of Site: Copi IF-46 is in the central/southern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-62**). The site is located 10 km directly east of Nulla Road and 8.2 km southeast of the Warwick homestead.

Description of Site: Copi IF-46 is a chert flake located on a sandplain (**Figure 6-66**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of orange clayey sand. Vegetation at the site consists of shrubs. The GSE at the time of recording was high (80%) with a GSV of 90%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-46 is assessed as negligible.

Figure 6-66: Copi IF-46. View of site and recorded artefact.

	
1. View west to the location of Copi IF-46.	2. Copi IF-46 artefact: a chert flake (dorsal surface).

Copi IF-47

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 532800E 6281510N

Location of Site: Copi IF-47 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-67**). The site is located 3.9 km directly east of Nulla Road and 5.3 km southeast of the Warwick homestead.

Description of Site: Copi IF-47 is a chert backed flake located on a long, gentle slope across a sandplain (**Figure 6-68**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of red sand. Vegetation at the site consists of shrubs. The GSE at the time of recording was high (80%) with a GSV of 90%. Identified disturbances include vehicle movement, fence construction, erosion, and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-47 is assessed as negligible.

Figure 6-67: Location of Copi IF-47 to IF-48 and Copi OS-31.

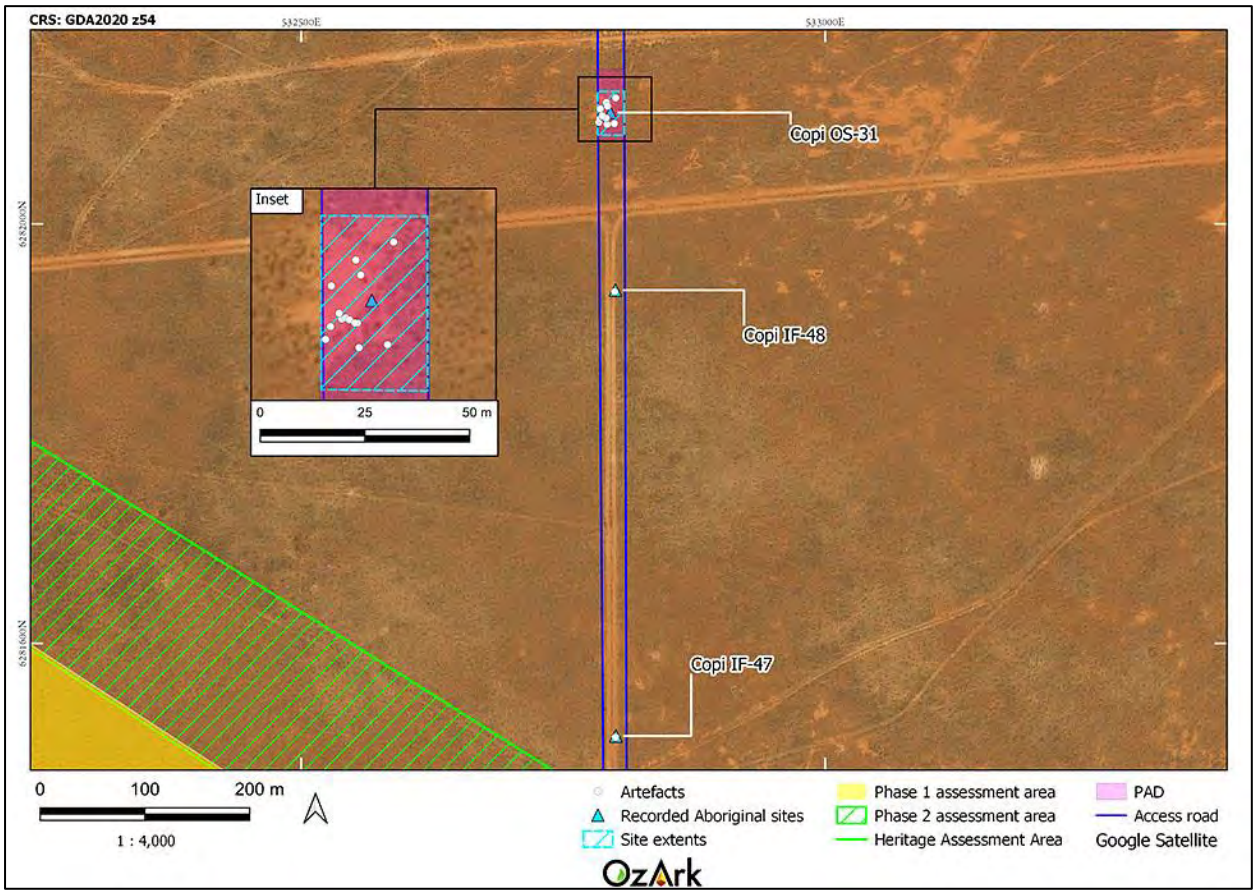


Figure 6-68: Copi IF-47. View of site and recorded artefact.

1. View south to the location of Copi IF-47 located along a vehicle track.

2. Copi IF-47 artefact: a chert backed flake (dorsal surface).

Copi IF-48

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 532799E 6281935N

Location of Site: Copi IF-48 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-67**). The site is located 3.8 km directly east of Nulla Road and 5.2 km southeast of the Warwick homestead.

Description of Site: Copi IF-48 is a quartzite flake located on a long, gentle slope across a sandplain (**Figure 6-69**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consists of red sand. Vegetation at the site consists of shrubs. The GSE at the time of recording was high (90%) with a GSV of 90%. Identified disturbances include vehicle movement, fence construction, erosion, and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-48 is assessed as negligible.

Figure 6-69: Copi IF-48. View of site and recorded artefact.

1. View north to the location of Copi IF-48 located along a vehicle track.

2. Copi IF-48 artefact: a quartzite flake (dorsal surface).

Copi IF-49

Site Type: Isolated find

GPS Coordinates: GDA Zone 54 533355E 6285101N

Location of Site: Copi IF-49 is in the north-western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-70**). The site is located 4 km directly east of Nulla Road and 4.6 km northeast of the Warwick homestead.

Description of Site: Copi IF-49 is a chert flake located on a flat sandplain (**Figure 6-71**). The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site

consists of red sand. Vegetation at the site consists of shrubs. The GSE at the time of recording was high (80%) with a GSV of 90%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-49 is assessed as negligible.

Figure 6-70: Location of Copi IF-49.

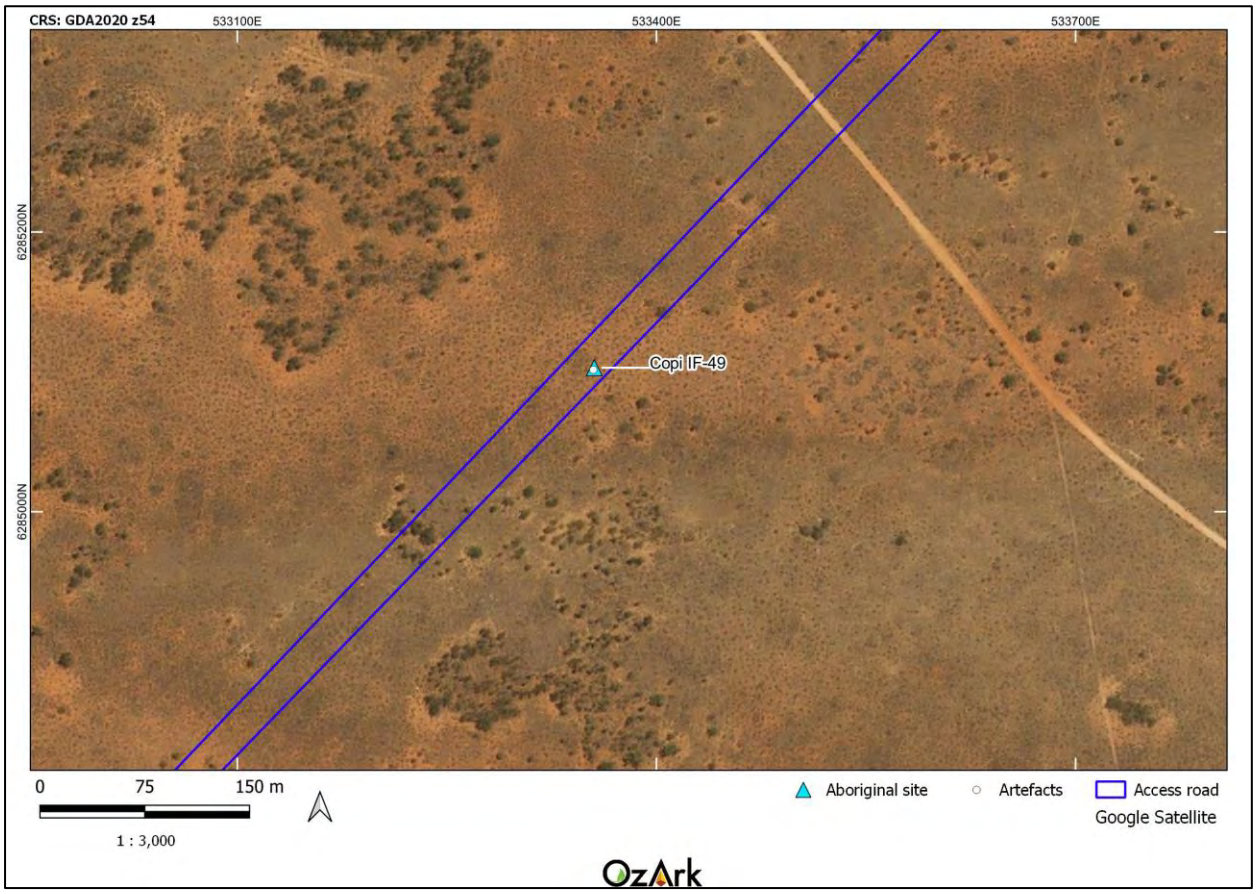


Figure 6-71: Copi IF-49. View of site and recorded artefact.

1. View southeast to the location of Copi IF-49 located along a vehicle track.

2. Copi IF-49 artefact: a chert flake (dorsal surface).

6.4.2 Open sites and PADs

Thirty-two open sites were recorded during the Phase 1 survey. These are detailed in **Table 6-5** and are shown on **Figure 6-72** and **Figure 6-73**. Full details of each open site follow.

Table 6-5: Open sites recorded during the Phase 1 survey.

ID	AHIMS ID	Site name	GDA Zone 54 Easting	GDA Zone 54 Northing	Feature(s)	Landform
50	39-4-0608	Copi OS-1	524782	6285450	Artefact scatter; scarred tree; PAD	Lunettes and Islands
51	39-4-0609	Copi OS-2	528872	6282931	Artefact scatter; PAD	Sandplains and Dunes
52	39-4-0610	Copi OS-3	529378	6282701	Artefact scatter	Salt Pan
53	39-4-0611	Copi OS-4	530187	6282240	Artefact scatter	Sandplains and Dunes
54	39-4-0612	Copi OS-5	531418	6281097	Artefact scatter	Sandplains and Dunes
55	39-4-0613	Copi OS-6	531190	6280699	Artefact scatter; hearth; PAD	Lake Footslopes
56	39-4-0579	Copi OS-7	530899	6280307	Artefact scatter	Lake Footslopes
57	39-4-0580	Copi OS-8	530700	6280238	Artefact scatter	Lake Footslopes
58	39-4-0581	Copi OS-9	530918	6279863	Artefact scatter	Lake Footslopes
59	39-4-0582	Copi OS-10	532560	6279916	Artefact scatter	Lake Footslopes
60	39-4-0583	Copi OS-11	532787	6280327	Artefact scatter; PAD	Lake Footslopes
61	39-4-0584	Copi OS-12	532186	6280930	Artefact scatter; hearths; PAD	Lake Footslopes
62	39-4-0585	Copi OS-13	532996	6281057	Artefact scatter	Lake Footslopes
63	39-4-0586	Copi OS-14	534105	6279230	Artefact scatter	Lunettes and Islands
64	39-4-0587	Copi OS-15	534515	6279332	Artefact scatter	Salt Pan
65	39-4-0588	Copi OS-16	534790	6279744	Artefact scatter	Lunettes and Islands
66	39-4-0589	Copi OS-17	533416	6278591	Artefact scatter	Lunettes and Islands
67	39-4-0590	Copi OS-18	533741	6278697	Artefact scatter; PAD	Lunettes and Islands
68	39-4-0591	Copi OS-19	533788	6277941	Artefact scatter	Lunettes and Islands
69	39-4-0592	Copi OS-20	534595	6277843	Artefact scatter, hearth	Islands and Lunettes
70	39-4-0593	Copi OS-21	534507	6278085	Artefact scatter	Islands and Lunettes
71	39-4-0595	Copi OS-22	534566	6278385	Artefact scatter	Islands and Lunettes
72	39-4-0594	Copi OS-23	535045	6278925	Artefact scatter; PAD	Salt Pan
73	39-4-0596	Copi OS-24	534929	6279086	Artefact scatter	Salt Pan
74	39-4-0597	Copi OS-25	535170	6279050	Artefact scatter	Islands and Lunettes
75	39-4-0598	Copi OS-26	535059	6279426	Artefact scatter	Salt Pan
76	39-4-0578	Copi OS-27	535206	6279561	Artefact scatter	Salt Pan
77	39-4-0577	Copi OS-28	535170	6277392	Artefact scatter	Islands and Lunettes
78	39-4-0576	Copi OS-29	536416	6276759	Artefact scatter; PAD	Sandplains and Dunes
79	39-4-0575	Copi OS-30	538359	6276402	Artefact scatter	Sandplains and Dunes
80	39-4-0574	Copi OS-31	532794	6282105	Artefact scatter; PAD	Sandplains and Dunes
81	39-4-0573	Copi OS-32	527299	6283831	PAD	Lunettes and Islands

Figure 6-72: Overview of the location of all recorded open sites within the western portion of the Phase 1 assessment area.

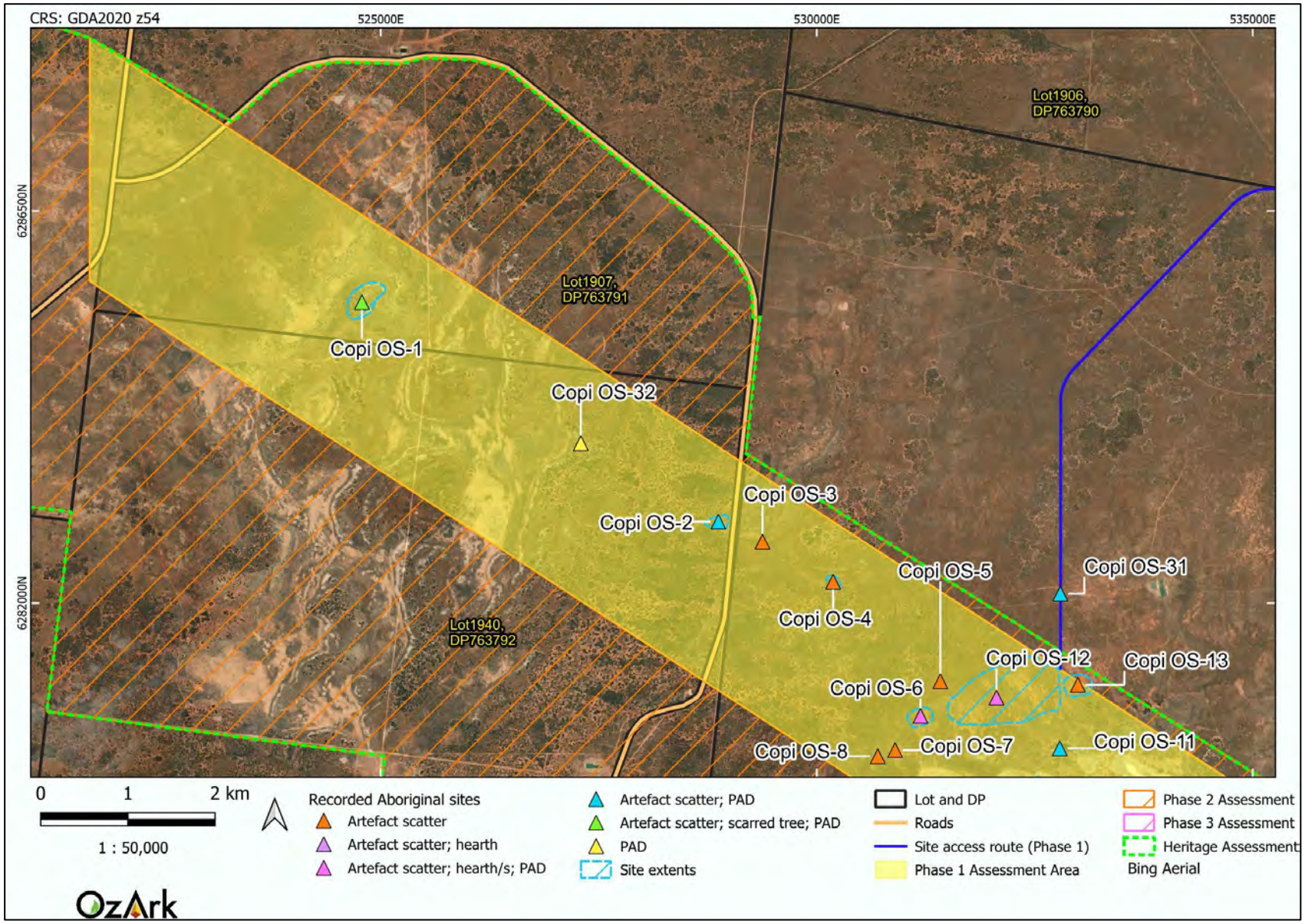
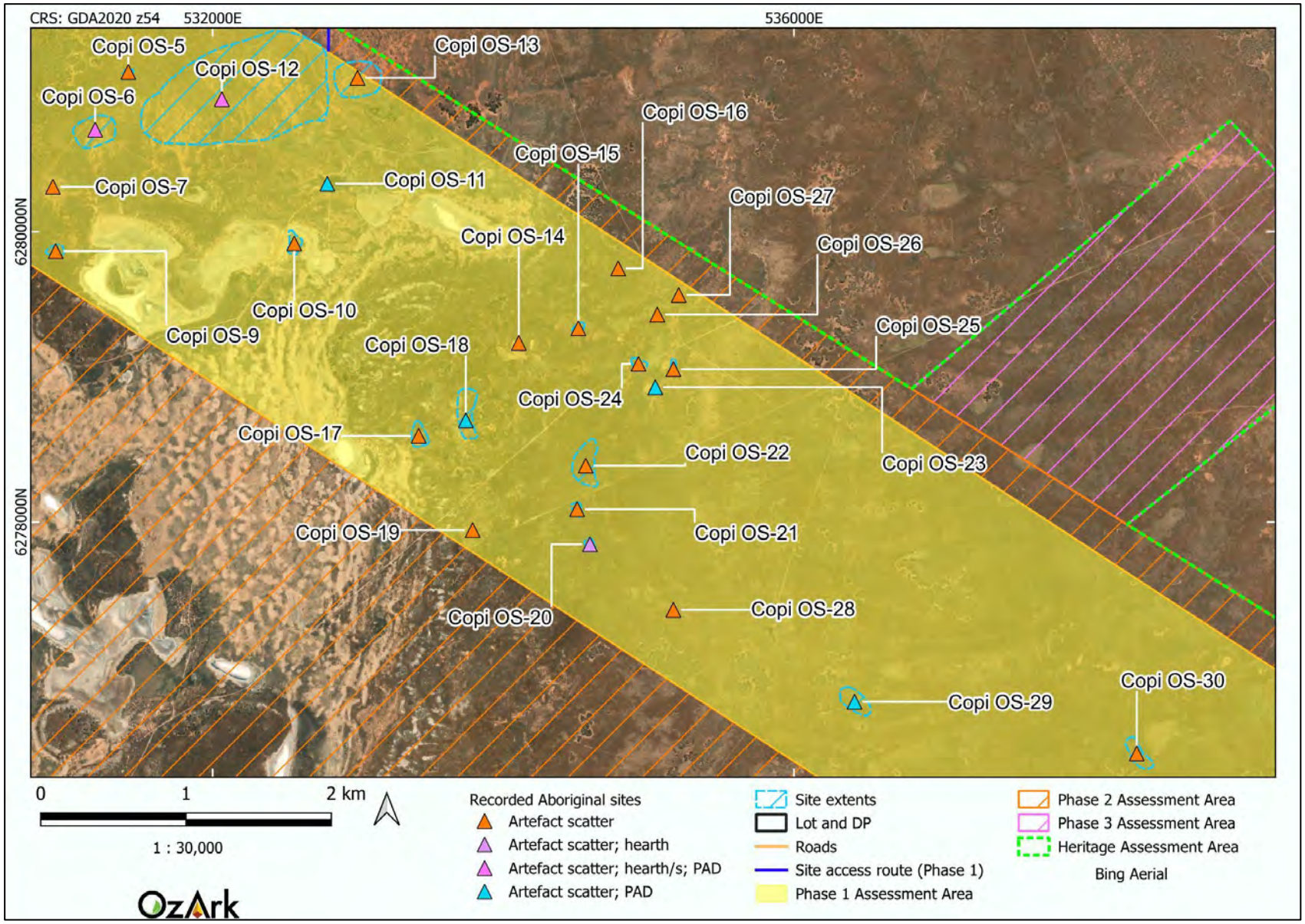


Figure 6-73: Overview of the location of all recorded open sites within the eastern portion of the Phase 1 assessment area.



Copi OS-1

Site Type: Artefact scatter; scarred tree; PAD

GPS Coordinates: Site centroid - GDA Zone 54 524782E 6285450N

Location of Site: Copi OS-1 is in the south-western portion of Lot 1907 DP763791 on the Huntingfield property (**Figure 6-74**). The site is 3.4 km directly east of Pine Camp Road and 3.2 km southeast of the intersection of Springwood Road/Pine Camp Road and Nulla Road.

Description of Site: Copi OS-1 is an artefact scatter consisting of seven artefacts located on a gypsum island and side slopes (**Figure 6-75**). Artefacts include flakes, a piece of shatter, and two grindstone fragments (**Table 6-6**). A scarred tree was also recorded in association with the artefact scatter (**Table 6-7** and **Figure 6-76**). The tree includes a relatively small black box. It is likely the tree is reasonably old but that its growth has been hampered by the poor soil conditions and lack of water.

The site extent is 518 x 260 m, encompassing an area of 11 ha of land. The extent of the site is defined by the island landform. The GSE at the site was high (80%) with a GSV of 70% within the site extent. Soil on the island consists of patches of powdery gypsum and light red/brown sand. Vegetation includes sparse shrub cover and open woodland of trees including black box. Identified disturbances include grazing, erosion, rabbit burrows and vehicle tracks.

Copi OS-1 is considered to be associated with subsurface archaeological deposits in areas that do not contain rabbit burrows or areas with the gypsum.

Figure 6-74: Location of Copi OS-1.

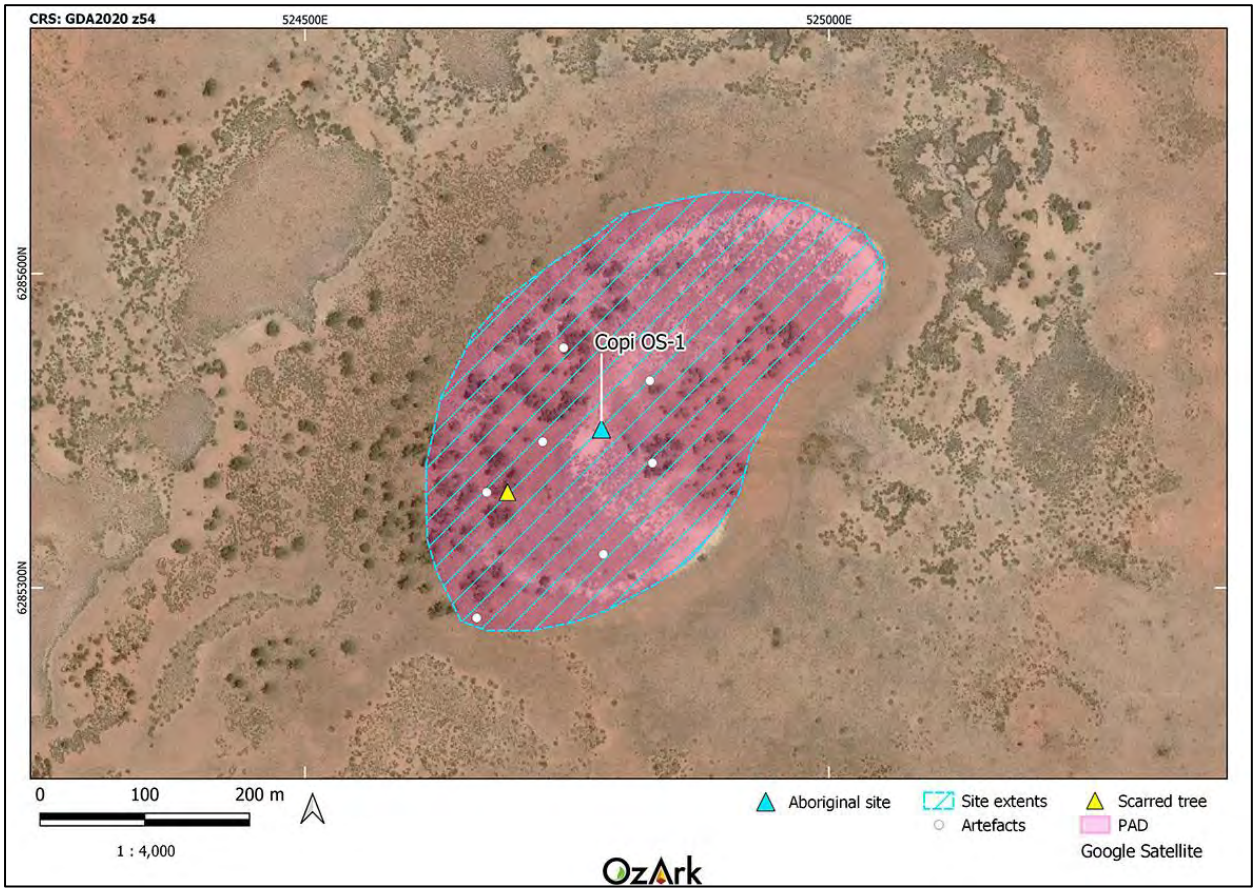
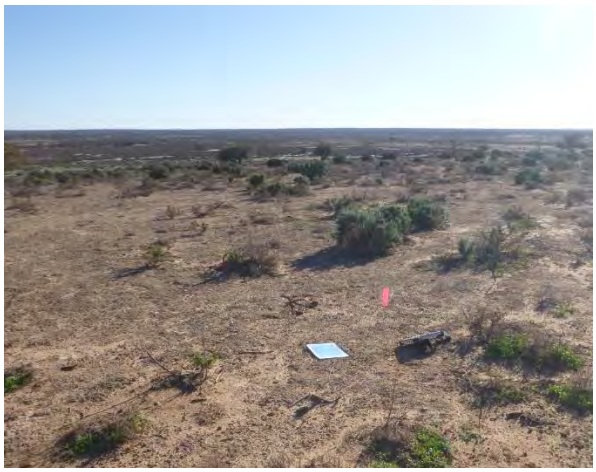


Figure 6-75: Copi OS-1. View of site and a selection of recorded artefacts.

	
1. View north to northern extent of Copi OS-1 on the crest of the gypsum island.	2. View east across the southern extent of Copi OS-1 at the base of the gypsum island.

3. Copi OS-1 artefact: a chert flake.

4. Copi OS-1 artefact: a quartzite grindstone fragment.

5. Copi OS-1 artefact: a quartzite grindstone fragment.

6. Copi OS-1 artefact: a quartzite flake.

Table 6-6: Copi OS-1. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (LxWxD) mm	Additional detail
Shatter	Quartzite	-	Secondary	20 x 14 x 10	
Flake	Silcrete	Complete	Tertiary	18 x 22 x 6	Use-wear
Flake	Quartzite	Distal fragment	Tertiary	25 x 30 x 5	
Grindstone	Quartzite	Fragment	-	44 x 45 x 18	
Flake	Quartzite	Distal fragment	Primary	20 x 22 x 12	
Flake	Chert	Complete	Tertiary	12 x 13 x 4	
Grindstone	Quartzite	Fragment	-	40 x 37 x 20	

Figure 6-76: Copi OS-1. View of scarred tree.

1. Copi OS-1: view of the scar and surrounds.

2. Copi OS-1: detail of the scar.

Table 6-7: Copi OS-1. Scarred tree attributes.

Type of tree	Black box (?)
Circumference (cm)	133
Condition of tree (good, fair, dead)	Good
Scar Length (cm)	72
Scar Width (cm)	58
Scar Depth (cm)	6
Overgrowth (cm)	12
Scar shape (elongated, oval, irregular)	Ovoid
Orientation (direction of scar is facing)	Southeast
Condition of scar (good, fair, poor)	Good
Associated with artefacts/PAD	Yes

Copi OS-2

Site Type: Artefact scatter; PAD

GPS Coordinates: Site centroid - GDA Zone 54 528872E 6282931N

Location of Site: Copi OS-2 is located west of Nulla Road, approximately 12 km east along Nulla Road from the intersection of Springwood Road/Pine Camp Road and Nulla Road (**Figure 6-14**). The site is along eastern edge of Lot 1940 DP763792 on the Huntingfield property.

Description of Site: Copi OS-2 is an artefact scatter consisting of a minimum of 22 artefacts located on the eroding sloped bank of a drainage line (**Figure 6-77**). The artefacts recorded consisted mostly of complete flakes manufactured from quartzite or chert (**Table 6-8**). The extent of the site is defined by the landform of the site and includes the erosion scald and remaining banks of the drainage line. The site extent measures 165 x 250 m and encompasses 2.8 ha of land. Soils consist of orange/red sand. Surrounding

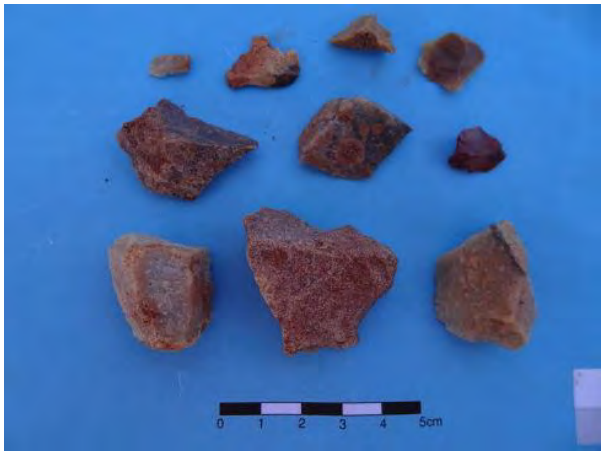
vegetation at the site comprises isolated trees and shrubs including saltbush. The GSE at the time of recording was high (80%) with a GSV of 60% within the large area of exposure. Identified disturbances include erosion and grazing.

Copi OS-2 has potential for subsurface archaeological deposits. The extent of the PAD is 150 x 300 m and encompasses the flat elevated land to the west of the area where surface artefacts have eroded downslope.

Figure 6-77: Copi OS-2. View of site and a selection of recorded artefacts.

1. View west along a gentle slope to Copi OS-2 site location.

2. View east downslope across Copi OS-2.



3. Copi OS-2 artefacts: quartzite and chert flakes.

Table 6-8: Copi OS-2. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (LxWxD) mm	Additional detail
Flake	Chert	Complete	Tertiary	30 x 15 x 10	Retouch along margin. Fine. Unidirectional.
Core	Quartzite	Complete	Secondary	25 x 20 x 20	Multidirectional, 5 flake scars, 20% cortex, reduced.
Flake	Quartzite	Complete	Tertiary	25 x 20 x 10	
Core	Quartzite	Complete	Tertiary	40 x 30 x 20	Multidirectional, 6 flake scars, <5% cortex, reduced

Artefact type	Material	Integrity	Reduction	Size (LxWxD) mm	Additional detail
Flake	Quartzite	Complete	Secondary	30 x 25 x 15	Negative flake scars (n=3)
Flake	Chert	Proximal fragment	Tertiary	15 x 10 x 5	
Flake	Chert	Complete	Tertiary	20 x 10 x 7	
Flake	Quartzite	Complete	Tertiary	13 x 18 x 10	
Flake	Quartzite	Complete	Tertiary	20 x 22 x 12	
Flake	Quartzite	Complete	Tertiary	25 x 30 x 8	
Flake	Quartzite	Complete	Tertiary	10 x 12 x 10	
Flake	Chert	Proximal fragment	Tertiary	24 x 25 x 12	
Flake	Chert	Complete	Tertiary	12 x 14 x 8	
Shatter	Chert	-	Tertiary	5 x 7 x 5	
Flake	Chert	Complete	Tertiary	22 x 20 x 15	
Shatter	Quartzite	-	Tertiary	8 x 8 x 5	
Shatter	Quartzite	-	Tertiary	6 x 8 x 5	
Shatter	Chert	-	Primary	10 x 6 x 8	
Flake	Quartzite	Complete	Secondary	18 x 12 x 10	
Shatter	Quartzite	-	Tertiary	5 x 7 x 4	
Flake	Quartzite	Complete	Secondary	16 x 15 x 12	
Flake	Quartzite	Complete	Tertiary	14 x 12 x 10	

Copi OS-3

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 529378E 6282701N

Location of Site: Copi OS-3 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-14**). The site is 360 m directly east of Nulla Road and 3.4 km northeast of the Huntingfield homestead.

Description of Site: Copi OS-3 is an artefact scatter consisting of seven artefacts located within and on the banks of a drainage line (**Figure 6-78**). Most artefacts are flakes (n=5), with one piece of shatter and a fragment of grindstone. All artefacts are manufactured from quartzite (**Table 6-9**). The site extent is 28x 17 m, encompassing 360 m^2 of land. Soils consist of orange/red sand. Surrounding vegetation at the site comprises isolated trees and shrubs including saltbush. The GSE at the time of recording was high (80%) with a GSV of 70% within the large area of exposure. Identified disturbances include erosion and grazing.

Copi OS-3 is not considered to be associated with subsurface archaeological deposits as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-78: Copi OS-3. View of site and a selection of recorded artefacts.

1. View east to the location of Copi OS-3 located a drainage line.

2. Copi OS-3 artefacts: quartzite flakes.

3. Copi OS-3 artefacts: quartzite flakes.

4. Copi OS-3 artefact: quartzite grindstone fragment.

Table 6-9: Copi OS-3. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Flake	Quartzite	Complete	Tertiary	35 x 27 x 8
Flake	Quartzite	Complete	Tertiary	23 x 26 x 5
Grindstone	Quartzite	Fragment	Tertiary	110 x 84 x 35
Flake	Quartzite	Complete	Tertiary	29 x 29 x 7
Shatter	Quartzite		Tertiary	12 x 13 x3
Flake	Quartzite	Distal fragment	Tertiary	22 x 14 x 5
Flake	Quartzite	Distal fragment	Tertiary	11 x 14 x 4

Copi OS-4

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 530187E 6282240N

Location of Site: Copi OS-4 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-14**). The site is 1.2 km directly east of Nulla Road and 3.6 km northeast of the Huntingfield homestead.

Description of Site: Copi OS-4 is an artefact scatter consisting of two artefacts located on a gentle slope along the sandplain (**Figure 6-79**). The artefacts include chert and fine-grained siliceous flakes (**Table 6-10**). The site extent is 180 x 125 m, encompassing an area of 1.8 m^2. Soils consist of orange/red sand. Surrounding vegetation at the site comprises open woodland and scattered shrubs including saltbush. The GSE at the time of recording was high (80%) with a GSV of 60% within the area of exposure. Identified disturbances include erosion and grazing.

Copi OS-4 is not considered to be associated with subsurface archaeological deposits as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-79: Copi OS-4. View of site and the recorded artefacts.

1. View southwest to the location of Copi OS-4.

2. Copi OS-4 artefact: a chert flake.

3. Copi OS-4 artefact: a fine-grained siliceous flake.

Table 6-10: Copi OS-4. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Flake	Chert	Complete	Tertiary	14 x 21 x 8
Flake	Fine-grained siliceous	Complete	Tertiary	30 x 35 x 15

Copi OS-5

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 531418E 6281097N

Location of Site: Copi OS-5 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-18**). The site is 2.7 km directly east of Nulla Road and 4.6 km northeast of the Huntingfield homestead.

Description of Site: Copi OS-5 consists of two chert artefacts consisting of one retouched flake and one multidirectional core (**Table 6-11**). The site is situated on a sandplain at the flat top of a slope descending east (**Figure 6-80**). The extent of the site is 70 x 40 m. Soils consist of red/brown sand. Surrounding vegetation at the site comprises isolated trees and shrubs including saltbush. The GSE at the time of recording was high (80%) with a GSV of 60% within the large area of exposure. Identified disturbances include the track to the southeast of the site and grazing.

Copi OS-5 is not considered to be associated with subsurface archaeological deposits as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-80: Copi OS-5. View of site and a selection of recorded artefacts.

1. View west to Copi OS-5 location.

2. Copi OS-5 artefact: a chert flake.

Table 6-11: Copi OS-5. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Flake	Chert	Complete	Tertiary	20 x 15 x 5	Retouch along margin. Semi fine and unidirectional.
Core	Chert	-	Tertiary	22 x 20 x 10	Multidirectional, 4 flake scars, <5% cortex, reduced.

Copi OS-6

Site Type: Artefact scatter; hearth; PAD

GPS Coordinates: Site centroid - GDA Zone 54 531190E 6280699N

Location of Site: Copi OS-6 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-18**). The site is 2.5 km directly east of Nulla Road and 3.6 km northeast of the Huntingfield homestead.

Description of Site: Copi OS-6 consists of a minimum of 32 artefacts located on a sand plain (**Figure 6-81**). Most artefacts were flakes manufactured from quartzite, though silcrete, quartz and chert were also present (**Table 6-12**). A hearth consisting of charcoal and clay nodules is present along the southern extent of the site eroding out of a remnant patch of soil at the base of a shrub. The extent of the site is 290 x 238 m, encompassing an area of 49 ha. The site is situated on the intersection of two dirt tracks, one running northeast to southwest, the second running northwest to southeast. Soils consist of red/brown loamy sand. Surrounding vegetation at the site comprises of shrubs including saltbush. The GSE at time of recording was high (80%) with a GSV of 70% within the exposures. Identified disturbances include the construction and use of the tracks, grazing, and erosion.

Copi OS-6 has been subject to high levels of erosion but has the potential to be associated with subsurface archaeological deposits. The extent of the PAD is 150 x 300 m and encompasses the flat to gently sloping elevated land to the north of the area where surface artefacts have eroded downslope (**Figure 6-81**).

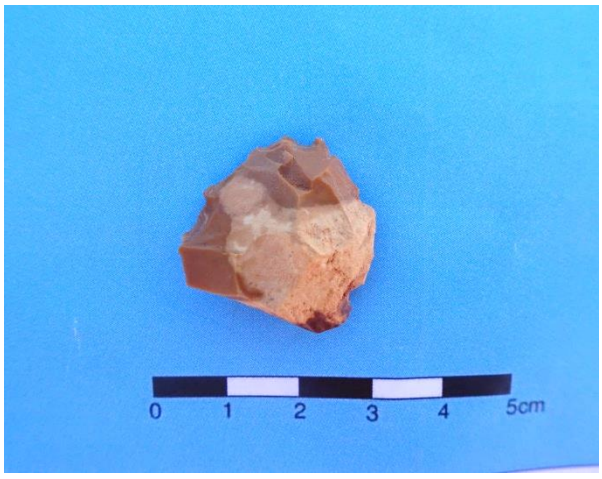
Figure 6-81: Copi OS-6. View of site and a selection of recorded artefacts and features.

1. View west across Copi OS-6 site location showing an area of erosion along the slope.

2. View east along a vehicle track with Copi OS-6 where a number of artefacts were identified.

3. Copi OS-6 artefacts: select quartzite and chert flakes.

4. Copi OS-6 artefacts: selection of quartzite and chert flakes.



5. Copi OS-6 artefact: a chert flake with retouch.

6. Copi OS-6 hearth at GDA Zone 54 531191E 628064N.

Table 6-12: Copi OS-6. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Flake	Quartzite	Complete	Tertiary	18 x 15 x 8	
Shatter	Quartzite	-	Primary	25 x 15 x 10	70% cortex
Shatter	Quartzite	-	Tertiary	15 x 10 x 2	
Flake	Quartzite	Complete	Tertiary	15 x 20 x 5	
Shatter	Quartzite	-	Tertiary	15 x 10 x 5	
Flake	Quartzite	Complete	Tertiary	10 x 10 x 8	
Flake	Quartzite	Complete	Tertiary	32 x 45 x 12	
Core	Quartz	Complete	Tertiary	25 x 20 x 20	Multidirectional, 3 flake scars, <5% cortex, reduced.
Flake	Quartzite	Complete	Tertiary	15 x 20 x 8	
Flake	Quartzite	Complete	Tertiary	20 x 25 x 10	
Flake	Quartzite	Complete	Tertiary	8 x 5 x 4	
Flake	Quartzite	Complete	Tertiary	10 x 20 x 5	
Backed flake	Silcrete	Complete	Tertiary	25 x 15 x 8	Retouch along margin. Fine and unidirectional.
Flake	Quartzite	Distal fragment	Tertiary	18 x 12 x 4	
Flake	Quartzite	Complete	Tertiary	22 x 15 x 12	
Flake	Quartzite	Complete	Tertiary	20 x 30 x 15	
Flake	Quartzite	Proximal fragment	Tertiary	32 x 22 x 10	
Flake	Quartzite	Complete	Tertiary	22 x 25 x 10	
Flake	Silcrete	Complete	Tertiary	22 x 22 x 8	
Flake	Quartzite	Complete	Tertiary	15 x 20 x 10	
Flake	Quartzite	Complete	Tertiary	22 x 17 x 9	
Flake	Quartzite	Complete	Secondary	30 x 22 x 12	
Flake	Quartzite	Proximal fragment	Tertiary	5 x 10 x 3	
Flake	Quartzite	Complete	Tertiary	20 x 15 x 5	
Flake	Quartzite	Complete	Tertiary	18 x 15 x 4	
Flake	Quartzite	Complete	Tertiary	22 x 25 x 10	
Core	Quartzite	Complete	Tertiary	13 x 15 x 4	
Flake	Chert	Complete	Tertiary	12 x 12 x 3	
Backed flake	Chert	Complete	Secondary	29 x 28 x 10	Semi-fine and unidirectional.
Side scraper	Quartzite	Complete	Tertiary	35 x 25 x 15	Retouch along one margin and distal end. Semi-fine and unidirectional.
Flake	Quartzite	Complete	Tertiary	10 x 20 x 8	
Flake	Quartzite	Complete	Tertiary	20 x 30 x 5	
Shatter	Quartzite	-	Tertiary	10 x 12 x 4	

Copi OS-7

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 530899E 6280307N

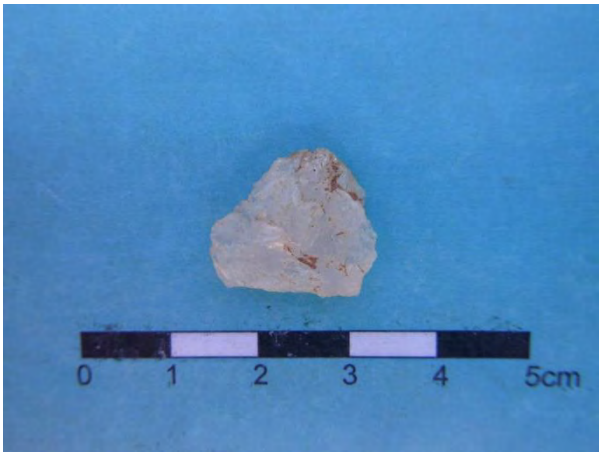
Location of Site: Copi OS-7 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-18**). The site is 3 km directly east of Nulla Road and 3.5 km northeast of the Huntingfield homestead.

Description of Site: Copi OS-7 is an artefact scatter consisting of two artefacts located on the footslope (**Figure 6-82**). The two artefacts are both flakes, one manufactured from chert and the other quartz (**Table 6-13**). The site extent is 29 x 28 m and is defined by the extent of visible artefacts with an area of water wash. Soils consist of orange/red sand. Surrounding vegetation at the site comprises shrubs including saltbush. The GSE at the time of recording was high (80%) with a GSV of 90% within the large area of exposure. Identified disturbances include erosion and grazing.

Copi OS-7 is not considered to be associated with subsurface archaeological deposits as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-82: Copi OS-7. View of site and recorded artefacts.

1. View southeast to the location of Copi OS-7 showing the eastern salt pan in the background.



2. Copi OS-7 artefact: a quartz flake.

3. Copi OS-7 artefact: a chert flake.

Table 6-13: Copi OS-7. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Flake	Quartz	Proximal fragment	Tertiary	15 x 18 x 5	
Flake	Chert	Complete	Tertiary	22 x 12 x 5	

Copi OS-8

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 530700E 6280238N

Location of Site: Copi OS-8 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-18**). The site is 2.9 km directly east of Nulla Road and 3.2 km northeast of the Huntingfield homestead.

Description of Site: Copi OS-8 is an artefact scatter consisting of three artefacts located on the footslope (**Figure 6-83**). The three artefacts are flakes manufactured from quartzite or chert (**Table 6-14**). The site extent is 70 x 34 m and is defined by the extent of visible artefacts with an area of water wash. Soils consist of orange/red sand. Surrounding vegetation at the site comprises shrubs including saltbush. The GSE at the time of recording was high (80%) with a GSV of 90% within the large area of exposure. Identified disturbances include erosion and grazing.

Copi OS-8 is not considered to be associated with subsurface archaeological deposits as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-83: Copi OS-8. View of site and recorded artefacts.

1. View west to the location of Copi OS-8 along the gentle slope.

2. View north towards Copi OS-8.

3. Copi OS-8 artefact: a quartzite flake.

4. Copi OS-8 artefacts: a quartzite and chert flake.

Table 6-14: Copi OS-8. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Flake	Quartzite	Complete	Tertiary	30 x 27 x 10
Flake	Chert	Complete	Tertiary	12 x 12 x 5
Flake	Quartzite	Complete	Tertiary	35 x 15 x 10

Copi OS-9

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 530918E 6279863N

Location of Site: Copi OS-9 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-18**). The site is 3.3 km directly east of Nulla Road and 3.4 km east of the Huntingfield homestead.

Description of Site: Copi OS-9 is an artefact scatter consisting of two artefacts located on a gentle slope (**Figure 6-84**). The two artefacts are quartzite flakes (**Table 6-15**). The site extent is 124 x 86 m, encompassing 0.7 ha of land. Soils consist of orange/red sand. Surrounding vegetation at the site comprises shrubs including saltbush. The GSE at the time of recording was high (70%) with a GSV of 80% within the large area of exposure. Identified disturbances include erosion, rabbit burrows and grazing.

Copi OS-9 is not considered to be associated with subsurface archaeological deposits as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-84: Copi OS-9. View of site and recorded artefacts.

1. View east upslope to the location of Copi OS-9.

2. View west downslope to the location of Copi OS-9.

3. Copi OS-4 artefact: a quartzite backed flake.

4. Copi OS-4 artefact: a quartzite flake.

Table 6-15: Copi OS-9. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Flake	Quartzite	Complete	Tertiary	40 x 22 x 10	
Backed flake	Quartzite	Complete	Secondary	20 x 30 x 10	Retouch on distal edge

Copi OS-10

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 532560E 6279916N

Location of Site: Copi OS-10 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-22**). The site is 4.9 km directly east of Nulla Road and 5.1 km east of the Huntingfield homestead.

Description of Site: Copi OS-10 is an artefact scatter consisting of four artefacts located in erosion scalds of a dune between parts of the eastern salt pan (**Figure 6-85**). The four artefacts include two quartz and two quartzite flakes (**Table 6-16**). The site extent is 172 x 88 m, defined by the dune landform. Soils consist of yellow loamy sand. Surrounding vegetation at the site comprises shrubs including saltbush. The GSE at the time of recording was high (80%) with a GSV of 90%. Identified disturbances include erosion, grazing, and a vehicle track.

Copi OS-10 is not considered to be associated with subsurface archaeological deposits as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-85: Copi OS-10. View of site and recorded artefacts.

1. View east to the location of the southern artefacts associated with Copi OS-10 showing part of the eastern salt pan in the background.

2. View northeast to the location of the northern artefacts associated with Copi OS-10 showing part of the eastern salt pan in the background.

3. Copi OS-10 artefacts: quartz flakes.

4. Copi OS-10 artefacts: quartzite flakes.

Table 6-16: Copi OS-10. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Flake	Quartzite	Complete	Tertiary	31 x 22 x 9
Flake	Quartzite	Distal fragment	Tertiary	18 x 11 x 5
Flake	Quartz	Proximal fragment	Tertiary	12 x 10 x 5
Flake	Quartz	Complete	Tertiary	18 x 15 x 8

Copi OS-11

Site Type: Artefact scatter; PAD

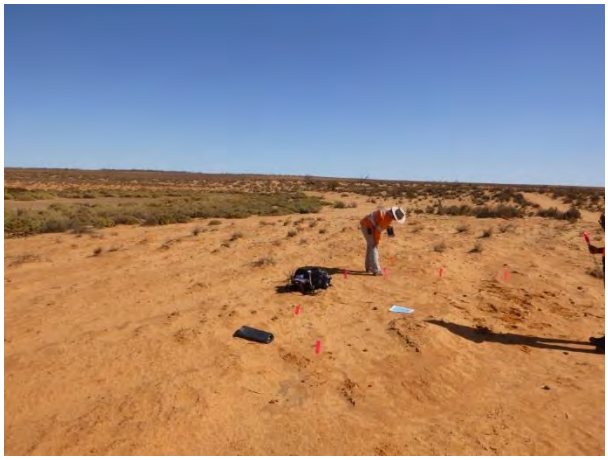
GPS Coordinates: Site centroid - GDA Zone 54 532787E 6280327N

Location of Site: Copi OS-11 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-22**). The site is 4.9 km directly east of Nulla Road and 5.3 km northeast of the Huntingfield homestead.

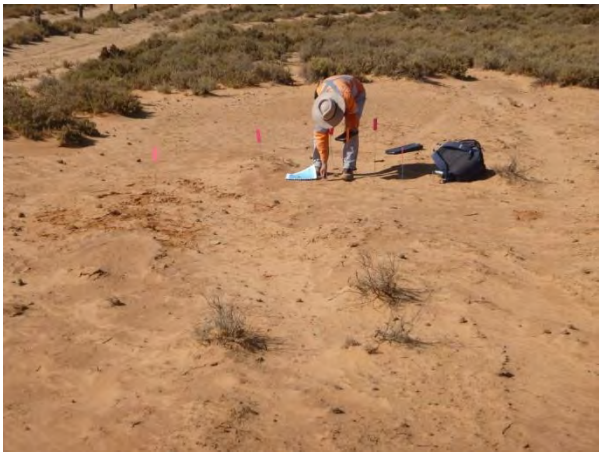
Description of Site: Copi OS-11 is an artefact scatter consisting of 11 artefacts eroding out of the edge of a deflated dune adjacent to a small depression (**Figure 6-86**). The assemblage consists of 10 quartzite flakes and a quartz flake (**Table 6-17**). The scatter has the potential to be part of a knapping floor eroding from the dune given the discrete concentration of small artefacts generally manufactured from the same material. The extent of the artefact scatter is 8 x 8 m, defined by the area of visible artefacts. Soils consist of yellow loamy sand. Surrounding vegetation at the site comprises isolated trees and shrubs including saltbush. The GSE at the time of recording was high (80%) with a GSV of 90% across the landform. Identified disturbances include a vehicle track, fencing, erosion, and grazing.

Copi OS-11 is considered to be associated with subsurface archaeological deposits as the visible surface artefacts are eroding out the edge of the deflated dune. The extent of the PAD is 90 x 30 m and encompasses the dune bordering the depression.

Figure 6-86: Copi OS-11. View of site and recorded artefacts.



1. View north to flagged artefacts at Copi OS-11 showing the adjacent depression (left).



2. View south to flagged artefacts at Copi OS-11.

3. Copi OS-11 artefacts: quartz and quartzite flakes.

Table 6-17: Copi OS-11. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Flake	Quartzite	Complete	Tertiary	32 x 22 x 5
Flake	Quartzite	Complete	Tertiary	12 x 10 x 5
Flake	Quartzite	Complete	Tertiary	28 x 12 x 5
Flake	Quartz	Distal fragment	Tertiary	14 x 15 x 7
Flake	Quartzite	Complete	Tertiary	10 x 10 x 5
Flake	Quartzite	Distal fragment	Tertiary	17 x 10 x 5
Flake	Quartzite	Complete	Tertiary	5 x 5 x 2
Flake	Quartzite	Complete	Tertiary	20 x 12 x 5
Flake	Quartzite	Complete	Tertiary	10 x 8 x 4
Flake	Quartzite	Complete	Tertiary	25 x 22 x 12
Flake	Quartzite	Distal fragment	Tertiary	20 x 12 x 4

Copi OS-12

Site Type: Artefact scatter; hearths; PAD

GPS Coordinates: Site centroid - GDA Zone 54 532186E 6280930N

Location of Site: Copi OS-12 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-87**). The site is 2.8 km directly east of Nulla Road and 4 km northeast of the Huntingfield homestead.

Description of Site: Copi OS-12 has a minimum of 123 artefacts recorded (**Table 6-18**). Most artefacts recorded are flakes (n=70), followed by pieces of shatter (n=40) and cores (n=5). There were also three fragments of grinding plates and a top stone, several retouched artefacts including flakes, flaked pieces, a backed flake, and an end scraper. Most artefacts were made from quartzite, chert, and quartz. Other materials such as chalcedony, basalt, jasper, mudstone, silcrete, and volcanic materials were also present, though in less frequency. Nine hearths are recorded inside the site extent, all of which are highly eroded (**Table 6-19**). The hearths are located near or on the edges of erosion scalds and consist of charcoal and burnt clay nodules. The site extent is 1.29 km x 750 m in size, totalling 73.7 ha. The site encompasses a gentle slope from the northeast site extent descending towards the south and southeast where the landform flattens (**Figure 6-88**). Soils at the site consist of orange/red sand. Vegetation comprises isolated trees and shrubs including saltbush. The GSE at the time of recording was high (85%) with a GSV of 70% within areas of exposures. Many of the surface artefacts were recorded in association with erosion scalds. Identified disturbances include grazing and erosion.

Copi OS-12 has been subject to high levels of erosion but has the potential to be associated with subsurface archaeological deposits across the site extent.

Figure 6-87: Location of Copi OS-12 to OS-13 and IF-15.

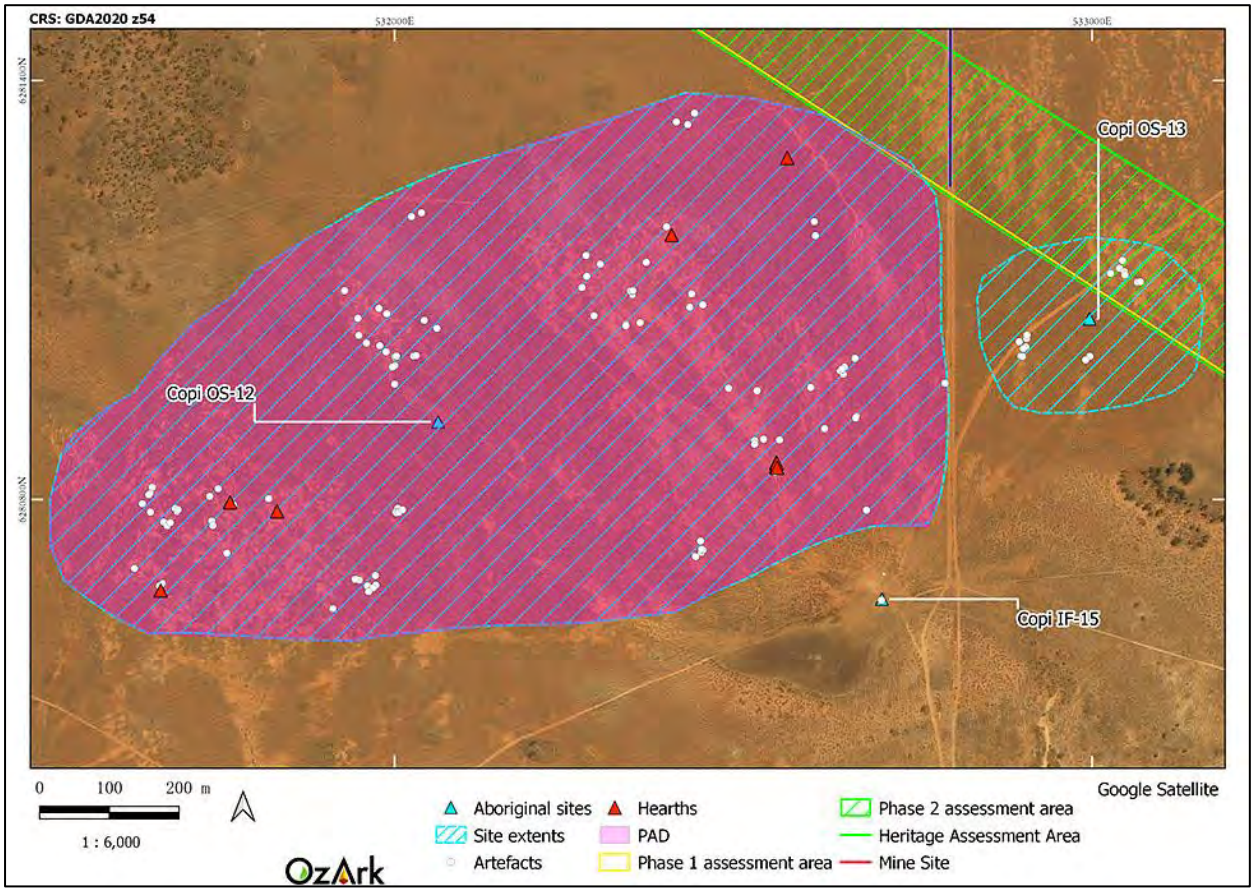
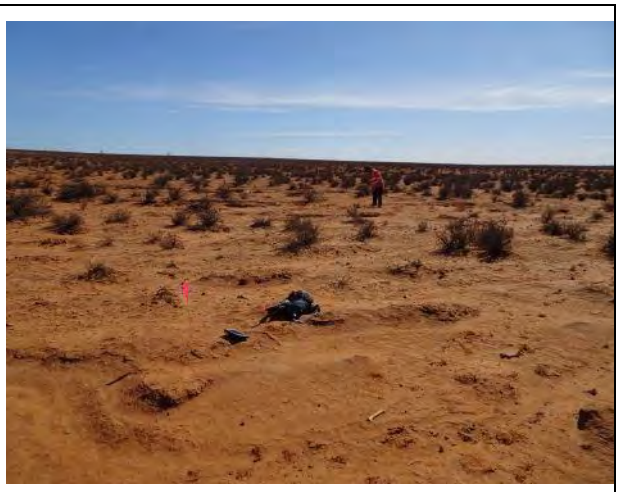


Figure 6-88: Copi OS-12. View of site, selection of recorded artefacts and hearths.

	
1. View east across centre of site location from western site extent.	2. View north across eastern extent of site location from southern site extent.

3. View south across site location from centre of site extent.

4. Copi OS-12 artefacts: selection of quartzite flakes.

5. Copi OS-12 artefacts: selection of quartzite flakes.

6. Copi OS-12 artefact: grindstone dish fragment and top stone *in situ.*

7. Copi OS-12 artefact: grindstone dish fragment.

8. Copi OS-12 artefact: top stone (muller).

9. Copi OS-12 hearth at GDA Zone 54 532397E 6281178N.

10. Copi OS-12 hearth at GDA Zone 54 531764E 6280795N.

Table 6-18: Copi OS-12. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Flake	Quartzite	Proximal fragment	Secondary	25 x 8 x 5	
Flake	Chert	Complete	Tertiary	15 x 8 x 3	
Shatter	Chert	-	Secondary	30 x 15 x 10	
Flake	Quartzite	Complete	Primary	20 x 30 x 10	50% cortex on dorsal surface
Flake	Quartzite	Complete	Secondary	50 x 30 x 2	10% cortex
Shatter	Quartzite	-	Tertiary	6 x 8 x 5	
Flake	Quartzite	Complete	Tertiary	40 x 25 x 7	
Flake	Quartzite	Proximal fragment	Tertiary	12 x 12 x 3	
Core	Quartzite	Complete	Tertiary	50 x 30 x 20	Multidirectional, 3 flake scars, <5% cortex, opportunistic.
Core	Quartzite	Complete	Tertiary	35 x 15 x 20	Multidirectional, 5 flake scars, <5% cortex, reduced.
Flake	Quartzite	Longitudinal break	Tertiary	35 x 25 x 5	Retouch along distal edge, semi-steep, unidirectional.
End scraper	Basalt	Complete	Tertiary	22 x 22 x 10	Retouch on margin, semi-steep, unidirectional.
Flake	Quartzite	Complete	Tertiary	20-40	
Shatter	Quartzite	-	Tertiary	6 x 10 x 6	
Flake	Quartzite	Complete	Tertiary	10 x 12 x 8	
Shatter	Quartzite	Complete	Tertiary	12 x 12 x 3	
Flake	Quartzite	Complete	Tertiary	10 x 12 x 4	
Flake	Quartzite	Proximal fragment	Tertiary	20 x 12 x 5	
Flake	Quartzite	Proximal fragment	Tertiary	25 x 20 x 5	
Flake	Quartzite	Complete	Secondary	25 x 20 x 5	
Flake	Chert	Complete	Tertiary	18 x 12 x 5	
Shatter	Chert	-	Tertiary	6 x 8 x 2	
Shatter	Chert	-	Tertiary	5 x 6 x 5	
Flake	Quartzite	Complete	Tertiary	12 x 10 x 8	
Shatter	Quartzite	-	Tertiary	10 x 12 x 6	
Flake	Quartzite	Complete	Tertiary	8 x 12 x 4	

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Flake	Jasper	Complete	Tertiary	6 x 6 x 5	
Shatter	Quartzite	-	Tertiary	8 x 10 x 8	
Flake	Quartzite	Complete	Tertiary	12 x 12 x 8	
Flake	Quartz	Complete	Tertiary	20 x 15 x 10	
Shatter	Chert	-	Tertiary	15 x 10 x 4	
Flake	Quartzite	Complete	Tertiary	12 x 15 x 10	
Shatter	Chert	-	Tertiary	10 x 12 x 4	
Flake	Chert	Complete	Tertiary	20 x 10 x 5	
Flake	Quartzite	Complete	Tertiary	18 x 25 x 5	
Flake	Quartzite	Complete	Tertiary	18 x 12 x 2	
Flake	Quartzite	Complete	Secondary	30 x 40 x 2	40% cortex
Flake	Quartz	Complete	Tertiary	17 x 12 x 5	
Flake	Quartzite	Complete	Tertiary	12 x 10 x 3	
Flake	Chert	Complete	Tertiary	10 x 7 x 2	
Shatter	Quartzite	-	Tertiary	10 x 8 x 2	
Shatter	Quartzite	-	Primary	13 x 14 x 6	
Flake	Chalcedony	Proximal fragment	Secondary	40 x 30 x 10	
Core	Quartzite	Complete	Secondary	35 x 35 x 20	Multidirectional, 3 flake scars, 45% cortex and opportunistic.
Shatter	Quartzite	-	Tertiary	10 x 12 x 4	
Shatter	Quartzite	-	Tertiary	8 x 8 x 7	
Flake	Quartzite	Complete	Tertiary	32 x 40 x 12	
Shatter	Quartzite	-	Tertiary	10 x 8 x 2	
Shatter	Quartzite	-	Tertiary	8 x 10 x 4	
Shatter	Quartzite	-	Tertiary	12 x 8 x 6	
Shatter	Quartzite	-	Tertiary	20 x 15 x 5	
Flake	Quartzite	Complete	Tertiary	13 x 8 x 5	
Flake	Quartzite	Complete	Tertiary	42 x 20 x 10	
Flake	Quartzite	Complete	Primary	25 x 30 x 5	
Flake	Chert	Proximal fragment	Tertiary	20 x 15 x 5	
Flake	Quartzite	Proximal fragment	Tertiary	22 x 20 x 8	
Shatter	Chert	-	Primary	10 x 10 x 8	
Flake	Quartzite	Complete	Tertiary	20 x 20 x 5	
Shatter	Jasper	-	Primary	20 x 10 x 12	40% cortex
Flake	Chert	Complete	Tertiary	12 x 10 x 2	
Flake	Chert	Complete	Tertiary	8 x 15 x 2	
Flake	Quartzite	Complete	Tertiary	2 x 15 x 5	
Shatter	Quartzite	Complete	Tertiary	10 x 15 x 4	
Shatter	Quartzite	Complete	Tertiary	15 x 20 x 1	
Flake	Quartzite	Complete	Tertiary	35 x 25 x 10	
Flake	Chert	Complete	Tertiary	10 x 10 x 8	
Flake	Chert	Complete	Secondary	30 x 15 x 15	10% cortex
Shatter	Quartzite	-	Tertiary	10 x 12 x 4	
Shatter	Quartzite	-	Tertiary	12 x 12 x 6	
Shatter	Quartzite	-	Tertiary	9 x 11 x 2	

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Shatter	Quartzite	Complete	Tertiary	20 x 15 x 5	
Shatter	Quartzite	-	Tertiary	4 x 8 x 6	
Flake	Quartzite	Complete	Tertiary	30 x 20 x 12	
Flake	Quartz	Complete	Tertiary	13 x 15 x 10	
Shatter	Quartz	-	Secondary	10 x 11 x 2	
Flake	Quartzite	Complete	Tertiary	40 x 20 x 15	Retouch along margin, semi-steep and unidirectional.
Shatter	Chert	-	Tertiary	15 x 16 x 8	
Flake	Quartz	Complete	Tertiary	20 x 15 x 5	
Flake	Chert	Proximal fragment	Tertiary	22 x 20 x 5	
Flake	Quartz	Complete	Tertiary	15 x 17 x 3	
Shatter	Chert	-	Tertiary	18 x 11 x 4	
Flake	Chert	Complete	Tertiary	20 x 15 x 7	
Shatter	Chert	-	Secondary	15 x 10 x 10	
Flake	Quartzite	Complete	Tertiary	30 x 20 x 3	
Flake	Quartzite	Proximal fragment	Secondary	30 x 15 x 5	
Flake	Chert	Complete	Tertiary	9 x 11 x 2	
Flake	Chert	Complete	Tertiary	20 x 18 x 5	Bifacial retouch along one margin. Semi-steep.
Core	Chert	Complete	Secondary	25 x 50 x 10	Multidirectional, 3 flake scars, 40% cortex, reduced.
Shatter	Quartz	-	Secondary	10 x 10 x 5	
Flake	Chert	Complete	Secondary	22 x 12 x 10	
Grinding stone	Volcanic	Longitudinal break	-	100 x 70 x 40	Fragment
Flake	Quartzite	Complete	Secondary	60 x 70 x 30	
Shatter	Quartz	-	Tertiary	8 x 6 x 4	
Shatter	Quartz	-	Tertiary	30 x 20 x 1	
Shatter	Quartz	-	Secondary	10 x 12 x 6	
Shatter	Chert	-	Secondary	14 x 8 x 4	
Flake	Quartzite	Longitudinal break	Tertiary	35 x 30 x 7	
Flake	Quartzite	Complete	Tertiary	40 x 25 x 10	Retouch along both margins. Semi-steep and unidirectional.
Shatter	Chert	-	Tertiary	15 x 12 x 5	
Shatter	Chert	-	Primary	12 x 15 x 2	Cortex on dorsal surface
Shatter	Chert	-	Secondary	21 x 15 x 10	15% cortex
Shatter	Chert	-	Tertiary	15 x 10 x 7	
Flake	Chert	Complete	Tertiary	10 x 10 x 2	
Flake	Quartzite	Proximal fragment	Tertiary	16 x 24 x 5	
Flake	Chert	Complete	Tertiary	14 x 7 x 3	
Grinding stone	Quartzite	Fragment	-	200 x 170 x 110	Dish
Grinding stone	Quartzite	Fragment	-	150 x 120 x 80	Top stone
Flake	Quartz	Complete	Tertiary	19 x 12 x 4	
Flake	Quartzite	Complete	Tertiary	100 x 60 x 20	
Flake	Chert	Proximal fragment	Tertiary	13 x 10 x 4	
Flake	Chalcedony	Complete	Secondary	25 x 22 x 10	
Flake	Quartzite	Complete	Tertiary	16 x 17 x 6	

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Flake	Quartzite	Complete	Tertiary	14 x 18 x 2	
Flake	Quartz	Distal fragment	Tertiary	31 x 22 x 10	
Flake	Quartz	Complete	Tertiary	8 x 13 x 5	
Core	Quartzite	Complete	Tertiary	12 x 15 x 2	Multidirectional, 4 flake scars, reduced.
Flake	Silcrete	Complete	Tertiary	30 x 24 x 5	
Flaked piece	Quartz	Complete	Tertiary	21 x 8 x 6	
Flake	Quartzite	Complete	Tertiary	13 x 15 x 5	
Flake	Mudstone	Distal fragment	Tertiary	14 x 11 x 9	
Backed flake	Quartzite	Longitudinal break	Tertiary	31 x 14 x 6	Retouch on burin spall. Semi-steep and unidirectional.

Table 6-19: Copi OS-12. Coordinates for hearths.

Number	GDA Zone 54 Easting	GDA Zone 54 Northing
1	532547	6280853
2	532547	6280847
3	531665	6280670
4	531831	6280783
5	531764	6280796
6	532397	6281179
7	532563	6281289
8	532548	6280846
9	532548	6280852

Copi OS-13

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 532996E 6281057N

Location of Site: Copi OS-13 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-87**). The site is 4.3 km directly east of Nulla Road and 5.7 km northeast of the Huntingfield homestead.

Description of Site: Copi OS-13 is an artefact scatter consisting of 14 artefacts located on a footslope (**Figure 6-89**). Most artefacts are flakes, though there was also one core and one end scraper (**Table 6-20**). The extent of the site is defined by the area of erosion scalding where the artefacts are located. The site extent is 325 x 245 m with an area of 6.7 ha. The GSE at the time of recording was high (70%) with a GSV of 80% within the exposure area. Soils consist of a light red/brown sand. The vegetation at the site consisted of shrubs including saltbush. Identified disturbances include a vehicle track, erosion, and grazing.

Copi OS-13 is not considered to be associated with subsurface archaeological deposits as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-89: Copi OS-13. View of site and a selection of recorded artefacts.

1. View north across an erosion scald with artefacts in the west of Copi OS-13.

2. View east across an erosion scald with artefacts in the east of Copi OS-13.

3. Copi OS-13 artefact: a quartzite end scraper.

4. Copi OS-13 artefacts: quartzite flakes.

5. Copi OS-13 artefacts: quartzite flakes.

6. Copi OS-13 artefact: a quartzite core.

Table 6-20: Copi OS-13. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
End scraper	Quartzite		Tertiary	32 x 28 x 15	
Flake	Quartzite	Distal fragment	Tertiary	30 x 22 x 12	
Flake	Quartzite	Distal fragment	Tertiary	20 x 12 x 5	
Flake	Chert	Longitudinal break	Tertiary	18 x 10 x 2	
Flake	Quartzite	Proximal fragment	Tertiary	22 x 15 x 6	
Flake	Quartzite	Distal fragment	Tertiary	10 x 12 x 4	
Flake	Quartzite		Tertiary	6 x 6 x 2	
Flake	Quartzite	Complete	Tertiary	24 x 20 x 10	
Flake	Quartzite	Complete	Tertiary	80 x 40 x 25	Possible retouch along margin
Flake	Silcrete	Proximal fragment	Tertiary	25 x 25 x 10	Retouch on margin
Flake	Quartzite	Complete	Tertiary	36 x 18 x 5	
Flake	Quartzite	Longitudinal break	Tertiary	10 x 12 x 5	
Flake	Quartzite	Proximal fragment	Tertiary	32 x 22 x 8	Weathered
Core	Quartzite		Tertiary	45 x 32 x 20	Multidirectional, 3 flake scars.

Copi OS-14

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 534105E 6279230N

Location of Site: Copi OS-14 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-41**). The site is 6.5 km directly east of Nulla Road and 5.8 km southwest of the Warwick homestead.

Description of Site: Copi OS-14 is an artefact scatter consisting of two artefacts located on a sandplain (**Figure 6-90**). The artefacts consist of one flake and one core both manufactured from quartzite (**Table 6-21**). The extent of the site is defined by the area of erosion scalding where the artefacts are located. The site extent is 45 x 28 m with an area of 712 m^2. The GSE at the time of recording was high (70%) with a GSV of 80% within the exposure area. Soils consist of a light red/brown sand over compacted light brown clay-sand. Surrounding vegetation at the site comprises shrubs including saltbush. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi OS-14 is assessed as negligible as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-90: Copi OS-14. View of site and recorded artefacts.

1. View north to the location of Copi OS-14.

2. Copi OS-14 artefact: a quartzite core.

3. Copi OS-14 artefact: a quartzite flake.

Table 6-21: Copi OS-14. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Flake	Quartzite	Longitudinal break	Tertiary	15 x 10 x 5	
Core	Quartzite	-	Tertiary	Max. 28	Unidirectional, 5 flake scars, fragment

Copi OS-15

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 534515E 6279332N

Location of Site: Copi OS-15 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-91**). The site is 6.9 km directly east of Nulla Road and 5.5 km southwest of the Warwick homestead.

Description of Site: Copi OS-15 is an artefact scatter consisting of two artefacts located on a sandplain (**Figure 6-92**). The artefacts are both quartzite flakes (**Table 6-22**). The site extent is 102 x 62 m and defined is defined by the area of erosion scalding where the

artefacts are located. The site extent has an area of 4,914 m^2. The GSE at the time of recording was high (70%) with a GSV of 80% within the exposure area. Soils consist of a light red/brown sand over compacted light brown clay-sand. Surrounding vegetation at the site comprises shrubs including saltbush. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi OS-15 is assessed as negligible as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-91: Location of Copi OS-15 and OS-23 to OS-25.

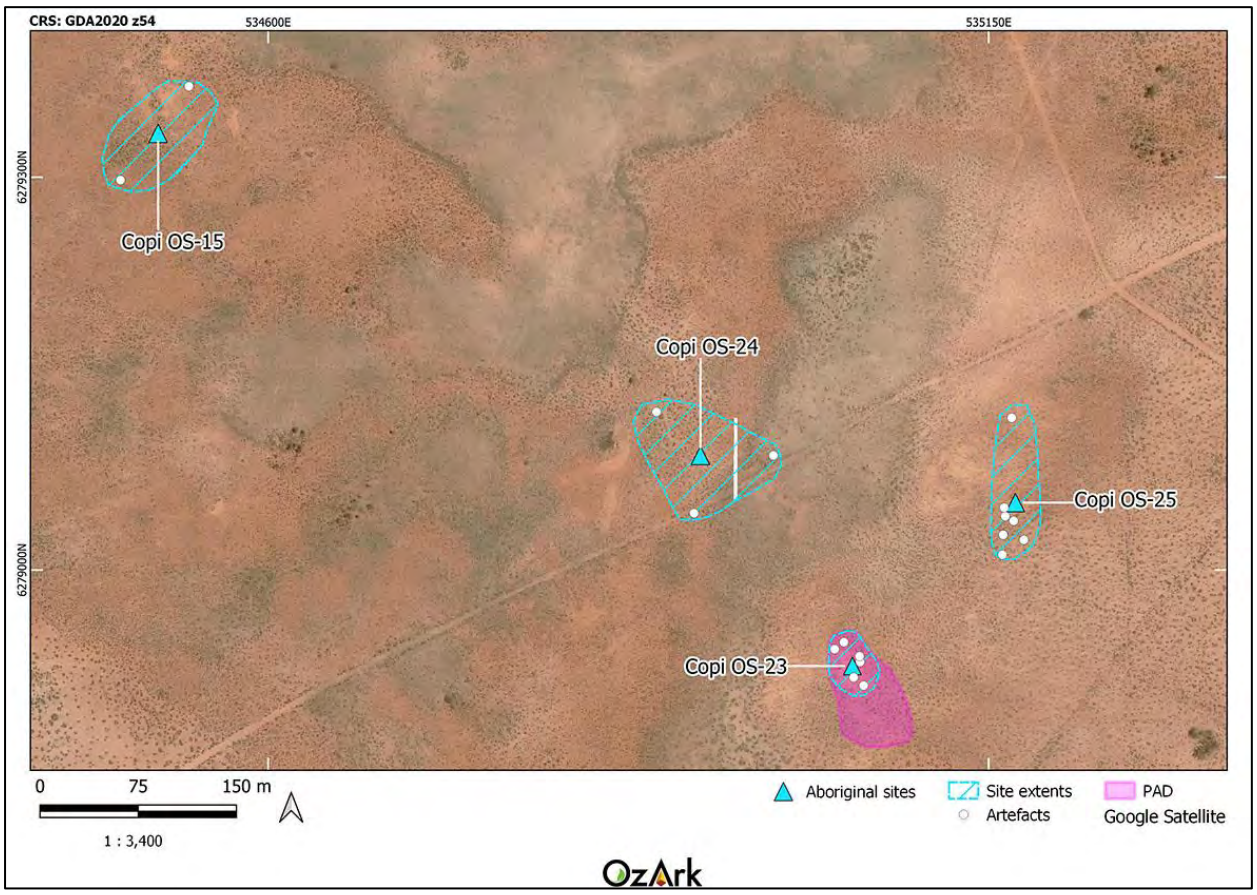


Figure 6-92: Copi OS-15. View of site and recorded artefacts.

1. View north to the location of Copi OS-15.

2. Copi OS-15 artefact: a quartzite flake.

3. Copi OS-15 artefact: a chert flake.

Table 6-22: Copi OS-15. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Flake	Quartzite	Complete	Tertiary	24 x 26 x 5
Flake	Chert	Longitudinal break	Tertiary	14 x 22 x 5

Copi OS-16

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 534790E 6279744N

Location of Site: Copi OS-16 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-32**). The site is 7.2 km directly east of Nulla Road and 5 km southwest of the Warwick homestead.

Description of Site: Copi OS-16 is an artefact scatter consisting of two artefacts located on a sandplain (**Figure 6-93**). The artefacts are a quartzite side scraper and a chert flake (**Table 6-23**). The site extent is 26 x 10 m defined by the area of erosion scalding where

the artefacts are located. The site extent has an area of 256 m^2. The GSE at the time of recording was high (70%) with a GSV of 80% within the exposure area. Soils consist of a light red/brown sand over compacted light brown clay-sand. Surrounding vegetation at the site comprises shrubs including saltbush. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi OS-16 is assessed as negligible as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-93: Copi OS-16. View of site and recorded artefacts.

1. View east to the location of Copi OS-16.

2. Copi OS-16 artefact: a quartzite end scraper.

3. Copi OS-16 artefact: a chert flake.

Table 6-23: Copi OS-16. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
End scraper	Quartzite	Complete	Secondary	68 x 45 x 78	Semi-steep, unifacial retouch.
Flake	Chert	Complete	Tertiary	8 x 8 x 2	

Copi OS-17

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 533416E 6278591N

Location of Site: Copi OS-17 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-94**). The site is 5.9 km directly east of Nulla Road and 6.8 km southwest of the Warwick homestead.

Description of Site: Copi OS-17 is an artefact scatter consisting of four artefacts located on a sandplain (**Figure 6-95**). The artefacts are all flakes manufactured from quartzite, quartz and chert (**Table 6-24**). The site extent is 180 x 80 m defined by the area of erosion scalding where the artefacts are located. The site extent has an area of 1.5 ha. The GSE at the time of recording was high (70%) with a GSV of 80% within the exposure area. Soils consist of a light red/brown sand over compacted light brown clay-sand. Surrounding vegetation at the site comprises shrubs including saltbush with a remnant stand of trees to the east. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi OS-17 is assessed as negligible as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-94: Location of Copi OS-17.

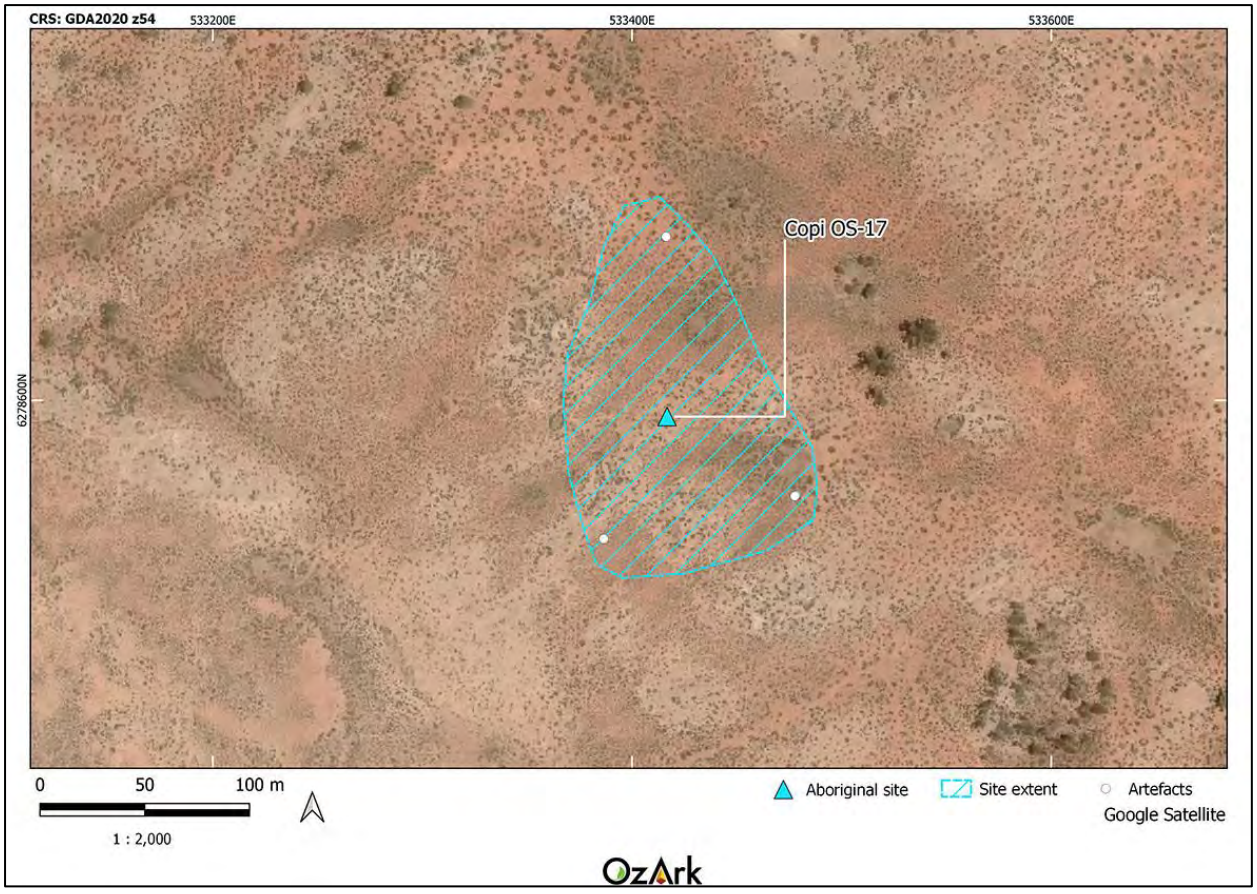


Figure 6-95: Copi OS-17. View of site and recorded artefacts.

1. View north towards Copi OS-17.

2. Copi OS-17 artefact: a quartzite flake.

3. Copi OS-17 artefacts: chert flakes.

4. Copi OS-17 artefact: a quartz flake.

Table 6-24: Copi OS-17. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Flake	Quartzite	Complete	Tertiary	41 x 22 x 8
Flake	Quartz	Complete	Tertiary	20 x 12 x 5
Flake	Chert	Proximal fragment	Tertiary	10 x 10 x 5
Flake	Chert	Complete	Tertiary	16 x 12 x 6

Copi OS-18

Site Type: Artefact scatter and PAD

GPS Coordinates: Site centroid - GDA Zone 54 533741E 6278697N

Location of Site: Copi OS-18 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-41**). The site is 6.2 km directly east of Nulla Road and 6.5 km southwest of the Warwick homestead.

Description of Site: Copi OS-18 is an artefact scatter consisting of 17 artefacts located on a low crest (**Figure 6-96**). The artefacts are manufactured from quartzite, quartz, silcrete and chert (**Table 6-25**). The site extent is 360 x 126 m and defined by elevated landform to the west of a depression. The GSE at the time of recording was high (70%) with a GSV of 80% within the exposure area. Soils consist of patches a light red/brown sand over compacted light brown clay-sand and gypsum. Surrounding vegetation at the site comprises shrubs including saltbush with a remnant stand of trees in the central portion. Identified disturbances include erosion, rabbit burrows and grazing.

Copi OS-18 is considered to be associated with subsurface archaeological deposits in areas that have been less disturbed by rabbit burrows and contain fewer pockets of gypsum. The PAD extent is 145 m x by 120 m.

Figure 6-96: Copi OS-18. View of site and a selection of recorded artefacts.

1. View southeast to Copi OS-18 on a low dune adjacent to a depression.

2. View north to the northern portion of Copi OS-18.

3. Copi OS-18 artefact: a chert end scraper.

4. Copi OS-18 artefacts: selection of quartzite flakes.

5. Copi OS-18 artefact: a quartzite flake.

6. Copi OS-18 artefact: a quartzite flake.

Table 6-25: Copi OS-18. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
End scraper	Chert	Complete	Tertiary	28 x 20 x 12	Steep; unifacial retouch
Flake	Quartzite	Distal fragment	Tertiary	15 x 15 x 5	
Flake	Quartzite	Complete	Tertiary	10 x 10 x 2	
Flake	Quartzite	Longitudinal break	Tertiary	30 x 25 x 8	
Flake	Quartzite	Complete	Tertiary	55 x 20 x 5	
Core	Quartz	-	Tertiary	Max. 30	Multidirectional, 2 flake scars, 10% cortex
Flake	Quartz	Distal fragment	Tertiary	20 x 10 x 8	
Flake	Quartz	Complete	Tertiary	10 x 10 x 2	
Flake	Quartz	Distal fragment	Tertiary	5 x 5 x 2	
Flake	Quartzite	Complete	Tertiary	22 x 25 x 10	
Flake	Quartzite	Complete	Tertiary	30 x 20 x 10	
Flake	Silcrete	Complete	Tertiary	21 x 23 x 7	
Flake	Quartzite	Complete	Tertiary	13 x 14 x 4	
Blade	Quartzite	Complete	Tertiary	18 x 10 x 5	
Flake	Quartzite	Complete	Tertiary	21 x 18 x 6	
Flake	Silcrete	Complete	Primary	23 x 18 x 5	
Blade	Quartzite	Complete	Tertiary	28 x 10 x 8	

Copi OS-19

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 533788E 6277941N

Location of Site: Copi OS-19 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-44**). The site is 5.9 km directly east of Nulla Road and 7.1 km southwest of the Warwick homestead.

Description of Site: Copi OS-19 is an artefact scatter consisting of five artefacts located on a sandplain (**Figure 6-97**). The artefacts include four quartzite flakes and one chert

flaked piece (**Table 6-26**). The site extent is 18 x 15 m defined by the area of erosion scalding where the artefacts are located. The site extent has an area of 235 m^2. The GSE at the time of recording was high (70%) with a GSV of 80% within the exposure area. Soils consist of a light red/brown sand over compacted light brown clay-sand. Surrounding vegetation at the site comprises open woodland and shrubs including saltbush. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi OS-19 is assessed as negligible as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-97: Copi OS-19. View of site and recorded artefacts.

1. View west to location of Copi OS-19.

2. Copi OS-19 artefacts: chert flaked piece and quartzite flakes.

3. Copi OS-19 artefacts: quartzite flakes.

Table 6-26: Copi OS-19. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Flaked piece	Chert	-	Tertiary	25 x 15 x 10	
Flake	Quartzite	Complete	Tertiary	30 x 287 x 8	

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Flake	Quartzite	Proximal fragment	Tertiary	10 x 10 x 5	
Flake	Quartzite	Distal fragment	Tertiary	12 x 16 x 8	Use wear on margin
Flake	Quartzite	Complete	Tertiary	22 x 15 x 4	

Copi OS-20

Site Type: Artefact scatter; hearth

GPS Coordinates: Site centroid - GDA Zone 54 534595E 6277843N

Location of Site: Copi OS-20 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-48**). The site is 6.6 km directly east of Nulla Road and 6.7 km southwest of the Warwick homestead.

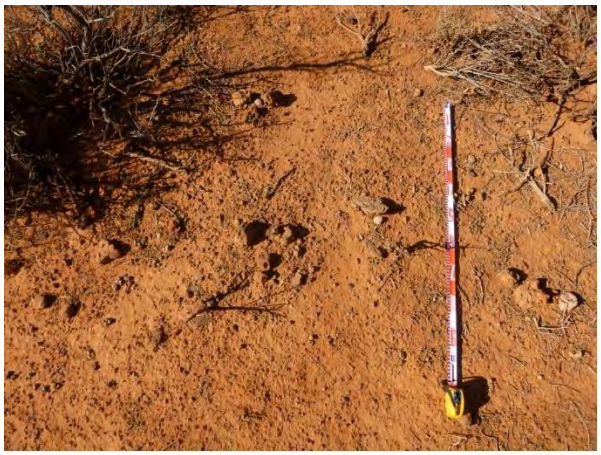
Description of Site: Copi OS-20 is an artefact scatter consisting of two artefacts and a hearth, located on a sandplain (**Figure 6-98**). The artefacts are two quartzite flakes (**Table 6-27**). The site extent is 87 x 57 m and includes a hearth. The hearth is eroded and consisted of burnt clay nodules including nodules from termite mounds. The GSE at the time of recording was high (70%) with a GSV of 80% within the exposure area. Soils consist of a light red/brown sand over compacted light brown clay-sand. Surrounding vegetation at the site comprises shrubs including saltbush. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi OS-20 is assessed as negligible, apart from an area 1 x 1 m around the hearth at GDA Zone 54 534576E 6277861N.

Figure 6-98: Copi OS-20. View of site and a selection of recorded artefacts.

1. View south to Copi OS-20 location.

2. Copi OS-20 artefact: a quartzite flake.



3. Copi OS-20 hearth at GDA Zone 54 534576E 6277861N.

Table 6-27: Copi OS-20. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Flake	Quartzite	Complete	Tertiary	22 x 20 x 12
Flake	Quartzite	Complete	Tertiary	36 x 20 x 12

Copi OS-21

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 534507E 6278085N

Location of Site: Copi OS-21 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-48**). The site is 6.8 km directly east of Nulla Road and 6.5 km southwest of the Warwick homestead.

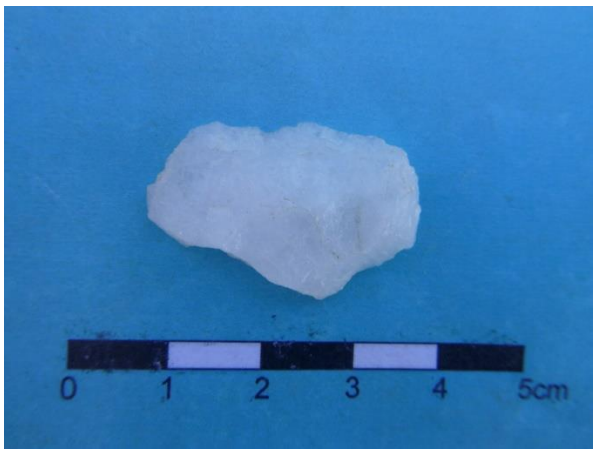
Description of Site: Copi OS-21 is an artefact scatter consisting of three artefacts located on a sandplain (**Figure 6-99**). The artefacts are two quartzite flakes and one chert flake (**Table 6-28**). The site extent is 103 x 60 m defined by the area of erosion scalding where the artefacts are located. The site extent has an area of 5,575 m^2. The GSE at the time of recording was high (70%) with a GSV of 80% within the exposure area. Soils consist of a light red/brown sand over compacted light brown clay-sand. Surrounding vegetation at the site comprises shrubs including saltbush. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi OS-21 is assessed as negligible as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-99: Copi OS-21. View of site and recorded artefacts.

1. View west across Copi OS-21.

2. Copi OS-21 artefact: a chert flake.



3. Copi OS-21 artefact: a quartz flake.

4. Copi OS-21 artefact: a quartzite flake.

Table 6-28: Copi OS-21. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Flake	Quartz	Complete	Tertiary	28 x 18 x 5
Flake	Quartzite	Complete	Tertiary	40 x 35 x 15
Flake	Chert	Longitudinal break	Tertiary	20 x 12 x 5

Copi OS-22

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 534566E 6278385N

Location of Site: Copi OS-22 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-48**). The site is 7 km directly east of Nulla Road and 6.2 km southwest of the Warwick homestead.

Description of Site: Copi OS-22 is an artefact scatter consisting of six artefacts located on a sandplain to the west of an area of depression (**Figure 6-100**). The artefacts include

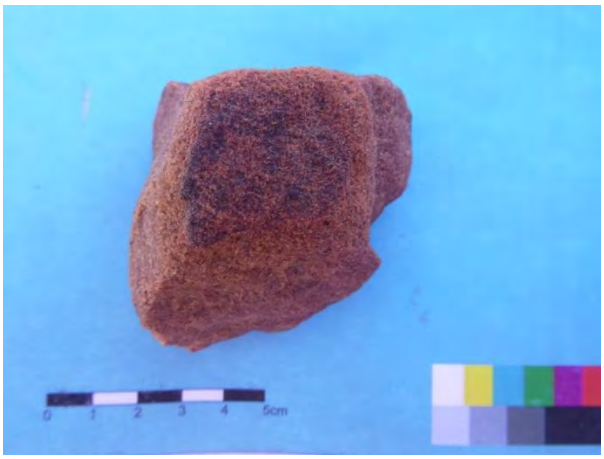
five flakes and one grinding plate fragment (**Table 6-29**). The site extent is 325 x 155 m defined by the area of erosion scalding where the artefacts are located. The site extent has an area of 3.9 ha. The GSE at the time of recording was high (70%) with a GSV of 80% within the exposure area. Soils consist of a light red/brown sand over compacted light brown clay-sand. Surrounding vegetation at the site comprises shrubs including saltbush. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi OS-22 is assessed as negligible as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-100: Copi OS-22. View of site and a selection of recorded artefacts.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>1. View northeast from the southern extent of Copi OS-22.</td><td>2. View west across the western portion of Copi OS-22.</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>3. Copi OS-22 artefact: a quartzite flake.</td><td>4. Copi OS-22 artefact: a chert flake.</td></tr>
</table>

5. Copi OS-22 artefact: a quartzite flake.



6. Copi OS-22 artefact: a sandstone (?) grindstone fragment.

Table 6-29: Copi OS-22. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Flake	Quartzite	Complete	Tertiary	35 x 18 x 10	
Flake	Quartzite	Complete	Tertiary	33 x 34 x 10	
Grinding plate	Quartzite	Fragment		72 x 60 x 52	
Flake	Quartzite	Complete	Tertiary	15 x 20 x 5	
Flake	Chert	Complete	Tertiary	22 x 21 x 5	Possible retouch on proximal end
Flake	Sandstone(?)	Complete	Tertiary	42 x 21 x 10	

Copi OS-23

Site Type: Artefact scatter; PAD

GPS Coordinates: Site centroid - GDA Zone 54 535045E 6278925N

Location of Site: Copi OS-23 is in the southwestern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-91**). The site is located 7.6 km directly east of Nulla Road and 5.2 km southwest of the Warwick homestead.

Description of Site: Copi OS-23 is an artefact scatter consisting of five artefacts situated on a sandplain (**Figure 6-101**). Most artefacts are manufactured from quartzite and include one core, one flake and three pieces of shatter (**Table 6-30**). The extent of the site is defined by the area of erosion scalding where the artefacts are located. The extent is 50 x 37 m with an area of 1,424 m^2. The GSE at the time of recording was high (70%) with a GSV of 80% within the exposure area. Identified disturbances include grazing. The vegetation at the site consisted of dead dry bushes around the edges of the site extent. Soils consist of a light red/brown sand over compacted light brown clay-silt.

Copi OS-23 has potential for subsurface archaeological deposits although much of the A-Horizon has eroded.

Figure 6-101: Copi OS-23. View of site and a selection of recorded artefacts.

1. View northwest to the location of Copi OS-23

2. Copi OS-23 artefact: a quartzite flake.

3. Copi OS-23 artefact: a quartzite flake.

4. Copi OS-23 artefact: a quartzite flake.

Table 6-30: Copi OS-23. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Shatter	Quartz	-	Tertiary	8 x 8 x 2	
Shatter	Quartzite	-	Tertiary	12 x 6 x 2	
Core	Quartzite	-	Secondary	45 x 25 x 15	Multidirectional, 3 flake scars, 50% cortex, opportunistic.
Shatter	Quartzite	-	Tertiary	20 x 20 x 10	
Flake	Quartzite	Complete	Tertiary	20 x 15 x 7	

Copi OS-24

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 534929E 6279086N

Location of Site: Copi OS-24 is in the southwestern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-91**). The site is located 7.4 km directly east of Nulla Road and 5.4 km southwest of the Warwick homestead.

Description of Site: Copi OS-24 is an artefact scatter consisting of three artefacts located on a sandplain (**Figure 6-102**). The artefacts include two flakes and flaked piece (**Table 6-31**). The site extent is 102 x 90 m defined by the area of erosion scalding where the artefacts are located. The site extent has an area of 6,668 m^2. The GSE at the time of recording was high (70%) with a GSV of 80% within the exposure area. Soils consist of a light red/brown sand over compacted light brown clay-sand. Surrounding vegetation at the site comprises shrubs including saltbush. Identified disturbances include erosion and grazing.

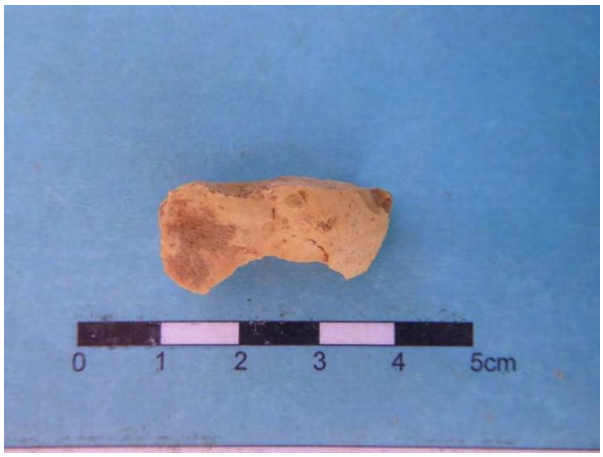
Potential for the presence of further subsurface archaeological deposits at Copi OS-24 is assessed as negligible as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-102: Copi OS-24. View of site and recorded artefacts.

1. View northeast across Copi OS-24.

2. Copi OS-24 artefact: a quartzite flake.

3. Copi OS-24 artefact: a quartzite flaked piece.



4. Copi OS-24 artefact: a chert flake.

Table 6-31: Copi OS-24. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Flaked piece	Quartzite	Complete	Tertiary	22 x 15 x 10
Flake	Chert	Longitudinal break	Tertiary	30 x 12 x 10
Flake	Quartzite	Complete	Tertiary	20 x 24 x 6

Copi OS-25

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 535170E 6279050N

Location of Site: Copi OS-25 is in the southwestern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-91**). The site is located 7.6 km directly east of Nulla Road and 5.1 km southwest of the Warwick homestead. The site is 180 m southwest of Copi OS-23 and 175 m east of Copi OS-24.

Description of Site: Copi OS-25 is an artefact scatter consisting of eight artefacts, manufactured from chert, quartzite or quartz. All artefacts are either flakes or cores (**Table 6-32**). The extent of the site is 117 x 40 m and is situated on a flat sandy plain (**Figure 6-103**). Soils at the site are light red/brown sand over compacted light brown clay-silt and vegetation consists of scattered bushes, including salt bush. Identified disturbances include grazing. There is a dirt track 40 m north of the site extent. The GSE at the time of recording was high (70%) with a GSV of 60% inside exposures.

Copi OS-25 is not considered to be associated with subsurface archaeological deposits as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-103: Copi OS-25. View of site and a selection of recorded artefacts.

1. View south across Copi OS-25.

2. Copi OS-25 artefact: a chert flake.

3. Copi OS-25 artefact: a quartzite flake.

4. Copi OS-25 artefact: a quartz flake.

Table 6-32: Copi OS-25. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Core	Quartz	-	Tertiary	20 x 20 x 10	Multidirectional, 5 flake scars, <5% cortex, reduced.
Flake	Quartzite	Medial break	Tertiary	12 x 15 x 3	
Flake	Chert	Proximal fragment	Tertiary	15 x 12 x 3	
Flake	Quartzite	Proximal fragment	Tertiary	20 x 15 x 5	
Flake	Chert	Complete	Tertiary	20 x 15 x 5	
Flake	Chert	Complete	Tertiary	7 x 15 x 3	
Flake	Quartzite	Complete	Tertiary	13 x 11 x 1	
Core	Chert	Complete	Secondary	30 x 20 x 15	Multidirectional, 5 flake scars, 50% cortex, reduced.

Copi OS-26

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 535059E 6279426N

Location of Site: Copi OS-26 is in the central portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-39**). The site is 7.4 km directly east of Nulla Road and 5 km southwest of the Warwick homestead. The site is 90 m west of a dirt track running northwest–southeast.

Description of Site: Copi OS-26 is an artefact scatter consisting of two artefacts, both quartzite flakes (**Table 6-33**). The extent of the site is defined by the area of exposure where both artefacts are located on a flat sandy plain (**Figure 6-104**). The site extent measures 8 x 8 m. The soil at the site consists of light red/brown sand over a compacted light grey/brown clay-silt. Surrounding vegetation was minimal and comprised of dry and / or dead bushes. The GSE at the site was high (90%) with a GSV of 80% within the site extent. Identified disturbances include grazing.

Copi OS-26 is not considered to be associated with subsurface archaeological deposits as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-104: Copi OS-26. View of site and recorded artefacts.

1. View south to the location of Copi OS-26.

2. Copi OS-26 artefacts: quartzite flakes.

Table 6-33: Copi OS-26. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Flake	Quartzite	Proximal fragment	Tertiary	10 x 10 x 3
Flake	Quartzite	Complete	Tertiary	30 x 40 x 10

Copi OS-27

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 535206E 6279561N

Location of Site: Copi OS-27 is in the central portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-39**). The site is 7.6 km directly east of Nulla Road and 4.8 km southwest of the Warwick homestead. The site is 100 m east of a dirt track running northwest – southeast.

Description of Site: Copi OS-27 is an artefact scatter consisting of five artefacts: four manufactured from quartz and one chert (**Table 6-34**). The site extent is 23 x 18 m and the site is located on a flat sandy plain (**Figure 6-105**). Soils consist of red/brown sand overlaying red/brown dry clay-silt. Vegetation at the site comprises dry and / or dead bushes. The GSE at the time of recording was high (80%) with a GSV of 70%. Identified disturbances include erosion and grazing.

Copi OS-27 is not considered to be associated with subsurface archaeological deposits as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-105: Copi OS-27. View of site and a selection of recorded artefacts.

1. View north to the location of Copi OS-27.

2. Copi OS-27 artefact: a quartz flake.

3. Copi OS-27: quartzite core and chert shatter.

Table 6-34: Copi OS-27. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Flake	Quartz	Complete	Secondary	20 x 20 x 10	
Flake	Quartz	Complete	Secondary	20 x 15 x 10	
Core	Quartzite	-	Secondary	30 x 25 x 20	Multidirectional, 4 flake scars, 20% cortex, reduced.
Shatter	Chert	-	Secondary	12 x 5 x 5	
Shatter	Quartz	-	Secondary	15 x 5 x 5	

Copi OS-28

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 535170E 6277392N

Location of Site: Copi OS-28 is in the southwestern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-48**). The site is located 6.9 km directly east of Nulla Road and 6.7 km southwest of the Warwick homestead.

Description of Site: Copi OS-28 is an artefact consisting of two artefacts: one quartzite core and one quartzite flaked piece (**Table 6-35**). The site is situated on a gentle slope descending towards the west (**Figure 6-106**). The extent of the site 27 x 19 m. The GSE of the site is high (70%) with a GSV of 60% inside the site extent. Surrounding vegetation includes scattered dry and / or dead bushes. Identified disturbances include grazing.

Copi OS-28 is not considered to be associated with subsurface archaeological deposits as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-106: Copi OS-28. View of site and a selection of recorded artefacts.

1. View west to the location of Copi OS-28.

2. Copi OS-28 artefact: a quartzite core.

Table 6-35: Copi OS-28. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Flaked piece	Quartzite	Complete	Tertiary	25 x 20 x 10	6 negative flake scars on dorsal surface
Core	Quartzite	-	Tertiary	30 x 25 x 20	Multidirectional, 8 flake scars, <5% cortex, reduced.

Copi OS-29

Site Type: Artefact scatter; PAD

GPS Coordinates: Site centroid - GDA Zone 54 536416E 6276759N

Location of Site: Copi OS-29 is in the central/southern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-58**). The site is located 7.7 km directly east of Nulla Road and 7 km south of the Warwick homestead. Copi OS-29 is 420 m northeast of Copi IF-41.

Description of Site: Copi OS-29 is an artefact scatter consisting of four artefacts located on a sand plain (**Figure 6-107**). Details of the artefacts are provided in **Table 6-36**. The site extent is 260 x 120 m and defined by a series of exposures and a decrease in the number of dry / dead bushes present in the area. Surrounding vegetation includes a stand of mulga trees approximately 30 m south of the site extent, and dry / dead bushes, including salt bush. The GSE at the time of recording was high (70%) overall, with a GSE of 80% within exposures. Soils consist of red/light brown sand and medium brown loamy sand. Identified disturbances include grazing.

Copi OS-29 has potential for subsurface archaeological deposits although much of the A-Horizon has eroded. The area of PAD excludes the erosion scald at the centre of the site.

Figure 6-107: Copi OS-29. View of site and a selection of recorded artefacts.

1. View southeast across Copi OS-29.

2. Copi OS-29 artefact: a quartzite core.

3. Copi OS-29 artefact: a chert flake.

4. Copi OS-29 artefact: a quartzite flake.

Table 6-36: Copi OS-29. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Flake	Chert	Complete	Tertiary	23 x 18 x 8	Retouch on margin. Steep and unidirectional.
Flake	Quartzite	Longitundinal break	Tertiary	20 x 12 x 4	
Hammerstone		Proximal fragment	Primary	50 x 60 x 55	Possible hammerstone.
Core	Quartzite	Complete	Tertiary	20 x 20 x 15	Multidirectional, 5 flake scars, 10% cortex, reduced/globular.

Copi OS-30

Site Type: Artefact scatter

GPS Coordinates: Site centroid - GDA Zone 54 538359E 6276402N

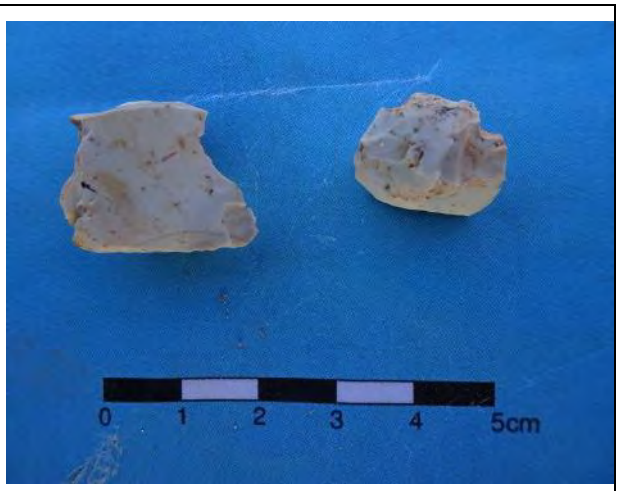
Location of Site: Copi OS-30 is in the central/southern portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-62**). The site is located 9.3 km directly east of Nulla Road and 7.1 km south of the Warwick homestead.

Description of Site: Copi OS-30 is an artefact scatter consisting of four chert flakes, two of which have retouch on the margins (**Table 6-37**). The site is located on a sand plain (**Figure 6-108**). The site extent is 250 x 85 m and encompasses the area along the southwest edge of a salt pan adjacent to the site extent. Surrounding vegetation includes dry / dead bushes, including saltbush, and a two discrete stands of mulga trees located 70 m south and 130 m southwest of the site extent, respectively. The GSE at the time of recording was high (80%) with a GSV of 70% in the site extent. Identified disturbances include grazing.

Copi OS-30 is not considered to be associated with subsurface archaeological deposits as the artefacts are likely to be within a secondary context due to erosion.

Figure 6-108: Copi OS-30. View of site and a selection of recorded artefacts.

1. View northwest across Copi OS-30.



2. Copi OS-30 artefacts: chert flakes.

Table 6-37: Copi OS-30. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Flake	Chert	Complete	Tertiary	15 x 8 x 5	Retouch on margin. Semi-steep, bifacial.
Flake	Chert	Medial break	Secondary	15 x 22 x 8	
Flake	Chert	Complete	Secondary	18 x 20 x 10	Retouch on margin. Semi steep and unifacial.
Flake	Chert	Proximal fragment	Primary	10 x 15 x 10	

Copi OS-31

Site Type: Artefact scatter; PAD

GPS Coordinates: Site centroid - GDA Zone 54 532794E 6282105N

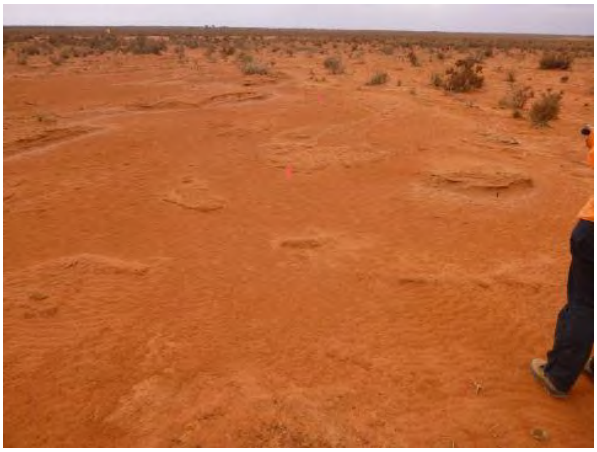
Location of Site: Copi OS-31 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 6-67**). The site is located 3.8 km directly east of Nulla Road and 3.8 km southeast of the Warwick homestead.

Description of Site: Copi OS-31 is an artefact scatter consisting of 14 artefacts located on a flat sandplain to the north of the footslope and south of a drainage line (**Figure 6-109**). Most artefacts are quartzite flakes (**Table 6-38**). The site extent is 47 x 26 m and defined by the area of erosion in which the artefacts were visible. The GSE at the time of recording was high (90%) with a GSV of 90% within the large area of exposure. Soils consist of orange/red sand. Surrounding vegetation at the site comprises sparse shrubs including saltbush. Identified disturbances include the construction of a small contour bank, erosion, and grazing.

Copi OS-31 has potential for subsurface archaeological deposits although much of the A-Horizon has eroded.

Figure 6-109: Copi OS-31. View of site and a selection of recorded artefacts.

1. View north to the location of Copi OS-31



2. Details of erosion scald where Copi OS-31 artefacts were identified.

3. Copi OS-31 artefacts: quartzite flakes.

4. Copi OS-31 artefact: a quartzite flake.

Table 6-38: Copi OS-31. Artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm	Additional detail
Flake	Chert	Distal fragment	Tertiary	20 x 22 x 8	
Flaked piece	Quartzite	-	Tertiary	20 x 18 x 15	
Flake	Silcrete	Distal fragment	Secondary	13 x 12 x 5	
Flake	Quartzite	Longitudinal break	Tertiary	12 x 11 x 6	
Flake	Quartzite	Complete	Secondary	70 x 50 x 15	Possible retouch on margin
Flake	Chert	Complete	Secondary	20 x 12 x 10	
Flake	Quartzite	Distal fragment	Tertiary	15 x 15 x 10	
Flake	Quartzite	Distal fragment	Tertiary	20 x 10 x 5	
Flake	Quartzite	Proximal fragment	Tertiary	15 x 10 x 10	
Flake	Quartzite	Distal fragment	Secondary	22 x 24 x 8	
Flake	Quartzite	Complete	Secondary	22 x 20 x 5	
Flake	Silcrete	Complete	Tertiary	20 x 15 x 8	
Flake	Quartzite	Distal fragment	Tertiary	12 x 18	
Flake	Silcrete	Complete	Tertiary	20 x 11 x 5	

Copi OS-32

Site Type: PAD

GPS Coordinates: Site centroid - GDA Zone 54 527299E 6283831N

Location of Site: Copi OS-32 is located the north-eastern portion of Lot 1940 DP763972 on the Huntingfield property (**Figure 6-110**). The site is 1.8 km directly west of Nulla Road and 4 km north of the Huntingfield homestead.

Description of Site: Copi OS-32 is a PAD located on a lunette bordering the western salt pan. (**Figure 6-111**). The site extent is 590 x 210 m and defined by the edge of the salt pan in the west and the base of the slope in the east. Soils consist of orange/red sand and pockets of gypsum, particularly of the western face of the lunette. Surrounding vegetation at the site comprises open woodland and spinifex in the east. The GSE at the time of recording was high (80%) with a GSV of 60%, however, no surface artefacts were identified. within the large area of exposure. Identified disturbances grazing and rabbit burrows.

Figure 6-110: Location of Copi OS-32.

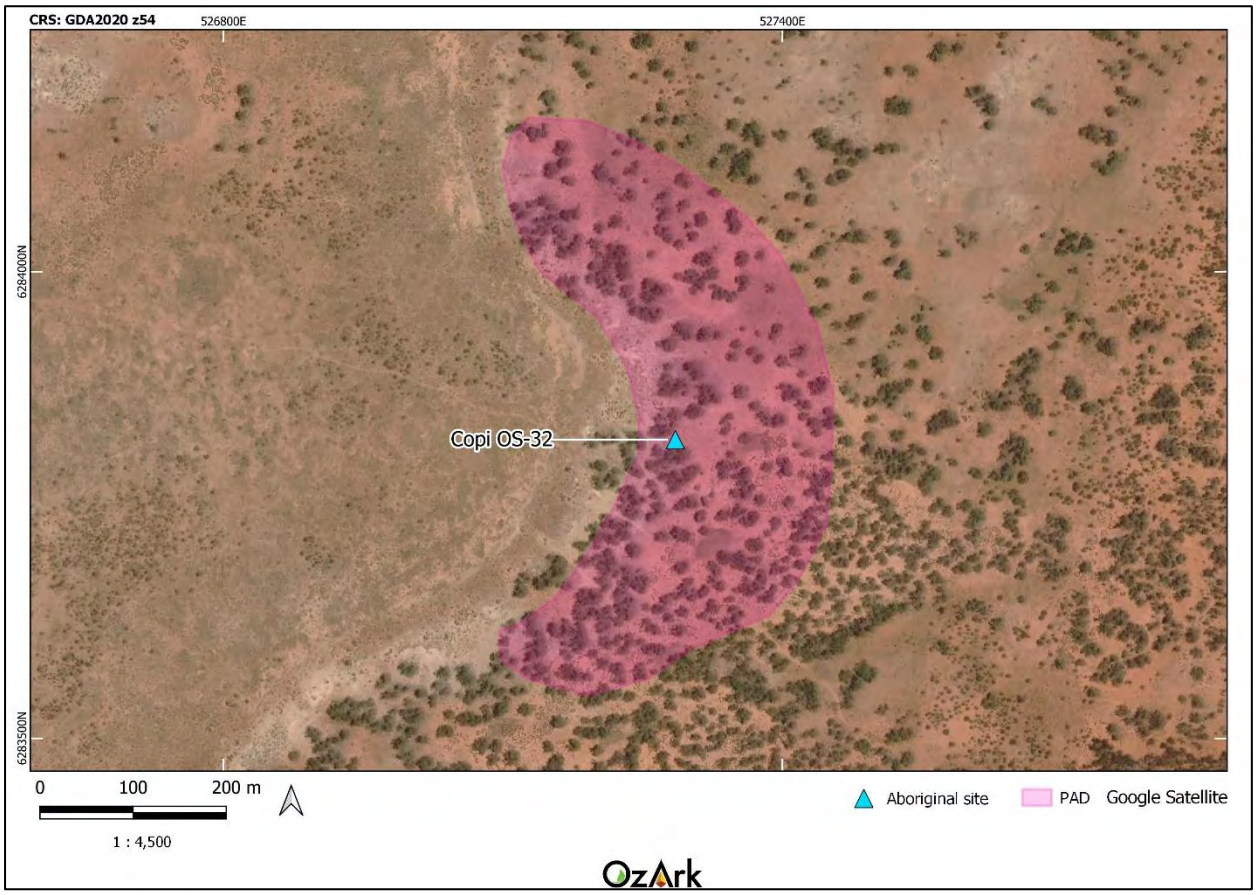


Figure 6-111: Copi OS-32. View of site.

	
1. View north along the border of the lunette and the western salt pan.	2. View northeast across a crest in the north of Copi OS-32.

6.5 DISCUSSION OF SURVEY RESULTS

This section reviews the results of the Phase 1 survey and places the results in the context of previous research that has taken place in the area.

6.5.1 Summary of Phase 1 survey results

The Phase 1 survey recorded 81 sites (**Section 6.4**) including:

- 49 isolated finds
- 21 artefact scatters
- Six artefact scatters with PAD
- One artefact scatter and hearth
- Two artefact scatters with hearths and PAD
- One artefact scatter and scarred tree with PAD
- One PAD.

6.5.2 Veracity of the predictive model

The review of the landscape and archaeological contexts of the Phase 1 assessment area enabled a predictive model for site location to be made (**Section 5.4**). The main elements of the predictive model are presented below, with each element followed by the observations based on the survey of the Phase 1 assessment area:

- Sites would be most commonly located on the Lake Footslopes and Lunettes and Islands as they border ephemeral water sources (the salt pans)
    - Most sites were recorded on the Lake Footslopes and Lunettes and Islands landforms during the survey.

- The most common site type would be stone artefact sites; either low density artefact scatters or isolated finds
    - Artefact sites are the most commonly recorded site type within the Phase 1 assessment area (n=80). Most artefacts sites are low density due to their distance from reliable water sources. Recorded artefacts were largely manufactured from silcrete, quartz, chert, and quartzite as predicted, while a low number of chalcedony artefacts were also identified.
- Artefact scatters have increased likelihood of being associated with hearths and/or middens
    - All recorded hearths (n=11) were identified in association with stone artefact sites. Most hearths (n=10) were located across the Lake Footslopes landform, as predicted, although one hearth was identified in the Sandplains and Dunes survey unit. All hearths were lagging on pedestals as predicted by Witter (2004)
- Artefact sites would likely be in a secondary context due to soil loss and deflation across the Phase 1 assessment area
    - Most sites are situated within erosion scalds across the landscape and therefore artefacts would likely be located within secondary contexts
- Culturally modified trees would be extremely rare due to the distance to semi- or permanent water sources and a lack of suitable vegetation
    - One scarred tree was identified in association with an artefact scatter (Copi OS-1) on an island within the western salt pan. The recording of this site type did not conform to the predictive modelling as these site types are not commonly identified in areas distant to semi- or permanent water (Craib 1992, Witter 2004)
- Quarries would not likely be present, but if identified would be located on outcrops and consist of silcrete
    - No middens or quarries were identified across the Phase 1 assessment area.
- Burials would likely not be present within the Phase 1 assessment area as it lacks typical source-bordering dunes and lunettes.
    - No particular landforms were identified as having high likelihood of containing burials.

6.5.3 Research questions

In the assessment methodology, several research questions were posed for the survey. These will be answered below.

- What resources were available to the Aboriginal people using the Phase 1 assessment area (food, stone, and water)?
    - No specific resources were noted during the assessment. No quarry sites were recorded, and no specific food resource locations were noted. In addition, freshwater within the Phase 1 assessment area would have been limited due to the presence of only highly saline groundwater basins.

- It is interesting to note that the results of the Phase 1 survey showed a distinct clustering of surface artefacts around the eastern salt pan when compared to the western salt pan (**Figure 6-4**). The greatest density of artefacts and hearths were identified within the Lake Footslopes landform to the north of the eastern salt pan, followed by the Lunettes and Islands to the east of the eastern salt pan, and further afield across the Sandplains and Dunes in the east. While very few artefacts were identified surrounding the western salt pan. It is likely some feature attracted occupation to the eastern salt pan, i.e. possible freshwater soaks as opposed to the saline features at the western salt pan.
- RAPs noted that the gypsum present across the Phase 1 assessment area may have been collected and used in antiquity as a source of paint for ceremonies and/or art.

- What tasks were Aboriginal people undertaking at the sites?
  - The presence of hearths indicates cooking within the Phase 1 assessment area. Other than the hearths, the additional sites recorded do not have sufficient distinguishing features to provide clues about what was happening at these sites beyond standard tool manufacture and/or curation.
- Are there hearths in the area? And if so, do they contain remains (animal/plant) that may indicate what people were cooking/eating?
  - Yes, 11 hearths were recorded across the Phase 1 assessment area including nine at Copi OS-12, and one each at Copi OS-6 and Copi OS-20. The hearths are located near or on the edges of erosion scalds and consist of charcoal and burnt clay nodules. No animal and/or plant remains were identified in association with the hearths, however, depending on their intactness subsurface excavation may provide answers regarding what people were cooking/eating.
- Are there burials in the area?
  - No burials were identified within the Phase 1 assessment area. However, identification of burials is highly difficult as they are subsurface or associated with features such as earth mounds. As such, identification of burials generally relies on the presence of favoured landforms. As noted by Martin (1985), Bonhomme (1990) and Witter (2004), burials in the lower Darling and Murray region are most likely in the source bordering dunes and lunettes around the lakes and river systems and have a lower likelihood in the dunes of the sandplains and dunes. While lunettes are present within the Phase 1 assessment area they do not represent typical lunettes. In addition, they are adjacent to highly saline groundwater basins and therefore would likely not have attracted people on a regular basis, thereby reducing the likelihood of burials.
- Is there evidence to suggest that Aboriginal people were using the area earlier than the mid to late Holocene?
  - No. Based on the artefact types identified during the survey, all indications are that the Phase 1 assessment area was occupied during the mid to late Holocene. The presence of scrapers, backed artefacts, and generally finer stone tools all indicate that the recorded sites date to the past 5,000 years. It is noted, however, that investigations by Niche (2019) have identified early Holocene and

Pleistocene deposits at Pine Creek and Lake Popiltah, respectively, within aeolian landform at deep depths (up to 2 m deep) and therefore it is more likely that evidence of early Holocene and Pleistocene occupation will be subsurface. However, this occupation was found within a source-bordering dune and a lunette associated with semi-permanent water sources, which are not present within the Phase 1 assessment area.

- A small number of artefacts identified were highly weathered (**Figure 6-112**) and therefore looked to be very old in comparison to the majority of artefacts identified, however, it is considered more likely that they are weathered due to the abrasive nature of the landscape given the prevalence of sand.

Figure 6-112: Example of a highly weathered artefact.

<table>
<tr>
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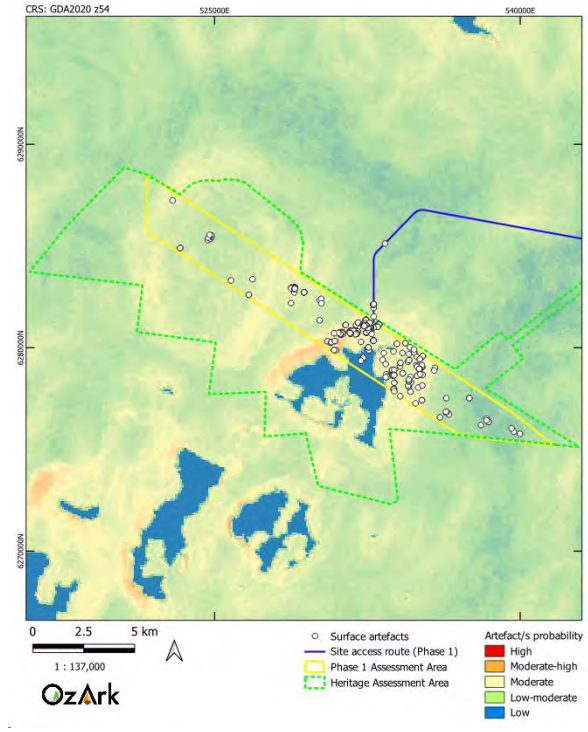
<tr>
<td>1. Copi OS-13 artefact: a quartzite flake (dorsal surface).</td>
<td>2. Copi OS-13 artefact: a quartzite flake (ventral surface).</td>
</tr>
</table>

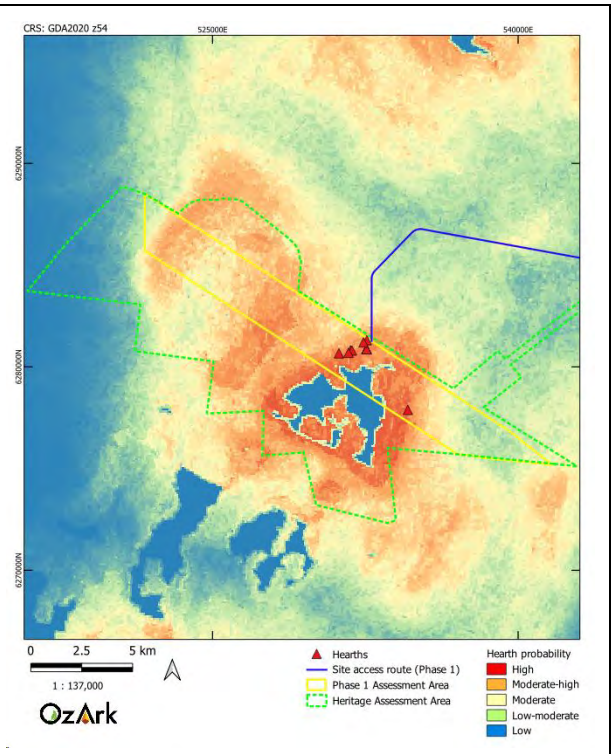
- Can dates be obtained for the Aboriginal use of the area?
  - Yes. 11 hearths were identified across the Heritage Assessment Area. These features have potential to provide dates for Aboriginal occupation of the area. However, as found by Witter (2004) and Fanning et al. (2007), many hearths in semi-arid NSW do not contain enough charcoal for dating purposes as they have been too disturbed by processes of bioturbation, erosion and/or the effects of grazing animals. In addition, Niche (2019) found through their salvage excavations that several recorded hearths were determined to be remnants of natural, burnt termite mounds and/or attributed to land clearance practices.
- What resources were transported to the area and where?
  - No raw material suitable for stone tool manufacture is outcropping within the Phase 1 assessment area. As such, all artefactual stone material present within the Phase 1 assessment area has been transported from the surrounding landscape. Materials recorded within the Phase 1 assessment area included quartzite, silcrete, quartz, chert, chalcedony, and sandstone.
- Do the survey results correlate with the ASDST likelihood maps shown in **Appendix 3**?

- In **Section 5.4.4.1** the ASDST models were used to develop a predictive model for site location. When the recorded site types are plotted against these models, the accuracy of the models can be demonstrated. An examination of **Figure 6-113** allows the following observations to be made:
    - The ASDST model predicting the likelihood of an area recording an artefact site is accurate, particularly in the eastern portion of the Phase 1 assessment area when the sites recorded during the assessment are plotted against the model. Artefact numbers were the greatest around the eastern salt pan, particularly also the western margin
    - The ASDST model predicting the likelihood of an area recording a hearth was generally accurate. All hearths were recorded in the areas of moderate-high potential around the eastern salt pan however none were identified in areas with increased likelihood around the western salt pan
    - The ASDST model predicting the likelihood of an area recording a scarred tree was accurate. While a scarred tree was identified in an area with low potential, the remainder of the Phase 1 assessment area also had low potential and only one scarred tree was identified.

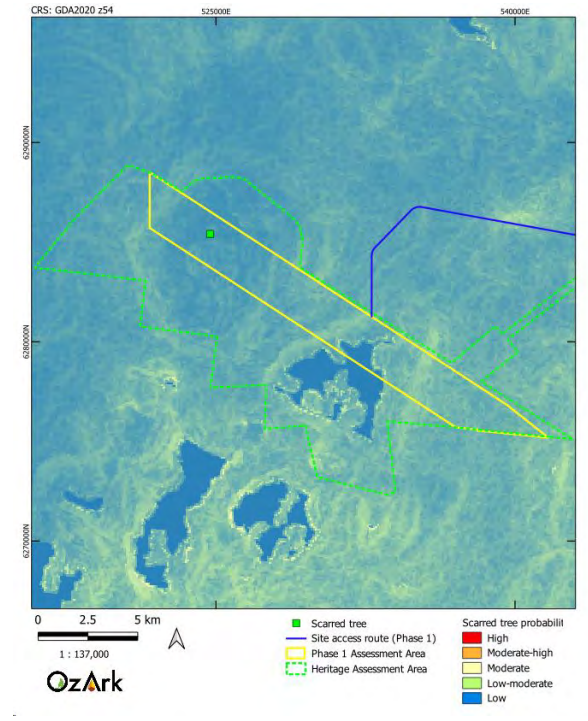
Figure 6-113: Recorded sites in relation to ASDST models.



1. Recorded stone artefacts and the ASDST model of artefact site probability.



2. Recorded hearths and the ASDST model of hearth probability.



3. Recorded scarred tree and the ASDST model of scarred tree probability.

7 PHASE 1 - TEST EXCAVATION PROGRAM

This section documents the results of the of the test excavation within the Phase 1 assessment area. The Phase 1 test excavation was completed over seven days from 12 to 18 May 2020 (see **Section 1.2**).

7.1 BACKGROUND TO THE TEST EXCAVATION PROGRAM

The test excavation program followed an extensive program of surface survey completed across the Phase 1 assessment area. The initial Aboriginal heritage surface survey was undertaken by two teams on 25 February to 4 March 2020 with each team consisting of two archaeologists and two RAPs. The assessment consisted of sampling all landforms in the Phase 1 assessment area while concentrating more intensively on landforms with greater archaeological potential.

The initial survey identified ten areas where test excavation could provide a clearer picture of the subsurface archaeological potential across the Phase 1 assessment area. These areas, and the reasons why they were selected are outlined in **Table 7-1**.

Following the identification of the ten proposed test excavation areas, the proponent refined their Limit of Disturbance. **Table 7-2** outlines the status of the ten initially proposed areas based on the amended Limit of Disturbance.

The location of these ten areas are shown on **Figure 7-1** and **Figure 7-2** shows the proposed test excavation areas overlaid on the Associated Soils map (Hulme 2020).

Table 7-1: Proposed areas for test excavation.

Area	Landform	Associated Soils	Reason for test excavation
Area 1	Isolated, elevated crest above the groundwater discharge basin/ relict lake? (the western salt pan).	Lunette and Islands	Lunettes are considered to be a landform with increased archaeological sensitivity. One of the few areas where artefacts were identified in the west of the Phase 1 assessment area.
Area 2	Broad, elevated plain with gentle undulations to the west of the western salt pan.	Lunette and Islands	A broad, undifferentiated landform where no surface artefacts were identified, however, as it has been mapped as a lunette (Hulme 2020), a landform considered to have archaeological potential, subsurface deposits have an increased likelihood of being present and excavation will provide insight into the formation process and nature of the landform.
Area 3	Gentle slope rising to the west adjacent to gypsum flats.	Dunes and Sandplains	Several surface artefacts were visible during the survey along an area of water wash. Area in the west where the highest concentration of artefacts was identified. Testing would confirm whether the artefacts are present on a deflated surface.
Areas 4 and 5	Long, gentle slope to the north of the eastern salt pan.	Lake Footslopes	Appeared to have high archaeological potential during the survey. The greatest density of artefacts was identified along this landform as were several hearths in areas subject to water and wind erosion. Testing will confirm whether the artefacts are present on a deflated surface or if there are associated subsurface deposits.

Area	Landform	Associated Soils	Reason for test excavation
Area 6	Sandy rise bordering a small depression to the north, in the vicinity of the eastern salt pan.	Lake Footslopes	A discrete location of silcrete artefacts eroding from the edge of the landform. Appears to be a knapping floor.
Area 7	Slightly elevated landform along the western and northern sides of a depression.	Dunes and Sandplains	Chosen to test the nature of deposits on the dunes and sand plains. Archaeological potential of this particular area is increased as it is adjacent to a depression which may have held water seasonally and surface artefacts have been identified.
Area 8	Slightly elevated landform adjacent to an erosion scald with artefacts.	Salt Pans and Dunes and Sand Plains	Chosen as artefacts were identified on the surface and it is at the transition of two Soil Associations.
Area 9	Gentle, undulating sandplain.	Dunes and Sandplains	Chosen to gain further insight into the archaeological potential of landforms distant from the former groundwater basin/relict lake? (eastern salt pan)
Area 10	Flat, elevated plain above the long, gentle slope north of the eastern salt pan.	Dunes and Sandplains	A concentration of artefacts was identified along the proposed access track. Chosen to gain further insight into the flat, undifferentiated plain which transitions into the long, gentle slope where the greatest concentration of artefacts was identified.

Table 7-2: Revised status of proposed test excavation areas.

Area	Status following updated Limit of Disturbance	Summary of revised test excavation program at this location
Area 1	Located west of Nulla Road and therefore in an area of lower priority. Excluded from the main test excavation program. However, a limited number of TUs are proposed to be excavated in this landform should time permit to determine the nature of the landform which is mapped as a lunette and to inform future design of the Phase 1 assessment area.	Limited investigation (1 m^2)
Area 2	Located west of Nulla Road and in an area of lower priority. Excluded from the main test excavation program. However, a limited number of TUs are proposed to be excavated, should time permit, in this landform that has been mapped as a lunette in Hulme 2020 to determine the nature of the landform and to inform future design of the Phase 1 assessment area.	Limited investigation (1 m^2)
Area 3[6]	Located west of Nulla Road and therefore in an area of lower priority. Excluded from the test excavation program.	Excluded
Area 4	Located within the amended Limit of Disturbance therefore will be investigated during the test excavation program.	Included
Area 5	Located within the amended Limit of Disturbance therefore will be investigated during the test excavation program.	Included
Area 6	Located within the amended Limit of Disturbance therefore will be investigated during the test excavation program.	Included
Area 7	Located within the amended Limit of Disturbance therefore will be investigated during the test excavation program.	Included
Area 8	Located within the amended Limit of Disturbance therefore will be investigated during the test excavation program.	Included
Area 9	Will not be impacted by the proposed work, therefore the area is now excluded from the test excavation program.	Excluded
Area 10	Located on the access road to the north of the Heritage Assessment Area therefore will be investigated during the test excavation program.	Included

[6] Area 3 was subject to test excavation in 2022 – see **Section 9**.

Figure 7-1: Location of the initially proposed test excavation areas.

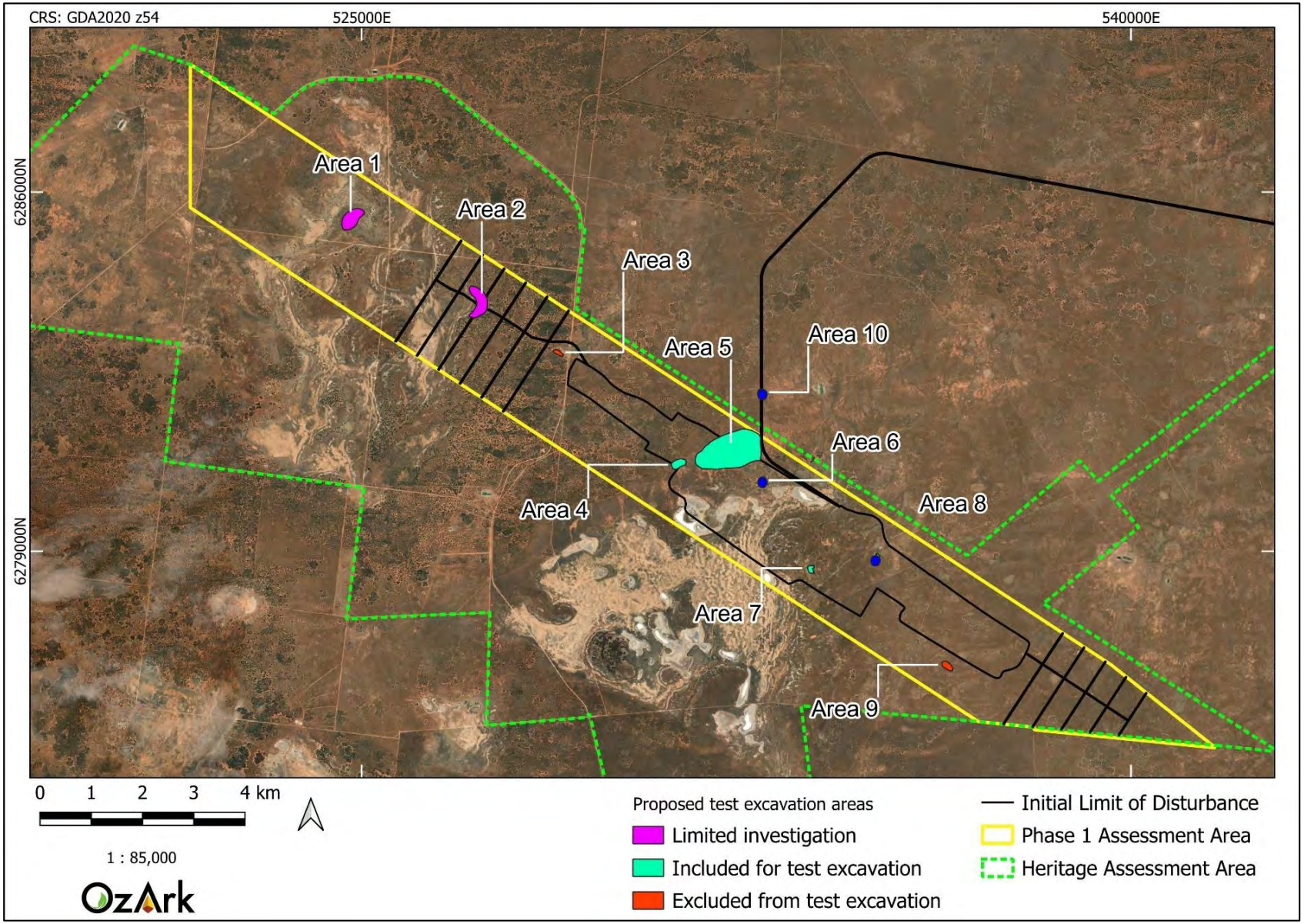
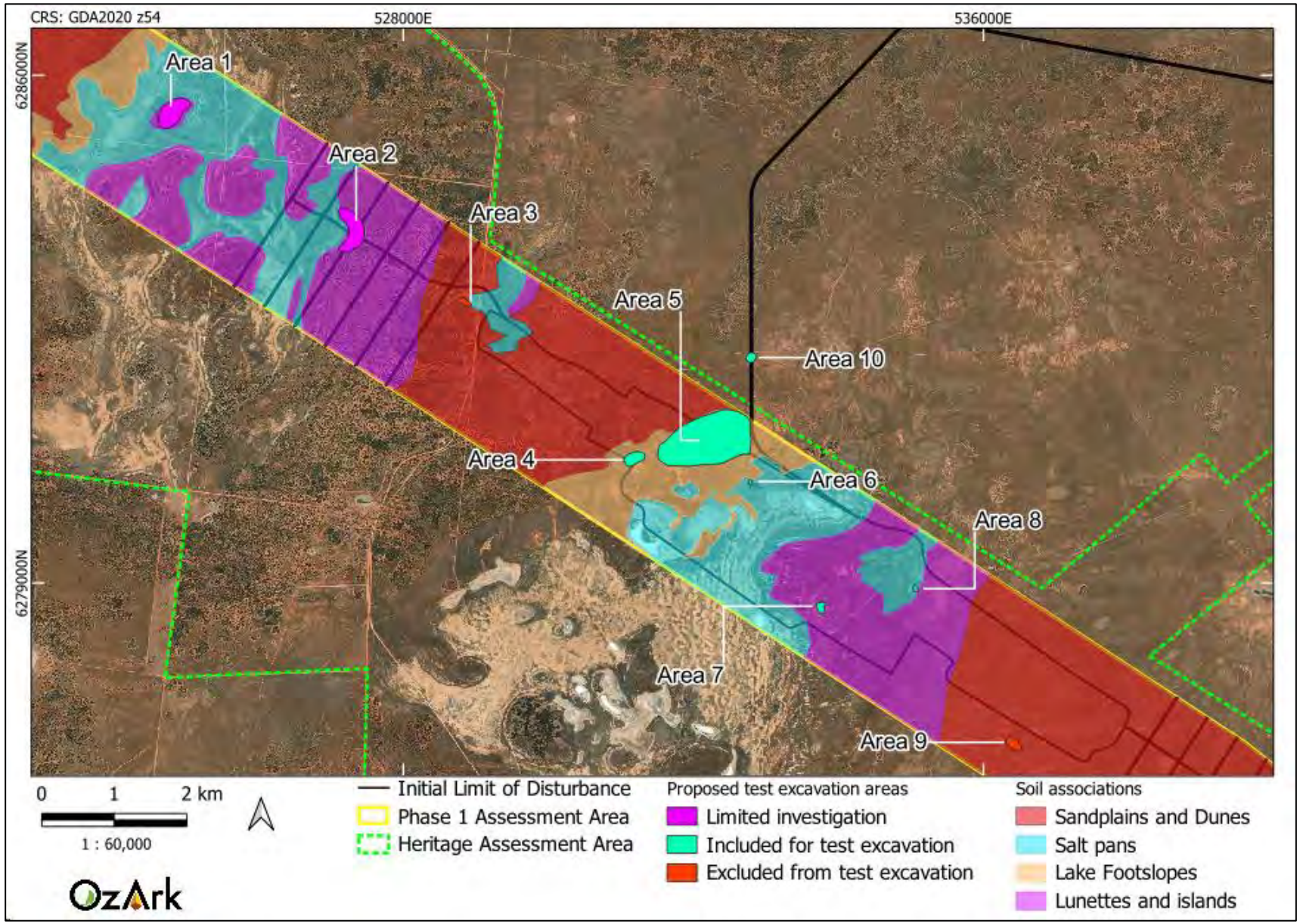


Figure 7-2: Initial proposed test excavation areas overlaid with the soil associations.



7.2 EXCAVATION METHODOLOGY

7.2.1 Purpose of the test excavation program

The purpose of the test excavation program is to understand more completely the nature of the subsurface material within the Phase 1 assessment area.

The aims are therefore to:

1. Establish the extent and nature the of subsurface archaeological deposits at a site or landform with archaeological potential
2. Use the data gained from the test excavation program to better evaluate the archaeological significance and potential of the Phase 1 assessment area
3. Develop, in consultation with the RAPs and the Applicant, an informed strategy for the management of impacts to any Aboriginal cultural heritage likely to be harmed by the Project.

As a result, locations initially considered for the test excavation program are limited to:

- Areas identified during the pedestrian survey as having archaeological potential
- Landforms which are relatively intact (i.e. not within disturbed contexts).

Excavations undertaken as per the Code do not require an AHIP under the NPW Act.

7.2.2 Rationale of the test excavation program

The test excavation methodology is provided as **Appendix 5**. This document sets out the predictive model used to design the test exaction program.

While any test excavation program is limited in the level of research objectives it can achieve due to the restricted nature of the excavations, the test excavations for the Project attempted to shed light on:

- How does the artefactual material and stratigraphy identified at the site compare to other archaeological excavations undertaken in the local area and the region?
- Is the observed surface manifestations and correlation to the mapped Soil Associations borne out by the subsurface investigations?
- Are intact archaeological features, such as hearths and/or middens, present in the site area?
- Can chronological dates be obtained (i.e. from *in situ* charcoal samples) that will aid our understanding of Aboriginal occupation in the region?

7.3 SAMPLING METHODOLOGY FOR THE TEST EXCAVATION PROGRAM

For further details on the methodology of the test excavation program, see **Appendix 5**.

Table 7-3 summarises the methodology planned at each excavation area including the minimum number of TUs. Often, as is detailed in **Section 7.5.2**, more TUs were excavated at each area during the test excavation program.

Table 7-3: Sampling methodology for the Phase 1 text excavation program.

Area	Test excavation methodology
Area 1	Up to four 0.5 x 0.5 m TUs will be excavated. Depending on the depth of A-Horizon soils, these will be excavated in a 1 x 1 m area or along a transect with four individual TUs.
Area 2	Up to four 0.5 x 0.5 m TUs will be excavated. Depending on the depth of A-Horizon soils, these will be excavated in a 1 x 1 m area or along a transect with four individual TUs.
Area 4	2 x 90 m transects (20 0.5 x 0.5 m TUs) will be excavated so the entire PAD area is investigated.
Area 5	3 x 90 m transects (30 0.5 x 0.5 m TUs) will be excavated so the entire PAD area is investigated.
Area 6	1 x 40 m transect (five 0.5 x 0.5 m TUs) will be excavated on a north-south alignment to the north of the concentration of artefacts.
Area 7	2 x 40 m transects (10 TUs total) will be excavated so the entire PAD area is investigated.
Area 8	2 x 40 m transects (10 TUs total) will be excavated so the entire PAD area is investigated.
Area 10	1 x 40 m transects (five 0.5 x 0.5 m TUs) will be excavated so the entire PAD area is investigated, should the existing access track alignment be utilised.

7.4 THE ARTEFACT CATALOGUE

7.4.1 Analysis terminology

The artefact catalogue of the excavation assemblage forms the basis of the presentation and discussion of test excavation results that follow.

Preliminary examination of the assemblage prior to cataloguing noted that it was not a complex assemblage with almost all artefacts being unmodified flakes. As a result, a tailored analysis was carried out on the assemblage that allowed the site's characteristics to be captured. The flake attributes that were analysed for the assemblage are shown in **Table 7-4**.

Table 7-4. Terminology used in the artefact catalogue.

Catalogue entry	Description of catalogue entry
Area	Denotes which of the eight excavation areas is being referred to (see Figures 6–1 and 6–2).
Transect	(Tr) Denotes which transect within an area is being referred to.
Test Unit	(TU) Denotes which square within a transect is being referred to.
Spit	All spits were 5cm. Therefore Spit 1 is 0cm to 5cm. If no spit is recorded it is because, due to the paucity of results, the entire pit was excavated in one spit.
Artefact type	Describes the type of artefact recorded. At this excavation, primarily flakes or less commonly blades, cores or scarpers etc. The following abbreviations are used: F = Flake; B = Blade; FP = Flaked Piece; BF = Backed Flake; BB = Backed Blade; M = Microlith; ES = End scraper; SS = Side scraper; A = Ground edge axe; AB = Axe blank; C = Core; S = Shatter; AH = Anvil/hammerstone; O = Other
Raw Material	Silcrete, mudstone, quartz and volcanics were recorded in the Survey Area. The following abbreviations are used: MS = Mudstone; S = Silcrete; C = Chert; T = Tuff; B = Basalt; V = Volcanics (other); PW = Petrified Wood; QZ = Quartzite; Q = Quartz; O = Other
Integrity	Records whether an artefact is complete or broken, and if broken, what type of break has occurred (i.e. whether the break is to the top (proximal) end of a flake, to the bottom (distal) end or medial if both proximal and distal ends are missing. Rarely longitudinal breaks (i.e. broken down the flake's axis) were recorded.

Catalogue entry	Description of catalogue entry
Max. dimension	Most often this measurement is along the plane of percussion. In some instances, such as when a flake is inordinately wide, measurement along the largest plane is taken. Size ranges are provided where: 1 = 0–10 mm; 2 = 10–20 mm; 3 = 20–30 mm; 4 = 30–50 mm; 5 = 50–100 mm; 6 = greater than 100 mm.
Reduction phase	The percentage of cortex in comparison to the full artefact was catalogued according to the following scale. Primary reduction (1): 50% or more cortex; Secondary reduction (2): 1% to 50% cortex; Tertiary reduction (3): no cortex.
Rotation	A parallel rotation (p) is one where the dorsal scars are in the same direction as the flake's plane of percussion. A rotated flake (r) is one where the dorsal flake scars are at a varying angle to the flake's plane of percussion. Not discernible (n) refers to flakes with cortical dorsal surfaces where rotation cannot be determined or on often small flakes that only retain one previous flake scar on the ventral surface.
Platform type	Records the proximal characteristics of a flake. Terms used to describe platforms are 'simple' (s) for what would commonly be regarded as a standard platform showing no faceting; 'point' (p) for very small platforms; 'Cortex' © for platforms containing cortex; 'Crushed' (cr) for platforms displaying crushing/shattering to the platform; and "Flaked (f) for platforms displaying platform preparation in the form of several flake removals from the platform surface.
Platform size	When intact on an artefact the platform size was described through the following abbreviations: 1 = Point; 2 = Very small (up to c. 3 mm); 3 = Small (up to c. 5 mm); 4 = Moderate (up to c. 10 mm); 5 = Large (over c. 10 mm)
Termination type	Records the distal characteristics of a flake. At this excavation 'Feather' (f) terminations were common where a flake terminates in a smooth, triangular cross-section. Also present were 'Step/Hinge' (sh) terminations and rarely 'Plunge' (p) terminations.
Notes	Any additional comments are provided here.

A discussion on why these attributes were analysed follows.

Artefact type

Description: Possible artefact types include flakes, blades, retouched flakes/blades, cores, scrapers, shatter/fragments and other (hammerstones, grindstones, ground-edge axes) although not all may be present at any one site.

Issues: Classing artefacts, generally, does not usually entail significant problems. A minority of artefacts are difficult to define such as ambiguities between recognising flaked pieces (flakes subsequently used as a core to source further flakes), and between cores and scrapers.

Uses: This category will be used to assess differences in provisioning strategies (e.g. core provisioning as opposed to flake provisioning), differences in site function/use (e.g. presence/absence of grindstones), and the taphonomic effects of past land use on the site (are more broken artefacts part of the assemblage?).

Raw Material

Description: A largely self-explanatory attribute, raw materials expected to be present include silcrete, chert, quartzite and quartz.

Uses: Raw material is an important attribute, which may broadly indicate the place of origin of an artefact. The dominance of one raw material or another may also be used to group or differentiate sites. Raw material is also frequently used in concert with attributes in the creation of analytic units for more in-depth inter and intra site comparisons.

Artefact Breakage

Description: At a basic level, flakes break in three different ways. Two are transverse (at 90 degrees to the direction of percussion) – proximal and distal; one is longitudinal (along the plane of percussion).

Issues: It is occasionally difficult to be certain of the breakage on an artefact. In most cases, however, the kind of breakage can be ascertained.

Use: It is important to differentiate broken from complete flakes for the purposes of analysis, as the two are not comparable regarding several measures. The amount of artefact breakage in an assemblage also indicates the degree of fragmentation to which the assemblage has been subject. In highly fragmented assemblages, the actual number of artefacts represented may be significantly exaggerated. Quantifying breakage allows a more accurate approximation of artefact numbers to be made.

Dimensions[7]

Description: Percussive dimensions measure the maximum length of the flake in the direction of force application from the point that force was applied. In this regard it relates to the length of core face that was removed during the manufacture of the artefact.

Issues: There is some uncertainty as to what these attributes are measuring in terms of the flake manufacturing process.

Use: Flake dimensions are expected to correlate with differences in the provisioning and reduction strategies at different places. For example, the reduction of cores at a site will produce many moderate to small flakes and some larger flakes. As a result, a histogram of flake length will show a relatively consistent increase in number of flakes from large to small. Contrastingly, when most flakes are the result of retouching or maintenance tasks on other flakes, most of the flakes remaining should be very small, with comparably few large to moderate flakes. However, it may be the case that a few moderate to large flakes will be discarded at the site as they are exhausted through excessive/heavy retouch or simply thrown away prior to a reprovisioning event. In such a case, a histogram of artefact size should show bimodality regarding length (a small peak in the moderate range and a large peak in the small range).

Reduction

[7] From experience OzArk does not routinely weigh artefacts as this information has been found to closely correlate either to artefact size or the raw material from which the flake has been struck. Thus, smaller artefacts are lighter than larger artefacts when made from the same material and artefacts made from denser stone (such as volcanics) are heavier than comparably sized artefacts from lighter (less-dense) stones such as mudstone. In practice, the category cataloguing the maximum size of the artefact is analogous with the artefact's weight.

Description: This category refers to the level of reduction evident on an artefact. This is assessed by the amount of cortex remaining on the artefact. Cortex refers to the 'skin' of a rock: the surface that has been weathered to a different texture and colour by exposure to the elements over a long period. The amount of cortex as a percentage of surface area will be measured on all artefacts (in relation to flakes, cortex can only occur on the dorsal and platform surfaces). The nature of cortex—its shape and texture—will vary depending on where the raw material was sourced. This measurement will help determine if an artefact is at a primary, secondary or tertiary level of reduction.

Issues: This is a relatively unambiguous descriptive category.

Use: When a natural cobble is first selected it will usually be covered in cortex. Therefore, the first artefacts produced from it will have a complete coverage of cortex on the dorsal side (primary reduction). As the cobble is increasingly reduced the amount of cortex on each artefact will rapidly decrease (secondary reduction) until it ceases to be present on artefacts (tertiary reduction). Because of this trend, it should be possible to determine how early in the reduction sequence the artefact was produced. If large numbers of artefacts or a high proportion of the artefacts of a raw material retain cortex it may indicate that the site is near the source. Differences between the proportions of artefacts retaining cortex between different raw material indicates relative differences in distance to source. This does not necessarily mean distance in terms of measurable distance across the landscape; it may also reflect length of time since leaving the source. For example, the last campsite when a group is returning to the source of the raw material may be very close to the source in terms of distance, but distant in terms of time elapsed since the group left the source. If artefacts with cortex are occurring in sites a long distance from the place of origin of the natural cobble, then it is likely that cobbles were being transferred to the site when still only slightly reduced. This would imply an attempt to maximise the amount of stone being provisioned with the weight of transported material being a relatively minor concern.

Rotation

Description: Describes whether a flake was struck from a core that was rarely rotated (a unidirectional or bidirectional core), or from a core that has been rotated frequently (a multidirectional core).

Issues: There is little ambiguity in assessing this category. If the orientation of previous flakes was unclear, this category is left blank.

Use: An examination of the direction in which previous flake scars on an artefact's dorsal surface have been removed, along with the orientation in which the flake itself was removed from its core, will give evidence about the core from which the flake was struck. This enables a greater sample pool to determine the types of cores used in the Heritage Assessment Area even if the original core may not have been recorded in the investigation.

Platform Surface

Description: Platform surface will be recorded as one of the following: simple, point, cortical, crushed or flaked.

Issues: This is a largely unambiguous descriptive attribute.

Use: The surface of a platform provides information about the history of the core prior to the detachment of the flake, and about methods employed to control the flaking process. 'Point' platforms often imply the use of an intermediary punch (or in-direct percussion) to remove a flake; while 'simple' platforms are often indicative of free-hand percussion. Crushing on the platform surface can imply a bipolar reduction technique where the core is first rested on an anvil prior to the flake being detached. Platforms displaying flaking have been linked to the systematic production of 'blades'. Patterns in the spatial distribution of these attributes may be used to infer differences in reduction strategies.

Platform Size

Description: Platform size will be recorded as fulfilling one of a series of size ranges.

Issues: This is a largely unambiguous descriptive attribute.

Use: Like the platform surface, platform size is illustrative in determining the type of reduction technique used to detach a flake. The smaller (finer) the platform size implies a greater likelihood that it was detached by in-direct percussion rather than direct percussion which often results in a larger platform size.

Termination

Description: Termination refers to the way in which force leaves a core during the detachment of a flake. Every complete flake has a termination. There are patterns in the forms that terminations will take, with the three major categories (those to be used here) being feather, hinge/step and plunging (outrepasse).

Issues: This is a largely unambiguous descriptive attribute although care needs to be taken to distinguish terminations on a previous flake scar from hinge/step terminations or breakages.

Use: Different terminations have different implications both for flake and core morphology. A flake with a feather termination (in which force exits the core at a low or gradual angle) will have a continuous sharp edge around the periphery beneath the platform. This has advantages in terms of the amount of the flake edge that can be used for cutting and makes the flake more amenable to subsequent retouching or resharpening activities. Detaching flakes with feather terminations also has minimal impact on the effective platform angle of the core, and so platform angle thresholds are reached relatively slowly while feather terminating flakes continue to be produced.

Hinge and step terminating flakes have none of these advantages. They result in edges that are amenable neither to cutting nor to retouching. Furthermore, hinge and step terminations lead to rapidly increasing effective platform angles, leading to a requirement for core rejuvenation and core exhaustion. For these reasons, such terminations are considered undesirable or *aberrant*. The number of aberrant flake terminations is expected to increase towards the end of a core's use-life, as reduction in core size and increase in core platform angle make it increasingly difficult to detach feather terminating flakes. In areas where aberrantly terminating flakes are relatively common it may be inferred that core potential was more thoroughly exploited. From this it may in turn be inferred that the pressure to realize core potential (e.g. a strategy of heavy raw material conservation) was greater. Increased mobility/emphasis on portability is one possible explanation of such a pattern.

Plunging or outrepasse flakes have the opposite effect on core morphology to step and hinge flakes, in that they remove the entire core face and part of the core bottom. As a result, such flakes may be used to rejuvenate cores in which core angles have become high, but which still retain useable potential (e.g. are still quite large). The presence of outrepasse flakes may be taken to indicate core rejuvenation and the requirement to increase core use-life.

7.4.2 Research considerations

Stone artefacts are probably the most resilient physical evidence of Aboriginal occupation in Australia and for many parts of the country form the most abundant archaeological evidence of Aboriginal occupation. Stone artefacts are important because they are tangible evidence of Aboriginal use of an area and can potentially contain information about lithic activities, the organisation of stone technologies, and potentially information about larger-scale issues of settlement organisation across regions and even social change over time.

The kinds of information which can be obtained from stone artefacts may vary considerably, depending in part on:

- The numbers of artefacts which can be examined and recorded: generally, the larger the number of artefacts the more reliable will be statistical statements about them
- The presence of other assemblages with which the artefacts can be compared
- The condition of sites in which they occur: generally undisturbed sites have more information potential than disturbed sites, depending on the scale at which research is carried out
- The theory which underlies the artefact recording and analysis.

7.4.2.1 Statistically useful sample sizes

A large enough number of artefacts need to be recorded so that analyses can be based on statistically sound data (Leonard and Jones 1989). The numbers of artefacts which are needed

in a sample will depend on how common or rare certain kinds of artefacts are. If a summary of most common raw material types is required, then a random sample of 20 or 30 artefacts might suffice. On the other hand, if no backed artefacts were found, and this type normally makes up 1% of an assemblage, then several hundred artefacts would need to be recorded to indicate whether backed artefacts are present on a site or in a certain landscape setting. Ideally, sample sizes should be large enough to be able to carry out statistical tests of significance (Clegg 1990).

7.4.2.2 Condition

As a rule, artefacts from undisturbed sites may be able to provide more information than artefacts from disturbed sites. On sites in good physical condition, it may be possible to identify artefacts relating to individual lithic activities, such as knapping floors (Hiscock & Mitchell 1993). It may be possible to refit or conjoin artefacts and analyse the evidence from those activities (White 1999). On very heavily disturbed sites the artefacts themselves may be very broken, making it harder to analyse them.

7.4.2.3 Theory and recording

Stone artefacts can be recorded and analysed in different ways to give different kinds of information about different topics. The variables that are recorded and the interpretations which are made will depend in part on the theory which underlies the analysis. If someone wants to know what stone tools were used for, then artefacts should be examined under a microscope for use-wear and residues. If someone wants to know how stone was flaked and tools were made, then a technological analysis may record data on stone flaking such as patterns of scarring on cores or flakes. If someone wants to know about how stone materials were obtained (procured), transported and discarded then recording might focus on stone raw materials; information about raw material types and where they occur naturally in the landscape will be critical, and raw material type and size of artefacts may be recorded.

Consulting projects may seek to provide a basic description of an assemblage, recording just a few variables to give information about general topics. The present analysis records provenance information (where each artefact was found) and nine other variables, with some additional information for modified artefacts and cores. This level of recording should not be regarded as a definitive record of the assemblage. If artefacts are kept in a safe place, they can be reanalysed in the future to provide new information and address new questions.

7.5 TEST EXCAVATION RESULTS

7.5.1 Preamble

The results of the test excavation program were very sparse. 110 TUs (0.5 x 0.5 m) were excavated at eight separate localities: a total of 27.5 m^2. From these eight localities, 12 artefacts

were recovered: an average of 0.4 artefacts per square metre. The maximum number of artefacts recorded in one excavation square was two (Area 4 Tr4 Sq2). This density of artefacts is extremely low.

Therefore, in summary, the results show an extremely low incidence of subsurface artefacts across the test excavation areas. Based on these results it would appear that, because of the extensive erosion, intact subsurface deposits are extremely rare within the Phase 1 assessment area and that the visible artefacts are the remnants of sites that have been exposed as a result of extensive erosion.

Due to the low artefact numbers, it is difficult to draw many conclusions from the test excavation assemblage as any one location did not record artefacts in sufficient quantities to allow for any meaningful analysis (see **Section 7.6.2**).

Table 7-5 summarises the location and results from each excavation square (locations of each area are shown in **Figure 7-1**). The artefact count in this table records all artefacts, regardless of size, and regardless of whether they are broken, or pieces catalogued as 'shatter'. As can be seen in this table, 99 TUs (or 90 per cent) recorded no artefacts and a further 10 TUs (or nine per cent) recorded only one artefact. Only one pit recorded two artefacts.

Table 7-5. Summary of results from each excavation square.

Area	Transect	Square	GDA Zone 54 East	GDA Zone 54 North	Artefacts (total)
Area 1	TR1	1	524802	6285468	0
Area 1	TR1	2	524806	6285461	0
Area 1	TR1	3	524808	6285453	0
Area 1	TR1	4	524811	6285443	0
Area 1	TR2	1	524719	6285436	0
Area 1	TR2	2	524719	6285427	0
Area 1	TR2	3	524718	6285416	0
Area 1	TR2	4	524718	6285405	0
Area 1	TR2	5	524718	6285405	0
Area 1	TR2	6	524718	6285436	0
Area 1	TR2	7	524718	6285435	0
Area 2	TR1	1	527305	6283840	1
Area 2	TR1	2	527300	6283831	0
Area 2	TR1	3	527294	6283823	1
Area 2	TR1	4	527289	6283816	0
Area 2	TR2	1	527253	6283999	0
Area 2	TR2	2	527262	6284002	0
Area 2	TR2	3	527272	6284007	0
Area 2	TR2	4	527280	6284010	0
Area 3	TR1	1	528839	6282877	0
Area 3	TR1	2	528828	6282881	0

Area	Transect	Square	GDA Zone 54 East	GDA Zone 54 North	Artefacts (total)
Area 3	TR1	3	528818	6282885	1
Area 3	TR1	4	528810	6282889	0
Area 3	TR1	5	528800	6282893	0
Area 3	TR1	6	528792	6282897	0
Area 3	TR2	1	528842	6282897	0
Area 3	TR2	2	528833	6282900	0
Area 3	TR2	3	528823	6282903	0
Area 3	TR2	4	528815	6282908	0
Area 3	TR2	5	528805	6282910	0
Area 3	TR2	6	528795	6282915	1
Area 4	TR1	1	531170	6280648	0
Area 4	TR1	2	531165	6280642	0
Area 4	TR1	3	531160	6280633	0
Area 4	TR1	4	531154	6280625	0
Area 4	TR1	5	531150	6280616	0
Area 4	TR2	1	531283	6280677	0
Area 4	TR2	2	531292	6280672	1
Area 4	TR2	3	531301	6280667	0
Area 4	TR2	4	531309	6280662	0
Area 4	TR2	5	531317	6280659	0
Area 4	TR3	1	531285	6280777	0
Area 4	TR3	2	531283	6280768	0
Area 4	TR3	3	531282	6280758	0
Area 4	TR3	4	531281	6280747	0
Area 4	TR3	5	531280	6280738	0
Area 4	TR4	1	531211	6280664	0
Area 4	TR4	2	531206	6280655	0
Area 4	TR4	3	531203	6280646	0
Area 4	TR4	4	531199	6280637	2
Area 4	TR4	**5**	531196	6280627	0
Area 5	TR1	1	531713	6280978	0
Area 5	TR1	2	531723	6280980	0
Area 5	TR1	3	531732	6280982	0
Area 5	TR1	4	531742	6280983	0
Area 5	TR1	5	531752	6280983	0
Area 5	TR1	6	531761	6280985	0
Area 5	TR1	7	531772	6280985	0
Area 5	TR1	8	531780	6280986	0
Area 5	TR1	9	531791	6280988	0
Area 5	TR1	10	531799	6280989	0
Area 5	TR2	1	531832	6280814	0
Area 5	TR2	2	531833	6280803	0
Area 5	TR2	3	531834	6280792	0
Area 5	TR2	4	531833	6280782	0

Area	Transect	Square	GDA Zone 54 East	GDA Zone 54 North	Artefacts (total)
Area 5	TR3	1	531760	6280827	0
Area 5	TR3	2	531761	6280818	0
Area 5	TR3	3	531761	6280807	0
Area 5	TR3	4	531761	6280798	0
Area 5	TR4	1	531690	6280697	0
Area 5	TR4	2	531684	6280689	0
Area 5	TR4	3	531679	6280682	0
Area 5	TR4	4	531672	6280673	0
Area 5	TR5	1	531976	6280707	1
Area 5	TR5	2	531973	6280698	1
Area 5	TR5	3	531971	6280688	0
Area 5	TR5	4	531970	6280678	1
Area 5	TR5	5	531968	6280669	0
Area 5	TR5	6	531968	6280674	0
Area 5	TR5	7	531970	6280683	0
Area 5	TR5	8	531975	6280705	1
Area 5	TR6	1	531991	6281060	0
Area 5	TR6	2	531992	6281048	0
Area 5	TR6	3	531996	6281040	0
Area 5	TR6	4	531996	6281031	0
Area 5	TR6	5	531998	6281020	0
Area 6	TR1	1	532783	6280355	0
Area 6	TR1	2	532783	6280346	0
Area 6	TR1	3	532784	6280336	0
Area 6	TR1	4	532784	6280328	0
Area 6	TR1	5	532785	6280317	0
Area 6	TR2	1	532706	6280478	0
Area 6	TR2	2	532715	6280482	0
Area 6	TR2	3	532723	6280486	0
Area 6	TR2	4	532733	6280490	0
Area 6	TR2	5	532739	6280493	0
Area 7	TR1	1	533773	6278660	0
Area 7	TR1	2	533776	6278651	0
Area 7	TR1	3	533777	6278642	0
Area 7	TR1	4	533779	6278631	0
Area 7	TR1	5	533780	6278623	0
Area 7	TR2	1	533711	6278646	1
Area 7	TR2	2	533712	6278636	0
Area 7	TR2	3	533712	6278625	0
Area 7	TR2	4	533713	6278616	0
Area 7	TR2	5	533717	6278606	0
Area 8	TR1	1	535056	6278926	0
Area 8	TR1	2	535061	6278919	1
Area 8	TR1	3	535067	6278912	0

Area	Transect	Square	GDA Zone 54 East	GDA Zone 54 North	Artefacts (total)
Area 8	TR1	4	535073	6278904	0
Area 8	TR1	5	535078	6278895	0
Area 8	TR2	1	535045	6278873	0
Area 8	TR2	2	535056	6278872	0
Area 8	TR2	3	535065	6278871	0
Area 8	TR2	4	535075	6278870	0
Area 8	TR2	5	535084	6278871	0
Area 10	TR1	1	532789	6282137	0
Area 10	TR1	2	532789	6282127	0
Area 10	TR1	3	532790	6282117	0
Area 10	TR1	4	532791	6282092	0
Area 10	TR1	5	532791	6282083	1
Area 10	TR1	6	532792	6282074	0

7.5.2 Description of excavation areas

The following section will describe the landscape features of each excavation area along with an analysis of any landform modification present that may pertain to the excavation results.

7.5.2.1 Area 1

Area 1 is located at Copi OS-1 which stretches for approximately 300 m across an island which has built up within the basin of the western salt pan. This location was chosen primarily for geomorphic testing as it was mapped in the Soil Associations as a 'lunette' (a landform considered to have high archaeological potential). In addition, this was one of the only areas where artefacts were recorded around the western salt pan during the survey, and a scarred tree was also identified. The island provides a prominent look-out point across the surrounding landscape.

Two transects (Tr1–2) were investigated and a total of 11 TUs excavated; four TUs at Tr1 and seven at Tr2.

Tr1 is located across the crest of the island in an area where red sandy soil was predominately present across the visible surface as opposed to gypsum (**Figure 7-3** to **Figure 7-5**). Tr2 is downslope of the crest to the west on a flat bench surrounded open woodland to the north and west. Soils across Tr2 comprised sandy red soil with only limited visible patches of gypsum (**Figure 7-3** to **Figure 7-5**).

Three TUs at Tr2 were expansions of initial squares. Tr2 Sq5 was excavated to the west of Sq1 to reach the sterile B-Horizon; and Tr2 Sq6 and Sq7 were excavated to the north and west of Sq1, respectively, to determine whether a feature (hearth) was present.

Figure 7-3. Location of transects within Area 1.

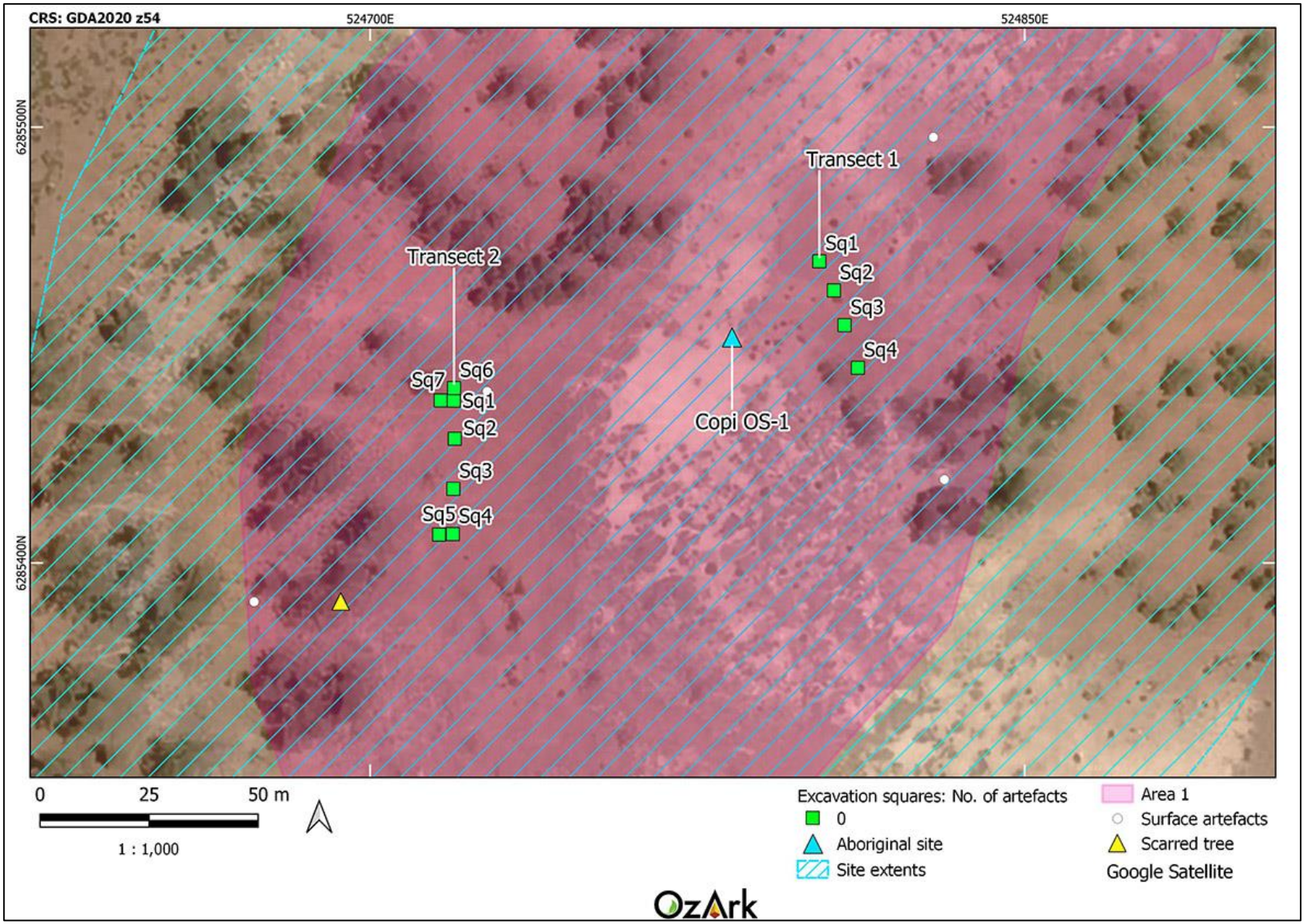


Figure 7-4. Area 1. Close up aerial showing Tr1 and Tr2 location.

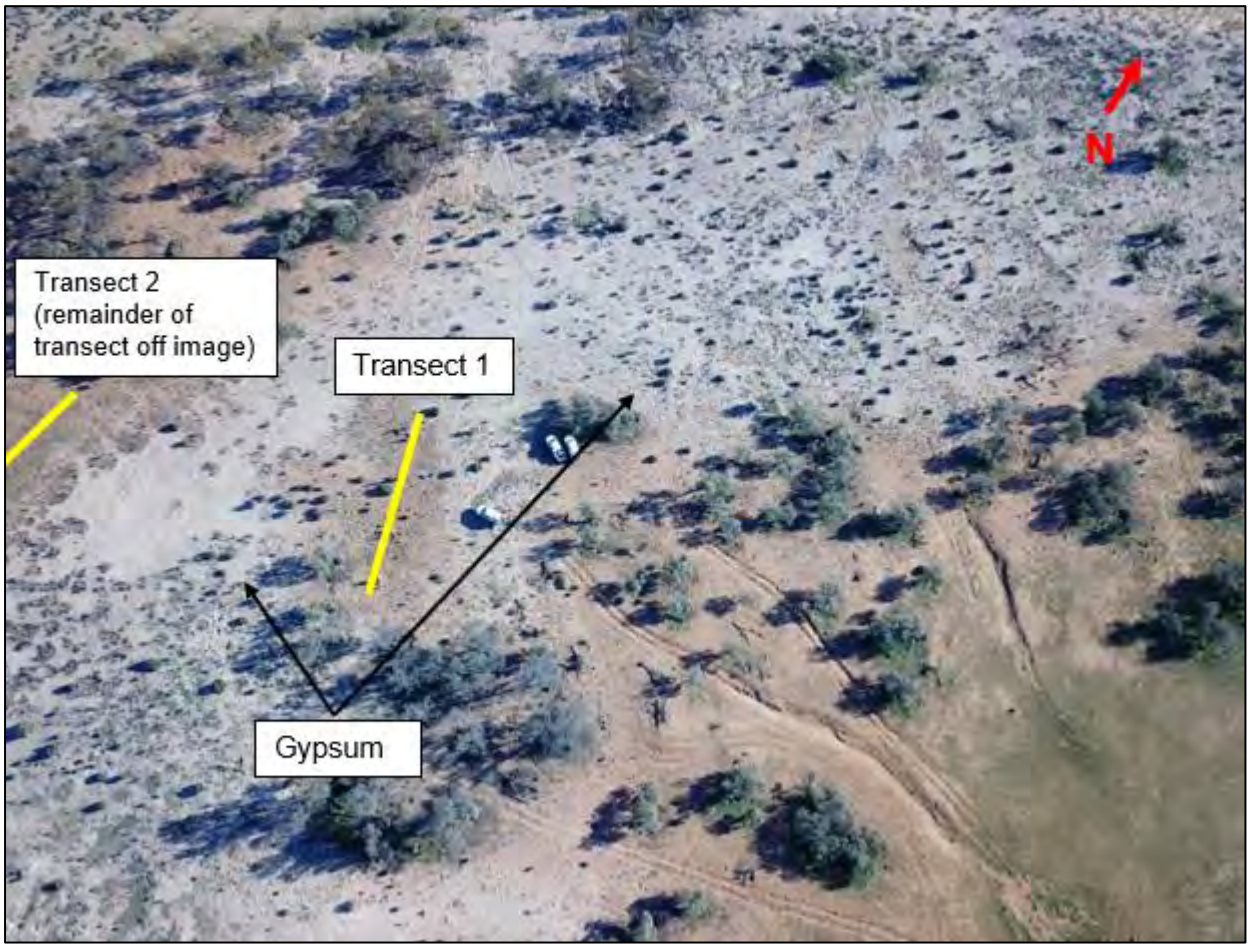
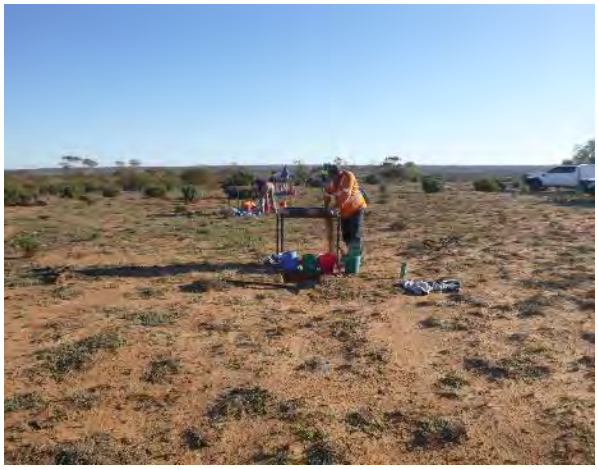


Figure 7-5. Area 1. View of transects.

1. View south to Tr1 on the crest of the island.



2. View north across Tr1 on the crest of the island.

	
3. View northwest to Tr2 to the west of the island on a flat bench.	4. View east to Tr2 showing the crest of the island in the background.

7.5.2.2 Area 2

Area 2 is located at Copi OS-32 which stretches for approximately 590 m across a lunette bordering the western salt pan. This location was chosen primarily for geomorphic testing as it was mapped in the Soil Associations as a 'lunette' (a landform considered to have high archaeological potential). No surface artefacts were identified at this location during the survey however it was considered likely that the lack of surface material may be attributed to the aeolian nature of the landform. The lunette consists of gypsum of the western slope facing the salt pan. The presence of gypsum decreases to the east of the landform from the crest where orange/red sandy soil is present although subsurface patches of gypsum were noted in areas from small burrows (**Figure 7-7**).

Two transects (Tr1–2) were investigated and a total of eight TUs excavated; four squares at each transect, spaced 10 m apart (**Figure 7-6**).

Tr1 is orientated northeast to southwest across the crest of the lunette beyond the transition from gypsum to orange/red sand (**Figure 7-6** to **Figure 7-8**). Tr2 is orientated almost east to west across a flat, broad rise on the lunette, also beyond the transition from gypsum to orange/red sand (**Figure 7-6** to **Figure 7-8**).

Figure 7-6. Location of transects within Area 2.

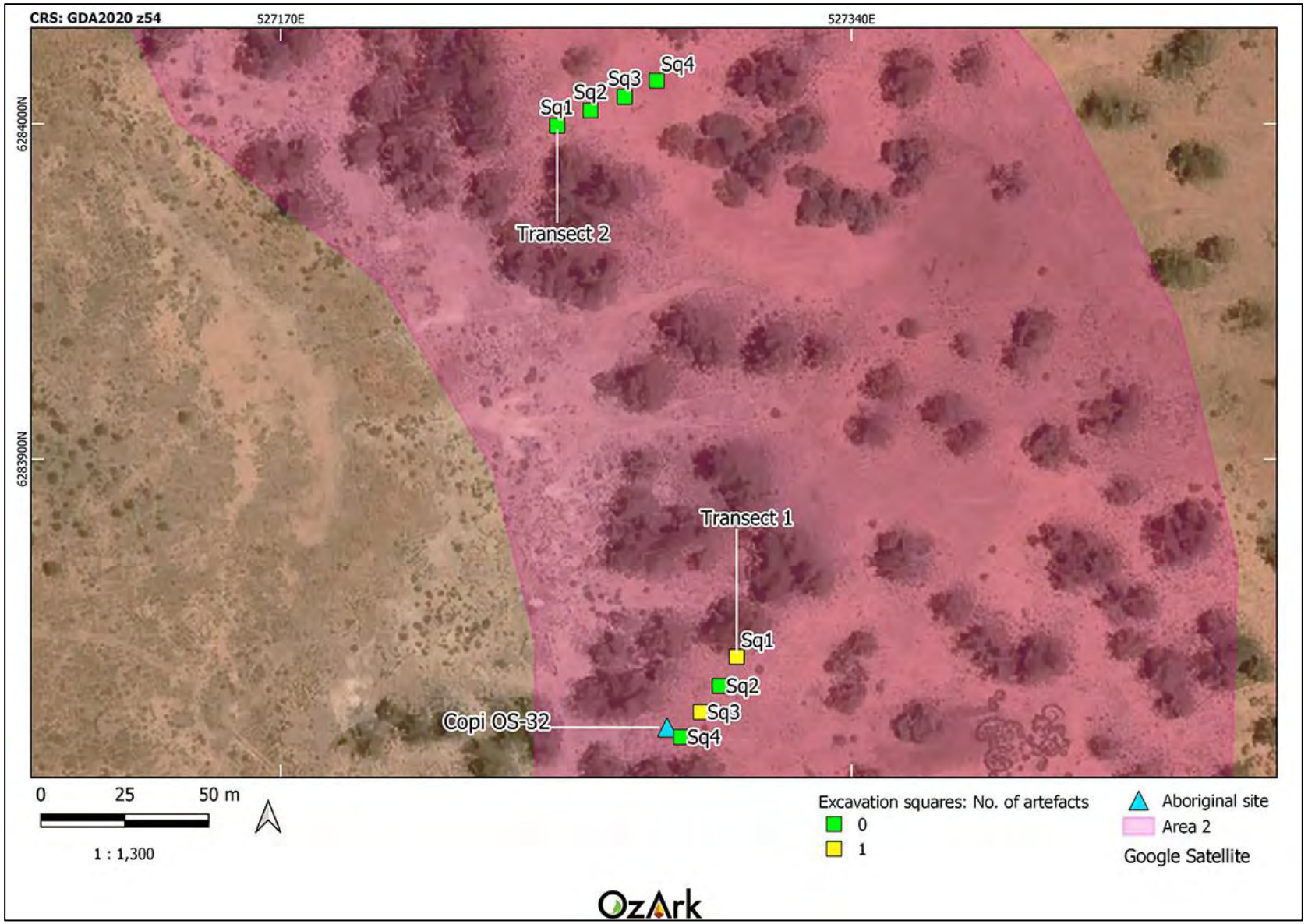


Figure 7-7. Area 2. Close up aerial showing Tr1 in relation to the western salt pan.

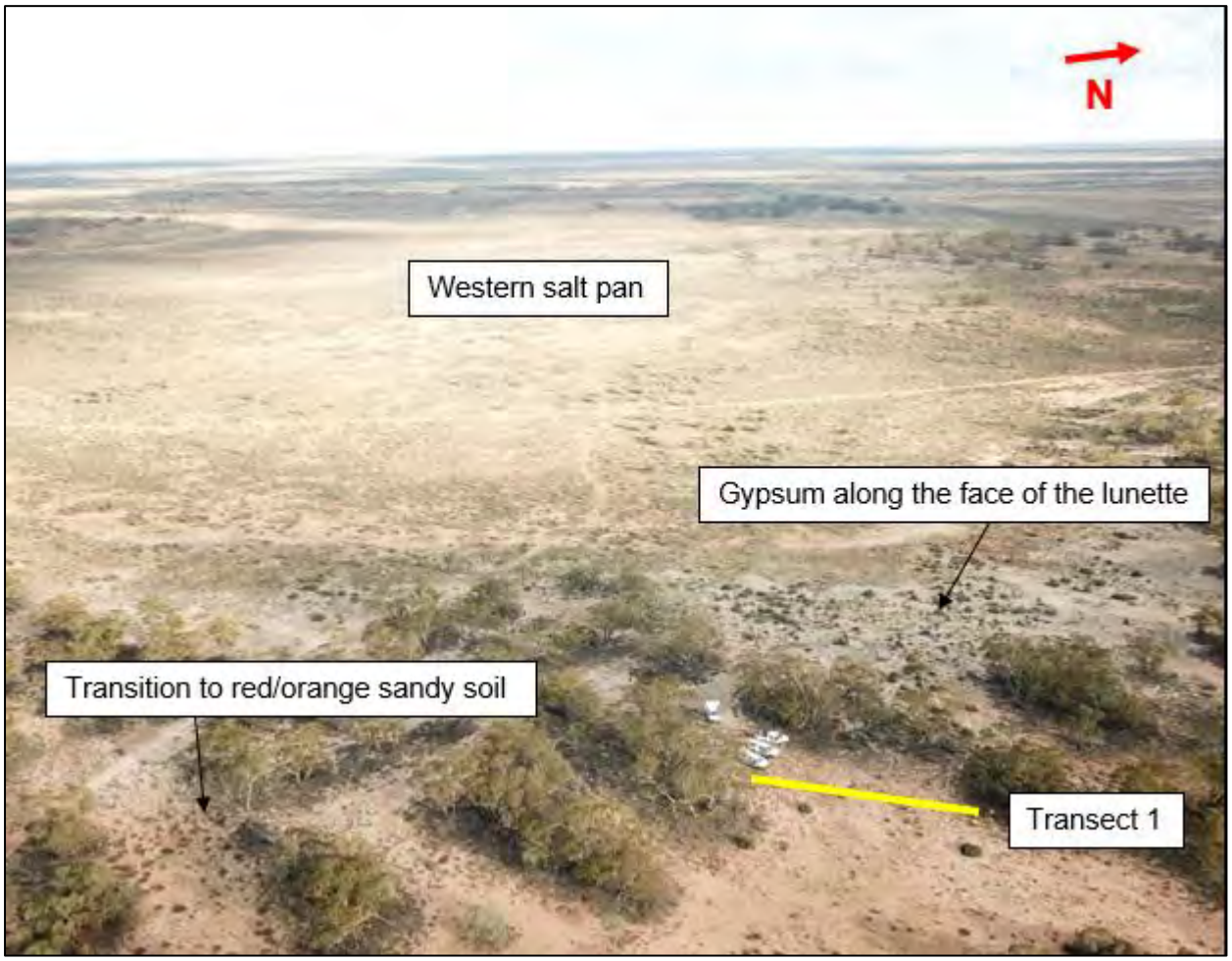


Figure 7-8. Area 2. View of transects.

1. View west to Tr1 on the crest of a lunette bordering the western salt pan.

2. View south to Tr1 on the crest of a lunette bordering the western salt pan.

	
3. View east along Tr2 to the north of Tr1 on the lunette.	4. View west along Tr2 showing the western salt pan in the distance.

7.5.2.3 Area 4

Area 4 is located at Copi OS-6 which stretches for almost 300 m across the Footslopes landform which comprises a long gentle slope receding east towards the eastern salt pan. The highest number of artefacts within the Phase 1 assessment area was identified along this landform. While the Footslopes landform recorded the highest number of artefacts compared to all other landforms, the presence of artefacts across the landform overall is at a low density. Artefacts are present in areas that have been subject to water and wind erosion (**Figure 7-10** and **Figure 7-11**) and therefore testing was completed to determine whether the artefacts are present on a deflated surface or if there is associated subsurface deposits.

Four transects (Tr1–4) were investigated and a total of 20 TUs excavated; five squares at each transect, spaced 10 m apart (**Figure 7-9**).

Tr1 is located along a gentle slope to the east of an erosion scald where a number of surface artefacts were identified (**Figure 7-12**; image 1); Tr 2 is orientated east to west across a broad spur which provides a prominent look-out point to the south across the eastern salt lake (**Figure 7-12**; image 2); Tr 3 is orientated north to south along the slope of the spur (**Figure 7-12**; image 3); and Tr4 is located along a gentle slope to the east of an erosion scald where a hearth was identified and to the west of a scald with surface artefacts (**Figure 7-12**; image 4).

Figure 7-9. Location of transects within Area 4.

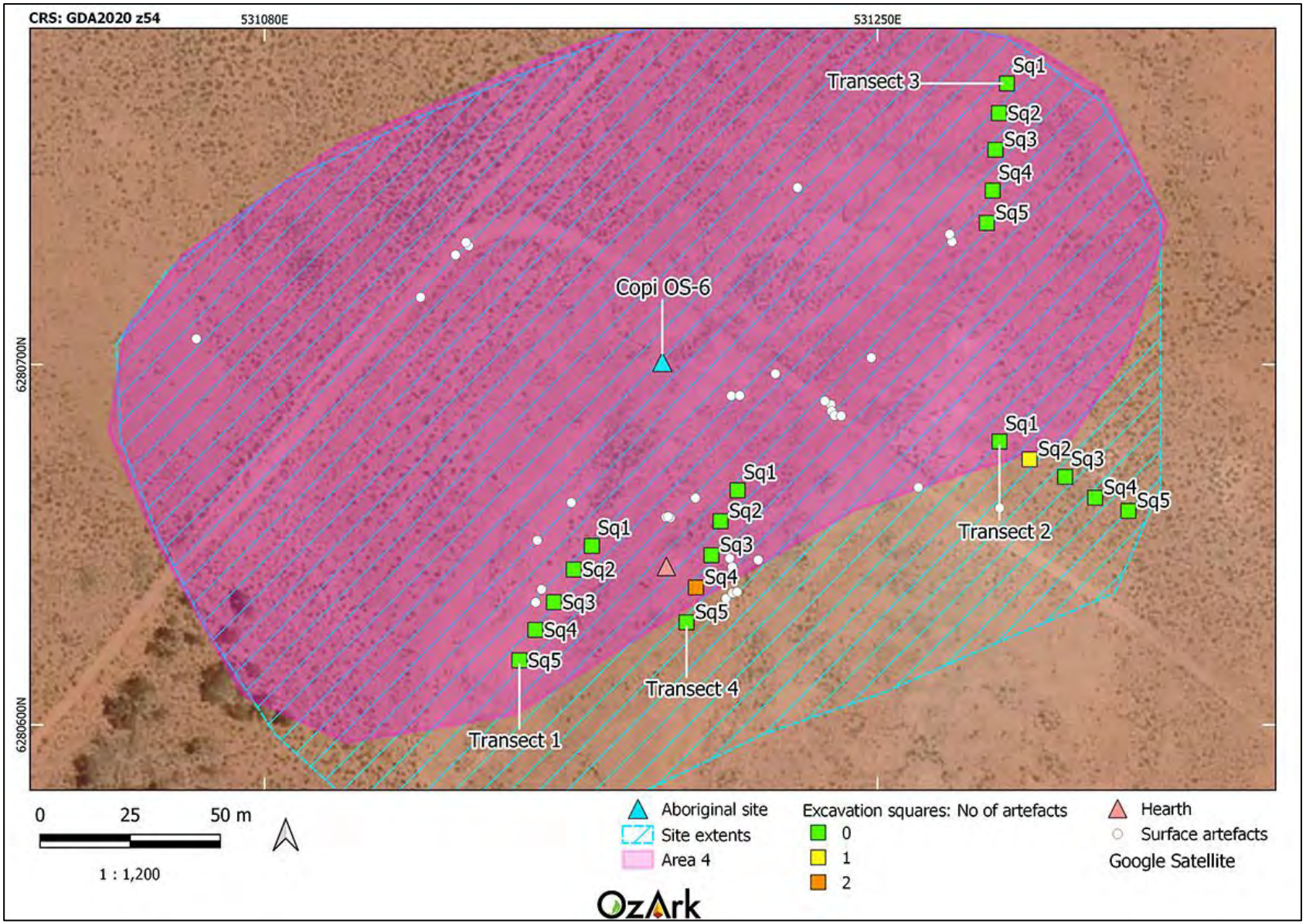


Figure 7-10. Area 4. Close up aerial showing Tr1 and Tr4 between areas which have been subject to high levels of water wash.

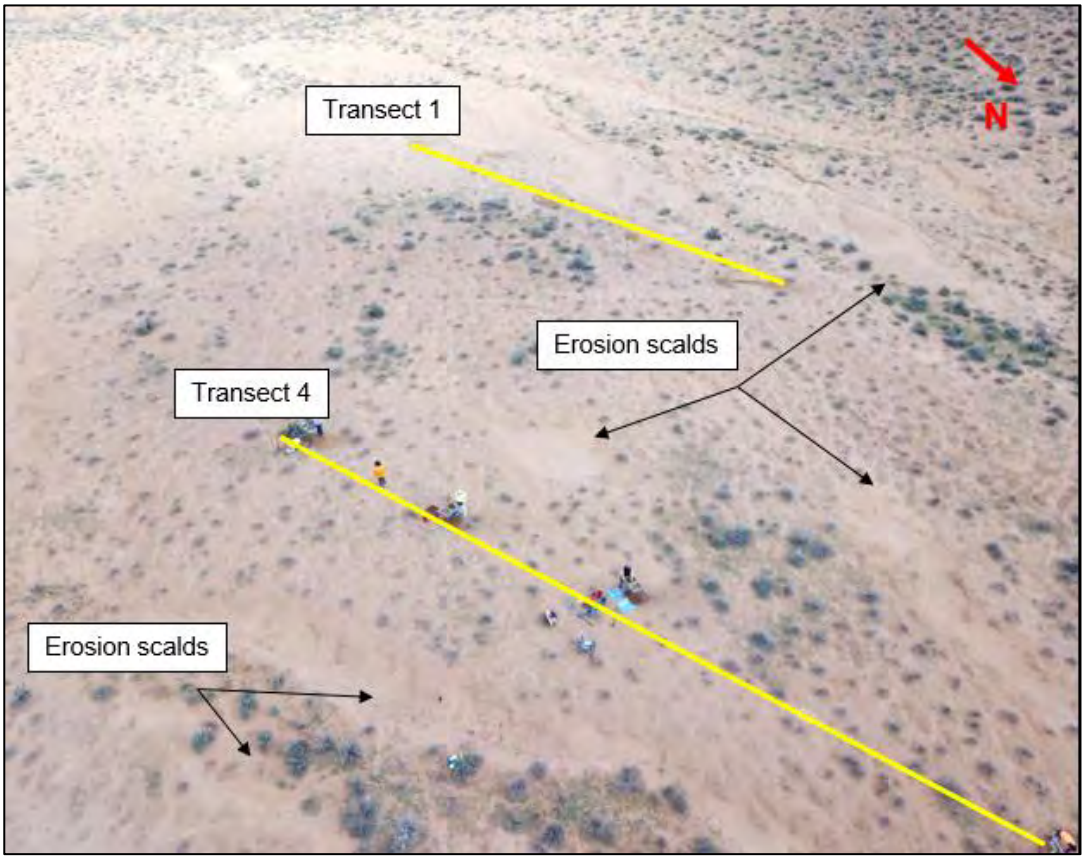


Figure 7-11. Area 4. Close up aerial showing Tr2 and Tr3 along a broad spur in relation to the eastern salt pan.

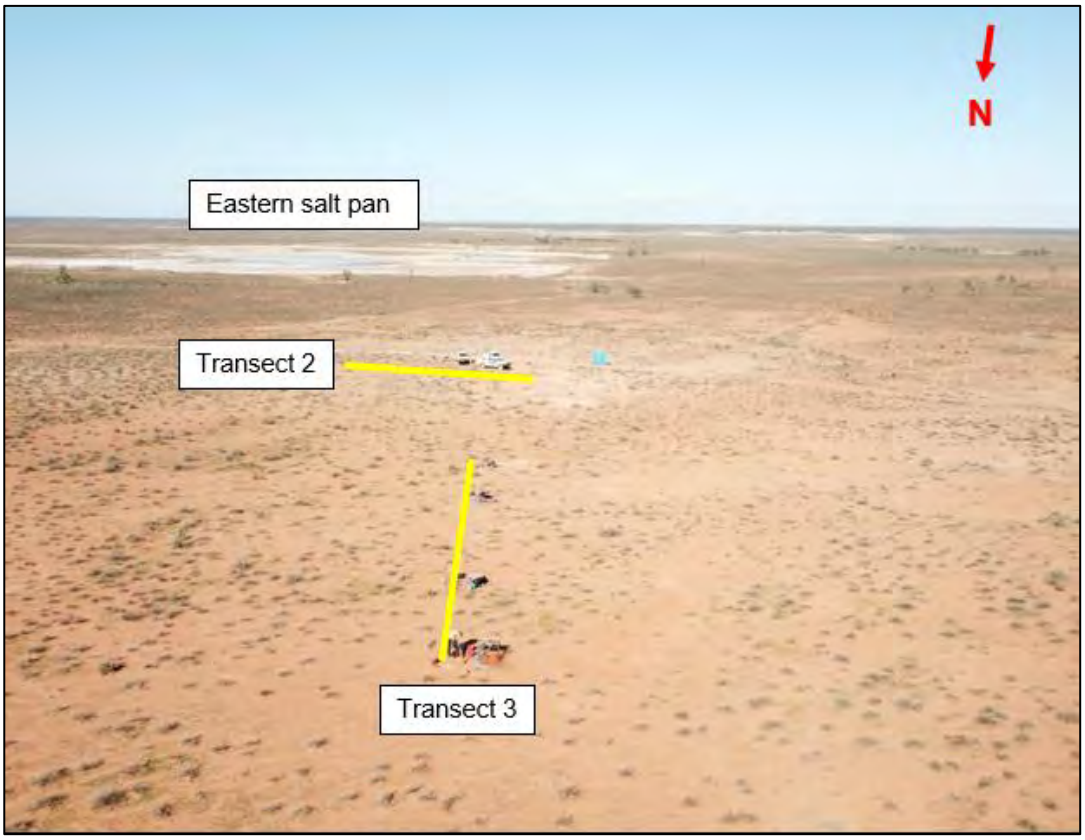
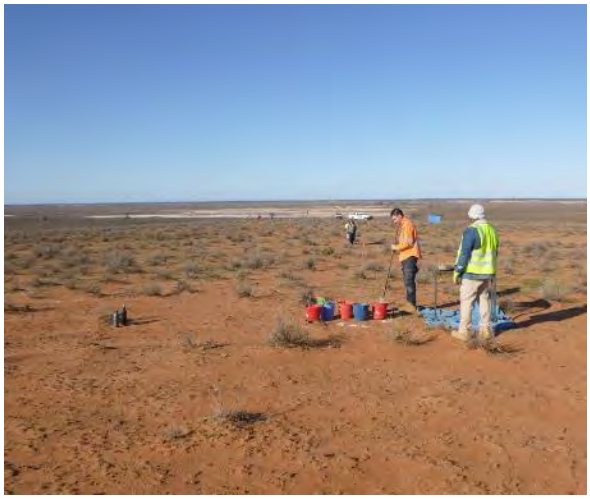


Figure 7-12. Area 4. View of transects.

1. View south along Tr1 located adjacent to an erosion scald with surface artefacts.

2. View south to Tr2 on a spur showing the eastern salt pan in the background.



3. View south to Tr3 on a gentle slope of a spur showing the eastern salt pan in the background.

4. View south along Tr4 on a long, gentle slope showing the western salt pan in the background (left).

7.5.2.4 Area 5

Similarly, to Area 4, Area 5 is located across the Footslopes landform which comprises a long gentle slope receding towards the eastern salt pan. Area 5 encompassing the PAD at Copi OS-12. The portion of Area 5 within the Limit of Disturbance stretches for approximately 830 m. Surface artefacts were identified within most erosion scalds across Copi OS-12, albeit at a low density, and nine hearths were also recorded across the site. Artefacts are present in areas that have been subject to water and wind erosion (**Figure 7-10** and **Figure 7-11**) and therefore testing was completed to determine whether the artefacts are present on a deflated surface or if there is associated subsurface deposits.

Six transects (Tr1–6) were investigated and a total of 35 TUs excavated (**Figure 7-13**). Across the transects, this consisted of:

- Ten TUs at Tr1, spaced 10 m apart
- Four TUs at Tr2 to Tr4, spaced 10 m apart
- Eight TUs at Tr5. Four squares were initially excavated at 10 m apart and three 'infill' squares were excavated, 5 m from original squares
- Five TUs spaced 10 apart.

Tr1 is orientated east to west on a relatively flat portion of the Footslope in an area subject to somewhat lower levels of erosion (**Figure 7-16**; image 1); Tr2 to Tr4 are orientated generally north to south in the southerly portion of the Footslope landform positioned adjacent to erosion scalds where artefacts and hearths were recorded (**Figure 7-16**; images 2 to 4); Tr5 is orientated north to south on the lower slope of the Footslope adjacent to an erosion scald where a number of surface artefacts were identified (**Figure 7-16**; image 5); and Tr6 is orientated north to south on a gentle slope adjacent to erosion scalds where a cluster of artefacts were recorded (**Figure 7-16**; image 6).

Figure 7-13. Location of transects within Area 5.

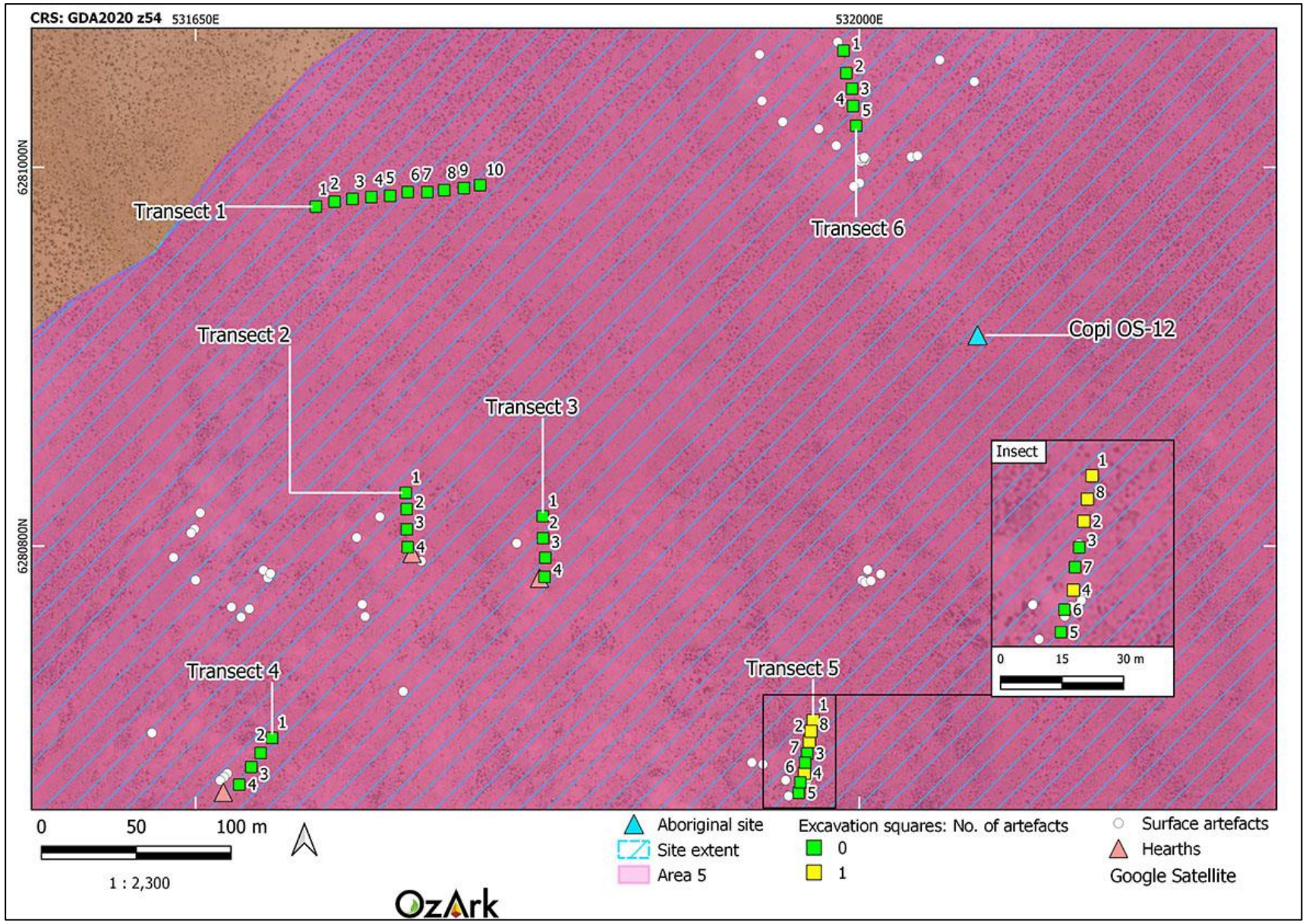


Figure 7-14. Area 5. Close up aerial showing Tr2 and surrounding areas which have been impacted by water wash.

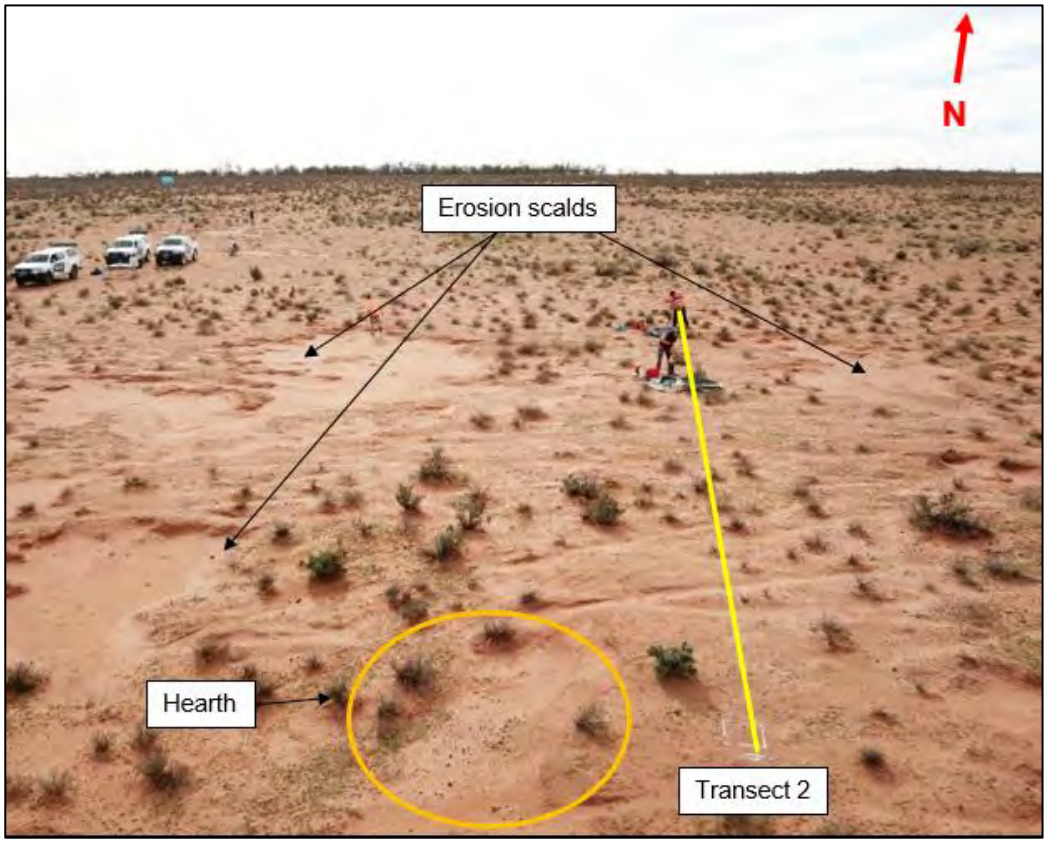


Figure 7-15. Area 5. Close up aerial of Tr4 and surrounding areas which have been impacted by water wash.

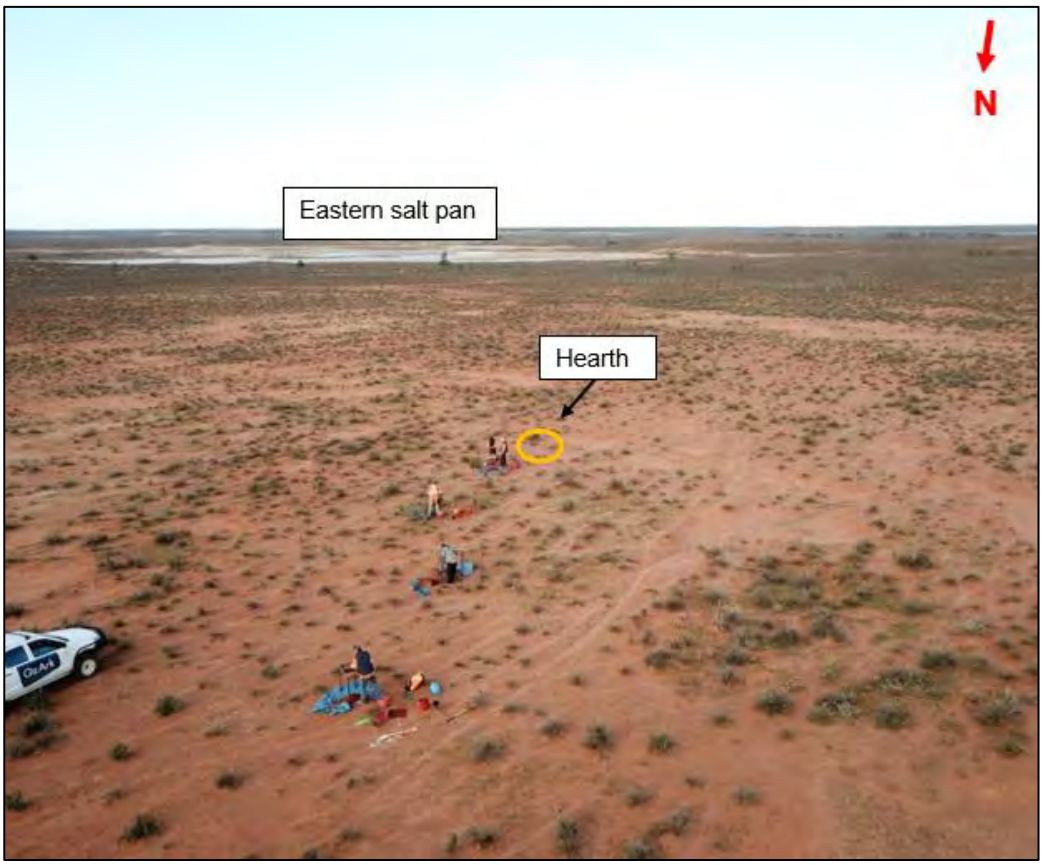
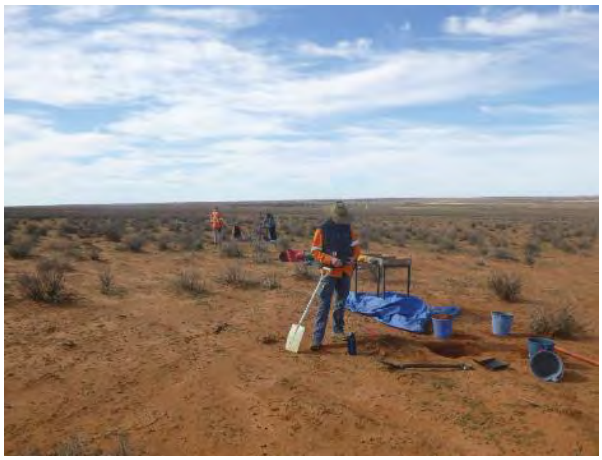
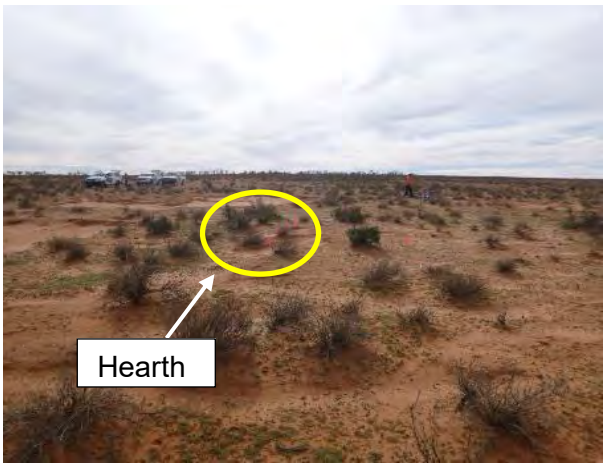


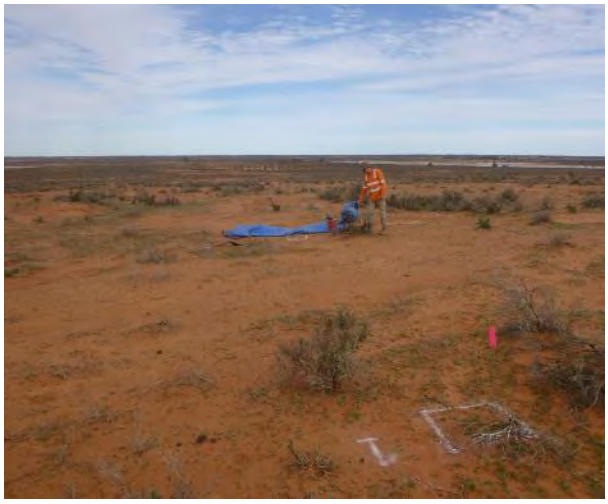
Figure 7-16. Area 5. View of transects.



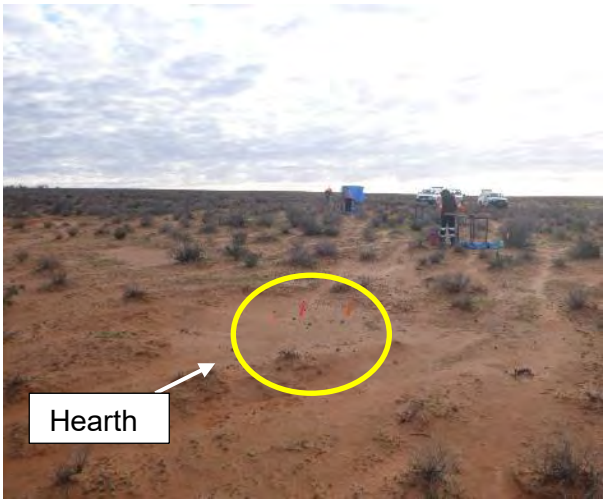
1. View east along Tr1 from Sq6 located on the upper slope of a long gentle slope.



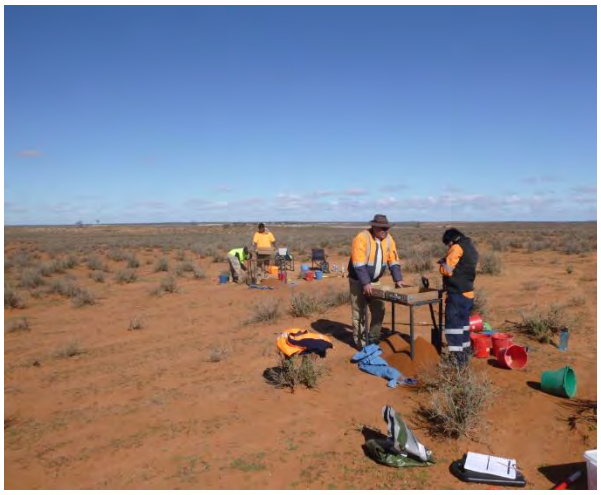
2. View north along Tr2, located to the east of an erosion scald where a hearth was recorded.



3. View south along Tr3 from Sq1 showing the eastern salt pan in the background.



4. View north along Tr4 on along, located to the east of an erosion scald where a hearth was recorded.



5. View south along Tr5, located adjacent to a small cluster of artefacts.

6. View east to Tr6 on a gentle slope surrounded by erosion scalds with surface artefacts.

7.5.2.5 Area 6

Area 6 is located on a deflated dune bordering a small depression, extending for 85 m (**Figure 7-17**). Area 6 was delineated as having PAD as a number of artefacts were identified eroding out of the southern extent of the dune at Copi OS-11 (**Figure 7-18**). Over 95% of the artefacts present consisted of grey quartzite and were relatively small (generally less than all less than 20 mm) and was considered to be a potential knapping event. As such, test excavation at Area 6 intended to determine whether there were further artefacts present subsurface which could confirm whether the artefacts were part of a knapping event or if the entirety of artefactual material was already exposed.

Two transects (Tr1–2) were investigated and a total of 10 TUs excavated; five squares at each transect, spaced 10 m apart (**Figure 7-17**). Only one transect of five TUs was originally proposed at Area 6, however, an additional transect was added to the program to test an elevated landform slightly north of Tr1.

Tr1 extends north to south along the deflated dune, adjacent to the surface manifestation (**Figure 7-19**; image 1). Tr2 is orientated east to west along the crest of a more elevated dune between two depressions (**Figure 7-19**; image 2).

Figure 7-17. Location of transects within Area 6.

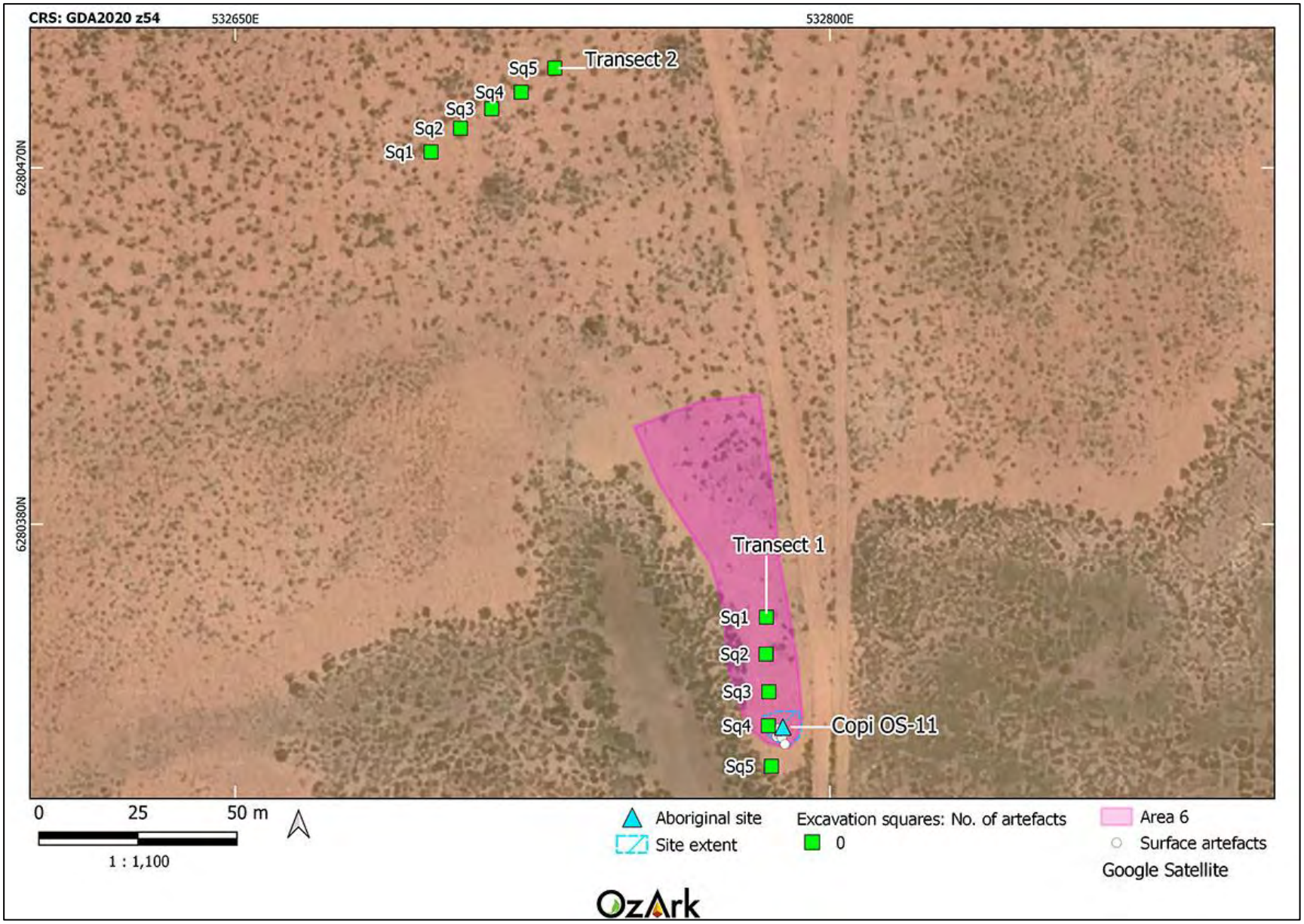


Figure 7-18. Area 6. Close up aerial showing Tr1 and Tr2 in relation to depressions and the surface artefact scatter.

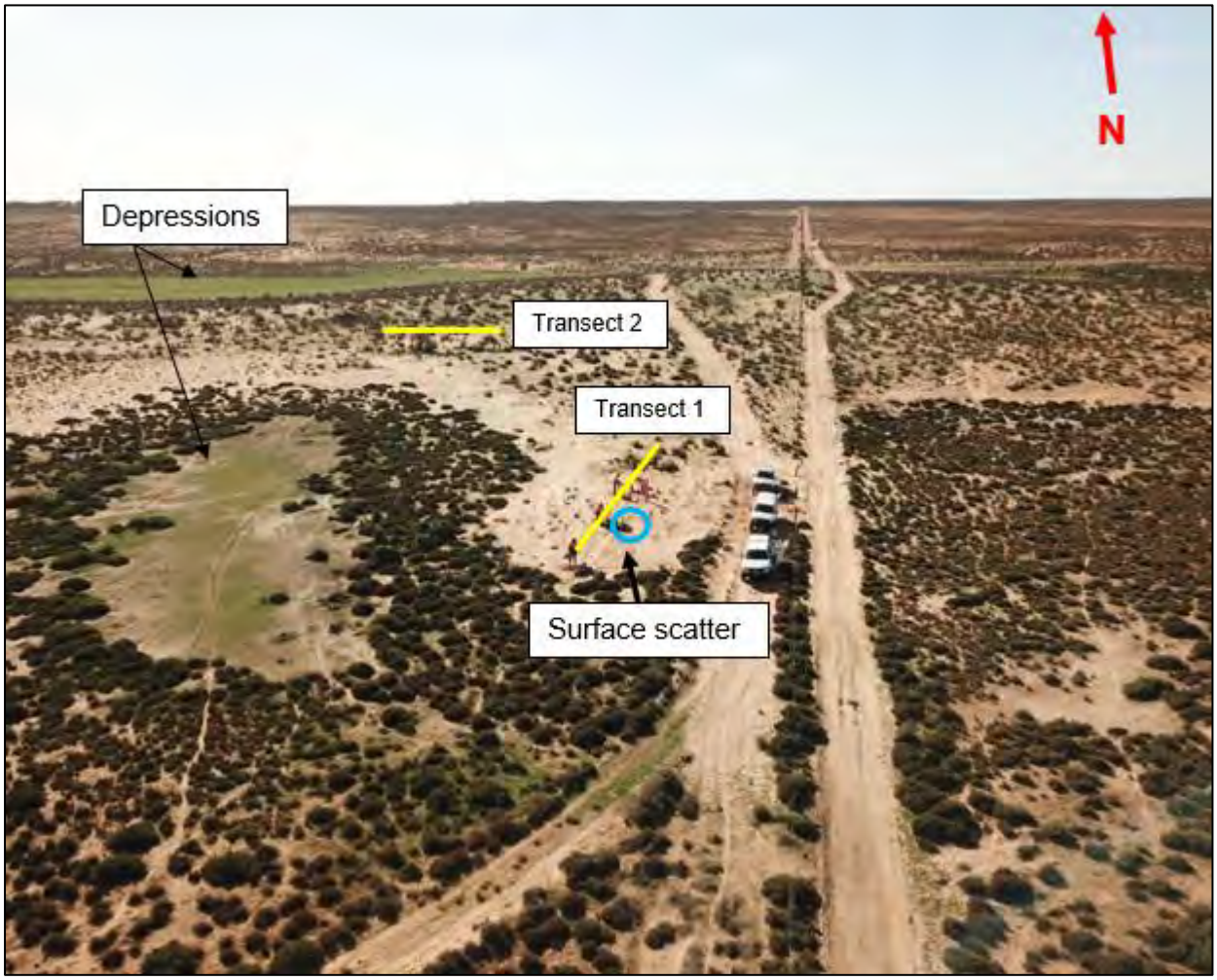
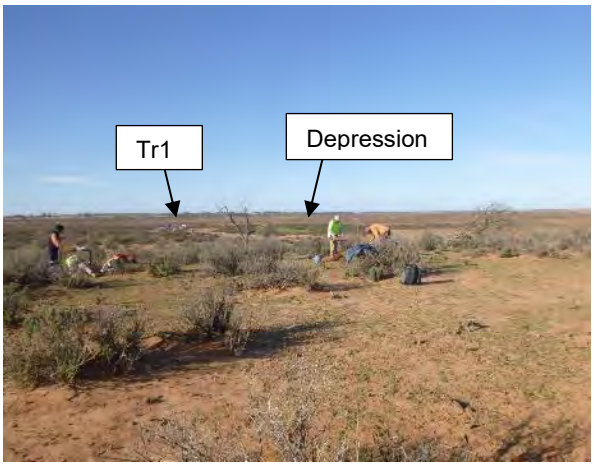


Figure 7-19. Area 6. View of transects.

1. View northwest to Tr1 showing the depression in the background.



2. View south to Tr2, showing Tr1 and the depression in the background.

7.5.2.6 Area 7

Area 7 is located at Copi OS-18 which stretches for a maximum distance of 150 m. Area 7 encompasses a low rise adjacent to a small depression where at least 12 artefacts were identified during the survey. Area 7 was chosen to test the nature of deposits of landforms which are more distant from the eastern salt pan. Archaeological potential of this particular area is increased as it is adjacent to a depression which is likely to have held water seasonally and surface artefacts have been identified. Patches of gypsum are present across the landform, and large areas with the gypsum has been impacted by rabbit burrows. As such, areas with visible sandy soil were determined to have greater archaeological potential (**Figure 7-21**).

Two transects (Tr1–2) were investigated and a total of 10 TUs excavated; five squares at each transect (**Figure 7-20**).

Tr1 is located parallel to the depression close to artefacts which are likely to have washed downslope (**Figure 7-22**; image 1). Tr2 is further west of Tr1 on the crest of the rise where a number of artefacts were identified. The crest provides views west across the surrounding landscape (**Figure 7-22**; image 2).

Figure 7-20. Location of transects within Area 7.

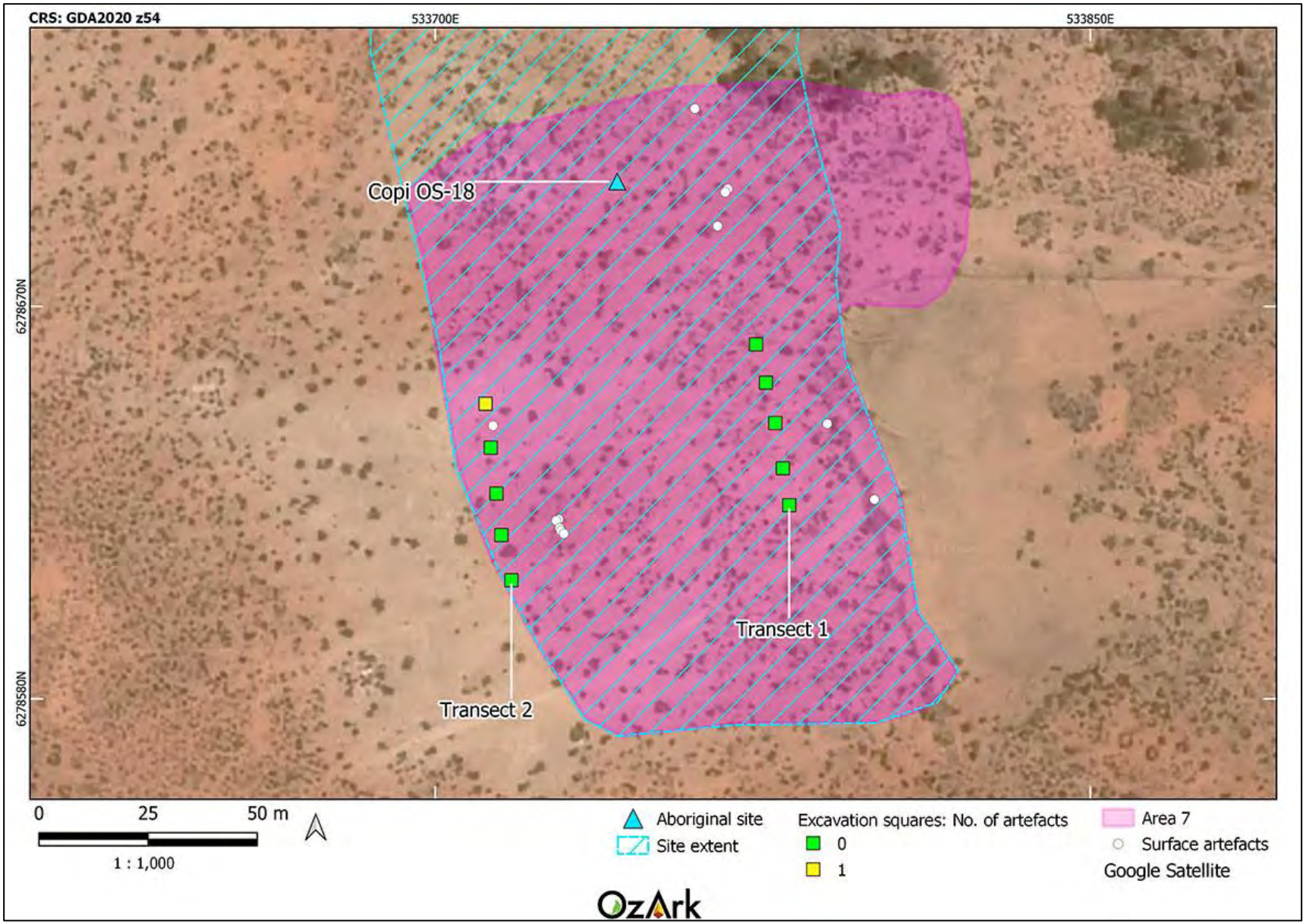


Figure 7-21. Area 7. Close up aerial showing Tr1 and Tr2 in relation to the depression and areas of gypsum.

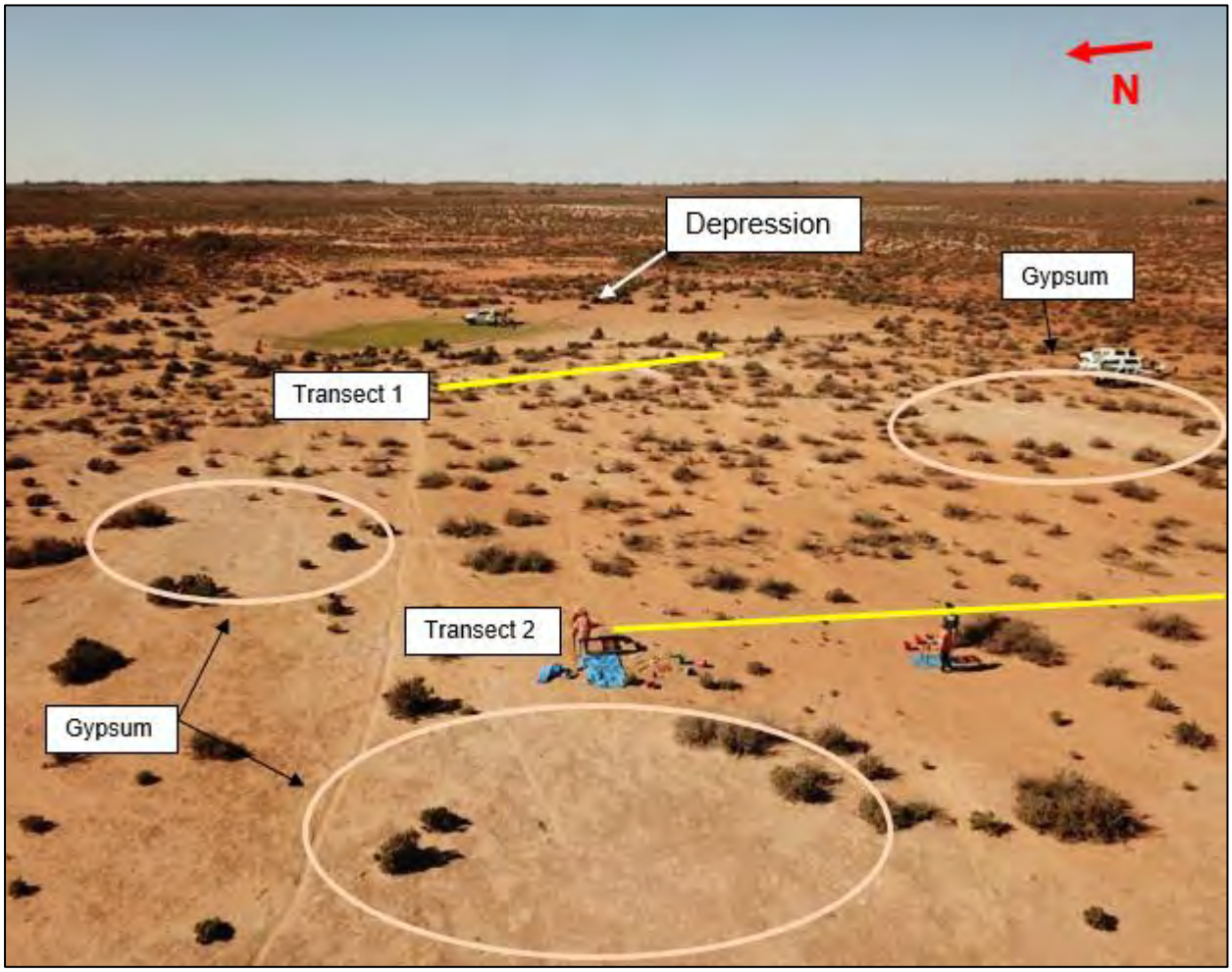


Figure 7-22. Area 7. View of transects.

1. View east to Tr1 showing the depression in the background.

2. View south to Tr2, along the top of a low rise.

7.5.2.7 Area 8

Area 8 stretches for approximately 90 m alongside, and to the south of the artefact scatter associated with Copi OS-23. Area 8 was chosen for the test excavation program as artefacts were identified within an erosion scald and it is at the transition of two Soil Associations (Lake Floor East and Sandplains and Dunes).

Two transects (Tr1–2) were investigated and a total of 10 TUs excavated; five squares along each transect (**Figure 7-23**).

Tr1 is orientated northwest to southeast adjacent to the erosion scald where surface artefacts were identified (**Figure 7-24**; image 1). Tr2 is further south of the erosion scald on a gentle rise (**Figure 7-24**; image 2).

Figure 7-23. Location of transects within Area 8.

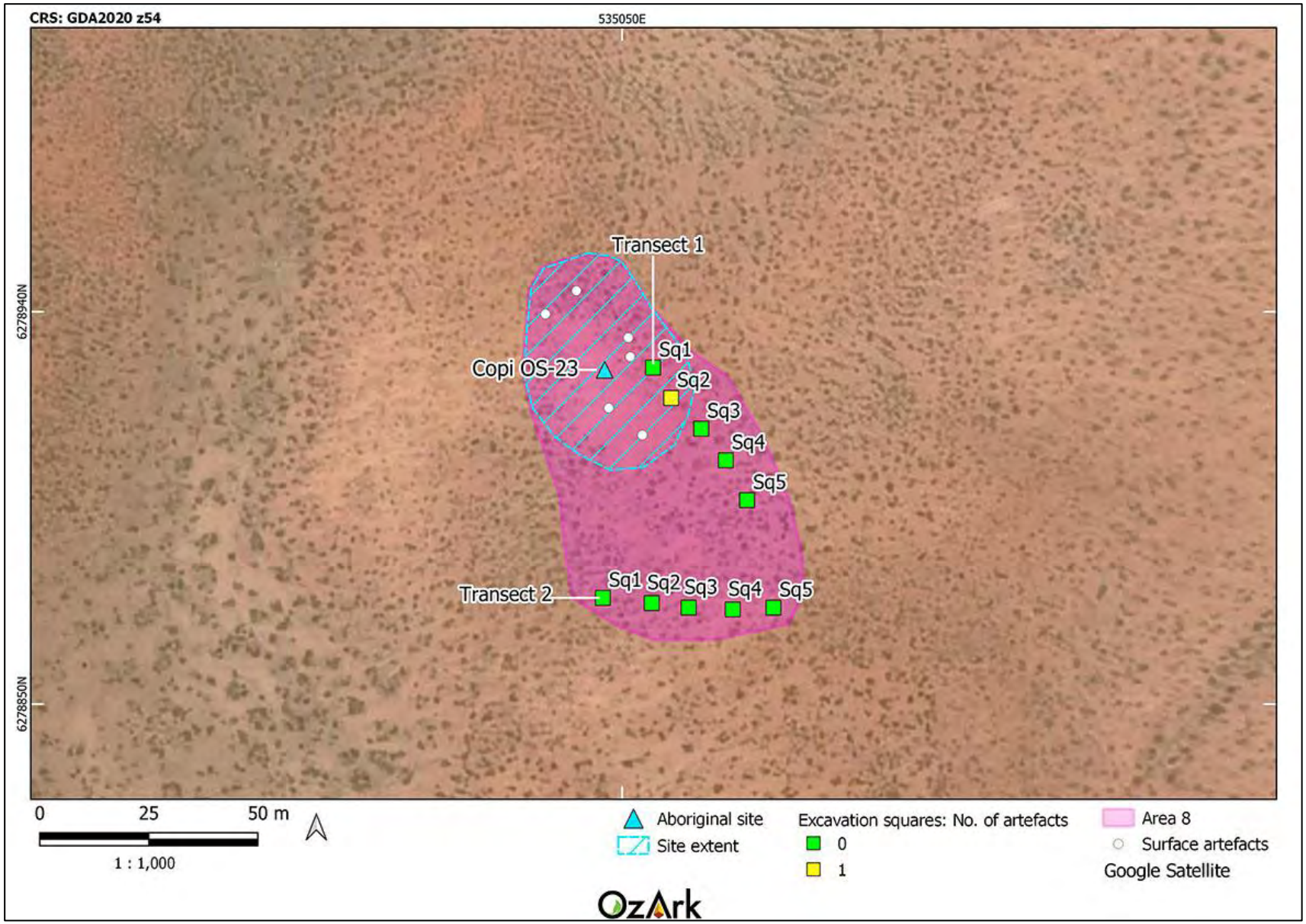


Figure 7-24. Area 8. View of transects.

	
1. View east to Tr1 located to the east of an erosion scald with surface artefacts.	2. View north to Tr2, along a gentle rise.

7.5.2.1 Area 10

Area 10 is located on an elevated sandplain which a slight slope to the east above the long, gentle slope (Footslope) north of the eastern salt pan. A modified drainage line is located to the north of Area 10. Area 10 extends for 75 m, an includes an erosion scald in the centre where several artefacts were identified and recorded as Copi OS-31 (**Figure 7-26**). Area 10 was chosen for the test excavation program to gain further insight into the sandplain to the north of the Footslope where the greatest concentration of artefacts in this landform were identified.

One transect (Tr1) was investigated which included six TUs. Three TUs were placed to the north of the erosion scald and the other three were located to the south (**Figure 7-25** to **Figure 7-27**).

Figure 7-25. Location of transects within Area 10.

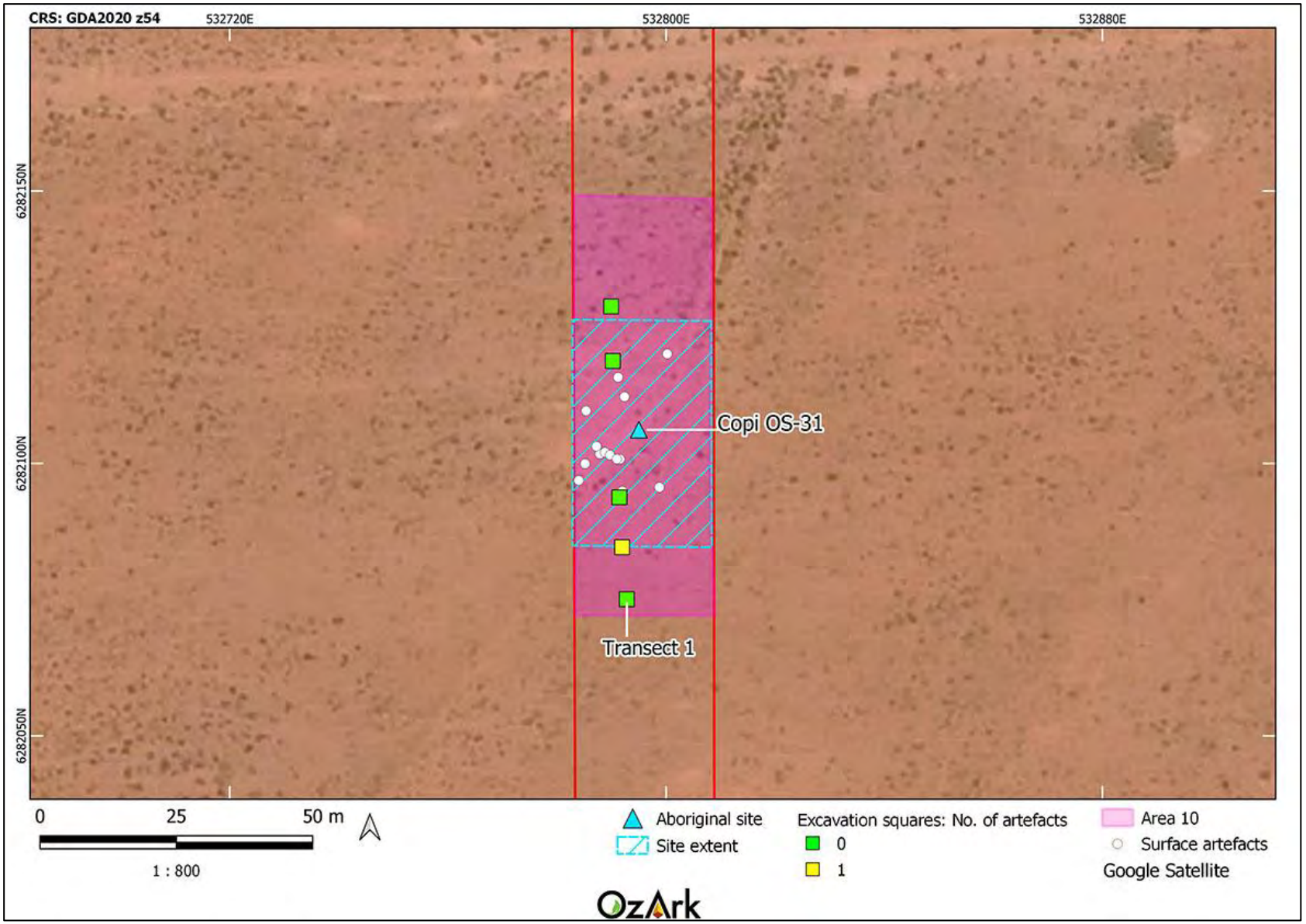


Figure 7-26. Area 10. Close up aerial showing Tr1 in relation to the drainage line and erosion scald with surface artefacts.

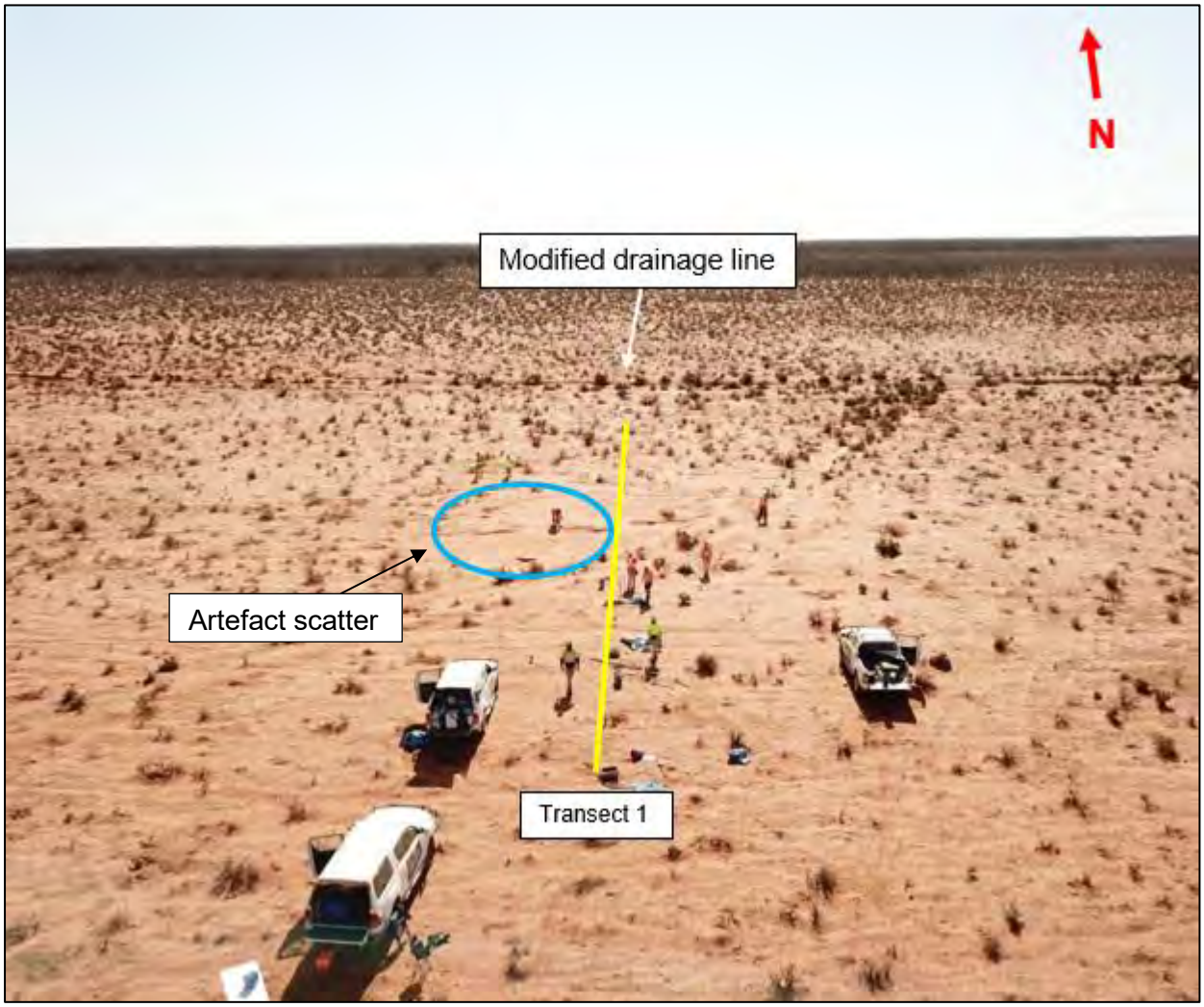


Figure 7-27. Area 10. View of transect.

1. View north to Tr1 Sq3 to the north an erosion scald with surface artefacts.

2. View southwest to Tr1 Sq4–6.

7.5.3 Stratigraphy

Archaeological stratigraphy was not present at any of the TUs investigated.

At several areas, the lack of artefacts and stratigraphy meant that a change of strategy was agreed to between the archaeologists and the RAPs present. This change was going from excavating in 5 cm spits to 10 cm spits. It was felt that without artefacts or stratigraphy to justify a finer excavation methodology that the main aim of the test excavation program was to identify where there may be surviving archaeological deposits of any note. The excavation depth at each area is highlighted below by location.

7.5.3.1 Area 1

All squares within Tr1 and Tr2 were excavated in 10 cm spits. **Table 7-6** provides detail on the soil profiles at Area 1 and **Figure 7-28** shows a sample of excavated soil profiles from Tr1 and Tr2 excavated at Area 1.

Soils across Tr1 encountered gypsum despite being positioned along a pocket of red sandy soils visible across the ground surface. Soils across Tr1 initially comprised red-brown sandy clay. Sq1 encountered soft, powdery gypsum first at 13 cm. Excavation continued at Sq1 through the powdery gypsum to determine whether there was a transition back into sandy soil. However, a hard-packed gypsum base was reached at 44 cm and therefore excavation ceased. Sq2 to Sq4 differed from Sq1, as they encountered a thin layer of leached light brown fine sand between the red-brown sandy clay and the soft, powdery gypsum. Excavation ceased when all squares encountered a hard-packed gypsum base. Depth of this base was variable, increasing from north to south, with depths ranging between 44 and 80 cm.

TUs across Tr2 also encountered gypsum, again at variable depths. A-Horizon soils at Sq2 to Sq5 consisted of fine light-brown sand to depths between 26 to 40 cm which overlaid a leached fine pink sand between 55 and 74 cm. Soft, powdery gypsum was encountered beneath the leached fine pink sand and overlaid a hard-packed gypsum base. The A-Horizon at Sq1 differed to the other squares. Sq1 consisted of fine light-brown sand to 40 cm overlying reddish sandy clay. Sq1 encountered a layer of burnt sand with small charcoal inclusions and very small clay nodules (<2 cm) at 43 cm (**Figure 7-28**; image 3) just below a tree root present in the southern half of the square. Two additional squares were excavated to the north and west (Sq6 and Sq7, respectively) to determine to the extent and nature of the burnt sand layer and clay nodules as two fragments of shell (2.5 to 3 cm) had been recovered at 40 cm. The shell had no indications of burning. The burnt sand and clay nodules only partially extended into these squares. Brushing of the clay nodules showed they generally all had circular hole in the centre, indicating they were likely a result of insect burrows (**Figure 7-28**; image 5). Excavation into the burnt layer showed it was very thin and was not associated with any feature or artefactual material which indicated

Aboriginal occupation. It was concluded that the burnt layer was most likely the result of a burnt tree root.

No stone artefacts were recorded at Area 1, so the soil profile has no association with recorded artefacts.

Table 7-6. Area 1: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	44	Red-brown sandy clay layer to 13 cm. Soft white gypsum sand with few inclusions down to a hard-packed gypsum base at 44 cm.
Tr1 Sq2	49	Red-brown sandy clay layer to 20 cm. Thin layer of leeched light brown fine sand to 32 cm. White gypsum sand mottled with light brown sands down to hard-packed gypsum base at 49 cm.
Tr1 Sq3	55	Red-brown sandy clay layer to 18 cm. Thin layer of leached light brown fine sand to 32cm. White gypsum sands mottled with light brown sands down to hard-packed gypsum base at 55 cm.
Tr1 Sq4	60	Red sandy clay layer to 18 cm. Pink fine sands to 29 cm. Soft white gypsum sand with few inclusions down to hard-packed gypsum base at 60 cm.
Tr1 Sq5	80	Deep red-brown sandy clay layer to 35 cm. Leached fine pink sand to 74 cm. Soft white gypsum sands down to hard-packed gypsum base at 80 cm.
Tr2 Sq1	48	Fine light-brown sand to 40 cm. Reddish sandy clay to 45 cm with charcoal inclusions from burnt roots. Pink fine sand to 48 cm. Not excavated to compacted gypsum base.
Tr2 Sq2	65	Fine red sand down to 40 cm. Leached fine pink sand to 55 cm. Soft white gypsum to 65 cm overlying compacted gypsum base.
Tr2 Sq3	120	Red sandy clay to 26 cm. Leached fine pink sand to 75 cm with no variations. Soft white gypsum from 100 cm down to hard-packed gypsum base at 120 cm..
Tr2 Sq4	80	Deep red-brown sandy clay layer to 35 cm. Leached fine pink sand to 74 cm. Soft white gypsum sands down to hard-packed gypsum base at 80 cm.
Tr2 Sq5	80	Deep red-brown sandy clay layer to 35 cm. Leached fine pink sand to 74cm. Soft white gypsum sands down to hard-packed gypsum base at 80 cm.
Tr2 Sq6	48	Fine light-brown sand to 40 cm. Reddish sandy clay to 45 cm with charcoal inclusions from burnt roots. Pink fine sand to 48 cm. Not excavated to compacted gypsum base
Tr2 Sq7	48	Fine light-brown sand to 40 cm. Reddish sandy clay to 45 cm with charcoal inclusions from burnt roots. Pink fine sand to 48 cm. Not excavated compacted gypsum base

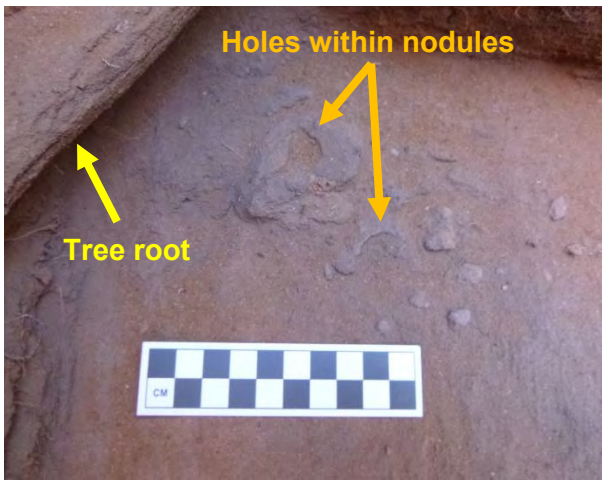
Figure 7-28. Test excavation Area 1. Soil profile.

1. Area 1: Tr1 Sq1, west profile.

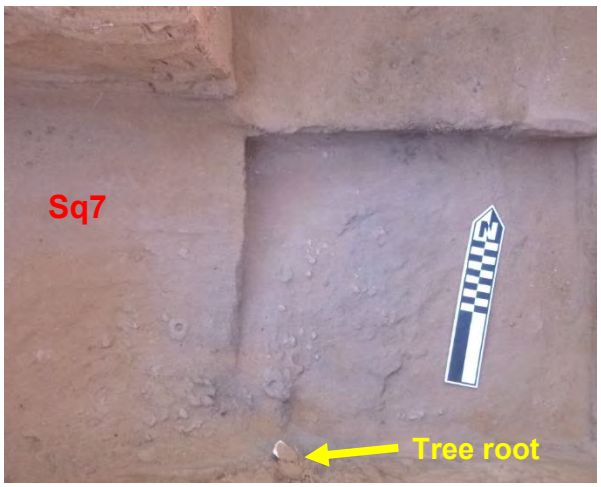
2. Area 2: Tr2 Sq2, north profile.

3. Area 1: Tr2 Sq1, north profile showing the burnt sand.

4. Area 1: Tr2 Sq1, view of square base at 43 cm showing the burnt layer and clay nodules.



5. Area 1: Tr2 Sq1, close up of burnt nodules.



6. Area 1: Tr2 Sq1, Sq6, and Sq7 showing the burnt layer and clay nodules.

7.5.3.2 Area 2

All squares within Tr1 and Tr2 were excavated in 10 cm spits. **Table 7-7** provides detail on the soil profiles at Area 2 and **Figure 7-29** shows a sample of excavated soil profiles from Tr1 and Tr2 excavated at Area 2.

Tr1 and Tr2 were placed beyond the transition of gypsum on the western face of the lunette to where red sand was present on the crest of the lunette. Soils in this area consisted of undifferentiated red sand to depths beyond 60 cm. The only difference between soils at Tr1 and Tr2 was Tr2 had slightly increased clay in association with the red sand.

The depth of gypsum within the TUs was variable. Tr1 Sq2 encountered powdery gypsum mottled with the red sand at 60 cm and a compact gypsum base at 70 cm. Either side of Sq2 at Sq1 and Sq3, red sand continued well past 70 cm, with gypsum present at depths between 150 to 185 cm. At Tr2, crumbly gypsum was reached in Sq2 to 4 between 65 and 88 cm.

A few squares demonstrated disturbances from bioturbation and large tree roots, particularly Tr1 Sq1 and 4.

Two artefacts were recovered from Area 2, both at Tr1. One artefact was recovered from Sq1 in Spit 7 (60–70 cm) and one from Sq3 in Spit 3 (20–30 cm).

Table 7-7. Area 2: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	85	Red sandy clay layer to 30 cm. Fine pink sands with some bioturbation (roots) to 185 cm with no identified basal layer. Auger used at 85 cm which showed white powdery gypsum base at 185 cm.
Tr1 Sq2	70	Red sandy clay layer to 25 cm. Fine pink sands mottled with gypsum to 70 cm overlying white powdery gypsum base.
Tr1 Sq3	80	Red sandy clay layer to 35 cm. Fine pink sands to 85 cm overlying white powdery gypsum base. Auger used at 80 cm which showed white powdery gypsum base at 150 cm.
Tr1 Sq4	65	Red sandy clay layer to 35 cm. Fine pink sands with some bioturbation (roots) to 65 cm with no identified basal layer.
Tr2 Sq1	88	Fine red sand down to 40 cm. Fine light grey sands down to 80 cm over crumbly white gypsum layer with no base.
Tr2 Sq2	60	Gritty red sand to 60 cm over crumbly white gypsum layer with no base.
Tr2 Sq3	65	Gritty red sand to 60 cm. Fine white/grey leached sands to 65 cm overlying crumbly white gypsum base.
Tr2 Sq4	80	Fine red sand to 55 cm. Lighter leached sand to 80 cm.

Figure 7-29. Test excavation Area 2. Soil profile.

1. Area 2: Tr1 Sq2, north profile.

2. Area 2: Tr2 Sq2, north profile.

7.5.3.3 Area 4

All squares within Tr1 to Tr4 were excavated in 10 cm spits. **Table 7-8** provides detail on the soil profiles at Area 4 and **Figure 7-30** shows a sample of excavated soil profiles from Tr1 to Tr4 excavated at Area 4.

Area 4 has been subject to level highs of wind and water erosion. As such, transects were placed in areas where levels of erosion were somewhat lower.

Tr1 and Tr4 had similar profiles as they were both located on gentle slopes. They generally consisted of fine red sand between 0–25 cm overlying red sand with clay to a maximum depth of 38 cm before encountering a hard packed white/pink sand base.

Tr2 was located across a spur and consisted of fine red sand overlying a leached gritty red sand layer and a crumbly white carbonate base between 33 to 40 cm. Most squares along Tr2 had evidence of bioturbation from animal burrows within the leached gritty red sand layer.

Tr3 was located along the slope of the spur with soils consisting of fine red sand transitioning to red sandy clay and overlying hard packed pink sand base. This base was encountered between 22 to 37 cm.

Two artefacts at Area 4 were recovered from Spit 1 (0–10 cm) at Tr2 Sq2 and Tr4 Sq4. An additional artefact was recovered from Tr4 Sq4 Spit 2 (10–20 cm).

Table 7-8. Area 4: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	38	Fine red sand layer to 25 cm. Red sandy clay to 38 cm overlying hard packed white/pink sand base.
Tr1 Sq2	30	Fine red sand layer to 20 cm. Red sandy clay to 30 cm overlying hard packed white/pink sand base.
Tr1 Sq3	22	Fine red sand layer to 15 cm. Fine pink sands to 22 cm overlying hard packed white/pink sand base.
Tr1 Sq4	29	Red sands to 13 cm. Fine red sands with red clays to 29 cm overlying hard packed white/pink sand base.
Tr1 Sq5	20	Red sand with high clay content to 20 cm overlying hard white sand base.
Tr2 Sq1	33	Fine red sands to 20 cm. Red sandy layer with clay content to 26 cm. Crumbly white carbonate to 33 cm.
Tr2 Sq2	38	Fine red sand to 23 cm. Gritty red sands with bioturbation (animal burrows) down to 30 cm. Crumbly white carbonate base 30–38 cm.
Tr2 Sq3	35	Fine red sand to 20 cm. Gritty red sands with bioturbation (animal burrows) down to 30 cm. Crumbly white carbonate base 30–35 cm.
Tr2 Sq4	38	Fine red sand to 28 cm. Leached gritty red sand with bioturbation (animal burrows) down to 34 cm. Crumbly white carbonate base 30–38 cm.
Tr2 Sq5	40	Fine red sand to 15 cm. Leached gritty red sand with bioturbation (animal burrows) down to 27 cm. Crumbly white carbonate base 27–40 cm.
Tr3 Sq1	35	Fine red sand to 20 cm. Red sandy clay to 35 cm overlying hard packed pink sand base.
Tr3 Sq2	37	Fine red sand to 20 cm. Red sandy clay to 35 cm overlying hard packed pink sand base extending to 37 cm.
Tr3 Sq3	22	Fine red sand to 9 cm. Red sandy clay to 22 cm overlying hard packed pink sand base.
Tr3 Sq4	37	Fine red sand to 9 cm. Red sandy clay to 37 cm overlying hard packed pink sand base.
Tr3 Sq5	35	Fine red sand to 9 cm. White carbonate sand with hardened nodules to 30 cm overlying hard packed pink sand base to 37 cm.
Tr4 Sq1	28	Fine red sand to 15 cm. Gritty red sand to 28 cm overlying hard packed pink sand base.
Tr4 Sq2	35	Fine red sand to 13 cm. Gritty red sand to 35 cm overlying hard packed pink sand base.
Tr4 Sq3	30	Fine red sand to 12 cm. Gritty red sand with clay to 30 cm over hard packed pink sand.
Tr4 Sq4	28	Fine red sand to 10 cm. Gritty red sand with clay to 28 cm over hard packed pink sand.
Tr4 Sq5	35	Fine red sand to 18 cm. Gritty red sand with clay to 35 cm over hard packed pink sand.

Figure 7-30. Test excavation Area 4. Soil profile.

1. Area 4: Tr1 Sq5, west profile.

2. Area 4: Tr2 Sq1, north profile.

3. Area 4: Tr3 Sq2, north profile.

4. Area 4: Tr4 Sq3, north profile.

7.5.3.4 Area 5

Squares within Tr1 were excavated in 5 cm spits. Following excavation of Tr1, the remaining transects at Area 5 (Tr2 to Tr6) were excavated in 10 cm spits. **Table 7-9** provides detail on the soil profiles at Area 5 and **Figure 7-31** shows a sample of excavated soil profiles from Tr1 to Tr6 excavated at Area 5.

Area 4 has been subject to level highs of wind and water erosion. As such, transects were placed in areas where levels of erosion were somewhat lower. Tr1 Sq1–2 and Sq6–7 consisted of fine red sand, overlying a grittier red sand, while the remaining squares did not comprise the top fine red sand layer. All squares encountered a crumbly white carbonate base between 30 to 40 cm. Sq2 encountered the white carbonate at 30 cm, however, it was excavated to 80 cm to determine whether there was any transition in the soil profile. No transition was noted in the additional 50 cm of carbonate excavated.

Tr2 to Tr4 had similar soil profiles. Most squares transition into a leached red sand with clay, with other transitioned into a gritty red sand with clay or went straight into a crumbly carbonate base.

A-Horizon soils across Tr5 were similar to Tr1 to Tr4, however they encountered a hard packed white-grey sand base as opposed to the crumbly carbonate base.

Tr6 had overall generally low A-Horizons with fine red sand, then dark red sand with clay over hard packed brown sandy clay base. A-Horizons ranged from 20 to 30 cm. Small shell and bone fragments were also recovered from Area 5 Tr5 across three squares (Sq1, 4, and 7). All fragments were located within the Spit 1 (0–10 cm) and Spit 2 (10–20 cm). No shell or bone displayed any clear indication of cultural modifications, only two pieces of bone appeared to possibly be burnt.

Table 7-9. Area 5: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	32	Fine red sand layer to 15 cm. Gritty red sand to 32 cm overlying crumbly white carbonate base.
Tr1 Sq2	80	Fine red sand layer to 20 cm. Gritty red sand to 30 cm overlying crumbly white carbonate continuing to 80 cm.
Tr1 Sq3	28	Fine red sand layer to 28 cm directly overlying crumbly white carbonate base.
Tr1 Sq4	40	Fine red sand layer to 25 cm directly overlying crumbly white carbonate base continuing to 40 cm.
Tr1 Sq5	40	Fine red sand layer to 25 cm directly overlying crumbly white carbonate base continuing to 40 cm.
Tr1 Sq6	40	Fine red sand layer to 30 cm. Gritty red sand to 40 cm overlying crumbly white carbonate base.
Tr1 Sq7	45	Fine red sand to 30 cm. Gritty red sand to 45 cm overlying crumbly white carbonate base.
Tr1 Sq8	30	Fine red sand to 30 cm directly overlying crumbly white carbonate base.
Tr1 Sq9	35	Fine red sand to 30 cm directly overlying crumbly white carbonate base extending to at least 35 cm.
Tr1 Sq10	35	Fine red sand to 35 cm directly overlying crumbly white carbonate base layer.
Tr2 Sq1	38	Fine red sand to 28 cm. Leached red sand with clay content to 38 cm overlying hard packed pink sand base.
Tr2 Sq2	46	Fine red sand to 26 cm. Leached red sand with clay content to 46 cm overlying hard packed pink sand base.
Tr2 Sq3	40	Fine red sand to 15 cm. Gritty red sand to 40 cm overlying hard packed pink sand base.
Tr2 Sp4	35	Fine red sand to 25 cm overlying crumbly white carbonate layer to 35 cm.
Tr3 Sq1	38	Fine red sand to 22 cm directly overlying loose white carbonate base layer continuing to 38 cm.
Tr3 Sq2	40	Fine red sand to 15 cm. Gritty red sand to 40 cm overlying crumbly white carbonate base layer.
Tr3 Sq3	30	Fine red sand to 30cm overlying white carbonate base.
Tr3 Sq4	33	Fine red sand to 20 cm. Crumbly white carbonate base layer to 33 cm.
Tr4 Sq1	33	Fine red sand to 33 cm overlying white carbonate base layer.
Tr4 Sq2	30	Fine red sand to 16 cm. Red sandy clay to 30 cm overlying white carbonate base layer.
Tr4 Sq3	37	Fine red sand to 37 cm with gradual increase in clay content before reaching white carbonate base.
Tr4 Sq4	35	Fine red sand to 35 cm overlying white carbonate base layer.
Tr5 Sq1	45	Fine red sand to 33 cm. Red leached sand with clay content to 45 cm over hard packed white sand base.

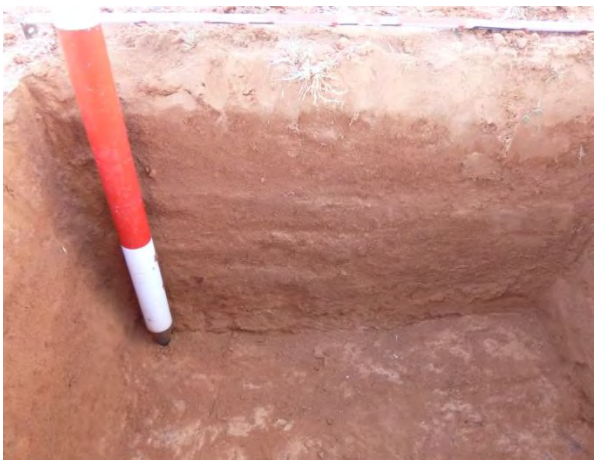
Transect/Square	Total depth of square (cm)	Soil profile description
Tr5 Sq2	40	Fine red sand to 20 cm. Red leached sand with clay content to 40 cm over hard packed white-grey sand base.
Tr5 Sq3	35	Fine red sand to 18 cm. Red leached sand with clay content to 35 cm over hard packed white-grey sand base.
Tr5 Sq4	35	Fine red sand to 17 cm. Gritty red sand to 35 cm over hard packed red-grey sand base.
Tr5 Sq5	28	Fine red sand to 12 cm. Gritty red sand to 28 cm over hard packed white-grey sand base.
Tr5 Sq6	30	Fine red sand to 15 cm. Gritty red sand to 30 cm over hard packed white-grey sand base.
Tr5 Sq7	33	Fine red sand to 25 cm. Red sand with clay content to 33 cm over hard packed white-grey sand base.
Tr5 Sq8	38	Fine red sand to 20 cm. Gritty red sand to 38 cm over hard packed white-pink sand base.
Tr6 Sq1	30	Fine red sand to 6 cm. Dark red sand with clay to leading to hard packed sandy clay base variably between 20 – 30 cm.
Tr6 Sq2	20	Fine red sand to 6 cm. Dark red sand with clay to 20 cm over hard packed sandy clay base.
Tr6 Sq3	20	Fine red sand to 8 cm. Dark red sand with clay to 20 cm over hard packed sandy clay base.
Tr6 Sq4	20	Fine red sand to 8 cm. Dark red sand with clay to 20 cm over hard packed brown sandy clay base.
Tr6 Sq5	28	Fine red sand to 9 cm. Dark red sand with clay to 28 cm over hard packed brown sandy clay base.

Figure 7-31. Test excavation Area 5. Soil profile.

1. Area 5: Tr1 Sq7, north profile.

2. Area 5: Tr2 Sq2, east profile.

3. Area 5: Tr3 Sq2, north profile.



4. Area 5: Tr4 Sq1, north profile.

5. Area 5: Tr5 Sq6, east profile.

6. Area 5: Tr6 Sq3, south profile.

7.5.3.5 Area 6

All squares within Tr1 and Tr2 were excavated in 10 cm spits. **Table 7-10** provides detail on the soil profiles at Area 6 and **Figure 7-32** shows a sample of excavated soil profiles from Tr1 and Tr2 excavated at Area 6.

Squares (Sq1, 4 and 5) across Tr1 that had been subject to higher levels of erosion comprised gritty red sand, while Sq2 and 3 had a top layer of fine red sand (10–12 cm). Sq5, located on the southern edge of the deflated dune, which was subject to the greatest level of erosion, encountered a hard-pack pink clay base at 33 cm. All remaining squares displayed no change in the gritty red sand for over 60 cm, apart from slightly increasing clay content with depth. Excavation continued at Sq2, which encountered a yellow/green clay at 105 cm.

Soils across Tr2 were generally uniform, consisting of a fine red sand to 65–90 cm. No change in soil profile was noted apart from in Sq1 and 2 which had a slight variation in colour with a pinker sand identified deeper in the profile. As no artefacts were identified in any of the squares, excavation ceased within reaching clay.

No stone artefacts were recorded at Area 6, so the soil profile has no association with recorded artefacts.

Table 7-10. Area 6: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	60	Gritty red sand with clay to 60 cm with increasing white gypsum content.
Tr1 Sq2	105	Fine red sand layer to 10 cm. Gritty red sand with clay content to 105 cm with no variability. Yellow/green clay base.
Tr1 Sq3	65	Fine red sand layer to 12 cm. Gritty red sand with clay content to 65 cm with increasing white gypsum content.
Tr1 Sq4	60	Gritty red sand with clay content to 60 cm. No identified base layer but increasing white gypsum content.
Tr1 Sq5	33	Gritty red sand to 33 cm overlying hard packed pink clay base.
Tr2 Sq1	95	Fine red sand to 50 cm covering variable layer of looser pink sands to 95 cm. No identified base.
Tr2 Sq2	65	Fine red sand to 65 cm with increasing light pink sand content. No identified base.
Tr2 Sq3	70	Fine red sand to 70 cm with no identified base layer.
Tr2 Sq4	70	Fine red sand to 70 cm with no identified base layer.
Tr2 Sq5	70	Fine red sand to 70 cm with no identified base layer.

Figure 7-32. Test excavation Area 6. Soil profile.

1. Area 6: Tr1 Sq3, west profile.

2. Area 6: Tr2 Sq1, east profile.

7.5.3.6 Area 7

All squares within Tr1 and Tr2 were excavated in 10 cm spits. **Table 7-11** provides detail on the soil profiles at Area 7 and **Figure 7-33** shows a sample of excavated soil profiles from Tr1 and Tr2 excavated at Area 7.

Soils across Tr1 and Tr2 encountered gypsum despite being positioned in areas across the landform where pockets of sandy soils were visible across the ground surface. Tr1 Sq1 differed from Sq2 to Sq5. Sq1 consisted of fine, light brown soil before encountering gypsum at a much

lower depth than the other squares (20 cm). Sq2 to Sq5 comprised fine, red sand between 0–20 cm, overlying a gritty red sand with clay. Gypsum was encountered between 38 to 52 cm.

Soils at Tr2 were generally consistent across the TUs. Soils consisted of light brown sandy clay with small nodules of gypsum (except for Sq1). This layer overlaid a soft white powdery gypsum with depths variable both across the landform and within the individual squares themselves.

Only one artefact was recorded at Area 7 within Spit 1 (0–10 cm).

Table 7-11. Area 7: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	20	Fine light brown sand to 20 cm overlying white gypsum base.
Tr1 Sq2	52	Fine red sand to 12 cm. Gritty red sand to 30 cm, smooth sandy clay to 52 cm overlying gypsum base.
Tr1 Sq3	50	Fine red sand to 11 cm. Gritty red sand clay to 48 cm overlying compacted white gypsum base extending to 50 cm.
Tr1 Sq4	45	Fine red sand to 6 cm and Gritty red sandy clay to 45 cm. Compacted white gypsum base layer.
Tr1 Sq5	38	Fine red sand to 7 cm. Gritty red sand with clay to 28 cm. White gypsum base layer 28–38 cm becoming increasingly compacted.
Tr2 Sq1	25	Light brown sandy clay to varying depth of 15–20 cm over white gypsum base extending to 25 cm.
Tr2 Sq2	29	Light brown sandy clay with gypsum nodules to a varying depth of 10–29 cm over white gypsum base at 29 cm.
Tr2 Sq3	20	Light brown sandy clay with gypsum nodules to a varying depth over white gypsum base at 20 cm.
Tr2 Sq4	25	Light brown sandy clay with gypsum nodules to 15 cm over white gypsum base extending to 25 cm.
Tr2 Sq5	20	Light brown sandy clay with gypsum nodules to a varying depth of 16–20 cm over white gypsum base.

Figure 7-33. Test excavation Area 7. Soil profile.

1. Area 7: Tr1 Sq3, east profile.

2. Area 7: Tr2 Sq1, north profile.

7.5.3.7 Area 8

All squares within Tr1 and Tr2 were excavated in 10 cm spits. **Table 7-12** provides detail on the soil profiles at Area 8 and **Figure 7-34** shows a sample of excavated soil profiles from Tr1 and Tr2 excavated at Area 8.

Soils across Tr1 were generally uniform, consisting of a thin layer of fine red sand overlying a gritter red sand with increased clay content. All squares encountered a crumbly white gypsum/carbonate base from depths of 24 to 40 cm.

Soils across Tr2 differed from Tr2 as they did not comprise a fine red sand on the top layer (except for Sq4). Squares across Tr2 consisted of gritty red sand with clay and generally encountered the crumbly white gypsum/carbonate base at shallower depths than Tr1, ranging between 17 to 30 cm.

Only one artefact was recorded at Area 8 within Spit 1 (0–10 cm).

Table 7-12. Area 8: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	24	Soft red-pink sand layer to 8 cm. Gritty red sand with clay to 24 cm overlying compact white carbonate base.
Tr1 Sq2	29	Soft red sand layer to 5 cm. Gritty red sand with clay to 29 cm overlying compact white carbonate base.
Tr1 Sq3	38	Soft red sand layer to 5 cm. Gritty red sand with clay to 38 cm overlying compact white carbonate base.
Tr1 Sq4	40	Soft red sand layer to 16 cm. Gritty red sand with clay to 40 cm overlying crumbly white carbonate base.
Tr1 Sq5	24	Soft red sand layer to 5 cm. Gritty red sand with clay to 24 cm overlying compact white carbonate layer.
Tr2 Sq1	22	Gritty red sand with clay content to 22 cm over crumbly carbonate base.
Tr2 Sq2	17	Gritty red sand with clay content to 17 cm over crumbly carbonate clay layer with no base layer.
Tr2 Sq3	22	Gritty red sand to 22 cm overlying crumbly carbonate clay base.
Tr2 Sq4	30	Soft red sand to 5 cm. Gritty red sand with clay to 30 cm over crumbly carbonate base.
Tr2 Sq5	29	Gritty red sand with clay content to 29 cm over crumbly carbonate clay base.

Figure 7-34. Test excavation Area 8. Soil profile.

1. Area 8: Tr1 Sq4, west profile.

2. Area 8: Tr2 Sq5, east profile.

7.5.3.8 Area 10

All squares within Tr1 were excavated in 10 cm spits. **Table 7-13** provides detail on the soil profiles at Area 1 and **Figure 7-35** shows a sample of excavated soil profiles from Tr1 excavated at Area 1.

No archaeological stratigraphy or features were noted in any of the TUs. All squares consisted of an undifferentiated A-Horizon which included a pink-red sand to a maximum depth of 20 cm. This transitioned into a slightly grittier sand with an increased proportion of clay. The clay base was encountered at variable depths, ranging from 17 to 40 cm across the transect.

Only one artefact was recorded at Area 10 within Spit 1 (0–10 cm).

Table 7-13. Area 10: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	17	Soft red-pink sand layer to 10 cm. Gritty red sand with clay to 17 cm overlying compact red clay base.
Tr1 Sq2	29	Soft pink-red sand to 15 cm. Gritty red sand with clay to 28 cm overlying compact red clay base.
Tr1 Sq3	40	Soft pink-red sand to 7 cm. Gritty red sand with clay to 40 cm overlying compact red clay base.
Tr1 Sq4	40	Soft pink-red sand to 16 cm. Gritty red sand with clay to 30 cm overlying hard sandy clay base.
Tr1 Sq5	24	Soft pink-red sand to 20 cm. Red sand with clay to 36 cm over compact red sandy clay base.
Tr1 Sq6	30	Soft pink-red and to 13 cm. Gritty red sand with clay to 30 cm over hard sandy clay base.

Figure 7-35. Test excavation Area 10. Soil profile.

1. Area 10: Tr1 Sq4, west profile.

2. Area 10: Tr1 Sq5, north profile.

7.5.4 Artefact assemblages: area/site by area/site

A total of 12 artefacts were recovered during the Phase 1 test excavation program. Of the artefacts recovered, five were manufactured from quartzite, followed by quartz (n=4) and chert (n=3). Artefact types included flakes (n=10), one core and one backed flake. Artefacts were all highly curated with no artefact being more than 22 mm. The highest number of artefacts (n=8) were found within Spit 1 (0–10 cm); two artefacts were recovered from Spit 2 (10–20 cm) and one artefact was found in Spit 3 (20–30 cm) and Spit 7 (60–70 cm).

The number of artefacts recovered at each area is summarised in **Table 7-14**. Artefact attributes are presented in **Appendix 9**.

The artefact assemblage from each area is highlighted below.

Table 7-14. Area 10: Excavation log.

Area	Number of artefacts
Area 1	0
Area 2	2
Area 4	3
Area 5	4
Area 6	0
Area 7	1
Area 8	1
Area 10	1

7.5.4.1 Area 1

No artefacts were recorded at Area 1.

7.5.4.2 Area 2

Two artefacts were recorded at Area 2: both quartzite flakes (**Figure 7-36**).

Figure 7-36. Test Excavation. Area 2 artefacts.

1. Area 2: Tr1 Sq1 Spit 7 (60–70cm). A quartzite flake.

2. Area 2: Tr1 Sq3 Spit 3 (20–30cm). A quartzite flake.

7.5.4.3 Area 4

Three artefacts were recorded at Area 4: a chert core; a quartz flake and a broken quartzite flake (**Figure 7-37**).

Figure 7-37. Test Excavation. Area 4 artefacts.

1. Area 4: Tr2 Sq2 Spit 1 (0–10cm). A chert core.

2. Area 4: Tr4 Sq4 Spit 1 (0–10cm). A quartz flake.

3. Area 4: Tr4 Sq4 Spit 2 (10–20cm). A quartzite flake.

7.5.4.4 Area 5

Four artefacts were recorded at Area 5: two chert flakes (with retouch) and two quartz flakes (**Figure 7-38**).

Figure 7-38. Test Excavation. Area 5 artefacts.

1. Area 5: Tr5 Sq5 Spit 2 (10–20cm). A chert flake.

2. Area 5: Tr5 Sq5 Spit 2 (10–20cm). Close up of retouch on distal end.

3. Area 5: Tr5 Sq2 Spit 1 (0–10cm). A chert backed flake.

4. Area 5: Tr5 Sq2 Spit 1 (0–10cm). Close up of retouch on margin.

5. Area 5: Tr5 Sq4 Spit 1 (0–10cm). A quartz flake.

6. Area 5: Tr5 Sq8 Spit 1 (0–10cm). A crystal quartz flake.

7.5.4.5 Area 6

No artefacts were recorded at Area 6.

7.5.4.6 Area 7

One artefact was recorded at Area 7: a quartzite flake (**Figure 7-39**).

Figure 7-39. Test Excavation. Area 7 artefact.

1. Area 7: Tr2 Sq1 Spit 1(0–10cm). A quartzite flake.

7.5.4.7 Area 8

One artefact was recorded at Area 8: a broken quartzite flake (**Figure 7-40**).

Figure 7-40. Test Excavation. Area 8 artefact.

1. Area 8: Tr1 Sq2 Spit 1 (0–10cm). A quartzite flake.

7.5.4.8 Area 10

One artefact was recorded at Area 10: a broken quartz flake (**Figure 7-41**).

Figure 7-41. Test Excavation. Area 10 artefact.

1. Area 10: Tr1 Sq5 Spit 1 (0–10cm). A quartz flake.

7.5.5 Conclusions

The results of the test excavation program have allowed for the classification of areas of subsurface deposits within the areas identified during the survey as having PAD. Each excavation area is discussed below to highlight where the associated site extent of the relevant site has been amended.

Aboriginal Site Impact Recording Forms (ASIRF) were submitted to AHIMS to update the status of the sites to 'partially destroyed'.

7.5.5.1 Area 1

Test excavation at Area 1 targeted an island within the basin of the western salt pan where an artefact scatter and scarred tree was identified (Copi OS-1). 10 TUs (0.5 x 0.5 m) were excavated at Area 1: a total of 2.5 m^2.

No artefacts were recovered during the test excavation program at Area 1, as such, the area identified as a PAD at Copi OS-1 is now redundant.

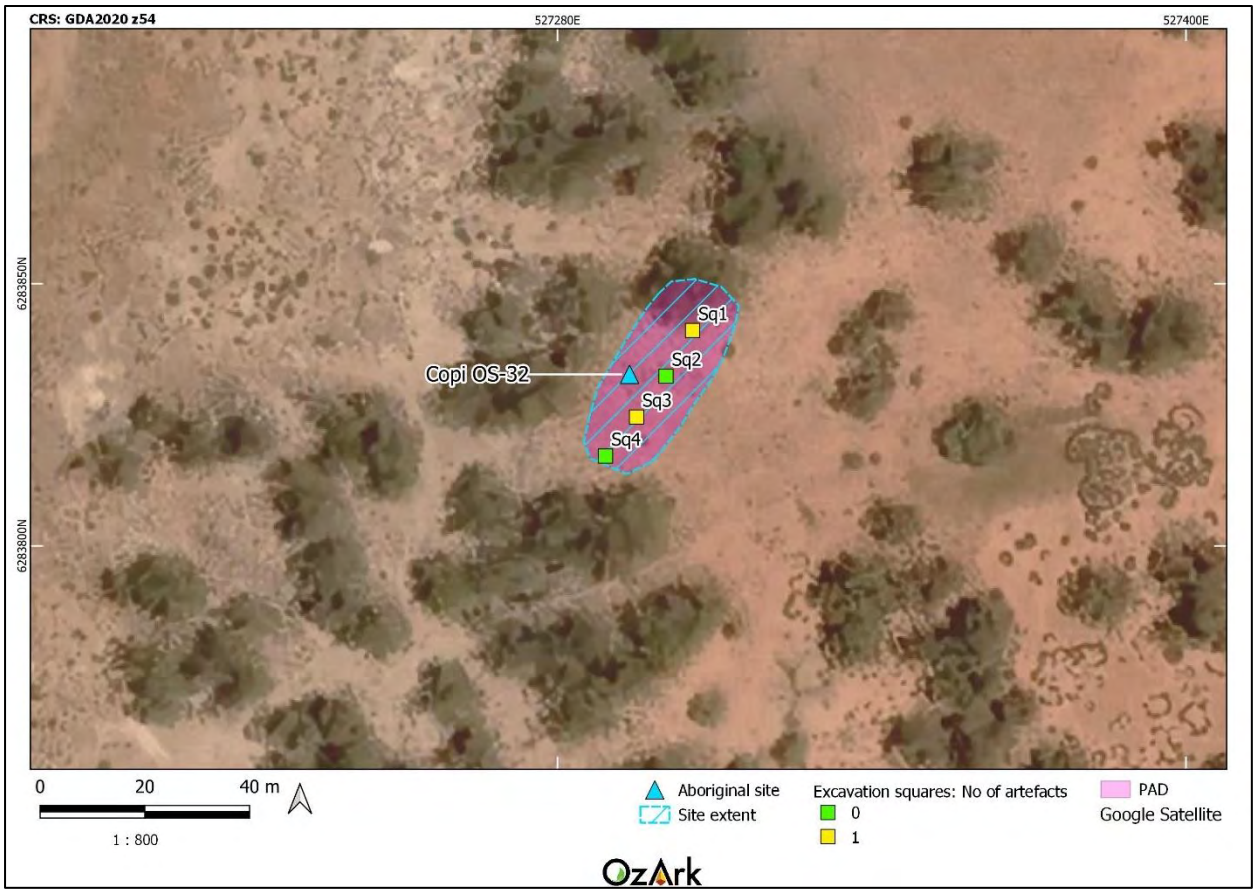
7.5.5.2 Area 2

Test excavation at Area 2 targeted a lunette bordering the western salt pan (Copi OS-32). Eight TUs (0.5 x 0.5 m) were excavated at Area 2: a total of 2 m^2. From this area of excavation, two artefacts were recovered from Tr1.

The results of the test excavation program led to Copi OS-32 being changed from a PAD to an artefact site. The area of subsurface deposit at Copi OS-32 includes the crest of the lunette at Tr1, measuring 40 m x 18 m (**Figure 7-42**).

The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a very low density within the site extent. Further archaeological excavation at this site is deemed unwarranted due to very low density of subsurface artefacts.

Figure 7-42. Area of subsurface deposit at Copi OS-32.



7.5.5.3 Area 4

Test excavation at Area 4 targeted a long, gentle slope receding to the eastern salt pan where artefacts and a hearth were identified largely in erosion scalds (Copi OS-6). 20 TUs (0.5 x 0.5 m) were excavated at Area 4: a total of 5 m^2. Three artefacts were identified at Area 4.

The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a very low density within the site extent. Further archaeological excavation at this site is deemed unwarranted due to very low density of subsurface artefacts.

7.5.5.4 Area 5

Test excavation at Area 4 targeted a long, gentle slope receding to the eastern salt pan where artefacts and hearths were identified largely in erosion scalds (Copi OS-12). 35 TUs (0.5 x 0.5 m) were excavated at Area 4: a total of 8.75 m^2. Four artefacts were identified at Area 5, all from Tr5.

The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a very low density within the site extent. Further archaeological excavation at this site is deemed unwarranted due to very low density of subsurface artefacts.

7.5.5.5 Area 6

Test excavation at Area 6 targeted a dune bordering a small depression where a discrete artefact scatter was identified eroding out of the edge of the dune (Copi OS-11). Ten TUs (0.5 x 0.5 m) were excavated at Area 6: a total of 2.5 m^2.

No artefacts were recovered during the test excavation program at Area 6, as such, the area identified as a PAD at Copi OS-11 is now redundant.

7.5.5.6 Area 7

Test excavation at Area 7 targeted a low rise adjacent to a small depression where an artefact scatter was identified (Copi OS-18). Ten TUs (0.5 x 0.5 m) were excavated at Area 7: a total of 2.5 m^2. One artefact was recovered at Area 7.

The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a very low density within the site extent. Further archaeological excavation at this site is deemed unwarranted due to very low density of subsurface artefacts.

7.5.5.7 Area 8

Test excavation at Area 8 targeted an area adjacent to an erosion scald where several artefacts were identified along a sandplain (Copi OS-23). Ten TUs (0.5 x 0.5 m) were excavated at Area 8: a total of 2.5 m^2. One artefact was recovered at Area 8.

The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a very low density within the site extent. Further archaeological excavation at this site is deemed unwarranted due to very low density of subsurface artefacts.

7.5.5.8 Area 10

Test excavation at Area 10 targeted a sandplain above the long, gentle slope above the eastern salt pan where an artefact scatter was identified (Copi OS-32). Six 0.5 x 0.5 m TUs were excavated at Area 10: a total of 1.5 m^2. One artefact was recovered at Area 10.

The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a very low density within the site extent. Further archaeological excavation at this site is deemed unwarranted due to very low density of subsurface artefacts.

7.6 DISCUSSION OF THE TEST EXCAVATION PROGRAM

7.6.1 Test excavation summary

As highlighted in **Section 7.5.1**, 110 TUs (0.5 x 0.5 m) were excavated at eight separate localities: a total of 27.5 m^2. From these eight localities, 12 artefacts were recovered: an average of 0.4 artefacts per square metre. The maximum number of artefacts recorded in one excavation square was two at Area 4 Tr4 Sq2.

As a result of the test excavation program, the allocation for 'PAD' at Copi OS-1 (Area 1) and Copi OS-11 (Area 6) is now redundant. The remaining sites Copi OS-6 (Area 4), Copi OS-12 (Area 5), Copi OS-18 (Area 7), Copi OS-23 (Area 8), Copi OS-31 (Area 10), and Copi OS-32 (Area 2) are associated with subsurface deposits consisting of a low-density background scatter.

The results of the test excavation program have determined that further archaeological excavation at these sites is deemed unwarranted due to very low density of subsurface artefacts.

7.6.2 Research questions

In **Section 7.2.2**, several research questions were posed for the test excavation program. These will be answered below.

- How does the artefactual material identified at the site compare to other archaeological excavations undertaken in the local area and the region?
    - Archaeological excavations that have occurred in proximity to the Phase 1 assessment area are limited to those completed as part of the W2BH pipeline project (Niche 2019) as such the results Niche (2019) will be used for the comparative analysis. The subsurface artefact assemblage recovered by Niche (2019) was dominated by silcrete (48.51%), followed by quartz (both milky and crystal) with 28.74% and quartzite comprising 11.9%. Due to the very small size of the artefact assemblage recovered during the test excavation program within the Phase 1 assessment area the assemblage is not robust enough for statistical analysis. However, for some general comparison, the materials identified within the Phase 1 assessment area included quartzite (42%), followed by quartz (33%) and chert (25%).
- Is the observed surface manifestations and correlation to the mapped Soil Associations borne out by the subsurface investigations?
    - The results of the survey showed that the greatest concentrations of artefacts were on the Footslopes landforms, followed by the Sandplains and Dunes and then Lunettes and Islands. This result was not borne out by the subsurface investigations with subsurface deposits across the investigated areas being very sparse. The highest number of artefacts was recovered from the Footslopes (n=7), followed by Lunettes and Island (n=3) and Sandplains and Dunes (n=2). This result confirms that the surface artefacts present across the Phase 1 assessment area have been heavily affected by erosion and become exposed through loss of A Horizon soils (**Figure 7-43**). As a result, the artefacts have

subsequently dispersed across the landscape and/or have become deflated coming to rest on lower soil strata (Witter 2004).

Figure 7-43: Aerial view of Area 5 Tr6 illustrating the erosion scalds.

- Are intact archaeological features, such as hearths and/or middens, present in the site area?
    - No archaeological stratigraphy or archaeological features such as hearths or middens were recorded during the test excavation program. Several fragments of shell were identified at Area 1 and Area 5 during the excavation, however, there was not sufficient evidence to confirm that the shell was a result of cultural discard as opposed to a small natural accumulation.
- Can chronological dates be obtained (i.e. from in situ charcoal samples) that will aid our understanding of Aboriginal occupation in the region?
    - Yes, as mentioned in **Section 6.5.3**, 11 hearths were identified across the Phase 1 assessment area. These features have potential to provide dates for Aboriginal occupation of the area. However, as found by Witter (2004) and Fanning et al. (2007), many hearths in semi-arid NSW do not contain enough charcoal for dating purposes as they have been too disturbed by processes of bioturbation, erosion and/or the effects of grazing animals. In addition, Niche (2019) found through their salvage excavations that several recorded hearths were determined to be remnants of natural, burnt termite mounds and/or attributed to land clearance practices.

7.6.3 Research considerations

Section 7.4.2 provides some research considerations that should be applied to any excavation. Some concluding remarks will be made in this section about the considerations raised in **Section 7.4.2**.

Statistically useful sample size

110 TUs (0.5 x 0.5 m) were excavated at eight separate localities: a total of 27 m^2. From these eight localities, twelve artefacts were recovered: an average of 0.4 artefacts per square metre. This density of artefacts is extremely low and not robust enough for statistical analysis.

The area with the highest artefact concentration, Area 5, recorded four artefacts, while the second densest area, Area 4, recorded three artefacts. Combined, these two areas represent 58 per cent of the excavation assemblage, yet neither, in themselves, provide enough data in the form of artefact types, or differences in raw material, to meaningfully add to our knowledge concerning the archaeological context of the area.

Equally any analysis of vertical or horizontal distribution of artefacts is hampered by a lack of data. In terms of vertical distribution, no excavation square displayed archaeological stratigraphy and most of the artefacts were confined to the two uppermost spits (**Section 7.5.4**). This allows limited opportunities to undertake a taphonomic analysis on how material has moved within the soil profile, and limited opportunities to study change in artefact types or sizes through time. There is also no discernible patterning in the horizontal distribution of artefacts.

Condition

Most of the TUs did not have overt evidence of disturbance. Most excavation areas, (Area 1, 2, 4, and 5) comprised undifferentiated A1-Horizon and a leached A2-Horizon, the implication is that the landscape has been subject to the stripping of the A1-Horizon and the exposure of the A2-Horizon. The assumption is, therefore, that the landscape has undergone a high general disturbance from soil loss that has compromised the archaeological deposits across the Phase 1 assessment area. As such, the general condition of the archaeological landscape within the Phase 1 assessment area is assessed to be poor because of sheep and goat grazing which has stripped vegetation covered and resulted in soil loss which has exposed and dispersed any archaeological deposits that may have been present prior to the colonial occupation of the area.

Theory and recording

The small size of the artefact assemblage does not allow for particularly meaningful interpretation. Therefore, only basic attributes were recorded for future research.

8 PHASE 2 - SURVEY RESULTS

This section documents the results of the survey within the Phase 2 assessment area. The Phase 2 survey was completed in February and March 2022 (see **Section 1.2**).

8.1 SAMPLING STRATEGY AND FIELD METHODS

Variable levels of pedestrian survey were completed across the Phase 2 assessment area as set out in the assessment methodology (**Appendix 6**). The assessment methodology also describes the zoning of the survey area into two zones, namely:

- Full survey areas: These areas include all landforms with greater archaeological potential such as most of the areas of the Lake Footslopes and Lunettes and Islands adjacent to the salt pans. An additional area of full survey was included in the southwest in the Sandplains and Dunes as desktop modelling indicated potential for linear sand dunes to be present. These transects were completed in pairs spaced 100 m apart, with 200 m between pairs of transects. Where it was deemed necessary, additional transects were completed to 'fill in' the space between pairs.
- Sample landform surveys: These areas include portions of the Sandplains and Dunes which are distant from the salt pans as well as depressions within the salt pans. Survey of these areas were spaced across 500 x 500 m to investigate landforms with lower archaeological potential based on the results of the Phase 1 survey. ASDST modelling indicates that these landforms have very low archaeological potential, and this sampling regime is designed to test this predictive model.

8.2 EFFECTIVE SURVEY COVERAGE

Table 8-1 calculates the effective survey coverage within Phase 2 assessment area. In general, levels of exposures and GSV were lower during the Phase 1 survey due to increased rainfall since 2020 resulting in increased ground cover. Despite this, levels of exposure and GSV were still relatively high across the Phase 2 assessment area. During the Phase 2 survey, visibility was greatest within the Lake Footslopes landforms which was the same during the Phase 1 survey.

The effective survey coverage over the Phase 2 assessment area was highest in the Lake Footslopes at 52% while survey coverage was lowest within the Salt Pans and Lunettes and Islands. Visibility was lower within the Salt Pans and the Lunettes and Islands as they contained greater shrub cover and generally more trees, consequently generating more leaf litter cover, while in the Lake Footslopes erosion is more prevalent resulting in less shrub coverage.

Table 8-1: Effective survey coverage within the Phase 2 assessment area.

Survey Unit	Landform	Survey Unit Area (sq m)	Visibility %	Exposure %	Effective Coverage Area (sq m) (= Survey Unit Area x Visibility % x Exposure %)	Effective Coverage % (= Effective Coverage Area / Survey Unit Area x 100)
1	Sandplains and Dunes	29,900,000	70	40	8,372,000	35%
2	Lunettes and Islands	6,800,000	65	40	1,768,000	26%
3	Lake Footslopes	14,330,000	80	60	6,878,400	52%
4	Salt Pans	20,340,000	60	40	4,881,600	24%

Table 8-2 demonstrates that although the survey efficacy within the Lunettes and Islands was one of the lowest during the Phase 2 survey at 26 per cent, this survey unit comprised the highest number of recorded sites. While the Sandplains and Dunes survey unit recorded the lowest number of sites (n=7), it comprised the greatest number of artefacts and features (hearths) (**Figure 8-3**).

Table 8-2: Effective survey coverage and incidences of site recording.

Landform	Landform area (sq m)	Area Effectively Surveyed (sq m) (= Effective Coverage Area)	% of Landform Effectively Surveyed (= Area Effectively Surveyed / Landform x 100)	Number of Sites	Number of artefacts and features
Sandplains and Dunes	29,900,000	8,372,000	35%	7	220
Lunettes and Islands	6,800,000	1,768,000	26%	18	88
Lake Footslopes	14,330,000	6,878,400	52%	16	142
Salt Pans	20,340,000	4,881,600	24%	0	0

Figure 8-1 shows representative examples of GSV across the survey units.

Figure 8-2 illustrates the pedestrian transects and landforms of the Phase 2 assessment area and **Figure 8-3** shows the locations of all recorded artefacts and features in relation to the survey units.

Figure 8-1: Examples of GSV throughout the landforms of the Phase 2 assessment area.

1. Example of GSV across the Footslopes landform surrounding the western salt pan.

2. GSV in part of the Salt Pan landform (western salt pan).

3. Example of GSV on the Lunettes and Islands landform to the north of the western salt pan.

4. Example of GSV on the Lunettes and Islands landform surrounding the eastern salt pan.

5. Example of GSV on the Sandplains and Dunes in the western portion of the Phase 2 assessment area.

6. Example of GSV on the Sandplains and Dunes landform in the southern portion of the Phase 2 assessment area.

Figure 8-2: Pedestrian transects across the Phase 2 assessment area.

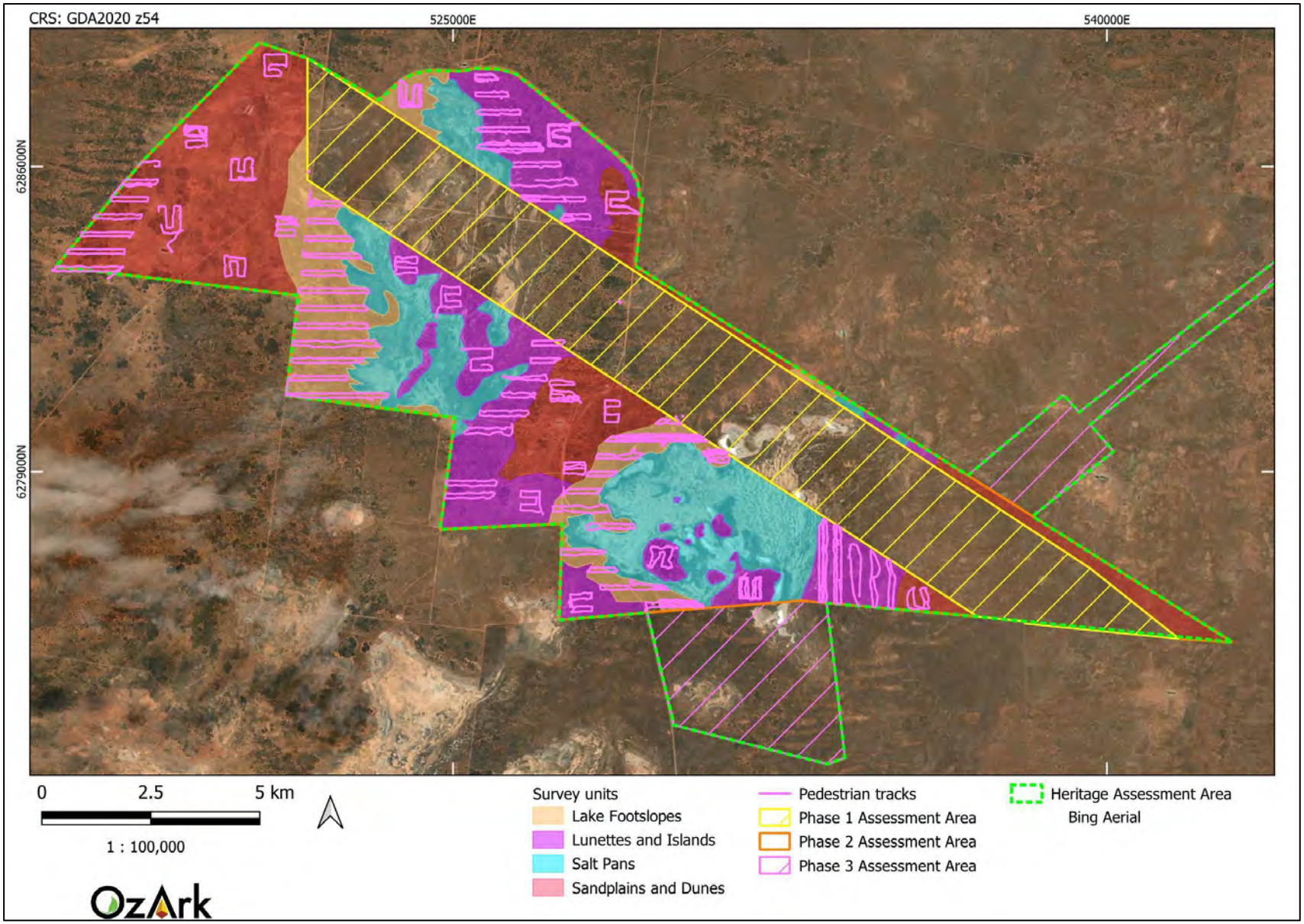
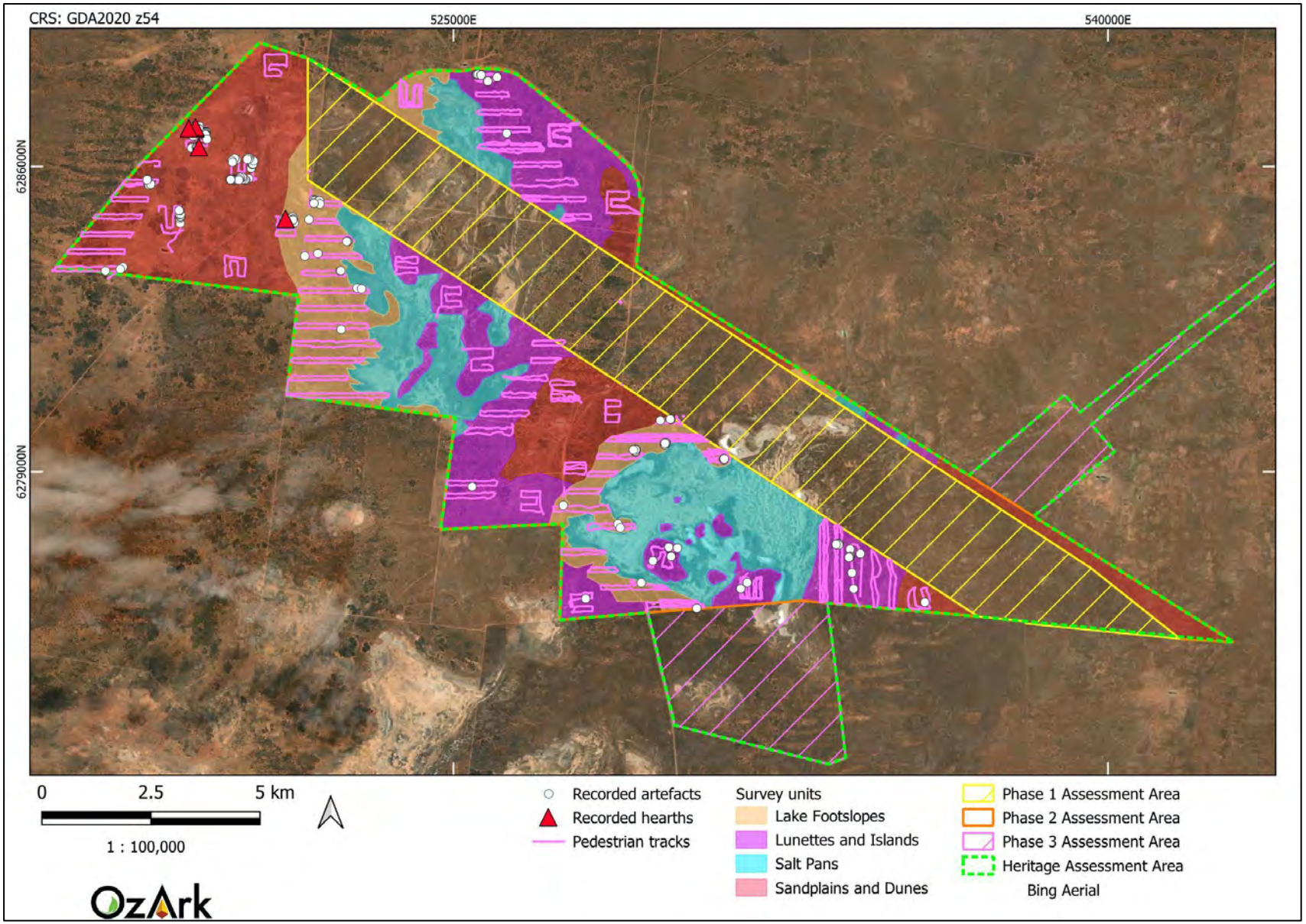


Figure 8-3: Location of recorded artefacts and features in relation to the landforms within the Phase 2 assessment area.



8.3 ABORIGINAL SITES RECORDED

Table 8-3 summarises the Aboriginal cultural heritage sites recorded during the Phase 2 survey. Further details on each site follow.

Table 8-3: Aboriginal cultural heritage sites recorded during the Phase 2 survey.

ID	AHIMS ID	Site name	GDA Zone 54 Easting	GDA Zone 54 Northing	Feature(s)	Landform
Isolated finds						
82	39-4-0806	Copi IF-50	535803	6276006	Isolated find	Sandplains and Dunes
83	39-4-0807	Copi IF-51	534170	6276314	Isolated find	Lunettes and Islands
84	39-4-0808	Copi IF-52	534131	6276682	Isolated find	Lunettes and Islands
85	39-4-0809	Copi IF-53	534324	6277120	Isolated find	Lunettes and Islands
86	39-4-0810	Copi IF-54	534089	6277222	Isolated find	Lunettes and Islands
87	39-4-0811	Copi IF-55	531732	6276458	Isolated find	Lunettes and Islands
88	39-4-0786	Copi IF-56	531582	6276316	Isolated find	Lunettes and Islands
89	39-4-0787	Copi IF-57	530575	6275869	Isolated find	Lake Footslopes
90	39-4-0788	Copi IF-58	529570	6276957	Isolated find	Lunettes and Islands
91	39-4-0789	Copi IF-59	530133	6277249	Isolated find	Lunettes and Islands
92	39-4-0790	Copi IF-60	529935	6277270	Isolated find	Lunettes and Islands
93	39-4-0791	Copi IF-61	529304	6276453	Isolated find	Lake Footslopes
94	39-4-0792	Copi IF-62	528030	6276089	Isolated find	Lunettes and Islands
95	39-4-0793	Copi IF-63	527517	6278228	Isolated find	Lake Footslopes
96	39-4-0794	Copi IF-64	529740	6280178	Isolated find	Sandplains and Dunes
97	39-4-0795	Copi IF-65	525427	6278658	Isolated find	Lunettes and Islands
98	39-4-0796	Copi IF-66	522424	6282263	Isolated find	Lake Footslopes
99	39-4-0797	Copi IF-67	526221	6286763	Isolated find	Lunettes and Islands
100	39-4-0798	Copi IF-68	526000	6288049	Isolated find	Lunettes and Islands
101	39-4-0799	Copi IF-69	521891	6284006	Isolated find	Lake Footslopes
102	39-4-0800	Copi IF-70	521593	6283947	Isolated find	Lake Footslopes
103	39-4-0801	Copi IF-71	517023	6283605	Isolated find	Sandplains and Dunes
Open sites						
104	39-4-0802	Copi OS-33	534077	6277047	Artefact scatter	Lunettes and Islands
105	39-4-0803	Copi OS-34	533808	6277337	Artefact scatter	Lunettes and Islands
106	39-4-0804	Copi OS-35	529989	6277061	Artefact scatter	Lunettes and Islands
107	39-4-0805	Copi OS-36	528793	6277754	Artefact scatter	Lake Footslopes
108	39-4-0771	Copi OS-37	529161	6279486	Artefact scatter	Lake Footslopes
109	39-4-0772	Copi OS-38	529854	6279650	Artefact scatter	Lake Footslopes
110	39-4-0773	Copi OS-39	531198	6279285	Artefact scatter	Lake Footslopes
111	39-4-0774	Copi OS-40	529977	6280205	Artefact scatter	Lake Footslopes
112	39-4-0775	Copi OS-41	522846	6283198	Artefact scatter	Lake Footslopes
113	39-4-0776	Copi OS-42	522410	6283608	Artefact scatter	Lake Footslopes
114	39-4-0777	Copi OS-43	522568	6284286	Artefact scatter	Lake Footslopes
115	39-4-0778	Copi OS-44	525592	6288106	Artefact scatter	Lunettes and Islands
116	39-4-0779	Copi OS-45	525787	6287957	Artefact scatter	Lunettes and Islands
117	39-4-0780	Copi OS-46	517389	6283672	Artefact scatter	Sandplains and Dunes

ID	AHIMS ID	Site name	GDA Zone 54 Easting	GDA Zone 54 Northing	Feature(s)	Landform
118	39-4-0781	Copi OS-47	518740	6284865	Artefact scatter	Sandplains and Dunes
119	39-4-0782	Copi OS-48	518013	6285631	Artefact scatter	Sandplains and Dunes
120	39-4-0784	Copi OS-49	519572	6286291	Artefact scatter; hearths	Sandplains and Dunes
121	39-4-0783	Copi OS-50	521858	6285163	Artefact scatter	Lake Footslopes
122	39-4-0785	Copi OS-51	521364	6284836	Artefact scatter; hearths	Lake Footslopes

8.3.1 Isolated finds

An additional 22 isolated finds were recorded during the Phase 2 survey. These are listed in **Table 8-4** and shown on **Figure 8-4** and **Figure 8-5**. Full details of each isolated find follow.

Table 8-4: Isolated finds recorded during the Phase 2 survey: artefact attributes.

Site name	AHIMS ID	GDA Zone 54 Easting	GDA Zone 54 Northing	Artefact type	Material	Size (LxWxD) mm	Additional detail
Copi IF-50	39-4-0806	535803	6276006	Core	Chert	22	No cortex; multi-directional; 4 flake scars; reduced/globular
Copi IF-51	39-4-0807	534170	6276314	Core	Quartz	20	No cortex; unidirectional; 2 flake scars; reduced/globular
Copi IF-52	39-4-0808	534131	6276682	Flake	Silcrete	18x23x10	Tertiary; complete
Copi IF-53	39-4-0809	534324	6277120	Flake	Silcrete	28x18x10	Secondary; distal fragment
Copi IF-54	39-4-0810	534089	6277222	Flake	Silcrete	33x20x9	Secondary; complete
Copi IF-55	39-4-0811	531732	6276458	Flake	Silcrete	23x22x6	Tertiary; complete
Copi IF-56	39-4-0786	531582	6276316	Flake	Quartz	14x10x7	Tertiary; complete
Copi IF-57	39-4-0787	530575	6275869	Flake	Quartz	15x20x5	Tertiary; complete
Copi IF-58	39-4-0788	529570	6276957	Flake	Silcrete	32x25x9	Secondary; complete
Copi IF-59	39-4-0789	530133	6277249	Flake	Silcrete	21x20x8	Tertiary; complete
Copi IF-60	39-4-0790	529935	6277270	Flake	Quartz	22x11x10	Tertiary; complete
Copi IF-61	39-4-0791	529304	6276453	Flaked piece	Silcrete	50x29x15	Secondary
Copi IF-62	39-4-0792	528030	6276089	Flaked piece	Chert	19x18x11	Tertiary
Copi IF-63	39-4-0793	527517	6278228	Flake	Quartzite	27x20x5	Conjoin; tertiary
Copi IF-64	39-4-0794	529740	6280178	Flake	Silcrete	25x33x10	Tertiary; complete
Copi IF-65	39-4-0795	525427	6278658	Flake	Fine-grained siliceous	40x22x12	Secondary; complete
Copi IF-66	39-4-0796	522424	6282263	Flake	Silcrete	20x18x7	Secondary; complete
Copi IF-67	39-4-0797	526221	6286763	Flake	Quartz	9x8x2	Tertiary; complete
Copi IF-68	39-4-0798	526000	6288049	Flake	Silcrete	21x15x4	Tertiary; complete
Copi IF-69	39-4-0799	521891	6284006	Flake	Silcrete	41x25x10	Tertiary; complete
Copi IF-70	39-4-0800	521593	6283947	Flake	Silcrete	38x20x6	Tertiary; complete
Copi IF-71	39-4-0801	517023	6283605	Flake	Silcrete	41x40x11	Tertiary; longitudinal break

Figure 8-4: Overview of the location of all recorded isolated finds within the eastern portion of the Phase 2 assessment area.

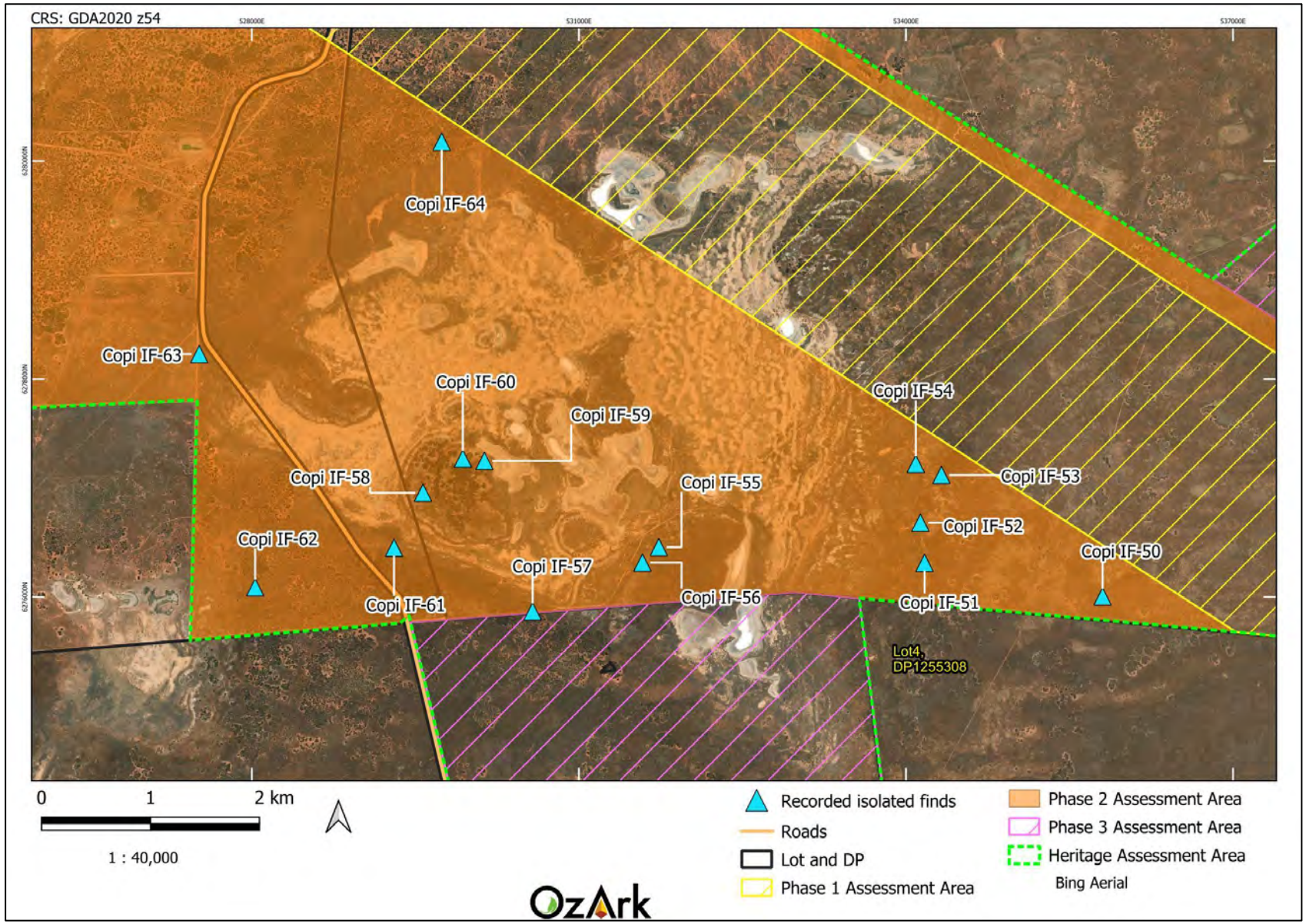
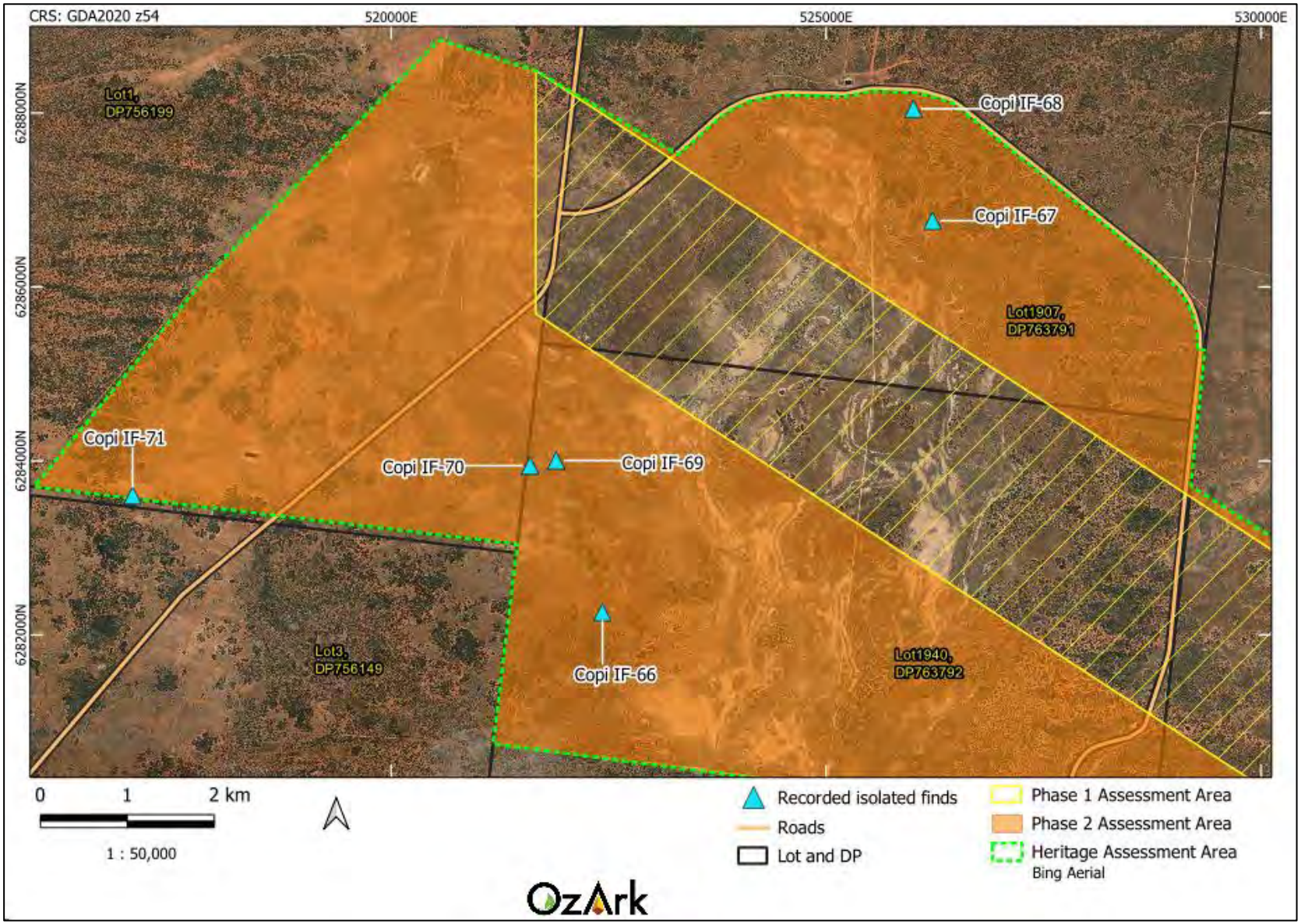


Figure 8-5: Overview of the location of all recorded isolated finds within the western portion of the Phase 2 assessment area.



Copi IF-50

Site type: Isolated find

GPS coordinates: GDA Zone 54 535803E 6276006N

Location of site: Copi IF-50 is located approximately 6 km from the western boundary, 11 km from the eastern boundary, and 220 m from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 8-4** and **Figure 8-6**). The site is located 6.3 km directly east of Nulla Road and 7.9 km south-southwest of Warwick homestead.

Description of site: Copi IF-50 is a single chert core located on a low gradient simple slope (**Figure 8-7**). The core has a maximum dimension of 22 mm and displays four previous flake scars. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange/yellow sand. Surrounding vegetation at the site is comprised of scattered saltbush and trees. The GSE at the time of recording was high (70%) with a GSV of 90% within the large area of exposure. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-50 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 8-6: Location of Copi IF-50 to IF-52.

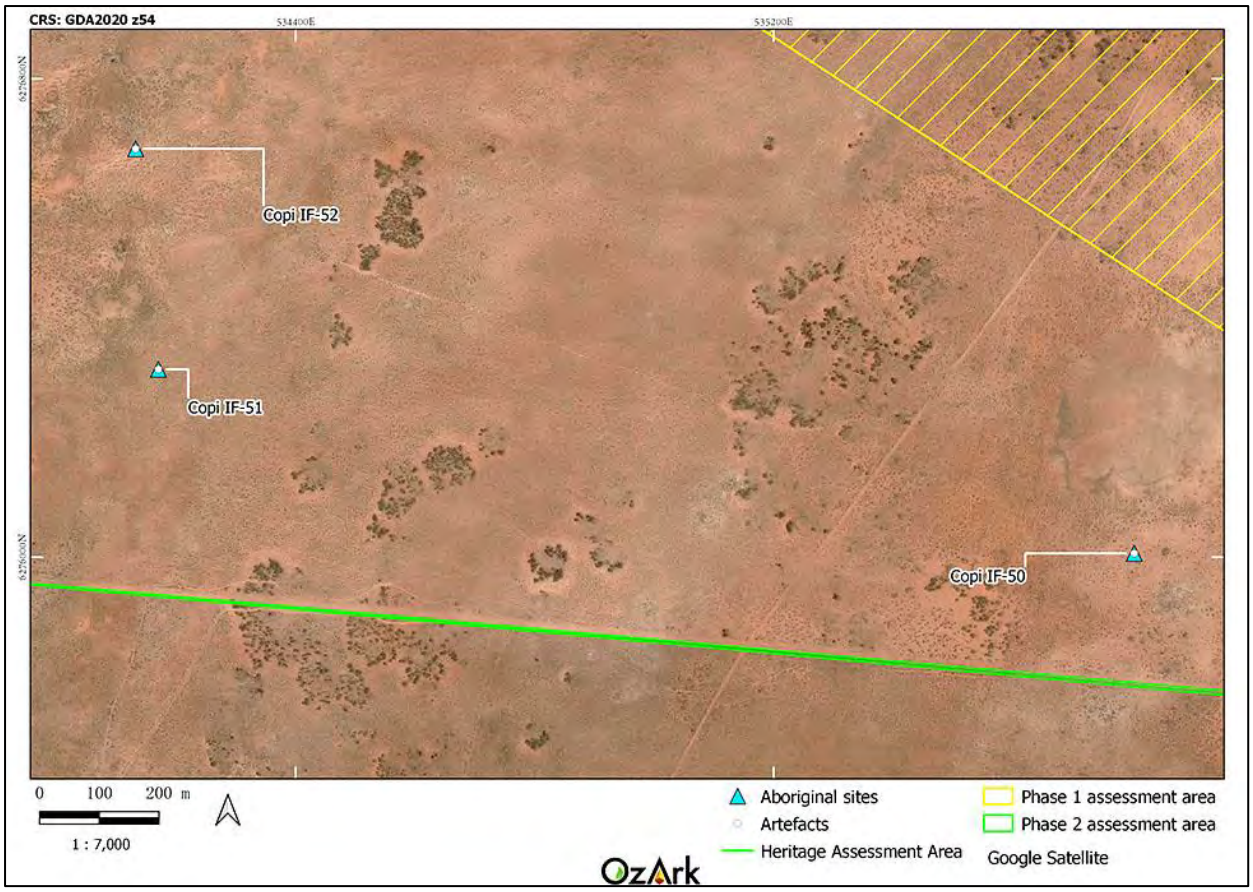
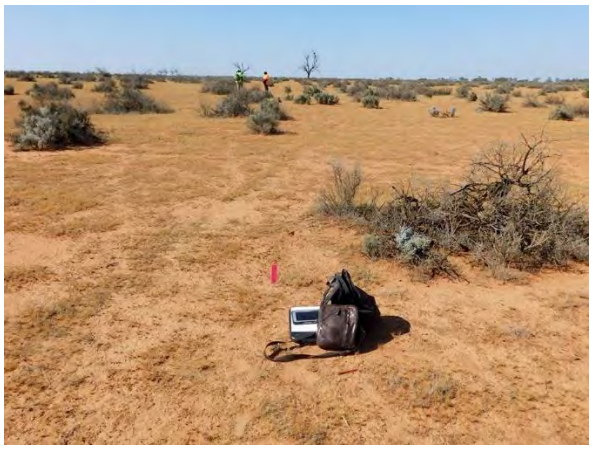


Figure 8-7: Copi IF- 50. View of site and recorded artefact.



1. View of Copi IF-50 (at pin flag).

2. Copi IF-50 artefact: a chert core.

Copi IF-51

Site type: Isolated find

GPS coordinates: GDA Zone 54 534170E 6276314N

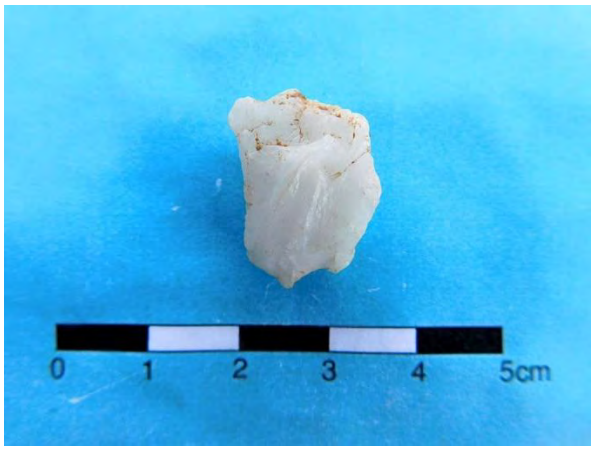
Location of site: Copi IF-51 is located approximately 4.5 km from the western boundary, 13 km from the eastern boundary, and 385 m from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 8-4** and **Figure 8-6**). The site is located 4.8 km directly east of Nulla Road and 8.2 km southwest of Warwick homestead.

Description of site: Copi IF-51 is a single quartz core located on a flat sand plain (**Figure 8-8**). The core has a maximum dimension of 20 mm and displays two previous flake scars. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange/yellow sand. Surrounding vegetation at the site is comprised of shrubs, predominately saltbush. The GSE at the time of recording was high (80%) with a GSV of 70% within the large area of exposure. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-51 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 8-8: Copi IF- 51. View of site and recorded artefact.

1. View of Copi IF-51 at the location of the bags.



2. Copi IF-51 artefact: a quartz core.

Copi IF-52

Site type: Isolated find

GPS coordinates: GDA Zone 54 534131E 6276682N

Location of site: Copi IF-52 is approximately 4.6 km from the western boundary, 13.3 km from the eastern boundary, and 740 m from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 8-4** and **Figure 8-6**). The site is located 5.2 km directly east of Nulla Road and 7.8 km southwest of Warwick homestead.

Description of site: Copi IF-52 is a single silcrete flake located on a flat sand plain (**Figure 8-9**). The artefact measures 18 x 23 x 10 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange/yellow sand. Surrounding vegetation at the site comprises shrubs, predominately saltbush. The GSE at the time of recording was high (80%) with a GSV of 80% within the large area of exposure. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-52 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 8-9: Copi IF-52. View of site and recorded artefact.

1. View of Copi IF-52 at the location of the bag.

2. Copi IF-52 artefact: a silcrete flake (dorsal surface).

Copi IF-53

Site type: Isolated find

GPS coordinates: GDA Zone 54 534324E 6277120N

Location of site: Copi IF-53 is located approximately 4.9 km from the western boundary, 13 km from the eastern boundary, and 1.2 km from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 8-4** and **Figure 8-10**). The site is located 5.8 km directly east of Nulla Road and 7.3 km southwest of Warwick homestead.

Description of site: Copi IF-53 is a single distal fragment of a silcrete flake located on a sand plain (**Figure 8-11**). The artefact measures 28 x 18 x 10 mm and is at a secondary stage of reduction. There is edge wear on one margin of the flake. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange/yellow sand. Surrounding vegetation at the site comprises predominately of saltbush. The GSE at the time of recording was moderate (40%) with a GSV of 90% within the large area of exposure. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-53 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 8-10: Location of Copi IF-53 to IF-54 and Copi OS-33 to OS34.

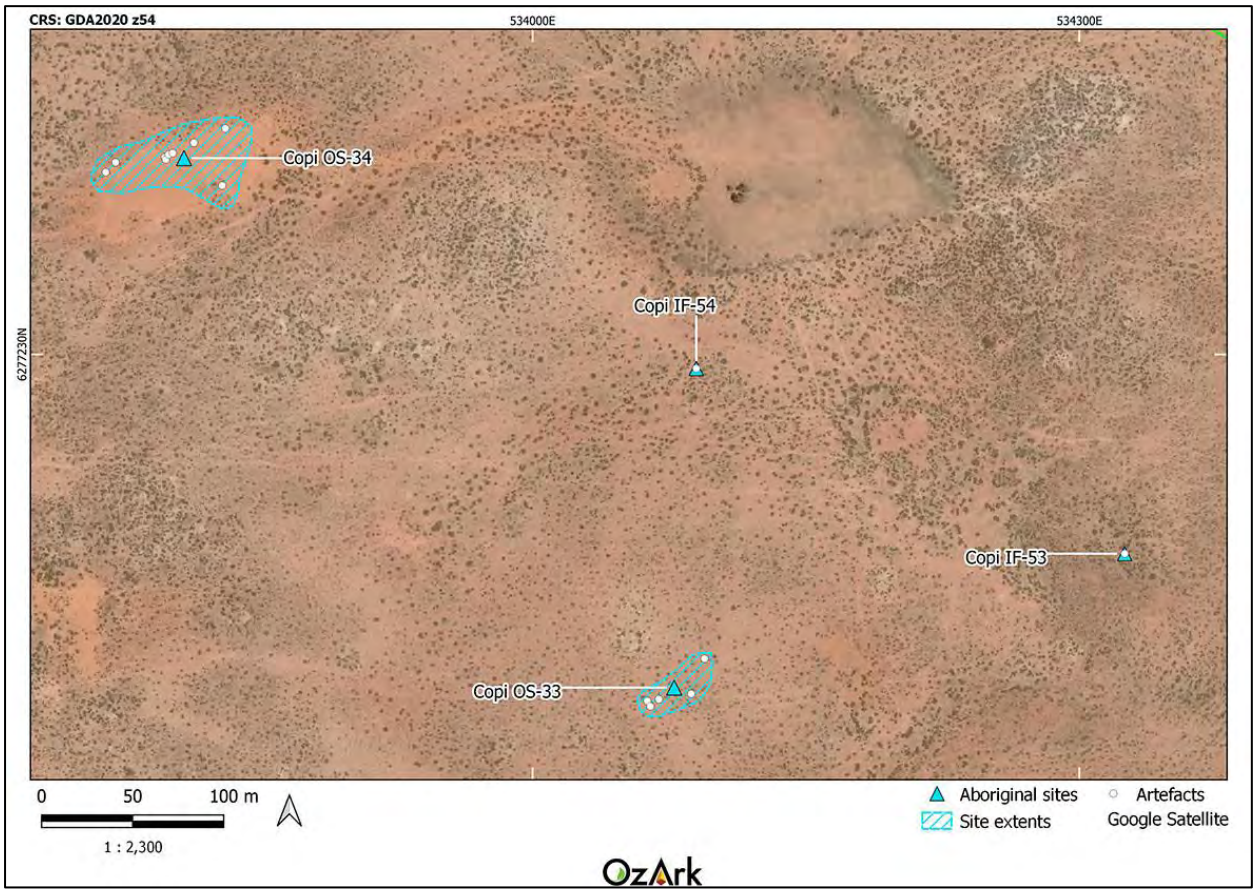


Figure 8-11: Copi IF-53. View of site and recorded artefact.

1. View of Copi IF-53 at the location of the bag.

2. Copi IF-53 artefact: a silcrete flake.

Copi IF-54

Site type: Isolated find

GPS coordinates: GDA Zone 54 534089E 6277222N

Location of site: Copi IF-54 is located approximately 4.7 km from the western boundary, 13.3 km from the eastern boundary and 1.2 km from the southern boundary of

Lot 4068 DP766543 on the Warwick property (**Figure 8-4** and **Figure 8-10**). The site is located 5.6 km directly east of Nulla Road and 7.4 km southwest of Warwick homestead.

Description of site: Copi IF-54 is a single silcrete flake located on a flat sand plain (**Figure 8-12**). The artefact measures 33 x 20 x 9 mm and is at a secondary stage of reduction. The artefact appears to have been heavily weathered. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange/yellow sand. Surrounding vegetation at the site comprises shrubs, predominately saltbush. The GSE at the time of recording was high (80%) with a GSV of 90% within the large area of exposure. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-54 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 8-12: Copi IF-54. View of site and recorded artefact.

1. View of Copi IF-54.

2. Copi IF-54 artefact: a silcrete flake (dorsal surface).

Copi IF-55

Site type: Isolated find

GPS coordinates: GDA Zone 54 531732E 6276458N

Location of site: Copi IF-55 is located approximately 2.1 km from the western boundary, 15.6 km from the eastern boundary, and 500 m from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 8-4** and **Figure 8-13**). The site is located 2.7 km directly east of Nulla Road and 9.4 km southwest of Warwick homestead.

Description of site: Copi IF-55 is a single silcrete flake located on a gentle slope (**Figure 8-14**). The artefact measures 23 x 22 x 6 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange/yellow sand. Surrounding vegetation at the site is comprised of isolated trees

and shrubs including saltbush. The GSE at the time of recording was high (75%) with a GSV of 90% within the large area of exposure. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-55 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 8-13: Location of Copi IF-55 to IF-57.

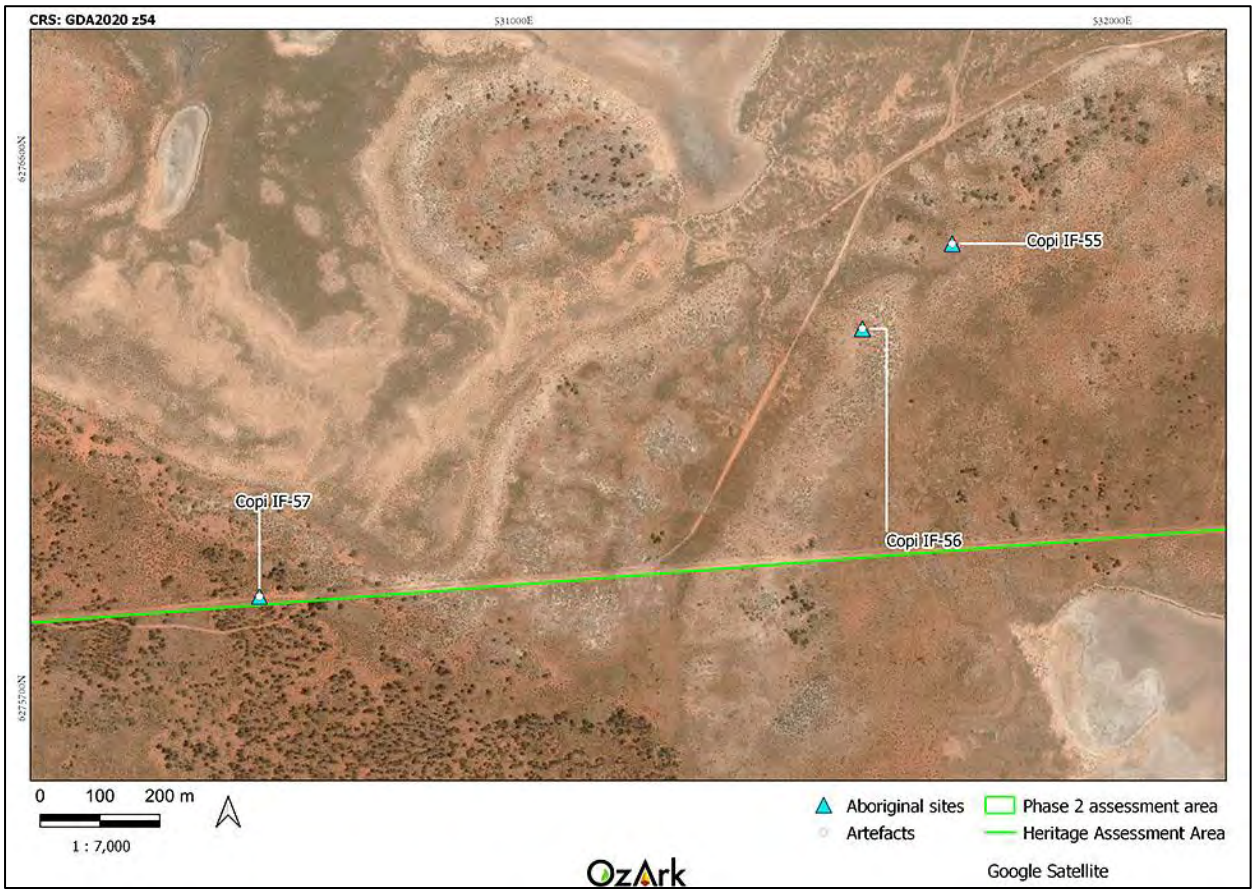


Figure 8-14: Copi IF-55. View of site and recorded artefact.

	
1. View of Copi IF-55 where the folder can be seen on the ground.	2. Copi IF-55 artefact: a silcrete flake (ventral surface).

Copi IF-56

Site type: Isolated find

GPS coordinates: GDA Zone 54 531582E 6276316N

Location of site: Copi IF-56 is located approximately 1.9 km from the western boundary, 15.7 km from the eastern boundary, and 380 m from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 8-4** and **Figure 8-13**). The site is located 2.4 km directly east of Nulla Road and 9.5 km southwest of Warwick homestead.

Description of site: Copi IF-56 is a single quartz flake located on a flat sand plain (**Figure 8-15**). The artefact measures 14 x 10 x 7 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange/yellow sand. Surrounding vegetation at the site comprises shrubs predominately saltbush. The GSE at the time of recording was high (60%) with a GSV of 50% within the large area of exposure. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-56 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 8-15: Copi IF-56. View of site and recorded artefact.

1. View of Copi IF-56 (where the person stands).

2. Copi IF-56 artefact: a quart flake (ventral surface).

Copi IF-57

Site type: Isolated find

GPS coordinates: GDA Zone 54 530575E 6275869N

Location of site: Copi IF-57 is located within the southwest corner of Lot 4068 DP 766543. The site is situated 1.7 km directly east of Nulla Road and 5 km southeast of the Huntingdale Homestead (**Figure 8-4** and **Figure 8-13**).

Description of site: The site is comprised of a single quartz flake located in the windrow of a used farm track (**Figure 8-16**). The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange/red sand. Surrounding vegetation at the site consists of a cleared open woodland with shrubs including saltbush. The GSE at the time of recording was relatively high on the dirt track at approximately 80%. Disturbances include the formation of the dirt track and some vegetation clearing in the surrounding area.

Copi IF-67 is not considered to be associated with subsurface archaeological deposits as it is likely located within secondary context.

Figure 8-16: Copi IF-57. View of site and recorded artefact.

	
1. View to the southwest of Copi IF-57 showing the quartz artefact at the pin flag.	2. Copi IF-57 artefact: a quartz flake (dorsal surface).

Copi IF-58

Site type: Isolated find

GPS coordinates: GDA Zone 54 529570E 6276957N

Location of site: Copi IF-58 is located approximately 164 m from the western boundary, 17.9 km from the eastern boundary, and 1.2 km north-northwest from the southwestern corner of Lot 4068 DP766543 on the Warwick property (**Figure 8-4** and **Figure 8-17**). The site is located 944 m directly east of Nulla Road and 10.6 km southwest of Warwick homestead.

Description of site: Copi IF-58 is a single silcrete flake located on a slight slope (**Figure 8-18**). The artefact measures 32 x 25 x 9 mm and is at a secondary stage of reduction. Although stone was very rare in the area of the recording, the artefact displays minimal flake attributes. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange/yellow sand. Surrounding vegetation at the site comprises open woodland and shrubs including saltbush. The GSE at the time of recording was low (40%) with a GSV of 70% within the area of exposure. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-58 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 8-17: Location of Copi IF-58 to IF-61 and Copi OS-35.

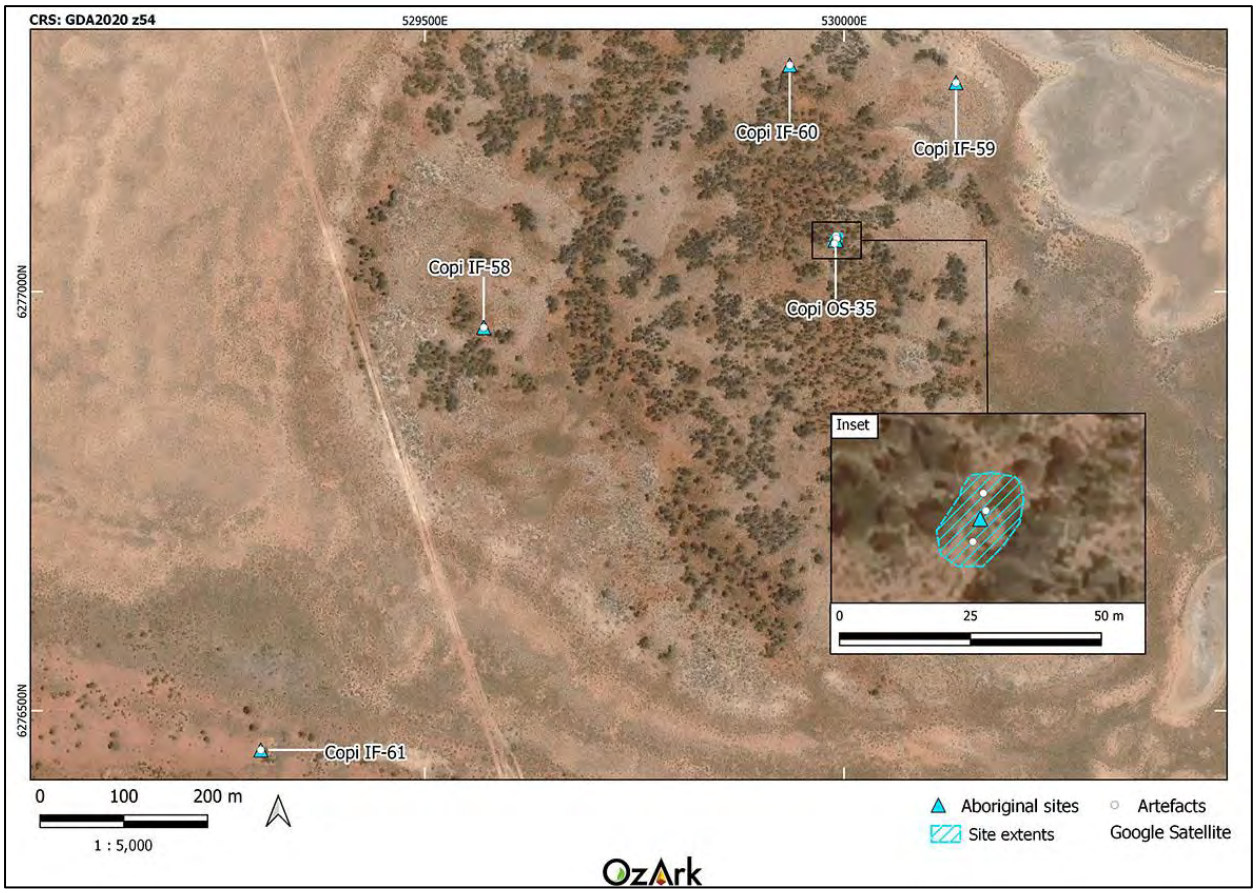


Figure 8-18: Copi IF-58. View of site and recorded artefact.

1. View of Copi IF-58 at the location of the pin flag near the bag on the ground.

2. Copi IF-58 artefact: a silcrete flake (dorsal surface).

Copi IF-59

Site type: Isolated find

GPS coordinates: GDA Zone 54 530133E 6277249N

Location of site: Copi IF-59 is located approximately 800 m from the western boundary, 17.2 km from the eastern boundary, and 1.5 km northeast from the southwestern corner of Lot 4068 DP766543 on the Warwick property (**Figure 8-4** and **Figure 8-17**). The site is located 1.7 km directly east of Nulla Road and 10 km southwest of Warwick homestead.

Description of site: Copi IF-59 is a single silcrete flake located on a flat knoll overlooking extensive depressions (salt lakes) (**Figure 8-19**). The artefact measures 21 x 20 x 8 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange/yellow sand. Surrounding vegetation at the site comprises shrubs including saltbush. The GSE at the time of recording was high (80%) with a GSV of 80% within the large area of exposure. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-59 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 8-19: Copi IF-59. View of site and recorded artefact.

1. View of Copi IF-59 at the pin flag in the foreground.

2. Copi IF-59 artefact: a silcrete flake (dorsal surface).

Copi IF-60

Site type: Isolated find

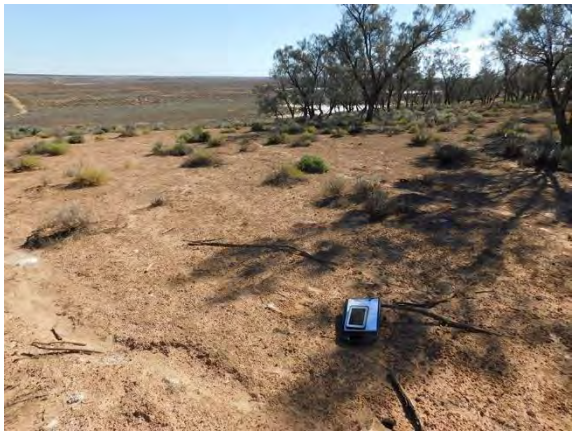
GPS coordinates: GDA Zone 54 529935E 6277270N

Location of site: Copi IF-60 is located approximately 610 m from the western boundary, 17.5 km from the eastern boundary, and 1.47 km northeast from the southwestern corner of Lot 4068 DP766543 on the Warwick property (**Figure 8-4** and **Figure 8-17**). The site is located 1.5 km directly east of Nulla Road and 10.1 km southwest of Warwick homestead.

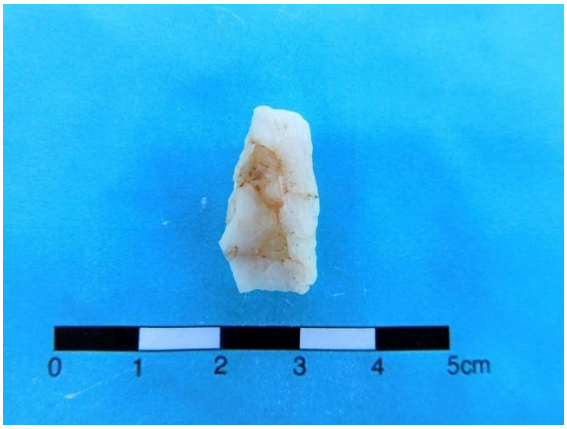
Description of site: Copi IF-60 is a single quartz flake located on a slight slope overlooking depressions (salt lakes) (**Figure 8-20**). The artefact measures 22 x 11 x 10 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange/yellow sand. Surrounding vegetation at the site comprises open woodland and shrubs which were predominately comprised of saltbush. The GSE at the time of recording was high (90%) with a GSV of 90% within the large area of exposure. Identified disturbances include grazing and water wash erosion.

Copi IF-60 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 8-20: Copi IF-60. View of site and recorded artefact.



1. View of Copi IF-60 overlooking an extensive depression.



2. Copi IF-60 artefact: a quartz flake (dorsal surface).

Copi IF-61

Site type: Isolated find

GPS coordinates: GDA Zone 54 529304E 6276453N

Location of site: Copi IF-61 is located in the southeast corner of Lot 1940 DP763792 on the Huntingfield property (**Figure 8-4** and **Figure 8-17**). The site is 340 m east of Nulla Road and 3.8 km southeast of the Huntingfield homestead.

Description of site: Copi IF-61 is a single silcrete flake located on an erosion scald on a gentle slope (**Figure 8-21**). The artefact measures 50 x 29 x 15 mm and is at a secondary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of orange sand. Surrounding vegetation at the site primarily comprises shrubs and scattered trees. The GSE at the time of recording was high (70%) with a GSV of 70%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-61 is assessed as negligible.

Figure 8-21: Copi IF-61. View of site and recorded artefact.

3. View of Copi IF-61 showing the landscape.

4. Copi IF-61 artefact: a silcrete flake (dorsal surface).

Copi IF-62

Site type: Isolated find

GPS coordinates: GDA Zone 54 528030E 6276089N

Location of site: Copi IF-62 is in the southeast corner of Lot 1940 DP763792 on the Huntingfield property (**Figure 8-4** and **Figure 8-22**). The site is 1.2 km west of Nulla Road and 3.7 km southeast of the Huntingfield homestead.

Description of site: Copi IF-62 is a single chert flake located on a rising red sandy flat (**Figure 8-23**). The artefact measures 19 x 18 x 11 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of orange/red sandy clay. Surrounding vegetation at the site primarily comprises shrubs. The GSE at the time of recording was high (70%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-62 is assessed as negligible.

Figure 8-22: Location of Copi IF-62.

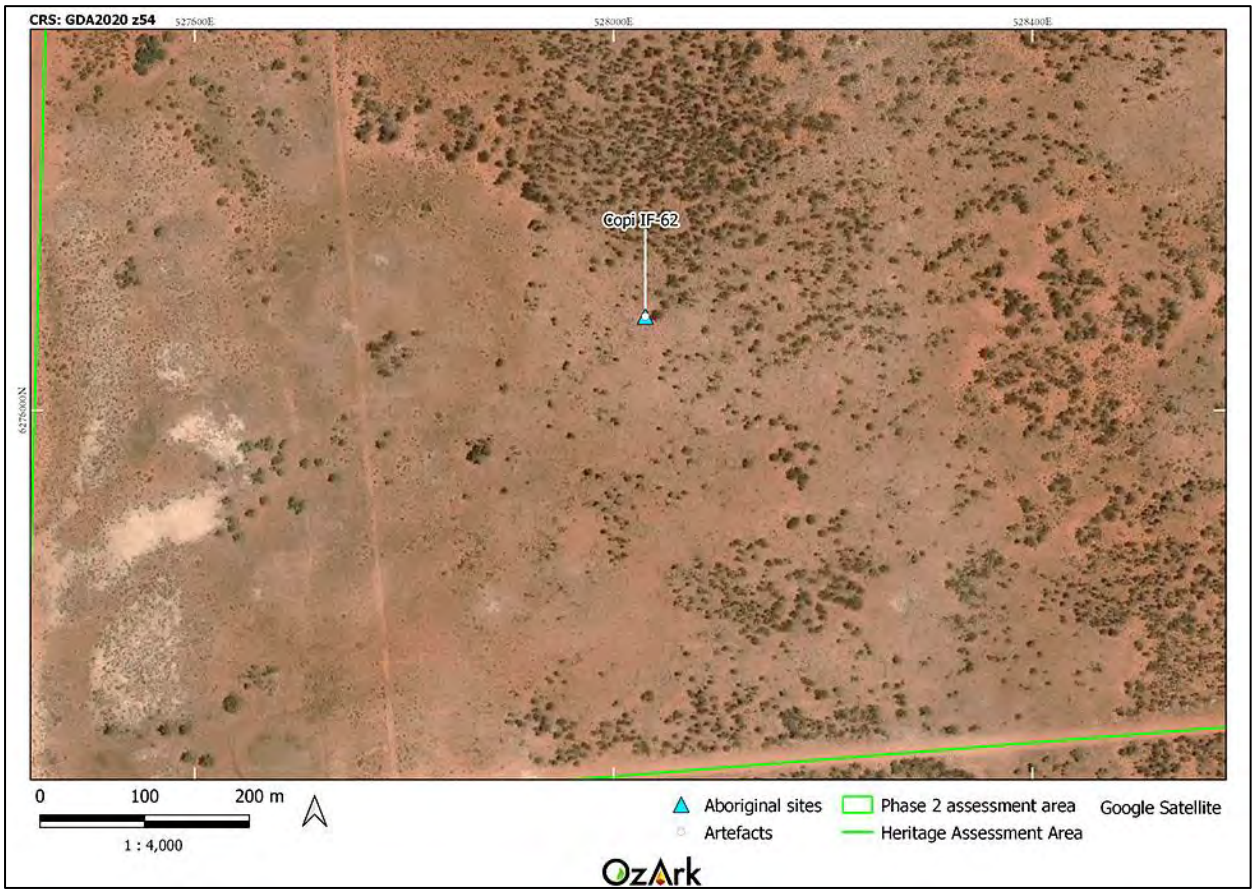


Figure 8-23: Copi IF-62. View of site and recorded artefact.

1. View of Copi IF-62 showing the landscape.

2. Copi IF-62 artefact: a chert flaked piece (dorsal surface).

Copi IF-63

Site type: Isolated find

GPS coordinates: GDA Zone 54 527517E 6278228N

Location of site: Copi IF-63 is in south-eastern portion of Lot 1940 DP763792 on the Huntingfield property (**Figure 8-4** and **Figure 8-24**). The site is 150 m directly west of Nulla Road and 1.5 km south of the Huntingfield homestead.

Description of site: Copi IF-63 is a single quartzite flake (broken into two pieces when discovered) located on a flat sandplain (**Figure 8-25**). The artefact measures 27 x 20 x 5 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of orange/red sand. Surrounding vegetation at the site primarily comprises shrubs. The GSE at the time of recording was high (70%) with a GSV of 70%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-63 is assessed as negligible.

Figure 8-24: Location of Copi IF-63 and IF-65 and Copi OS-36.

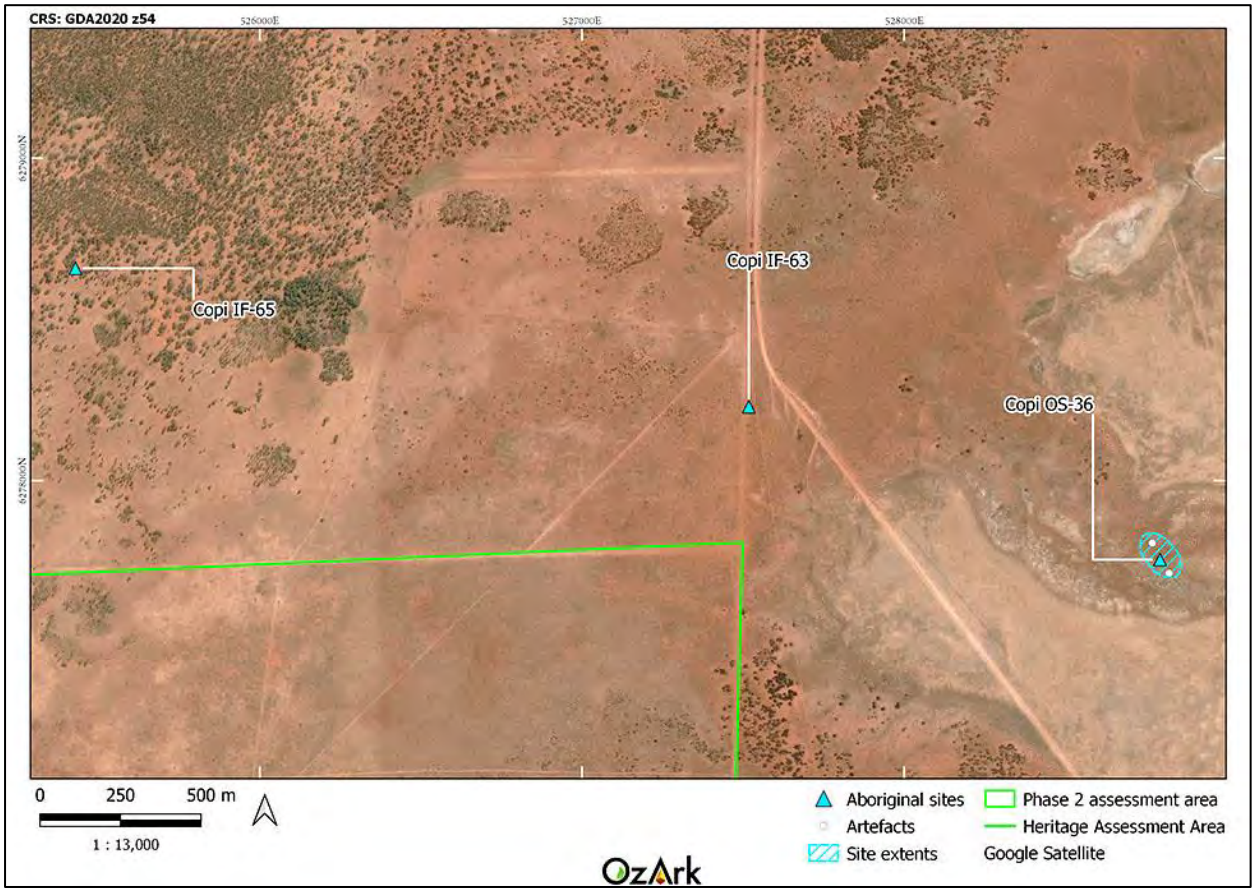


Figure 8-25: Copi IF-63. View of site and recorded artefact.

	
1. View east to the location of Copi IF-63 located on a sandplain.	2. Copi IF-63 artefact: a quartzite flake (dorsal surface). Both pieces are the one flake.

Copi IF-64

Site type: Isolated find

GPS coordinates: GDA Zone 54 529740E 6280178N

Location of site: Copi IF-64 is located approximately 956 m from the western boundary, 18.2 km from the eastern boundary, and 4.3 km north of the south-western corner of Lot 4068 DP766543 on the Warwick property (**Figure 8-4** and **Figure 8-26**). The site is located 1.9 km directly east of Nulla Road and 8.7 km west southwest of Warwick homestead.

Description of site: Copi IF-64 is a single silcrete flake located on a flat landform (**Figure 8-27**). The artefact measures 25 x 33 x 10 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange/yellow sand. Surrounding vegetation at the site comprises open woodland and saltbush. The GSE at the time of recording was high (90%) with a GSV of 80% within the large area of exposure. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-64 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 8-26: Location of Copi IF-64 and Copi OS-37, OS-38, and OS-40.

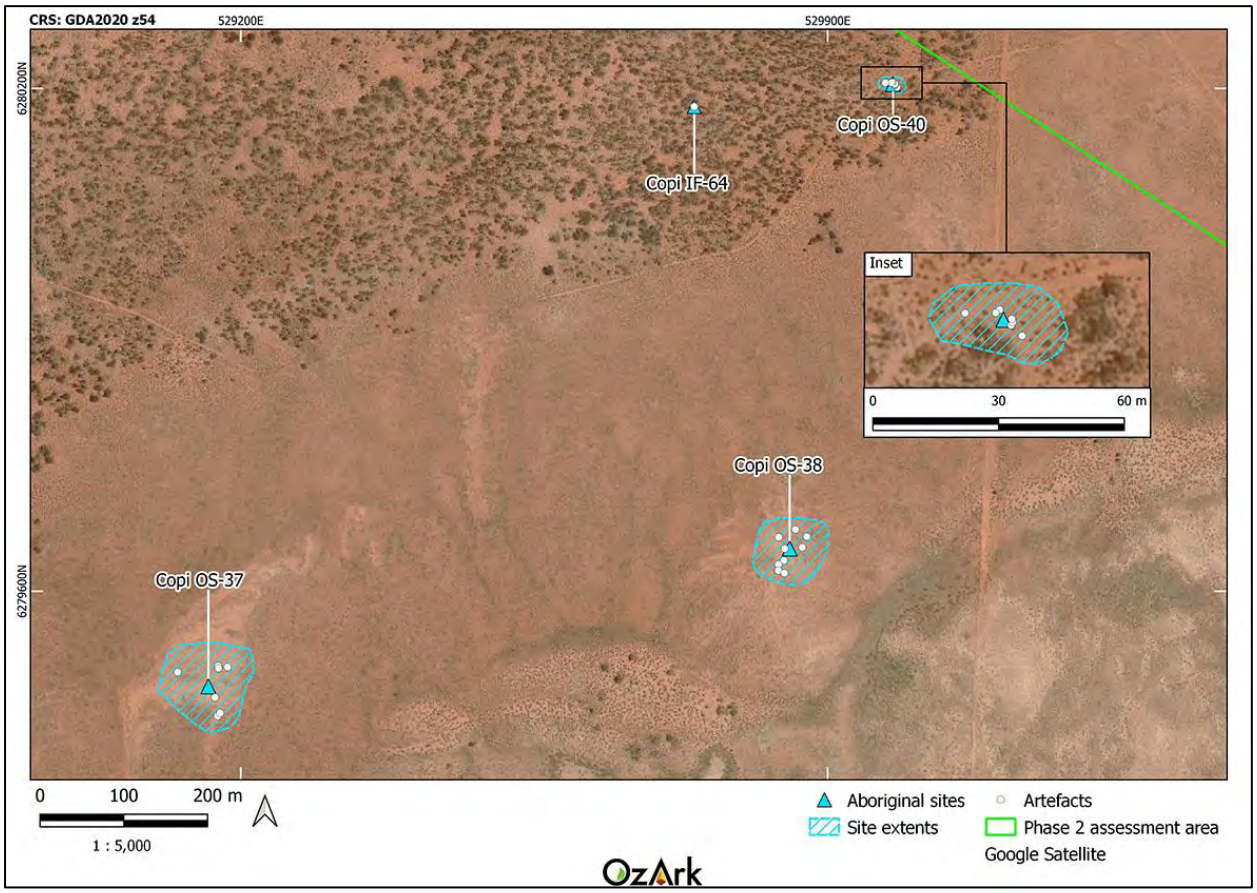
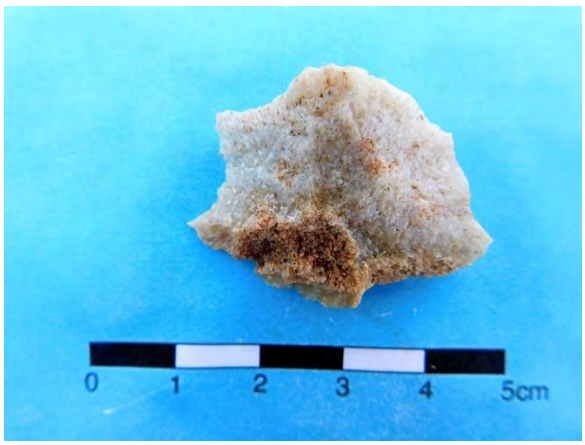


Figure 8-27: Copi IF-64. View of site and recorded artefact.

1. View of Copi IF-64 at the pin flag in the foreground.



2. Copi IF-64 artefact: a silcrete flake (dorsal surface).

Copi IF-65

Site type: Isolated find

GPS coordinates: GDA Zone 54 525427E 6278658N

Location of site: Copi IF-65 is in southern portion of Lot 1940 DP763792 on the Huntingfield property (**Figure 8-4** and **Figure 8-24**). The site is 2.1 km directly west of Nulla Road and 2.3 km southwest of the Huntingfield homestead.

Description of site: Copi IF-65 is a fragment of a fine-grained siliceous flake located on a slight slope (**Figure 8-28**). The artefact measures 40 x 22 x 12 mm and is at a secondary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of orange/red sand. Surrounding vegetation at the site comprises open woodland of trees and shrubs. The GSE at the time of recording was moderate to high (60%) with a GSV of 70%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-65 is assessed as negligible.

Figure 8-28: Copi IF-65. View of site and recorded artefact.

1. View south to the location of Copi IF-65 located on a slight slope.

2. Copi IF-65 artefact: a fine-grained siliceous flake (dorsal surface).

Copi IF-66

Site type: Isolated find

GPS coordinates: GDA Zone 54 522424E 6282263N

Location of site: Copi IF-66 is located in the north-eastern portion of Lot 1940 DP763792 on the Huntingfield property (**Figure 8-5** and **Figure 8-29**). The site is 5.6 km northwest of the Huntingfield homestead and 4.6 km southeast of the intersection of Springwood Road/Pine Camp Road and Nulla Road.

Description of site: Copi IF-66 is a piece of silcrete flake located on a flat sandplain (**Figure 8-30**). The artefact measures 20 x 18 x 7 mm and is at a secondary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of orange/red sand. Surrounding vegetation at the site comprises scattered trees and shrubs. The GSE at the time of recording was high (80%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-66 is assessed as negligible.

Figure 8-29: Location of Copi IF-66 and Copi OS-41.

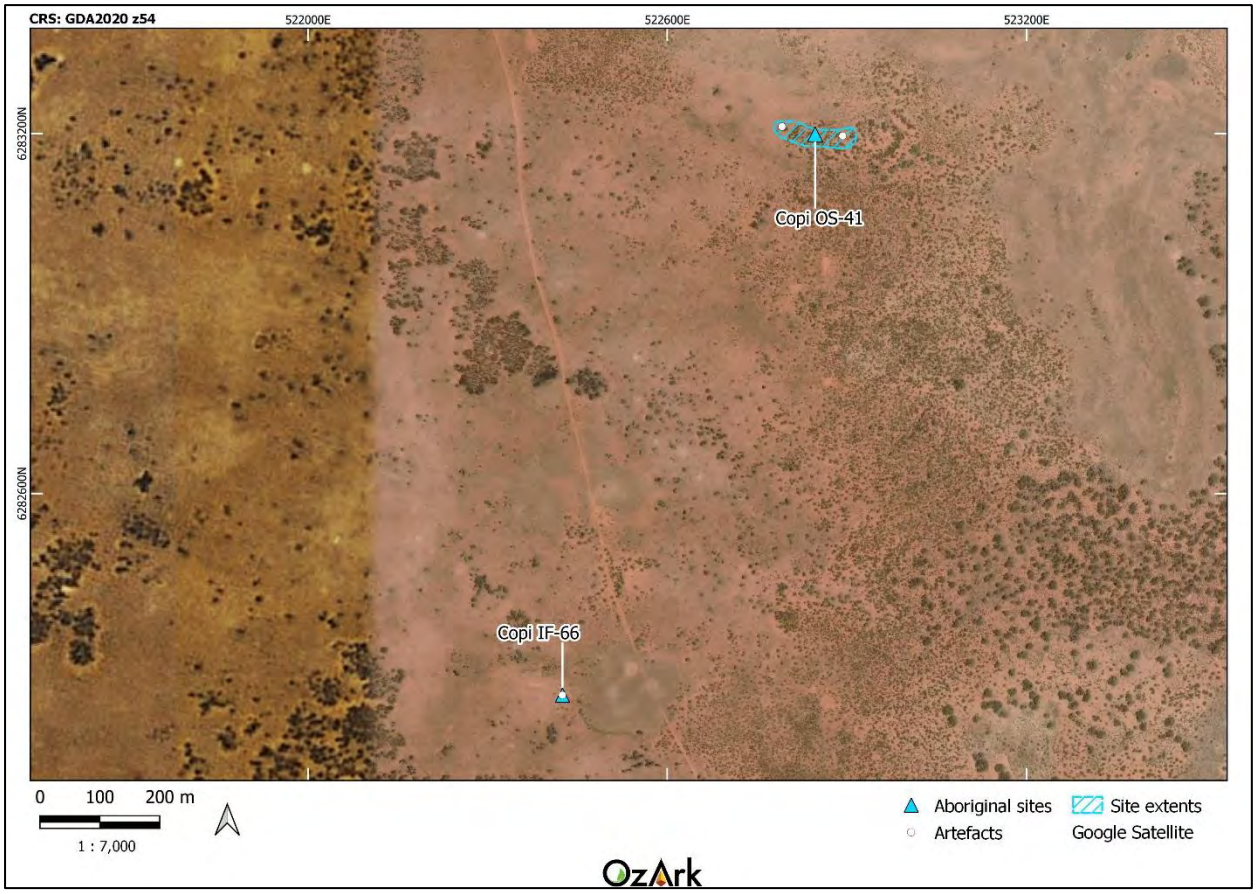


Figure 8-30: Copi IF-66. View of site and recorded artefact.

1. View north to the location of Copi IF-66 located on a flat sandplain.

2. Copi IF-66 artefact: a silcrete flake (dorsal surface).

Copi IF-67

Site type: Isolated find

GPS coordinates: GDA Zone 54 526221E 6286763N

Location of site: Copi IF-67 is situated on a dirt track approximately 4.1 km west of the Nulla Road and Pine Camp Road intersection (**Figure 8-5** and **Figure 8-31**). The site is located within Lot 1907 DP 763791.

Description of site: The site is comprised of a single quartz flake located on a lunette landform (**Figure 8-32**). The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange/red sand. Surrounding vegetation at the site consists of a cleared open woodland with shrubs including saltbush. The GSE at the time of recording was relatively high on the dirt track at approximately 80%. Disturbances include the formation of the dirt track and some vegetation clearing in the surrounding area.

Copi IF-67 is not considered to be associated with subsurface archaeological deposits as it is likely located within secondary context.

Figure 8-31: Location of Copi IF-67 to IF-68 and Copi OS-44 to OS-45.

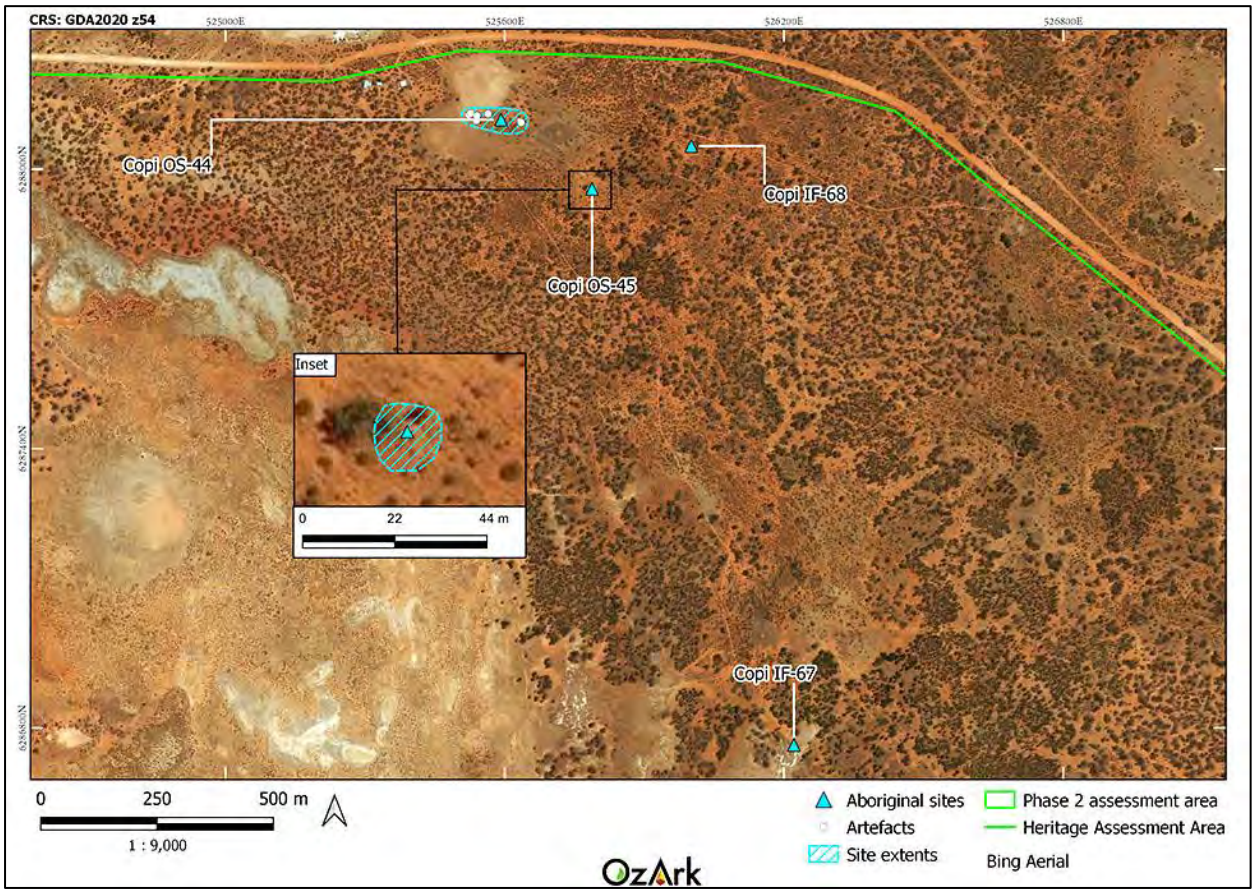
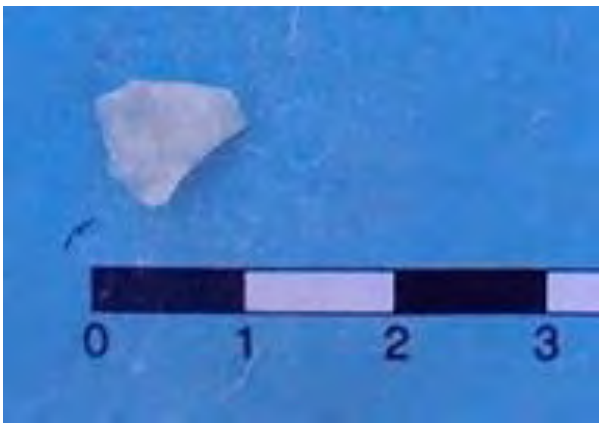


Figure 8-32: Copi IF-67. View of site and recorded artefact.

1. View to the southeast of Copi IF-67 on the dirt track.



2. View of the single quartz flake recorded at Copi IF-67.

Copi IF-68

Site type: Isolated find

GPS coordinates: GDA Zone 54 526000E 6288049N

Location of site: Copi IF-68 is located 4.2 km northeast of the intersection of Nulla Road and Pine Camp Road, 213 m south of Nulla Road, and 3.9 km directly east of Pine Camp Road (**Figure 8-5** and **Figure 8-31**). The site is in the north of the southern portion of Lot 1907 DP763971 on the Huntingfield property.

Description of site: Copi IF-68 is a single silcrete flake located on a lunette (**Figure 8-33**). The artefact measures 21 x 15 x 4 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange/yellow sand. Surrounding vegetation at the site comprises open woodland and shrubs. The GSE at the time of recording was high (90%) with a GSV of 90% within the large area of exposure. Identified disturbances include water wash erosion and sedimentation.

Copi IF-68 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 8-33: Copi IF-68. View of site and recorded artefact.

1. View of Copi IF-68 at the location of the pin flag in the foreground.

2. Copi IF-68 artefact: a silcrete flake (dorsal surface).

Copi IF-69

Site type: Isolated find

GPS coordinates: GDA Zone 54 521891E 6284006N

Location of site: Copi IF-69 is located in the north-western portion of Lot 1940 DP763792 on the Huntingfield property (**Figure 8-5** and **Figure 8-34**). The site is approximately 2.9 km south of the intersection of Springwood Road/Pine Camp Road and Nulla Road.

Description of site: Copi IF-69 is a single silcrete flake located on a red sandy flat to undulating ridge (**Figure 8-35**). The artefact measures 41 x 25 x 10 mm and is at a secondary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of orange/red sand. Surrounding vegetation at the site primarily comprises shrubs. The GSE at the time of recording was high (70%) with a GSV of 70%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-69 is assessed as negligible.

Figure 8-34: Location of Copi IF-69 to IF-70 and Copi OS-42 to OS-43.

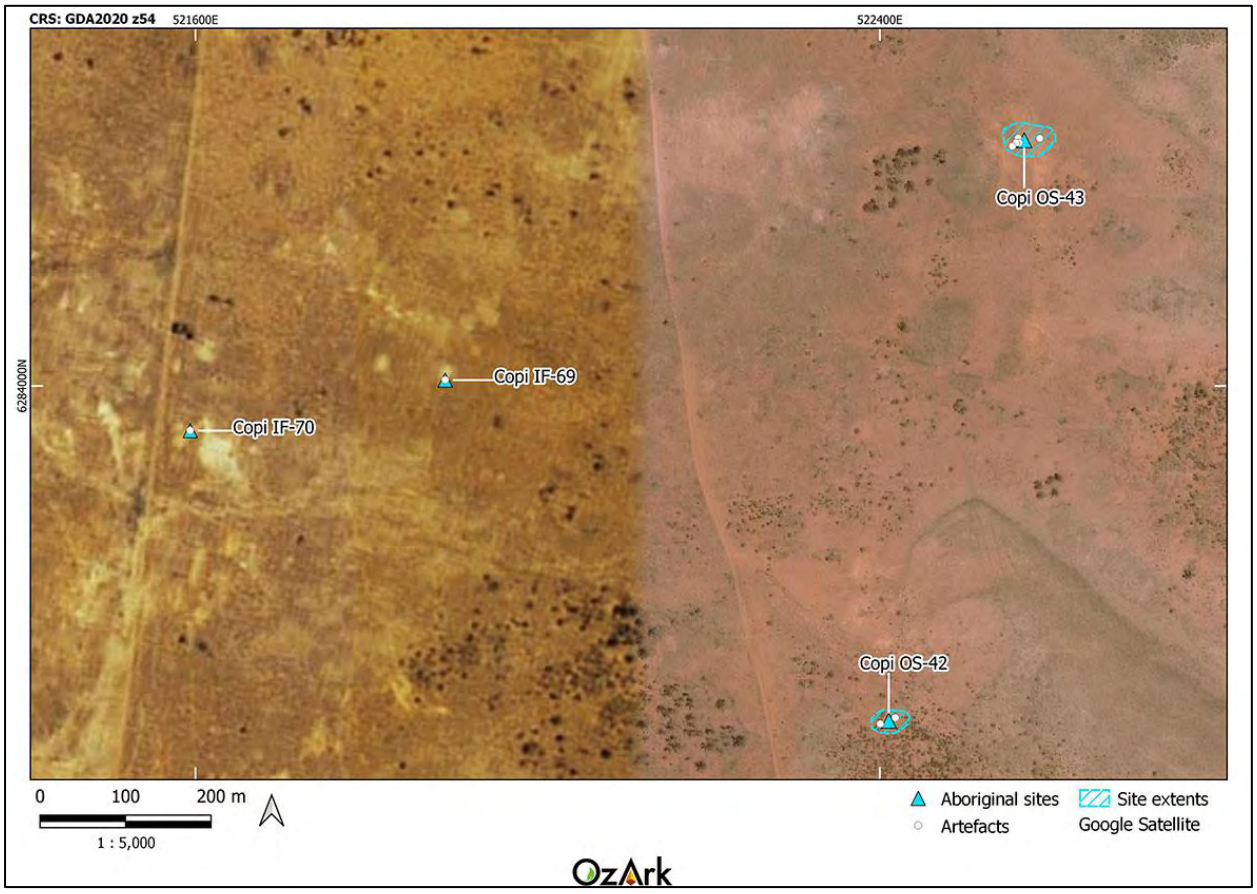


Figure 8-35: Copi IF-69. View of site and recorded artefact.

1. View of Copi IF-69 at the pin flag and bag.

2. Copi IF-69 artefact: a silcrete flake (dorsal surface).

Copi IF-70

Site type: Isolated find

GPS coordinates: GDA Zone 54 521593E 6283947N

Location of site: Copi IF-70 is in the north-western portion of Lot 1940 DP763792 on the Huntingfield property (**Figure 8-5** and **Figure 8-34**). The site is approximately 3.0 km south of the intersection of Springwood Road/Pine Camp Road and Nulla Road.

Description of site: Copi IF-70 is a single silcrete flake located on a low sandy rise within a gently undulating plain landform and was situated on the edge of an eroding clay pan (**Figure 8-36**). The artefact measures 38 x 20 x 6 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of orange/red sand. Surrounding vegetation at the site primarily comprises shrubs. The GSE at the time of recording was high (70%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-70 is assessed as negligible.

Figure 8-36: Copi IF-70. View of site and recorded artefact.

1. View of Copi IF-70 showing the landscape.

2. Copi IF-70 artefact: a silcrete flake (dorsal surface).

Copi IF-71

Site type: Isolated find

GPS coordinates: GDA Zone 54 517023E 6283605N

Location of site: Copi IF-71 is located along the southern boundary of Lot 1 DP756199 on the Sunshine property (**Figure 8-5** and **Figure 8-37**). The site is 1.7 km directly west of Nulla Road and 5.9 km southwest of the intersection of Springwood Road/Pine Camp Road and Nulla Road.

Description of site: Copi IF-71 is a black silcrete flake located on a very gentle slope just off a gentle spur crest (**Figure 8-38**). The artefact measures 41 x 40 x 11 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of orange/red sand. Surrounding vegetation at the site comprises scattered trees and shrubs. The GSE at the time of recording was high (70%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Potential for the presence of further subsurface archaeological deposits at Copi IF-71 is assessed as negligible.

Figure 8-37: Location of Copi IF-71 and Copi OS-46.

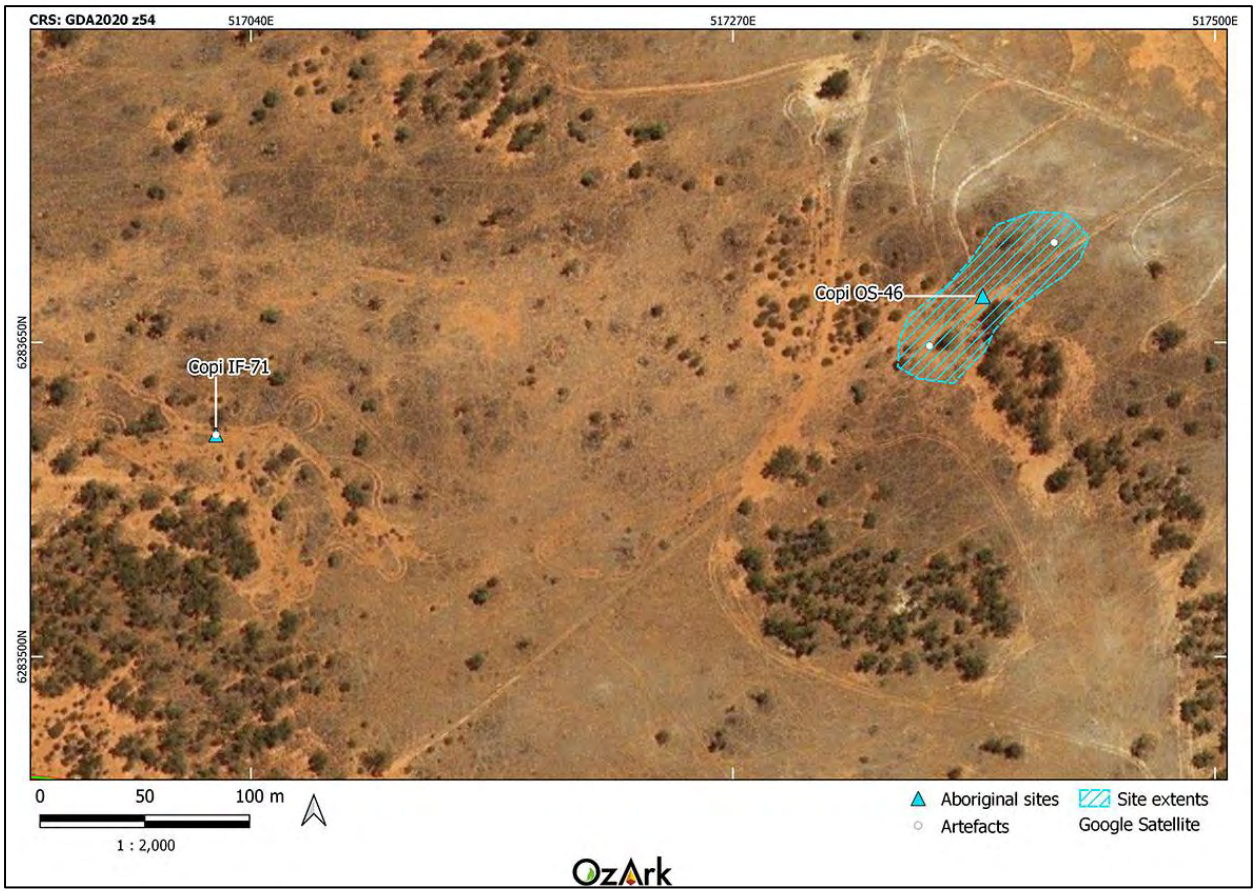


Figure 8-38: Copi IF-71. View of site and recorded artefact.

1. View of Copi IF-71 at the pin flag.

2. Copi IF-71 artefact: a silcrete flake (dorsal surface).

8.3.1 Open sites

An additional 19 open sites were recorded during the Phase 2 survey. These are listed in **Table 8-5** and shown on **Figure 8-39** and **Figure 8-40**. Full details of each open site follow.

Table 8-5: Open sites recorded during the Phase 2 survey.

ID	AHIMS ID	Site name	GDA Zone 54 Easting	GDA Zone 54 Northing	Feature(s)	Landform
104	39-4-0802	Copi OS-33	534077	6277047	Artefact scatter	Lunettes and Islands
105	39-4-0803	Copi OS-34	533808	6277337	Artefact scatter	Lunettes and Islands
106	39-4-0804	Copi OS-35	529989	6277061	Artefact scatter	Lunettes and Islands
107	39-4-0805	Copi OS-36	528793	6277754	Artefact scatter	Lake Footslopes
108	39-4-0771	Copi OS-37	529161	6279486	Artefact scatter	Lake Footslopes
109	39-4-0772	Copi OS-38	529854	6279650	Artefact scatter	Lake Footslopes
110	39-4-0773	Copi OS-39	531198	6279285	Artefact scatter	Lake Footslopes
111	39-4-0774	Copi OS-40	529977	6280205	Artefact scatter	Lake Footslopes
112	39-4-0775	Copi OS-41	522846	6283198	Artefact scatter	Lake Footslopes
113	39-4-0776	Copi OS-42	522410	6283608	Artefact scatter	Lake Footslopes
114	39-4-0777	Copi OS-43	522568	6284286	Artefact scatter	Lake Footslopes
115	39-4-0778	Copi OS-44	525592	6288106	Artefact scatter	Lunettes and Islands
116	39-4-0779	Copi OS-45	525787	6287957	Artefact scatter	Lunettes and Islands
117	39-4-0780	Copi OS-46	517389	6283672	Artefact scatter	Sandplains and Dunes
118	39-4-0781	Copi OS-47	518740	6284865	Artefact scatter	Sandplains and Dunes
119	39-4-0782	Copi OS-48	518013	6285631	Artefact scatter	Sandplains and Dunes
120	39-4-0784	Copi OS-49	519572	6286291	Artefact scatter; hearths	Sandplains and Dunes
121	39-4-0783	Copi OS-50	519572	6286291	Artefact scatter	Lake Footslopes
122	39-4-0785	Copi OS-51	521364	6284836	Artefact scatter; hearths	Lake Footslopes

Figure 8-39: Overview of the location of all recorded artefact scatters within the eastern portion of the Phase 2 assessment area.

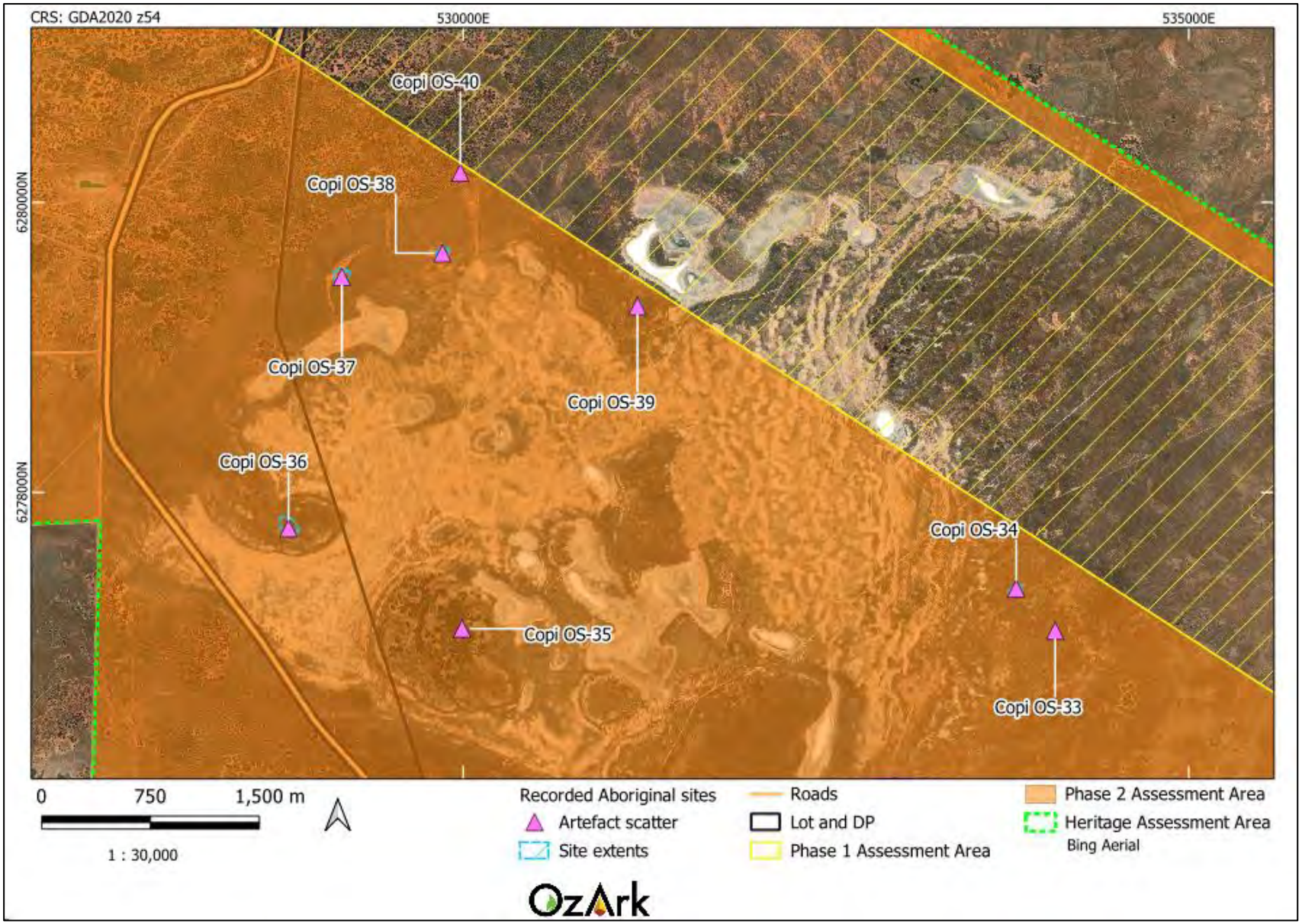
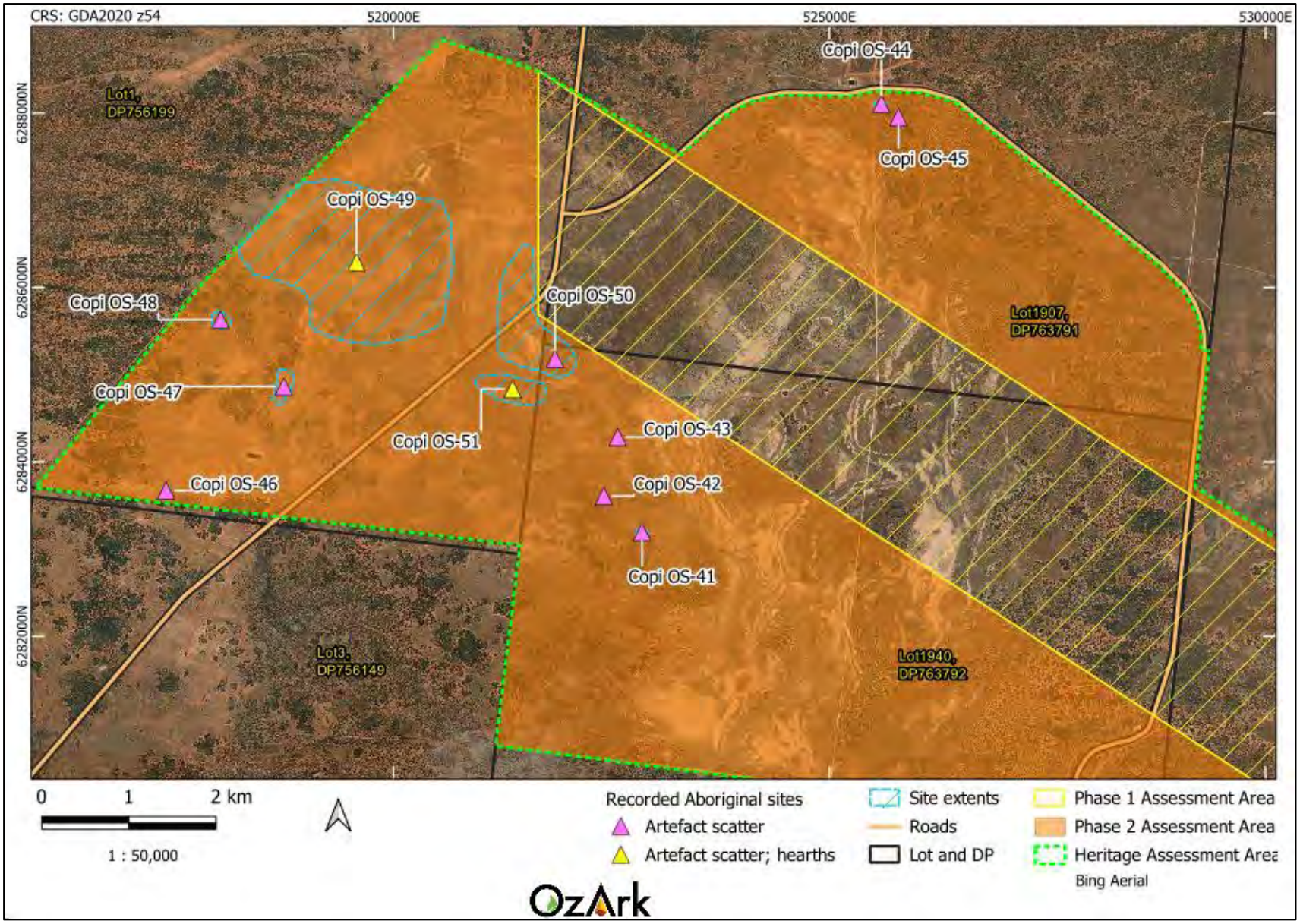


Figure 8-40: Overview of the location of all recorded open sites within the western portion of the Phase 2 assessment area.



Copi OS-33

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 534077E 6277047N

Location of site: Copi OS-33 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 8-39** and **Figure 8-10**). The site is 5.4 km directly east of Nulla Road and 7.5 km southwest of the Warwick homestead.

Description of site: Copi OS-33 is an artefact scatter consisting of five artefacts located on a toe slope above a depression (**Figure 8-41**). Artefacts include flakes, a piece of shatter, and a single core (**Table 8-6**). The site extent is 50 x 36 m, encompassing an area of 0.82 ha of land. The extent of the site is defined by the artefact spread. The GSE at the site was high (70%) with a GSV of 80% within the site extent. Soil on consists of orange/ yellow sand. Vegetation includes sparse shrub cover, predominately saltbush. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi OS-33 is not considered to be associated with subsurface archaeological deposits.

Figure 8-41: Copi OS-33. View of site and selection of recorded artefacts.

1. View of the landscape at Copi OS-33.

2. Selection of artefacts from Copi OS-33.

Table 8-6: Copi OS-33 artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Core	Silcrete	Complete	Tertiary	Max 31
Shatter	Silcrete	N/A	Tertiary	Max 35
Flake	Silcrete	Proximal fragment	Tertiary	Max 22
Flake	Silcrete	Complete	Tertiary	Max 23
Flake	Silcrete	Complete	Tertiary	Max 35

Copi OS-34

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 533808E 6277337N

Location of site: Copi OS-34 is located in the southwest portion of Lot 4068 DP 766543, approximately 6.5 km southeast of the Huntingdale airstrip (**Figure 8-39** and **Figure 8-10**).

Description of site: Copi OS-34 is an artefact scatter consisting of 9 artefacts located within a clay pan along a ridge line (**Figure 8-42**). Most artefacts are flakes (n=6), with two pieces of shatter and one core. Artefacts were manufactured from silcrete (n=8) with one quartz artefact (**Table 8-7**). The site extent is 87 x 50 m. Soil consists of orange/red sand with surrounding vegetation including low-lying shrub such as saltbush. The GSE was relatively high at 90% within the clay pan, with a GSV of 95%. Disturbances include erosion and grazing.

Copi OS-34 is not considered to be associated with subsurface archaeological deposits as it is likely located within secondary context.

Figure 8-42: Copi OS-34. View of site and selection of recorded artefacts.

1. View to the southeast of Copi OS-34 showing a selection of recorded artefacts flagged.

2. Selection of artefacts from Copi OS-34.

Table 8-7: Copi OS-34 artefact attributes.

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm	Additional detail
Flake	Silcrete	Complete	Tertiary	20 x 17 x 7	
Flake	Silcrete	Proximal fragment	Tertiary	15 x 22 x 7	
Flake	Silcrete	Complete	Tertiary	21 x 26 x 10	
Flake	Silcrete	Medial fragment	Tertiary	21 x 12 x 4	
Flake	Silcrete	Complete	Tertiary	14 x 23 x 6	
Flake	Quartz	Complete	Tertiary	19 x 19 x 5	

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm	Additional detail
Artefact scatter	Silcrete	N/A	Tertiary	14 x 21 x 7	
Artefact scatter	Silcrete	N/A	Tertiary	18 x 12 x 6	
Core	Silcrete	N/A	Secondary	32 x 38 x 16	Multidirectional, 8 flake scars, 5% cortex, opportunistic

Copi OS-35

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 529989E 6277061N

Location of site: Copi OS-35 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 8-39** and **Figure 8-17**). The site is 1.4 km directly east of Nulla Road and 7.4 km southwest of the Warwick homestead.

Description of site: Copi OS-35 is an artefact scatter consisting of three artefacts located in a gentle slope landform (**Figure 8-43**). Artefacts include a core and two manuports (**Table 8-8**). The site extent is 14.9 x 17.9 m, encompassing an area of 211 square meters. The GSV is 100% within the site extent. Soils consist of orange / yellow sand. Vegetation is comprised of very sparse shrub cover dotted through the erosion scald. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi OS-35 is not considered to be associated with subsurface archaeological deposits.

Figure 8-43: Copi OS-35. View of site and a sample of recorded artefacts.

1. View of the landscape at Copi OS-35.

2. Silcrete core from Copi OS-35.

Table 8-8: Copi OS-35 artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Core	Silcrete	Complete	Secondary	Max 46
Manuport	Silcrete	N/A	N/A	16 x 9 x 3

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Manuport	Silcrete	N/A	N/A	25 x 18 x 8

Copi OS-36

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 528793E 6277754N

Location of site: Copi OS-36 is in the southeast corner of Lot 1940 DP763792 on the Huntingfield property (**Figure 8-39** and **Figure 8-24**). The site is 750 m east of Nulla Road and 2.4 km southeast of the Huntingfield homestead.

Description of site: Copi OS-36 is an artefact scatter consisting of two artefacts located on raised dune ridge landform (**Figure 8-44**), with the two artefacts separated by over 160 m, one on a western facing upper slope and the second on the crest further to the east. The artefacts are both silcrete flakes (**Table 8-9**). The site extent is 160 x 95 m, encompassing an approximate area of 1.2 ha of land. The extent of the site is defined by the east west spread of these artefacts. Soils at the site consist of an orange sandy dune with vegetation mainly comprising of saltbush and scattered trees. GSE at the time of recording was high at 70%, with a GSV of 70% in the areas of exposures. Disturbance primarily includes grazing and erosion.

Copi OS-36 is not considered to be associated with subsurface archaeological deposits.

Figure 8-44: Copi OS-36. View of site and recorded artefacts.

1. View of Copi OS-36 showing the landscape off the dune to the west.

2. Silcrete flake from Copi OS-36.

3. View of Copi OS-36 showing the landscape off the dune to the east.

4. Silcrete flake, ventral surface.

Table 8-9: Copi OS-36 artefact attributes.

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm
Flake	Silcrete	Complete	Secondary	32 x 23 x 11
Flake	Silcrete	Complete	Tertiary	50 x 32 x 9

Copi OS-37

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 529161E 6279486N

Location of site: Copi OS-37 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 8-39** and **Figure 8-26**). The site is 1.6 km directly east of Nulla Road and 9.5 km southwest of the Warwick homestead.

Description of site: Copi OS-37 is an artefact scatter consisting of seven artefacts located in a large erosion scald on a gentle slope (**Figure 8-45**). Artefacts include flakes and two cores (**Table 8-10**). One of the cores is a good example of a horseshoe core. The site extent is 112 x 107 m, encompassing an approximate area of 0.9 ha of land. The extent of the site is defined by the artefact distribution. The GSE at the site was high (80%) with a GSV of 100% within the site extent. Soils consist of light red/brown sand. Vegetation includes sparse shrub cover. Identified disturbances include grazing and significant water wash erosion.

Copi OS-37 is not considered to be associated with subsurface archaeological deposits.

Figure 8-45: Copi OS-37. View of site and a sample of recorded artefacts.

1. View of the landscape at Copi OS-37.

2. Silcrete core from Copi OS-37.

Table 8-10: Copi OS-37 artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Core	Silcrete	Complete	Secondary	Max 32
Core	Silcrete	Complete	Secondary	Max 52
Flake	Silcrete	Complete	Tertiary	Max 17
Flake	Silcrete	Complete	Tertiary	Max 26
Flake	Silcrete	Complete	Tertiary	28 x 17 x 4
Flake	Silcrete	Proximal Fragment	Tertiary	17 x 29 x 9
Flake	Silcrete	Distal Fragment	Tertiary	22 x 24 x 8

Copi OS-38

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 529854E 6279650 N

Location of site: Copi OS-38 is located 2.3 km and 2.2 km directly east of the Huntingdale Homestead and Nulla Road respectively (**Figure 8-39** and **Figure 8-26**).

Description of site: The low-density artefact scatter consists of 9 artefacts located in a clay pan along a small ridge protruding south from the slope of a large salt lake (**Figure 8-46**). Most artefacts were manufactured from silcrete (n=8), with one artefact made from quartz (**Table 8-11**). The extent of the site is 85 x 80 m, encompassing most of the clay pan. Soils consist of orange/yellow sand with surrounding vegetation including an abundance of saltbush. GSE at the time of recording was high at 90% with a GSV of 95% within the clay pan. Disturbances primarily involve erosional processes and grazing.

Copi OS-38 is not considered to be associated with subsurface archaeological deposits as it is likely located within secondary context.

Figure 8-46: Copi OS-38. View of site and selection of recorded artefacts.

1. View to the south of Copi OS-38 showing a selection of recorded artefacts flagged.

2. Selection of artefacts from Copi OS-38.

Table 8-11: Copi OS-38 artefact attributes.

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm
Flake	Silcrete	Complete	Tertiary	26 x 34 x 6
Flake	Silcrete	Complete	Tertiary	16 x 22 x 5
Flake	Silcrete	Complete	Primary	36 x 30 x 8
Flake	Silcrete	Complete	Tertiary	20 x 29 x 9
Flake	Silcrete	Complete	Tertiary	39 x 43 x 18
Flake	Silcrete	Proximal fragment	Tertiary	22 x 26 x 10
Flake	Silcrete	Proximal fragment	Tertiary	21 x 12 x 8
Flake	Quartz	Complete	Tertiary	15 x 16 x 6
Shatter	Silcrete	N/A	Tertiary	20 x 31 x 12

Copi OS-39

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 531198E 6279285N

Location of site: Copi OS-39 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 8-39** and **Figure 8-47**). The site is 3.6 km directly east of Nulla Road and 7.9 km southwest of the Warwick homestead.

Description of site: Copi OS-39 is an artefact scatter consisting of four artefacts located on a gentle slope at the end of a long crest (**Figure 8-48**). Artefacts include flakes, and a side scraper (**Table 8-12**). Some artefacts displayed signs of long weathering. The site extent is 54 x 47 m, encompassing an approximate area of 2.2 ha of land. The GSE at the site was high (70%) with a GSV of 60% within the site extent. Soils consist of orange / yellow sand. Vegetation is categorised as open saltbush. Identified disturbances include grazing, and deflation.

Copi OS-39 is not considered to be associated with subsurface archaeological deposits.

Figure 8-47: Location of Copi OS-39.

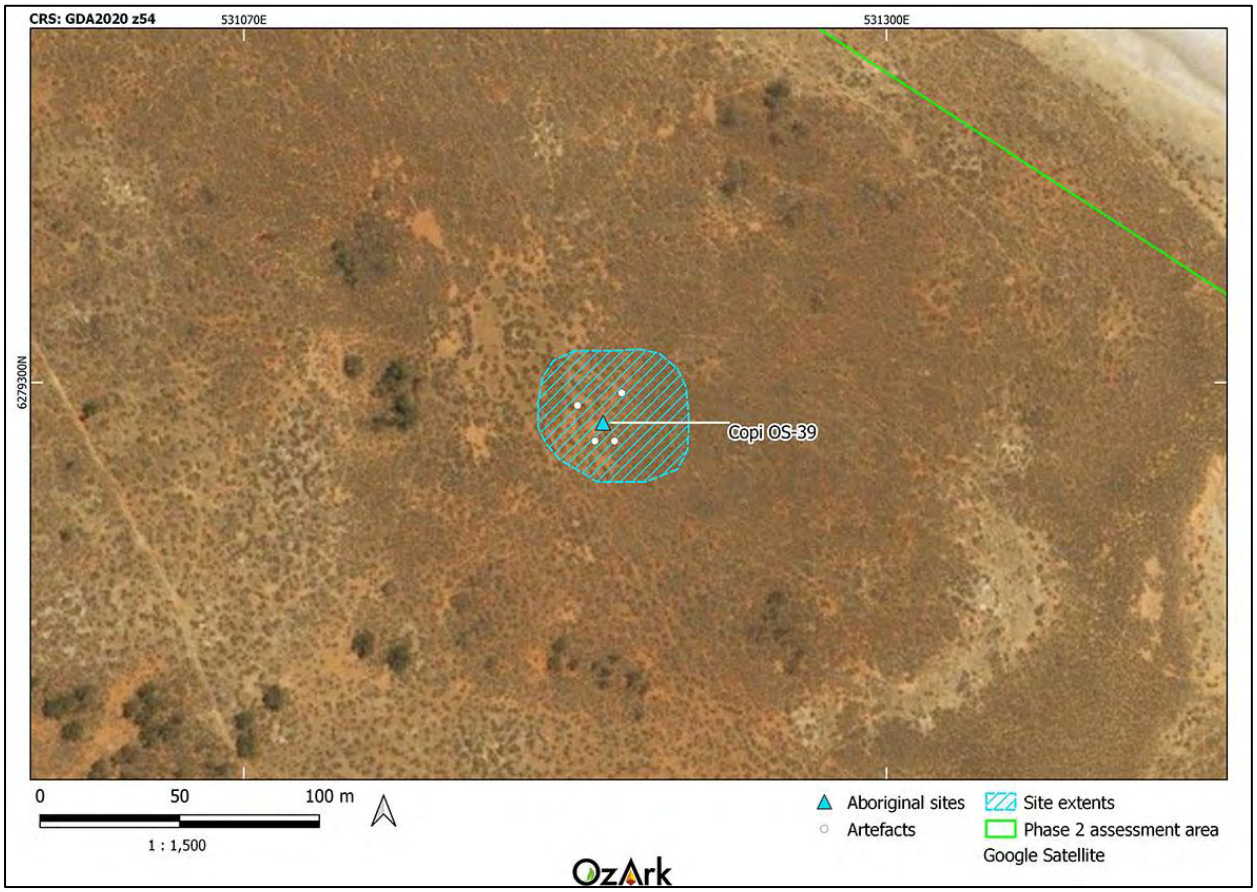


Figure 8-48: Copi OS-39. View of site and selection of recorded artefacts.

1. View of the landscape at Copi OS-39.

2. A silcrete flake from Copi OS-39 showing weathering.

Table 8-12: Copi OS-39 artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Flake	Silcrete	Complete	Tertiary	36 x 40 x 14
Flake	Silcrete	Complete	Tertiary	11 x 20 x 5
Flake	Silcrete	Complete	Tertiary	22 x 18 x 11
Side scraper	Silcrete	Complete	Tertiary	48 x 19 x 10

Copi OS-40

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 529977E 6280205N

Location of site: Copi OS-40 is in the western portion of Lot 4068 DP766543 on the Warwick property (**Figure 8-39** and **Figure 8-26**). The site is 2.2 km directly east of Nulla Road and 8.5 km southwest of the Warwick homestead.

Description of site: Copi OS-40 is an artefact scatter consisting of seven artefacts located on a slight slope in an erosion scald (**Figure 8-49**). Artefacts include flakes, shell (probably recent) and a deflated hearth (**Table 8-13**). The site extent is 32 x 18 m, encompassing an area of 473 square meters. The GSE at the site was high (40%) with a GSV of 60% within the site extent. Soil consists of orange/ yellow sand. Vegetation includes sparse trees and shrub. Identified disturbances include grazing, erosion, rabbit burrows, and vehicle tracks.

Copi OS-40 is not considered to be associated with subsurface archaeological deposits due to the amount of deflation that has occurred.

Figure 8-49: Copi OS-40. View of site and recorded artefacts.

1. View of the landscape at Copi OS-40.

2. Artefacts from Copi OS-40.

3. View of heat retainers from a deflated hearth at Copi OS-40.

4. View of in situ artefacts at Copi OS-40.

Table 8-13: Copi OS-40 artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Flake	Chert	Complete	Tertiary	20 x 16 x 6
Flake	Silcrete	Proximal Fragment	Tertiary	14 x 20 x 7
Flake	Silcrete	Complete	Tertiary	19 x 18 x 6
Flake	Chert	Complete	Secondary	20 x 12 x 4
Flake	Chert	Complete	Secondary	25 x 13 x 7
Flake	Chert	Complete	Tertiary	16 x 13 x 3

Copi OS-41

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 522846E 6283198N

Location of site: Copi OS-41 is in the north-western portion of Lot 1940 DP763792 on the Huntingfield property (**Figure 8-40** and **Figure 8-29**). The site is approximately 3.7 km southeast of the intersection of Springwood Road/Pine Camp Road and Nulla Road.

Description of site: The site is an artefact scatter comprising of two artefacts located on the edge of an eroding red dune, overlooking the valley floor (**Figure 8-50**). Artefacts include one core and one flake (**Table 8-14**). The artefacts were both manufactured from silcrete. The site extent is 130 x 35 m, encompassing an area of 0.41 ha of land. The extent of the site is defined by the artefact spread. Soils at the site consist of an orange sandy dune with vegetation mainly comprising of saltbush. GSE at the time of recording was high at 80%, with a GSV of 80% in the areas of exposures. Disturbance primarily includes grazing and erosion.

Copi OS-41 is not considered to be associated with subsurface archaeological deposits.

Figure 8-50: Copi OS-41. View of site and a sample of recorded artefacts.

1. View of Copi OS-41 showing the landscape.

2. Silcrete flake from Copi OS-41.

Table 8-14: Copi OS-41 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Core	Silcrete	N/A	Primary	32 x 27 x 15
Flake	Silcrete	Complete	Tertiary	23 x 10 x 5

Copi OS-42

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 522410E 6283608N

Location of site: Copi OS-42 is in the north-western portion of Lot 1940 DP763792 on the Huntingfield property (**Figure 8-40** and **Figure 8-34**). The site is approximately 3.3 km southeast of the intersection of Springwood Road/Pine Camp Road and Nulla Road.

Description of site: The site is an artefact scatter comprising of two artefacts located on a clay pan (**Figure 8-51**). Artefacts include one core and one flake. The artefacts were manufactured from silcrete (**Table 8-15**). The site extent is 60 x 40 m, encompassing an area of 0.1 ha of land. The extent of the site is defined by the artefact spread. Soils at the site consist of an orange sand/clay with vegetation mainly comprising of saltbush and shrubs. GSE at the time of recording was high at 80%, with a GSV of 90% in the areas of exposures. Disturbance primarily includes grazing and erosion.

Copi OS-42 is not considered to be associated with subsurface archaeological deposits.

Figure 8-51: Copi OS-42. View of site and a sample of recorded artefacts.

1. View of Copi OS-42 showing the landscape.

2. Silcrete core from Copi OS-42.

Table 8-15: Copi OS-42 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Core	Silcrete	N/A	N/A	48 x 40 x 22
Flake	Silcrete	Distal fragment	Tertiary	31 X 22 X 12

Copi OS-43

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 522568E 6284286N

Location of site: Copi OS-43 is in the north-western portion of Lot 1940 DP763792 on the Huntingfield property (**Figure 8-40** and **Figure 8-34**). The site is approximately 2.6 km southeast of the intersection of Springwood Road/Pine Camp Road and Nulla Road.

Description of site: The site is an artefact scatter comprising of five artefacts located on a flat, red sandy low ridge (**Figure 8-52**). Artefacts include four flakes and one core fragment (**Table 8-16**). The artefacts were manufactured from silcrete, chalcedony and quartz. The site extent is 60 x 40 m, encompassing an area of 0.19 ha of land. The extent of the site is defined by the artefact spread. Soils at the site consist of an orange sand with vegetation mainly comprising of saltbush. GSE at the time of recording was high at 90%, with a GSV of 90% in the areas of exposures. Disturbance primarily includes grazing and erosion.

Copi OS-43 is not considered to be associated with subsurface archaeological deposits.

Figure 8-52: Copi OS-43. View of site and selection of recorded artefacts.

1. View of Copi OS-43 showing the landscape.

2. Selection of artefacts from Copi OS-43.

Table 8-16: Copi OS-43 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Flake	Chalcedony	Complete	Tertiary	15 x 12 x 7
Flake	Silcrete	Longitudinal break	Tertiary	28 x 19 x 8
Flake	Quartz	Proximal fragment	Tertiary	12 x 8 x 5
Flake	Silcrete	Complete	Tertiary	2 x 15 x 5
Core fragment	Silcrete	N/A	Tertiary	28 x 15 x 10

Copi OS-44

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 525592E 6288106N

Location of site: Copi OS-44 is in the north of the southern portion of Lot 1907 DP763791 on the Huntingfield property (**Figure 8-40** and **Figure 8-31**). The site is 3.5 km directly east of Springwood Road, 3.6 km southeast of the intersection of Tarawi Road and Springwood Road, and 3.8 km northeast of the intersection of Springwood Road, Pine Camp Road and Nulla Road.

Description of site: Copi OS-44 is an artefact scatter consisting of thirteen artefacts located flat overlooking a small depression located to the north of the site. The depression recently had water in it but was dry at the time of the survey (**Figure 8-53**). Artefacts include flakes, a piece of shatter, and a core (**Table 8-17**). The site extent is 142 x 53 m, encompassing an area of 0.64 ha. The GSE at the site was moderate (50%) with a GSV of 90% within the site extent. Soil consists of orange/ yellow sand. Vegetation includes sparse shrub cover. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi OS-44 is not considered to be associated with subsurface archaeological deposits.

Figure 8-53: Copi OS-44. View of site and selection of recorded artefacts.

1. View of the landscape at Copi OS-44.

2. Selection of artefacts from Copi OS-44.

3. Detail of a silcrete flake displaying retouch at Copi OS-44.

4. View of a silcrete core from Copi OS-44.

Table 8-17: Copi OS-44 artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Core	Silcrete	Complete	Secondary	Max 30
Flake	Silcrete	Complete	Secondary	36 x 31 x 11
Flake	Silcrete	Distal Fragment	Tertiary	12 x 11 x 5
Flake	Silcrete	Complete	Tertiary	26 x 22 x 6
Flake	Silcrete	Complete	Tertiary	31 x 22 x 7
Flake	Silcrete	Distal Fragment	Tertiary	16 x 16 x 6
Flake	Silcrete	Complete	Tertiary	21 x 14 x 6
Flake	Chert	Distal Fragment	Tertiary	15 x 11 x 5
Flake	Chert	Complete	Secondary	12 x 15 x 5
Flake	Chert	Complete	Tertiary	15 x 20 x 5
Flake	Quartz	Complete	Secondary	22 x 10 x5
Flake	Mudstone	Complete	Tertiary	16 x 10 x 3
Shatter	Quartz	N/A	Tertiary	Max 12

Copi OS-45

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 525787E 6287957N

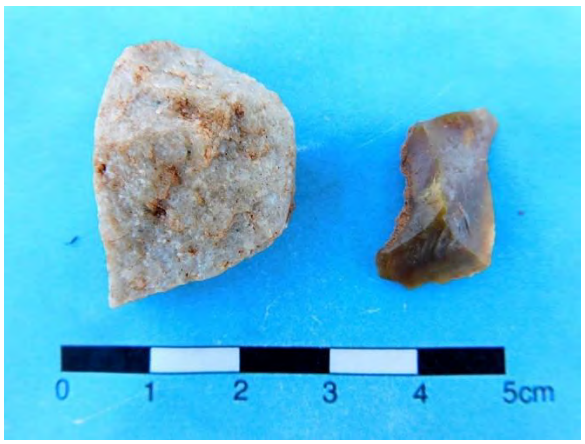
Location of site: Copi OS-45 is in the north of the southern portion of Lot 1907 DP763791 on the Huntingfield property (**Figure 8-40** and **Figure 8-31**). The site is 3.7 km directly east of Springwood Road, 3.8 km southeast of the intersection of Tarawi Road and Springwood Road, and 4 km northeast of the intersection of Springwood Road, Pine Camp Road and Nulla Road.

Description of site: Copi OS-45 is an artefact scatter consisting of two artefacts located in a flat open casuarina woodland with saltbush shrub cover (**Figure 8-54**). Artefacts include two flakes (**Table 8-18**). The site extent is 16 x 16 m, encompassing an area of 256 m^2. The GSE at the site was high (70%) with a GSV of 70% within the site extent. Soils consist of orange / yellow sand. Vegetation includes shrub cover, saltbush, and open woodland of trees. There is no obvious water source at the site. Identified disturbances include grazing, erosion, and vehicle tracks.

Copi OS-45 is not considered to be associated with subsurface archaeological deposits.

Figure 8-54: Copi OS-45. View of site and recorded artefacts.

1. View of the landscape at Copi OS-45.



2. Artefacts from Copi OS-45.

Table 8-18: Copi OS-45 artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Flake	Silcrete	Proximal Fragment	Secondary	24 x 20 x 10
Flake	Chert	Complete	Tertiary	18 x 13 x 7

Copi OS-46

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 517389E 6283672N

Location of site: Copi OS-46 is in the southern portion of Lot 1 DP756199 on the Sunshine property, approximately 500 m from the southern boundary (**Figure 8-40** and **Figure 8-37**). The site is approximately 5.5 km southwest of the intersection of Springwood Road/Pine Camp Road and Nulla Road.

Description of site: The site is an artefact scatter comprising of two artefacts located on a gentle slope that extends into a flat plain landform (**Figure 8-55**). Artefacts include a core fragment and a flake (**Table 8-19**). The site extent is 105 x 40 m. Soil consists of orange sand with surrounding vegetation including low-lying shrub such as saltbush and scattered trees. The GSE was relatively high at 90% within the clay pan, with a GSV of 90%. Disturbances include erosion and grazing.

Copi OS-46 is not considered to be associated with subsurface archaeological deposits as it is the artefacts are likely located within secondary contexts.

Figure 8-55: Copi OS-46. View of site and a sample of recorded artefacts.

1. View of the landscape at Copi OS-46.

2. Silcrete core fragment and flake and from Copi OS-46.

Table 8-19: Copi OS-46 artefact attributes.

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm
Core	Silcrete	N/A	Secondary	Max 52
Flake	Silcrete	Complete	Tertiary	12 x 10 x 3

Copi OS-47

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 518740E 6284865N

Location of site: Copi OS-47 is in the southeast portion of Lot 1 DP756199 on the Sunshine property (**Figure 8-40** and **Figure 8-56**). The site is approximately 3.6 km southwest of the intersection of Pine Camp Road and Nulla Road.

Description of site: The site is an artefact scatter comprising of a minimum of 23 artefacts (**Figure 8-57**). Most artefacts were manufactured from silcrete followed by chert (**Table 8-20**). The site extent is 200 x 400 m, where artefacts are scattered throughout the clay pans within this extent. The site is situated within a grazed paddock and contains artificial drainage canals to direct water. Soils at the site consist of an orange sand with vegetation mainly comprising of saltbush and an open woodland along the north and west boundaries of the site extent. GSE at the time of recording was high at 80%, with a GSV of 80% in the areas of exposures. Disturbances include the artificial drainage canals, grazing and erosion.

Copi OS-47 is not considered to be associated with subsurface archaeological deposits as it is the artefacts are likely located within secondary contexts.

Figure 8-56: Location of Copi OS-47 and OS-48.

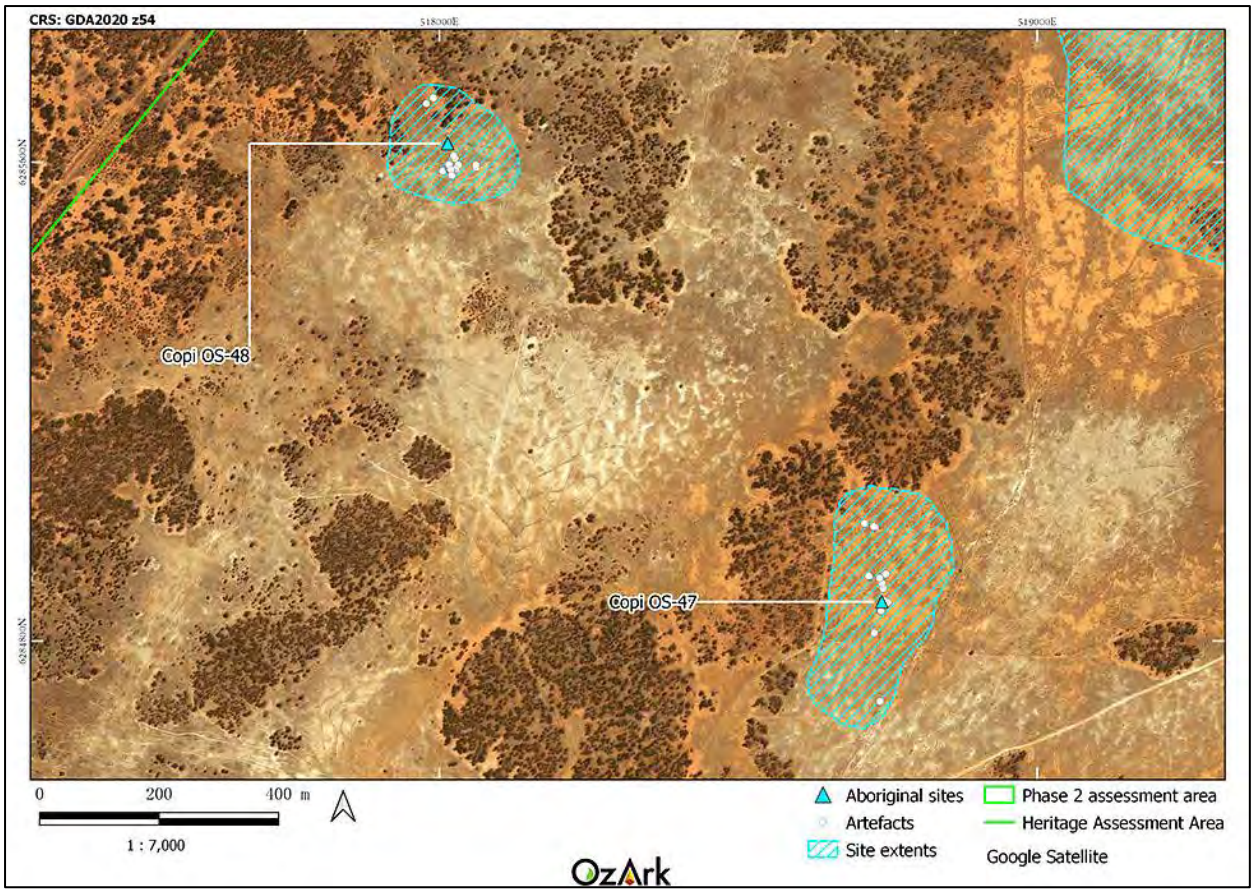


Figure 8-57: Copi OS-47. View of site and selection of recorded artefacts.

1. View west Copi OS-47 showing a flagged artefact adjacent to an artificial drainage canal.

2. View north of Copi OS-47 showing a selection of flagged artefacts.

3. View of a selection of artefacts recorded at Copi OS-47.

4. View of a selection of artefacts recorded at Copi OS-47.

Table 8-20: Copi OS-47 artefact attributes from a selection of artefacts recorded.

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm
Flake	Chert	Complete	Tertiary	8 x 5 x 2
Flake	Chert	Distal fragment	Tertiary	20 x 15 x 7
Flake	Chert	Complete	Tertiary	12 x 17 x 5
Flake	Chert (black)	Complete	Tertiary	28 x 22 x 6
Flake	Silcrete	Proximal fragment	Secondary	38 x 37 x 9
Flake	Silcrete	Complete	Tertiary	30 x 50 x 15
Flake	Silcrete	Complete	Tertiary	16 x 30 x 8
Flake	Silcrete	Complete	Tertiary	30 x 35 x 6
Flake	Silcrete	Complete	Tertiary	20 x 32 x 10
Shatter	Silcrete	N/A	Tertiary	10 x 10 x 3
Core	Silcrete	N/A	Tertiary	34 x 41 x 14

Copi OS-48

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 518013E 6285631N

Location of site: Copi OS-48 is in the southeast portion of Lot 1 DP756199 on the Sunshine property (**Figure 8-40** and **Figure 8-56**). The site is approximately 4.1 km southwest of the intersection of Springwood Road/Pine Camp Road and Nulla Road.

Description of site: The site is an artefact scatter comprising of a minimum of 27 artefacts (**Figure 8-58**). Most artefacts were manufactured from quartz followed by chert and silcrete (**Table 8-21**). The site extent is 230 x 190 m, comprised of artefacts scattered across a clay pan, with a couple of artefacts slightly upslope to the west. Soils at the site consist of orange sand with vegetation mainly comprising saltbush and an open woodland along the north and west boundaries of the site extent. GSE at the time of recording was high at 90%, with a GSV of 90% in the areas of exposures. Disturbance primarily includes grazing and erosion.

Copi OS-48 is not considered to be associated with subsurface archaeological deposits as it is the artefacts are likely located within secondary contexts.

Figure 8-58: Copi OS-48. View of site and selection of recorded artefacts.

1. View north of Copi OS-48 showing the landscape.

2. View east of Copi OS-48 showing the landscape.

3. Selection of artefacts from Copi OS-48.

4. Selection of artefacts from Copi OS-48.

Table 8-21: Copi OS-48 artefact attributes.

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm
Core	Chert	Complete	Secondary	36 x 24 x 24
Flake	Silcrete	Distal fragment	Tertiary	15 x 14 x 8
Flake	Silcrete	Longitudinal break	Tertiary	13 x 20 x 5
Flake	Silcrete	Proximal fragment	Tertiary	11 x 15 x 7
Flake	Quartz	Complete	Tertiary	11 x 15 x 6
Flake	Quartz	Complete	Tertiary	13 x 19 x 3
Flake	Quartz	Distal fragment	Tertiary	7 x 16 x 3
Flake	Quartz	Distal fragment	Tertiary	10 x 18 x 2
Flake	Quartz	Complete	Tertiary	30 x 14 x 8
Flake	Silcrete	Complete	Tertiary	10 x 20 x 2
Flake	Quartz	Distal fragment	Tertiary	5 x 7 x 2
Flake	Silcrete	Proximal fragment	Tertiary	15 x 20 x 5
Shatter	Quartz	Complete	Secondary	21 x 15 x 8
Flake	Silcrete	Complete	Tertiary	26 x 17 x 7
Flake	Quartz	Complete	N/A	18 x 30 x 9
Flake	Quartz	Distal fragment	Tertiary	15 x 24 x 7
Flake	Quartz	Complete	N/A	14 x 12 x 5
Flake	Quartz	N/A	Tertiary	14 x 4 x 4
Flake	Quartz	N/A	Tertiary	14 x 7 x 3
Flake	Silcrete	Distal fragment	Tertiary	15 x 16 x 5
Flake	Quartz	Complete	Tertiary	16 x 17 x 6
Flake	Chert	Complete	Secondary	18 x 22 x 4

Copi OS-49

Site type: Artefact scatter; hearths

GPS coordinates: Site centroid - GDA Zone 54 519572E 6286291N

Location of site: Copi OS-49 is located approximately 1.3 km to the west of the intersection of Pine Camp Road and Nulla Road (**Figure 8-40** and **Figure 8-60**). The site is in southeast portion of Lot 1 DP756199 on the Sunshine property.

Description of site: Copi OS-49 is a high-density artefact scatter that consists of at least 165 artefacts (**Figure 8-60**). Most artefacts were flakes manufactured from silcrete, quartzite, quartz, and chert (**Table 8-22**). Four heaths consisting of charcoal and clay nodules were present, with three located in the northwest portion of the site (**Table 8-23**). The site extent measures 2.4 x 1.8 km. The large site extent of 329.85 ha follows the open sand plain and sloped landform that contained numerous clay pans, which is where most artefact clusters were recorded and where further artefacts are expected to be present. Vegetation at the site primarily includes a dense layer of saltbush with a small patch of trees evident in the northwest and southeast portions of the site extent. The GSE at the time of recording was relatively high, averaging 70-80% and a GSV of 95% within these exposures. Identified disturbances include the construction and use of tracks, grazing and erosion.

Copi OS-49 is not considered to be associated with subsurface archaeological deposits as it is the artefacts are located on a deflated surface which has been heavily impacted by erosion.

Figure 8-59: Location of Copi OS-49.

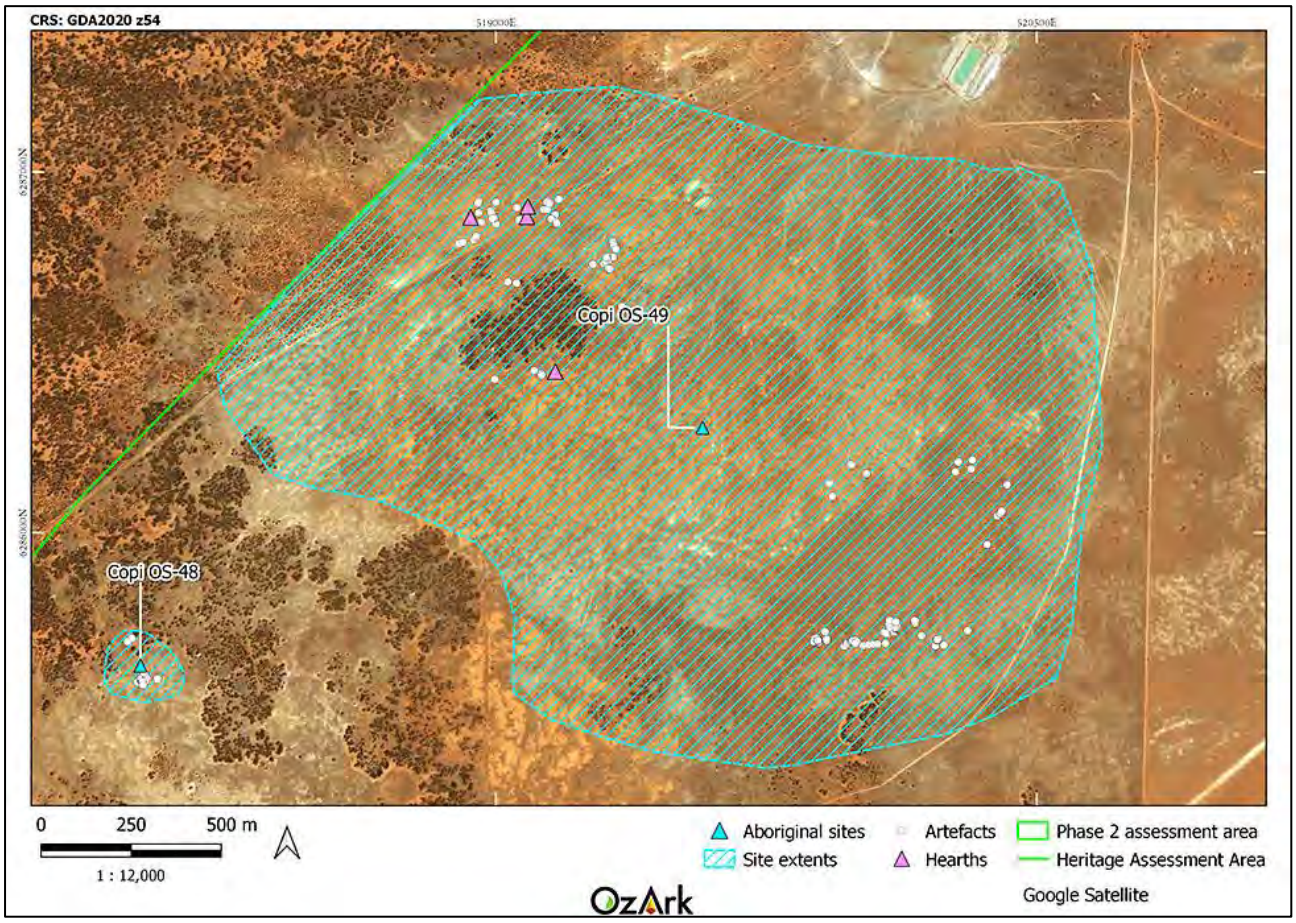


Figure 8-60: Copi OS-49. View of site and selection of recorded artefacts.

	
1. View to the west of Copi OS-49 showing a selection of flagged artefacts.	2. View to the west of Copi OS-49 showing a selection of flagged artefacts.

3. View of a selection of artefacts recorded from Copi OS-49.

4. View of a large silcrete core recorded at Copi OS-49.

5. View to the southeast of Copi OS-49

6. View to the north of Copi OS-49.

7. View of a selection of artefacts recorded from Copi OS-49

8. View of a hearth recorded at Copi OS-49.

9. View of the possible ground edge axe recorded at Copi OS-49.

10. View of a hearth recorded at Copi OS-49.

Table 8-22: Copi OS-49 artefact attributes.

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm
Shatter	Mudstone	N/A	Secondary	30x25x12
Shatter	Quartz	N/A	Secondary	12x20x9
Core	Chert	N/A	Secondary	21
Flake	Chert	Proximal fragment	Tertiary	12x19x10
Flake	Chert	Distal fragment	Tertiary	8x14x4
Flake	Chert	Proximal fragment	Tertiary	18x20x5
Flake	Chert	Proximal fragment	Tertiary	18x15x8
Shatter	Quartz	N/A	Tertiary	12x10x5
Flake	Quartz	Distal fragment	Tertiary	8x8x2
Flake	Silcrete	Complete	Tertiary	12x28x9
Shatter	Chert	N/A	Tertiary	6x7x2
Flake	Chert	Complete	Tertiary	12x10x2
Flake	Quartz	Medial break	Tertiary	10x17x4
Flake	Quartz	Complete	Tertiary	16x15x5
Flake	Silcrete	Distal fragment	Tertiary	18x20x5
Flake	Silcrete	Complete	Tertiary	27x40x11
Flake	Silcrete	Longitudinal break	Tertiary	20x36x5
Shatter	Chert	N/A	Tertiary	8x10x5
Flake	Silcrete	Complete	Secondary	30x38x12
Flake	Silcrete	Complete	Secondary	20x30x5
Flake	Quartz	Complete	Tertiary	4x7x4
Shatter	Quartz	N/A	Tertiary	5x5x2
Flake	Silcrete	Complete	Tertiary	14x17x7
Flake	Silcrete	Complete	Tertiary	18x17x8
Flake	Chert	Medial break	Tertiary	9x12x4
Flake	Chert	Distal fragment	Tertiary	21x15x8
Core	Silcrete	N/A	Secondary	30
Flake	Silcrete	Proximal fragment	Tertiary	20x32x12
Flake	Chert	Complete	Tertiary	15x20x10

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm
Flake	Silcrete	Proximal fragment	Tertiary	20x28x11
Flake	Silcrete	Complete	Secondary	23x50x15
Core	Silcrete	N/A	Tertiary	41
Shatter	Chert	N/A	Tertiary	3x10x2
Flake	Silcrete	Complete	Tertiary	20x32x15
Shatter	Chert	N/A	Tertiary	16x17x7
Flake	Silcrete	Complete	Secondary	14x22x6
Shatter	Chert	N/A	Tertiary	
Flake	Silcrete	Complete	Tertiary	18x23x10
Flake	Silcrete	Proximal fragment	Tertiary	30x51x12
Shatter	Silcrete	N/A	Tertiary	31x33x20
Flake	Silcrete	Complete	Tertiary	15x28x6
Flake	Silcrete	Distal fragment	Tertiary	18x20x6
Flake	Chert	Complete	Tertiary	22x24x12
Shatter	Quartz	N/A	Tertiary	8x9x6
Core	Silcrete	N/A	Tertiary	50
Flake	Silcrete	Distal fragment	Tertiary	24x30x11
Flake	Silcrete	Distal fragment	Tertiary	20x30x15
Flake	Silcrete	Complete	Tertiary	28x30x8
Flake	Quartz	Complete	Tertiary	10x12x5
Flake	Silcrete	Medial break	Tertiary	22x18x8
Flake	Quartz	Distal fragment	Tertiary	12x20x10
Flake	Silcrete	Proximal fragment	Tertiary	30x28x8
Flake	Silcrete	Complete	Tertiary	22x32x11
Flake	Silcrete	Complete	Tertiary	35x55x10
Flake	Silcrete	Complete	Tertiary	21x25x11
Shatter	Silcrete	N/A	Tertiary	15x18x10
Flake	Silcrete	Complete	Tertiary	10x15x4
Flake	Chert	Distal fragment	Tertiary	11x12x5
Flake	Silcrete	Proximal fragment	Tertiary	25x30x15
Flake	Silcrete	Complete	Tertiary	10x10x2
Flake	Quartz	Complete	Tertiary	18x20x10
Flake	Silcrete	Complete	Tertiary	23x25x10
Flake	Silcrete	Distal fragment	Tertiary	10x15x2
Flake	Chert	Complete	Tertiary	8x15x3
Shatter	Silcrete	N/A	Tertiary	30x25x15
Flake	Silcrete	Complete	Tertiary	15x15x7
Flake	Silcrete	Proximal fragment	Tertiary	5x10x2
Shatter	Silcrete	N/A	Tertiary	14x30x7
Flake	Silcrete	Complete	Tertiary	20x25x10
Flake	Silcrete	Proximal fragment	Secondary	21x26x5
Flake	Silcrete	Medial break	Tertiary	18x19x7
Flake	Silcrete	Distal fragment	Tertiary	26x24x8
Flake	Silcrete	Complete	Secondary	11x20x7
Flake	Quartzite	Complete	Tertiary	9x20x5
Shatter	Quartzite	N/A	Secondary	9x7x8

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm
Flake	Silcrete	Complete	Tertiary	13x20x5
Shatter	Silcrete	N/A	Tertiary	11x13x6
Flake	Silcrete	Distal fragment	Tertiary	20x15x3
Flake	Silcrete	Distal fragment	Primary	25x13x4
Flake	Silcrete	Proximal fragment	Primary	17x15x3
Flake	Silcrete	Proximal fragment	Secondary	45x42x8
Flake	Silcrete	Proximal fragment	Secondary	30x22x6
Flake	Silcrete	Distal fragment	Secondary	20x22x4
Flake	Quartzite	Distal fragment	Secondary	35x32x12
Core	Silcrete	N/A	Heavily reduced	80x50x65
Flake	Silcrete	Distal fragment	Secondary	35x18x9
Core	Chert	Exhausted	1 rotation	20x12x12
Flake	Chert	Complete	Secondary	32x23x10
Flake	Chert	Proximal fragment	Secondary	18x14x3
Flake	Silcrete	Complete	Primary	35x27x7
Core	Silcrete	N/A	2 rotation	55x70x52
Flake	Silcrete	Complete	Secondary	22x24x4
Shatter	Chalcedony	N/A	Tertiary	27x20x8
Flake	Silcrete	Complete	Primary	28x17x10
Core	Silcrete	Exhausted	4 rotation	30x31x23
Flake	Quartz	Complete	Secondary	22x12x8
Flake	Silcrete	Complete	Primary	35x22x3
Flake	Burin	Complete	Primary	27x13x8
Flake	Quartz	Distal fragment	Tertiary	28x20x7
Flake	Silcrete	Complete	Secondary	18x15x3
Flake	Silcrete	Distal fragment	Primary	17x14x5
Flake	Silcrete	Complete	Secondary	41x33x8
Flake	Silcrete	Medial break	Tertiary	40x23x12
Flake	Silcrete	Proximal fragment	Tertiary	28x28x10
Flake	Quartz	Distal fragment	Tertiary	12x12x3
Flake	Chalcedony	Distal fragment	Tertiary	14x7x3
Flake	Chalcedony	Complete	Secondary	24x12x4
Flake	Silcrete	Complete	Secondary	25x15x7
Flake	Chert	Complete	Tertiary	18x10x3
Flake	Chert	Proximal fragment	Secondary	13x12x4
Axe	Quartzite	Distal fragment	Tertiary	76x60x30
Flake	Chert	Core	Tertiary	23x20x11
Flake	Silcrete	Distal fragment	Tertiary	16x12x8

Table 8-23: Copi OS-49. Coordinates for hearths.

Number	GDA Zone 54 Easting	GDA Zone 54 Northing
1	519165	6286443
2	518929	6286871
3	519088	6286901
4	519086	6286872

Copi OS-50

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 521858E 6285163N

Location of site: Copi OS-50 is located across the southeast portion of Lot 1 DP756199, southwest corner of Lot 1907 DP763791 and northwest corner of Lot 1940 DP763792, on the Huntingfield and Sunshine properties (**Figure 8-40** and **Figure 8-61**). The site is approximately 1.5 km direct south of the intersection of Springwood Road/Pine Camp Road and Nulla Road.

Description of site: The site is an artefact scatter comprising of 10 artefacts on a gentle slope receding to the southeast (**Figure 8-62**). Most artefacts were manufactured from silcrete followed by chert and quartz (**Table 8-24**). The site extent is 1400 x 900 m, encompassing an area of 72 ha, where artefacts are concentrated on deflated series of salt pans along a low east-west ridge, generally facing south. It is presumed that artefacts may continue to the north and west beyond the assessed transect, as indicated by the site extent. Soils at the site consist of an orange sand with vegetation mainly comprising of saltbush. GSE at the time of recording was high at 70%, with a GSV of 80% in the areas of exposures. Disturbance primarily includes grazing and erosion.

Copi OS-50 is not considered to be associated with subsurface archaeological deposits as it is the artefacts are located on a deflated surface which has been heavily impacted by erosion.

Figure 8-61: Location of Copi OS-50.

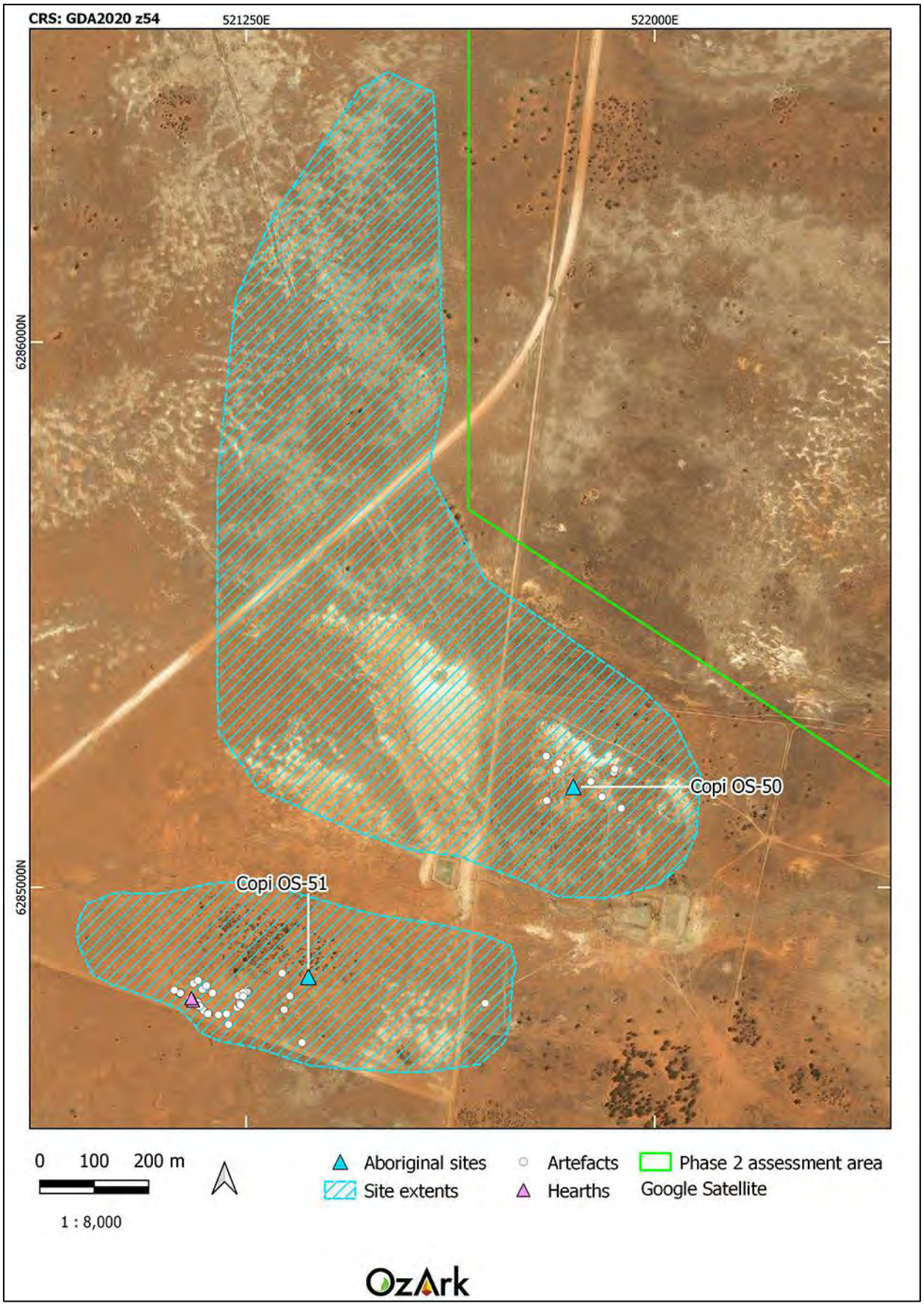
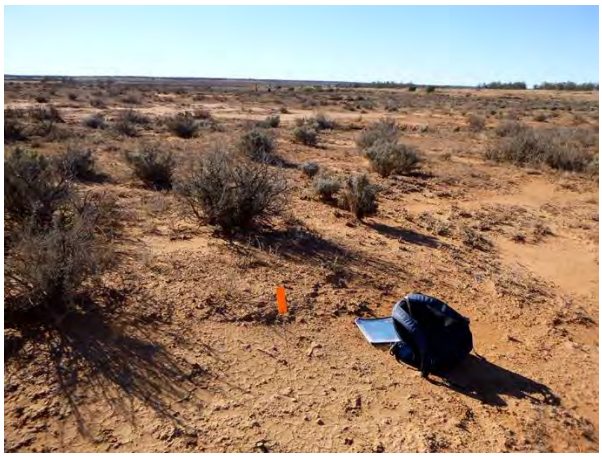


Figure 8-62: Copi OS-50. View of site and selection of recorded artefacts.



1. Copi OS-50 showing the landscape, view southeast.

2. Selection of artefacts from Copi OS-50.

3. View east across clay pans of Copi OS-50

4. Chert artefact, dorsal surface.

Table 8-24: Copi OS-50 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Flake	Chert	Complete	Tertiary	28 x 17 x 8
Flake	Silcrete	Distal fragment	Secondary	23 x 14 x 9
Flake	Silcrete	Complete	Tertiary	28 x 25 x 11
Flake	Silcrete	Proximal fragment	Tertiary	42 x 30 x 20
Flake	Silcrete	Distal fragment	Tertiary	22 x 20 x 3
Flake	Quartz	Distal fragment	Tertiary	10 x 9 x 3
Flake	Quartz	Distal fragment	Primary	21 x 18 x 10
Flake	Silcrete	Distal fragment	Tertiary	34 x 27 x 12
Flake	Silcrete	Distal fragment	Tertiary	12 x 6 x 3
Flake	Silcrete	Complete	Tertiary	37 x 20 x 4

Copi OS-51

Site type: Artefact scatter; hearths

GPS coordinates: Site centroid - GDA Zone 54 521364E 6284836N

Location of site: Copi OS-51 is located across the southeast portion of Lot 1 DP756199, and northwest corner of Lot 1940 DP763792, on the Huntingfield and Sunshine properties (**Figure 8-40** and **Figure 8-61**). The site is 300 m direct east of Pine Camp Road and 2.1 km direct south of the intersection of Springwood Road/Pine Camp Road and Nulla Road.

Description of site: Copi OS-51 is a high-density artefact scatter that consists of at least 60 artefacts on a gentle slope which redes to the north (**Figure 8-63**). Most artefacts were flakes manufactured from chert, silcrete, mudstone and quartz (**Table 8-25**). Two heaths consisting of charcoal and clay nodules were present in the southwest portion of the site extent (**Table 8-26**). The site extent is 800 x 140 m, encompassing an area of 20 ha of land, where artefacts are concentrated on eroding clay pans on gentle slopes and undulating flats. Soils at the site consist of an orange sand and sandy clay with vegetation mainly comprising of saltbush and an open woodland in the norther portion of the site extent. GSE at the time of recording was high at 80%, with a GSV of 90% in the areas of exposures. Disturbance primarily includes grazing and erosion.

Copi OS-51 is not considered to be associated with subsurface archaeological deposits as it is the artefacts are located on a deflated surface which has been heavily impacted by erosion.

Figure 8-63: Copi OS-51. View of site and selection of recorded artefacts.

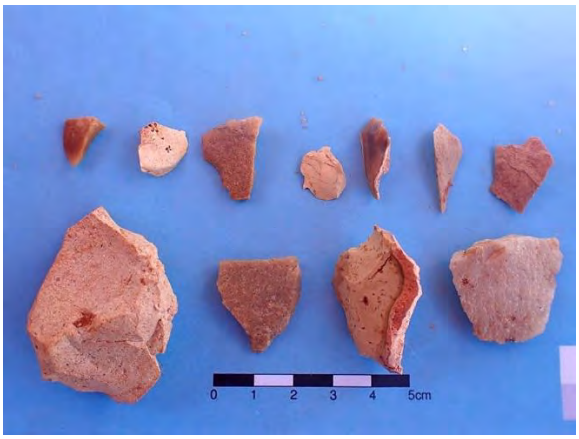
1. View to the west of Copi OS-51 showing a selection of flagged artefacts.

2. View to the east of Copi OS-51 showing a selection of flagged artefacts.

3. View to the west of Copi OS-51 showing a selection of flagged artefacts.

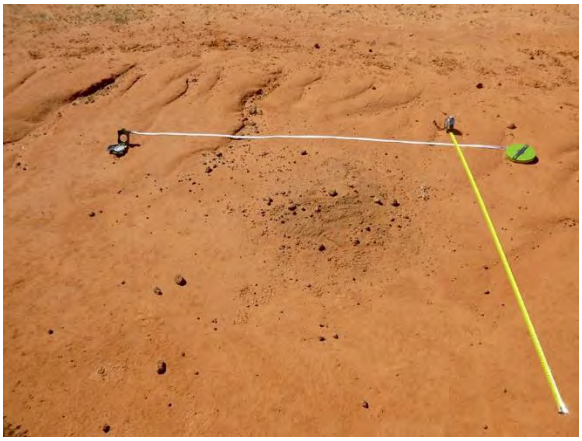
4. View to the north of Copi OS-51 showing a selection of flagged artefacts.

5. View of a selection of artefacts recorded from Copi OS-51.



6. View of a selection of artefacts recorded from Copi OS-51.

7. View of a selection of artefacts recorded from Copi OS-51.



8. View of a hearth recorded at Copi 0S-51.

Table 8-25: Copi OS-51 artefact attributes.

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm
Flake	Chert	Distal fragment	Tertiary	30 x 23 x 10
Flake	Chert	Proximal fragment	Tertiary	22 x 13 x 4
Flake	Chert	Distal fragment	Tertiary	18 x 10 x 4
Flake	Chert	Distal fragment	Tertiary	20 x 10 x 7
Flake	Chert	Distal fragment	Tertiary	20 x 12 x 5
Flake	Chert	Complete	Tertiary	12 x 8 x 3
Flake	Chert	Complete	Tertiary	18 x 16 x 9
Flake	Chert	Complete	Tertiary	32 x 26 x 6
Flake	Chert	Distal fragment	Secondary	22 x 11 x 8
Flake	Silcrete	Proximal fragment	Tertiary	22 x 17 x 9
Flake	Silcrete	Proximal fragment	Tertiary	8 x 10 x 2
Flake	Chert	Distal fragment	Tertiary	20 x 13 x 5
Flake	Chert	Distal fragment	Tertiary	20 x 12 x 3
Flake	Chert	Distal fragment	Tertiary	26 x 17 x 5
Flake	Chert	Distal fragment	Tertiary	13 x 11 x 3
Flake	Chert	Medial break	Tertiary	11 x 8 x 3
Flake	Silcrete	Complete	Tertiary	28 x 18 x 8
Core	Silcrete	N/A	Tertiary	48 x 32 x 20
Flake	Silcrete	Distal fragment	Tertiary	12 x 12 x 5
Flake	Silcrete	Complete	Tertiary	22 x 12 x 6
Flake	Silcrete	Complete	Tertiary	20 x 13 x 4
Flake	Silcrete	Distal fragment	Tertiary	12 x 8x 3
Core	Silcrete	N/A	Tertiary	44 x 38 x 40
Flake	Quartz	Complete	Tertiary	22 x 18 x 6
Flake	Silcrete	Complete	Secondary	19 x 8 x 7
Flake	Other	Complete	Tertiary	21 x 21 x 7
Flake	Silcrete	Distal fragment	Tertiary	25 x 18 x 10
Flake	Silcrete	Complete	Tertiary	27 x 13 x 8
Flake	Silcrete	Distal fragment	Tertiary	20 x 22 x 5
Flake	Silcrete	Distal fragment	Tertiary	9 x 12 x 2
Flake	Silcrete	Complete	Tertiary	15 x 20 x 5
Flake	Chert	Complete	Secondary	8 x 20 x 8
Flake	Silcrete	Longitudinal break	Tertiary	7 x 22 x 5
Shatter	Mudstone	N/A	Tertiary	10 x 10 x 5
Flake	Silcrete	Distal fragment	Tertiary	18 x 20 x 5
Flake	Chert	Complete	Secondary	25 x 32 x 15
Flake	Mudstone	Complete	Tertiary	10 x 10 x 4
Flake	Silcrete	Complete	Tertiary	30 x 33 x 10
Flake	Silcrete	Complete	Tertiary	35 x 45 x 20
Flake	Silcrete	Medial break	Tertiary	15 x 15 x 5
Flake	Silcrete	Distal fragment	Tertiary	18x x 25 x 8
Flake	Silcrete	Complete	Tertiary	16 x 20 x 2
Flake	Silcrete	Distal fragment	Tertiary	18 x 25 x 10

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm
Flake	Silcrete	Complete	Tertiary	18 x 22 x 15
Flake	Silcrete	Complete	Tertiary	20 x 22 x 8
Flake	Mudstone	Distal fragment	Tertiary	10 x 30 x 9
Flake	Silcrete	Distal fragment	Tertiary	10 x 10 x 3
Flake	Silcrete	Complete	Tertiary	8 x 16 x 4
Flake	Chert	Complete	Tertiary	19 x 15 x 5
Flake	Silcrete	Complete	Tertiary	15 x 20 x 4
Flake	Silcrete	Distal fragment	Tertiary	14 x 15 x 2
Flake	Silcrete	Proximal fragment	Tertiary	21 x 15 x 7
Flake	Silcrete	Distal fragment	Secondary	15 x 18 x 10
Flake	Silcrete	Complete	Tertiary	16 x 23 x 4
Flake	Mudstone	Distal fragment	Tertiary	12 x 20 x 6

Table 8-26: Copi OS-51. Coordinates for hearths.

Number	GDA Zone 54 Easting	GDA Zone 54 Northing
1	521149	6284796
2	521152	6284792

8.4 DISCUSSION OF SURVEY RESULTS

This section reviews the results of the Phase 2 survey and places the results in the context of previous research that has taken place in the area.

8.4.1 Summary of survey results

The Phase 2 survey recorded 41 sites (**Section 8.3**) including:

- 22 isolated finds
- 17 artefact scatters
- Two artefact scatters with hearths.

8.4.2 Research questions

Several research questions were posed for the Phase 2 assessment (**Appendix 6**). These will be answered below.

- Does the density of artefacts across the Lake Footslopes along the eastern salt pan continue throughout the Phase 2 assessment area?
    - The density of artefacts across the Lake Footslopes survey unit along the eastern salt pan did not continue into the Phase 2 assessment area. Several sites were recorded across this area, however, the sites consist of isolated finds or low-density artefact scatters identified in discrete areas that have been more heavily impacted by erosion. Further, no hearths were recorded in the area.

- Are there resources available to the Aboriginal people using the land within the Phase 2 assessment area (food, stone, and water) not present within the Phase 1 assessment area?

    - Similar to the Phase 1 assessment area, no specific resources were noted within the Phase 2 assessment area. No stone resources were identified, nor were any specific food resource locations. With regards to freshwater, the Phase 2 assessment area contains a greater area of salt pans which could have potentially contained freshwater soaks and also a larger number of drainage lines in the far west.

- Do the findings within the Phase 2 assessment area accord with the regional archaeological context examined in **Section 5.2** and the predictive model?

  The review of the landscape and archaeological contexts of the Phase 1 assessment area enabled a predictive model for site location to be made (**Section 5.4**). The main elements of the predictive model are presented below, with each element followed by the observations based on the survey of the Phase 2 assessment area:

    - Sites would be most commonly located on the Lake Footslopes and Lunettes and Islands as they border ephemeral water sources (the salt pans)

        - Most sites were recorded on the Lake Footslopes and Lunettes and Islands landforms during the Phase 2 assessment, however, the highest number of artefacts was recorded across the Sandplains and Dunes, particularly in the west of the Phase 2 assessment area (see **Table 8-2**).

    - The most common site type would be stone artefact sites, either low density artefact scatters or isolated finds

        - Artefact sites are the most commonly recorded site type within the Phase 2 assessment area (n=41). Most artefact sites were again low-density sites with two of the artefact scatters recorded with hearths (Copi OS-49 and Copi OS-51). Recorded artefacts were again largely manufactured from silcrete, quartz, chert, and quartzite as predicted, while a low number of chalcedony artefacts were also identified. During the Phase 1 assessment, quartzite (58%) was the dominant material recorded with silcrete representing only 2.6% of the assemblage, however, during the Phase 2 assessment, silcrete (56%) was the dominant material and quartzite represented only 0.9% of the assemblage. The disparity with these recordings is based on the ambiguity between these materials which often appear very similar.

    - Artefact scatters have increased likelihood of being associated with hearths and/or middens

        - The six recorded hearths within the Phase 2 assessment area were identified in association with the largest stone artefact sites (Copi OS-49 and Copi OS-51). All six hearths were recorded within the Sandplains and Dunes which differs to the result of the Phase 1 assessment where 91.5% of the recorded hearths were identified across the Lake Footslopes landform. All hearths were again comprised of clay nodules and are lagging on pedestals as predicted by Witter (2004).
    - Artefact sites would likely be in a secondary context due to soil loss and deflation across the Mine Site
        - Most sites were again situated within erosion scalds or what was considered likely to be the lower soil strata across the landscape and therefore artefacts would likely be located within secondary contexts
    - Culturally modified trees would be extremely rare due to the distance to semi- or permanent water sources and a lack of suitable vegetation
        - No scarred trees were recorded in the Phase 2 assessment area which is consistent with the predictive model which indicated that scarred trees are a rare site type in the landscape of the Heritage Assessment Area.
    - Quarries would not likely be present, but if identified would be located on outcrops and consist of silcrete
        - No middens or quarries were identified across the Phase 2 assessment area.
    - Burials would likely not be present within the Heritage Assessment Area as it lacks typical source-bordering dunes and lunettes.
        - No particular landforms were identified as having high likelihood of containing burials.
- How do the results of the Phase 2 assessment compare to those of the Phase 1 assessment, and do they support the ASDST modelling in **Section 5.4.4**?
    - In **Section 5.4.4.1** the ASDST models were used to develop a predictive model for site location. **Figure 8-64** and **Figure 8-65** show the location of artefact and hearths recorded across the Phase 1 and 2 assessment areas against the ASDST models. An examination of **Figure 8-64** and **Figure 8-65** allows the following observations to be made:
        - The ASDST model predicting the likelihood of an area recording an artefact site were found to be largely accurate with regards to the Phase 1 assessment results, particularly in the eastern portion of the Phase 1 assessment area when the sites recorded during the assessment are plotted against the model.

While areas modelling as with moderate-high potential for artefact sites continue further south along the eastern salt pan into the Phase 2 assessment area, the density of artefacts in this area did not continue. Instead, the highest density of artefacts in the Phase 2 assessment area was recorded in the west which models as an area of low potential. There are no obvious resources in this western portion of the Heritage Assessment Area which would have attracted occupation, however, it is possible that water drained to the slightly lower areas and sat there for short periods of time or there were freshwater soaks.

- The ASDST model predicting the likelihood of an area recording a hearth was generally accurate with regards to the Phase 1 assessment results, however, this is not the case for the hearths recorded as part of the Phase 2 assessment. All hearths recorded in the Phase 1 assessment area are in the areas of moderate-high potential around the eastern salt pan. No additional hearths were recorded around the eastern salt pan during the Phase 2 assessment, with all recorded hearths identified in areas of low potential distant from the western salt pan.

Figure 8-64: Phase 1 and 2 recorded stone artefacts from and the ASDST model of artefact site probability.

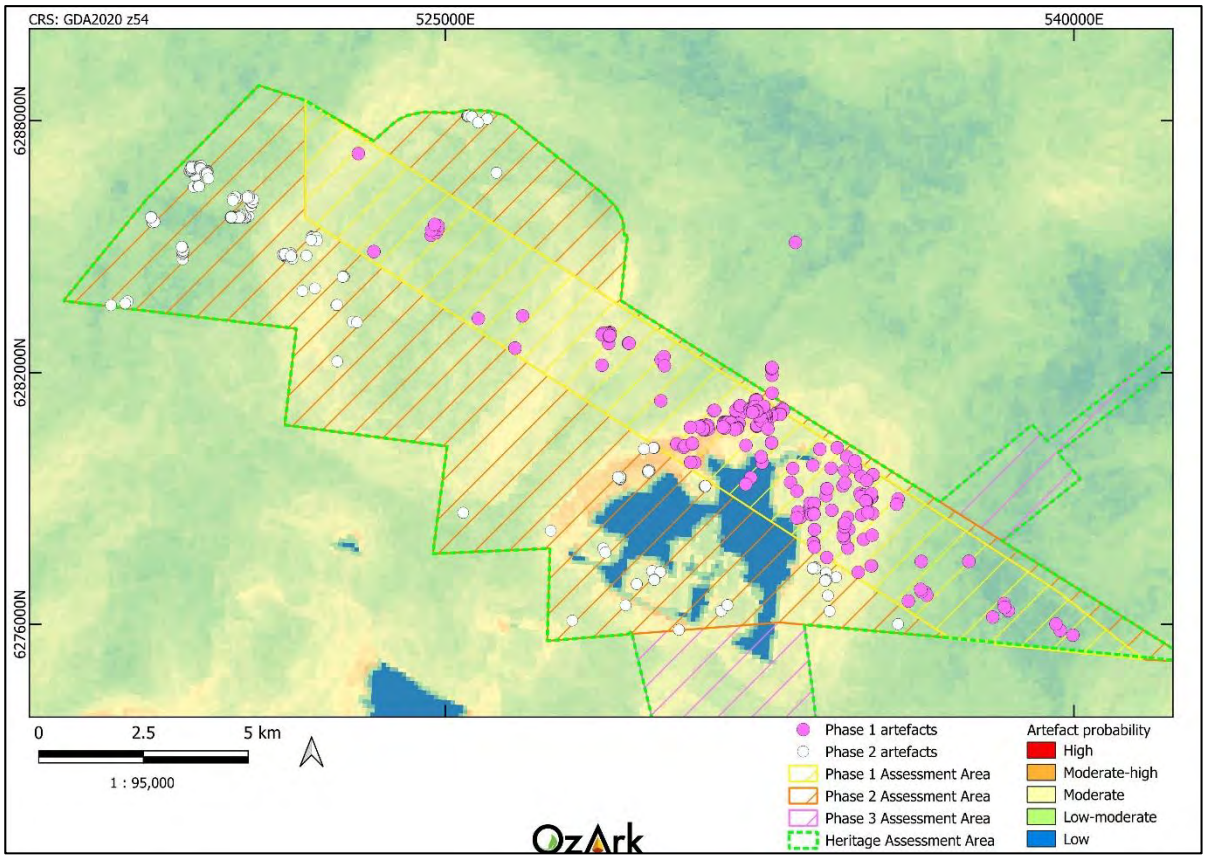
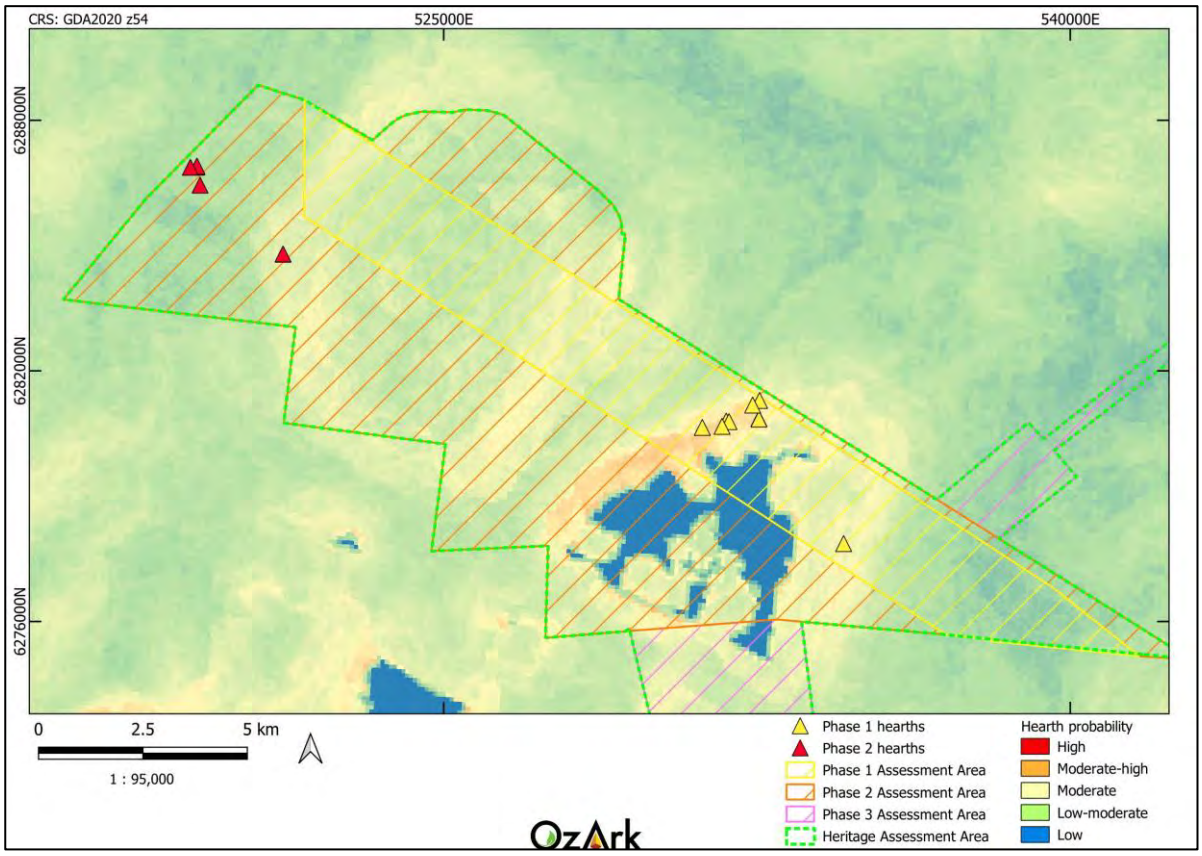


Figure 8-65: Phase 1 and 2 recorded hearths and the ASDST model of hearth probability.



9 PHASE 2 – TEST EXCAVATION PROGRAM

This section documents the results of the of the test excavation at Area 3 in the Phase 1 assessment area during the second phase of the Project. The Phase 2 test excavation was completed on Tuesday 1 March 2022 (see **Section 1.2**).

Please refer to **Section 7.4** for context of the recording regime used during the Phase 2 test excavation program.

9.1 BACKGROUND TO THE PHASE 2 TEST EXCAVATION PROGRAM

As noted in **Section 7.1**, during the 2020 survey, OzArk identified ten areas where test excavation was proposed to provide a clearer picture of the subsurface archaeological potential across the Phase 1 assessment area. Following the identification of the ten proposed test excavation areas, the Applicant refined the Limit of Disturbance, as such Areas 3 and 9 were excluded from the test excavation program (**Figure 7-1**).

Following the redesign of the Limit of Disturbance it was determined that Area 3 would now be impacted by the Project and therefore test excavation was required. Area 9 is still located outside of the Limit of Disturbance, as such, test excavation has not taken place at the site.

9.2 SAMPLING METHODOLOGY FOR AREA 3

Area 3 is within the Sandplains and Dunes soil association landform at Copi OS-2, an artefact scatter consisting of a minimum of 22 artefacts located on the eroding sloped bank of a drainage line. Copi OS-2 was assessed as having potential for subsurface archaeological deposits across the flat elevated land to the west of the area where surface artefacts have eroded downslope.

For further details on the methodology of the test excavation program see **Appendix 6**. Two parallel transects each consisting of six TUs were excavated at Area 3 (**Table 9-1**).

Table 9-1: Sampling methodology for the text excavation program.

Area	Test excavation methodology
Area 3	2 x 50 m transects (12 0.5 x 0.5 m TUs) will be excavated so the entire PAD area is investigated.

9.3 TEST EXCAVATION RESULTS

9.3.1 Preamble

A total of 12 TUs (0.5 x 0.5 m) were excavated at Area 3: a total of 3 m^2. From the 12 TUs only two artefacts were recovered: an average of 0.6 artefacts per square metre.

Table 9-2 summarises the location and results from each excavation square.

Table 9-2. Summary of results from each excavation square at Area 3.

Area	Transect	Square	GDA Zone 54 East	GDA Zone 54 North	Artefacts (total)
Area 3	TR1	1	528839	6282877	0
Area 3	TR1	2	528828	6282881	0
Area 3	TR1	3	528818	6282885	1
Area 3	TR1	4	528810	6282889	0
Area 3	TR1	5	528800	6282893	0
Area 3	TR1	6	528792	6282897	0
Area 3	TR2	1	528842	6282897	0
Area 3	TR2	2	528833	6282900	0
Area 3	TR2	3	528823	6282903	0
Area 3	TR2	4	528815	6282908	0
Area 3	TR2	5	528805	6282910	0
Area 3	TR2	6	528795	6282915	1

9.3.2 Description of Area 3

Area 3 is located at Copi OS-2 which stretches for approximately 260 m along an eroding sloped bank of a drainage line. This location was chosen because several surface artefacts were visible during the initial survey and testing was proposed to determine whether they are present on a deflated surface.

Two transects (Tr1–2) were investigated and a total of 12 TUs excavated; six squares at each transect, spaced 10 m apart (**Figure 9-1**). Both transects are oriented southeast to northwest across a terraced landform adjacent to a drainage line (**Figure 9-1** and **Figure 9-2**).

Figure 9-1: Location of transects at Area 3.

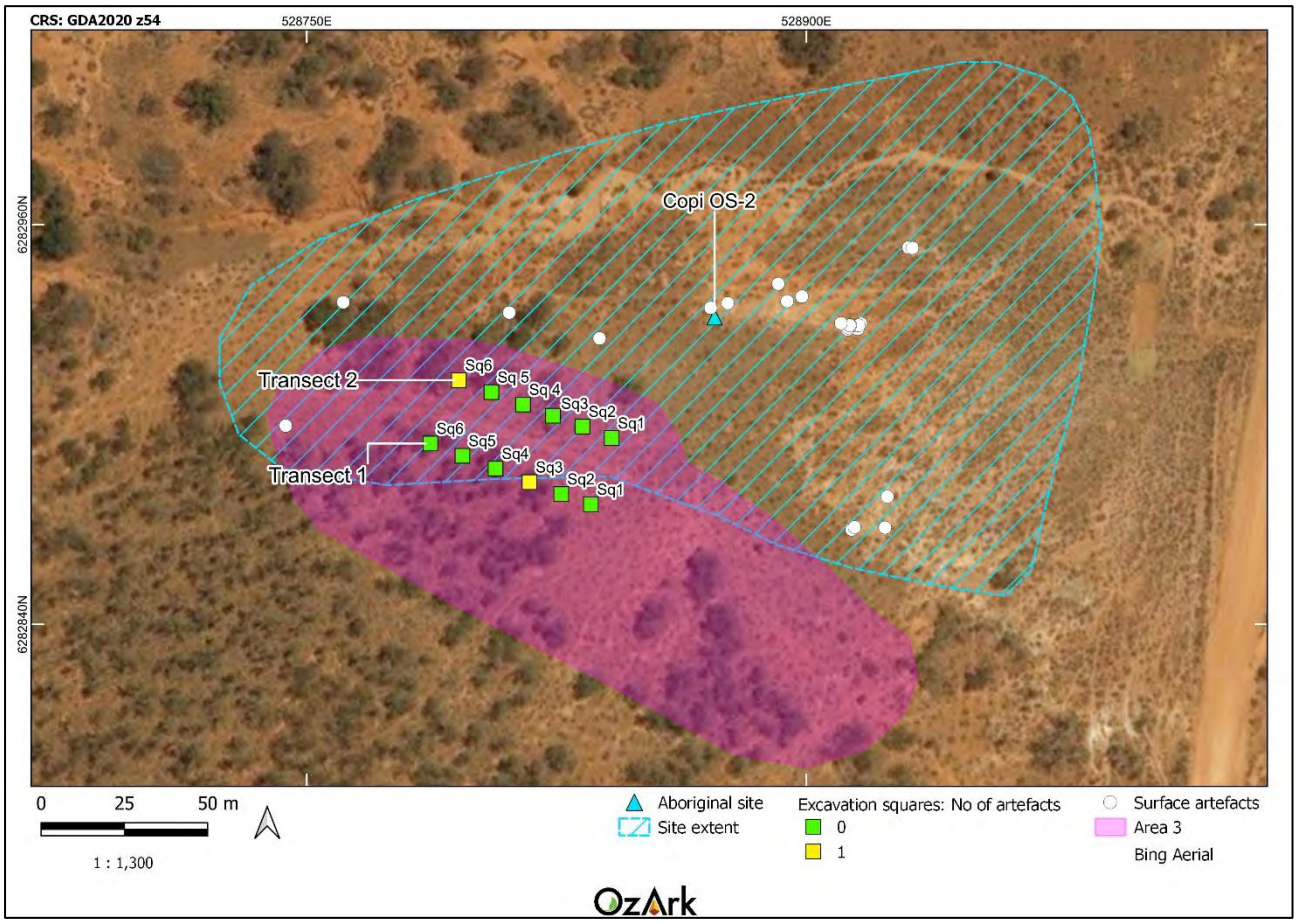


Figure 9-2: Area 3. View of transects.

	
1. View west to Transect 1.	2. View east to Transect 1.

9.3.3 Stratigraphy of Area 3

All squares within Tr1 were excavated in 5 cm spits, as was square one of Tr2. Squares 2 to 6 of Tr2 were excavated in 10 cm spits. **Table 9-3** provides detail on the soil profiles at Area 3 and **Figure 9-3** shows a sample of excavated soil profiles from Tr1 and Tr2 excavated at Area 3.

Soils across Tr1 were generally uniform, consisting of a thin layer of fine orange sand overlaying a sandy layer with vegetation inclusions (mostly roots and other vegetation) with increased compactness and gravels. All squares encountered a yellow/orange-cream coloured sand base from depths of 30 to 47 cm. Sq 5 encountered some roots between the depths of 9 to 20 cm (**Figure 9-3**; image 1).

Soils across Tr2, except Sq6, initially comprised orange sand to depths between 6 to 10 cm. Sq6 has an A-horizon layer comprised dark orange compact sand at a depth of 25 cm. Tr2 Sq5 differed from Sq1 to Sq4. Sq5 consisted of orange sand before encountering a very soft and extremely fine gypsum (white talc?) layer between 10-40 cm (**Figure 9-3**; image 3), which is absent from other squares. Sq2–Sq3 are generally uniform, consisting of a thin layer of orange sand overlaying a vegetation layer with increased compactness and gravels and encountered a compact creamy sandy base between the depths of 40-45 cm. Sq1 consisted of an orange sand layer on the top and a compact sandy layer on the bottom but also has a white (calcite) sandy layer with chunky root inclusions between the depths of 7–25 cm (**Figure 9-3**; image 4). Sq 4 comprised four soil layers, from top to bottom: orange sand layer, brown/orange sand layer, light brown sand layer, and orange compact sand layer (**Figure 9-3**; image 6).

Two stone artefacts were recorded at Area 3. One artefact was recovered from Tr1 Sq3 Spit 3 (10–15 cm) and one from Tr1 Sq6 Spit 3 (20–30 cm).

Table 9-3. Area 3: Excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	47	Yellow-orange sandy layer to 5 cm. Yellow-cream coloured sand with many inclusions down to a compact base at 47 cm.
Tr1 Sq2	45	Yellow-orange sandy layer to 6 cm. Yellow-cream coloured sand with some inclusions and calcite nodules down to a compact base at 45 cm.
Tr1 Sq3	40	Yellow-orange sandy layer to 5 cm. Yellow-cream coloured sandy clay with few inclusions down to a compact base at 40 cm.
Tr1 Sq4	40	Orange sandy layer to 11 cm. Cream coloured sandy clay with few inclusions down to a compact base at 40 cm.
Tr1 Sq5	40	Orange sandy layer to 9 cm. Compact cream coloured sandy clay with some roots and few inclusions down to a compact base at 40 cm.
Tr1 Sq6	30	Orange sandy layer to 10 cm. Orange/yellow sand with some large roots and few inclusions down to a soft base at 30 cm.
Tr2 Sq1	40	Orange sand to 7 cm. White (calcite) sandy layer to 25 cm with increased inclusions, Compact silty sand with few inclusions to 40 cm.
Tr2 Sq2	40	Orange sand down to 6 cm. A thin vegetation layer to 10 cm. Cream sandy silt to 40 cm overlaying compacted base.
Tr2 Sq3	45	Orange sand down to 8 cm. A soft sandy layer with dense vegetation to 18 cm. Compact creamy sandy clay to 45 cm overlaying compacted base.
Tr2 Sq4	40	Orange sand down to 8 cm. A brown/orange sand layer with thin vegetation inclusions to 14 cm. Light brown sand with few inclusions to 22 cm. Compact orange sandy clay to 40 cm overlaying compacted base.
Tr2 Sq5	40	Soft orange sand down to 10 cm. A very soft and extremely fine gypsum (white talc?) layer without inclusions to 40 cm.
Tr2 Sq6	25	Dark orange compact sand layer with many inclusions down to 25 cm overlaying compacted base.

Figure 9-3. Test excavation Area 3. Soil profiles.

1. Area 3: Tr1 Sq5, north profile.

2. Area 3: Tr1 Sq3, west profile.

3. Area 3: Tr2 Sq5, north profile showing the gypsum (white talc?) layer.

4. Area 3: Tr2 Sq1, west profile showing the white (calcite) sandy layer and roots.

	
5. Area 3: Tr2 Sq2, west profile whoing the root inclusions.	6. Area 3: Tr2 Sq4, north profile.

9.3.4 Artefact assemblage at Area 3

Two artefacts were recorded at Area 3: both chert flakes (**Figure 9-4**).

Figure 9-4. Test Excavation. Area 3 artefacts.

	
1. Area 3: Tr1 Sq3 Spit 3 (10–15 cm) artefact.	2. Area 3: Tr2 Sq6 Spit 3 (20–30 cm) artefact.

9.4 RESEARCH QUESTIONS

In **Section 7.2.2**, several research questions were posed for the test excavation program. These will be answered below with regards to Area 3.

- How does the artefactual material identified at the site compare to other archaeological excavations undertaken in the local area and the region?
    - The artefact assemblage from Area 3 is not substantial enough to form adequate comparison with other sites in the local area or broader region. However, the material (chert) identified during the test excavation program at Area 3 is consistent with those commonly found during excavations within the broader region.

- Is the observed surface manifestations and correlation to the mapped Soil Association of Area 3 (Sandplains and Dunes) borne out by the subsurface investigations?
    - The results of the survey showed that the greatest concentrations of artefacts were on the Footslopes landforms, followed by the Sandplains and Dunes. During the Phase 1 test excavation, only two artefacts were recovered from TUs across the Sandplains and Dunes. This result is similar to the results at Area 3. This result further confirms that the surface artefacts have been heavily affected by erosion and become exposed through loss of A Horizon soils.
- Are intact archaeological features, such as hearths and/or middens, present in the site area?
    - No archaeological stratigraphy or archaeological features such as hearths or middens were recorded during the test excavation at Area 3.
- Can chronological dates be obtained (i.e. from in situ charcoal samples) that will aid our understanding of Aboriginal occupation in the region?
    - No archaeological features (i.e. hearths) with *in situ* charcoal samples were identified during the test excavation at Area 3. As such, no dating can be undertaken.

9.5 RESEARCH CONSIDERATIONS

Section 7.4.2 provides some research considerations that should be applied to any excavation. Some concluding remarks will be made in this section about the considerations raised in **Section 7.4.2**.

Statistically useful sample size

Twelve TUs (0.5 x 0.5 m) were excavated at Area 3: a total of 3 m^2. From these 12 TUs, two artefacts were recovered an average of 0.6 artefacts per square metre. Similarly to the results of the Phase 1 test excavation, this density of artefacts is extremely low and not robust enough for statistical analysis.

Condition

The TUs did not have overt evidence of disturbance. Most excavation areas comprised undifferentiated A1-Horizon and a leached A2-Horizon, the implication is that the landscape has been subject to the stripping of the A1-Horizon and the exposure of the A2-Horizon. The assumption is, therefore, that Area 3 has undergone a high general disturbance from soil loss that has compromised the archaeological deposits at Area 3 and the condition of the deposit is poor.

9.6 CONCLUSION

Test excavation at Area 3 targeted a gently sloping landform along a drainage line where surface artefacts were identified (Copi OS-2). Twelve TUs (0.5 x 0.5 m) were excavated at Area 3: a total

of 3 m^2. Two stone artefacts were recorded at Area 3. One artefact was recovered from Tr1 Sq3 and one from Tr1 Sq6.

The site is now 'partially destroyed' but has the potential to contain further subsurface artefacts at a very low density within the site extent. Further archaeological excavation at this site is, however, deemed unwarranted due to very low density of subsurface artefacts.

10 PHASE 3 – SURVEY RESULTS

This section documents the results of the survey within the Phase 3 assessment area. The Phase 3 survey was completed in November 2023 (see **Section 1.2**).

10.1 SAMPLING STRATEGY AND FIELD METHODS

The assessment methodology provided in **Appendix 7** provided a sampling strategy for the Phase 3 assessment area however prior to the survey the area was reduced, and a greater level of survey effort was able to be completed.

The pedestrian survey completed across the Phase 3 assessment area included the 'full survey' approach across the south portion and the northern portions while sample survey was completed across the portion adjacent Anabranch Mail Road. A sample of approximately every kilometre was completed along Anabranch Mail Road.

10.2 EFFECTIVE SURVEY COVERAGE

Table 10-1 calculates the effective survey coverage within Phase 3 assessment area. Levels of exposures and GSV were higher than experienced during the Phase 2 survey due to conditions starting to dry out after prolonged periods of increased rainfall. Levels of exposure and GSV were relatively high across the Phase 3 assessment area. During the Phase 3 survey, visibility was greatest within the Sandplains and Dunes landforms which was the same during the Phase 1 survey.

The effective survey coverage over the Phase 3 assessment area was highest in the Sandplains and Dunes at 42% as it is more prevalent to erosion, while survey coverage was lowest within the Lake Footslopes which comprised higher ground cover than across the same landforms in the broader Heritage Assessment Area.

Table 10-1: Effective survey coverage within the Phase 3 assessment area.

Survey Unit	Landform	Survey Unit Area (sq m)	Visibility %	Exposure %	Effective Coverage Area (sq m) (= Survey Unit Area x Visibility % x Exposure %)	Effective Coverage % (= Effective Coverage Area / Survey Unit Area x 100)
1	Sandplains and Dunes	16,584,161	70	60	6,965,347	42
2	Lunettes and Islands	9,953,500	65	40	2,587,910	26
3	Lake Footslopes	259,000	50	30	38,850	15
4	Salt Pans	2,162,100	60	40	518,904	24

Table 10-2 demonstrates that the highest number of recorded sites was within the survey units with the greatest survey efficacy (Sandplains and Dunes and Lunettes and Islands) although this

result is not unexpected given the small portion of Lake Footslopes within the Phase 3 assessment area.

Table 10-2: Effective survey coverage and incidences of site recording.

Landform	Landform area (sq m)	Area Effectively Surveyed (sq m) (= Effective Coverage Area)	% of Landform Effectively Surveyed (= Area Effectively Surveyed / Landform x 100)	Number of Sites	Number of artefacts and features
Sandplains and Dunes	16,584,161	6,965,347	42	14	134
Lunettes and Islands	9,953,500	2,587,910	26	6	86
Lake Footslopes	259,000	38,850	15	0	0
Salt Pans	2,162,100	518,904	24	1	1

Figure 10-1 shows representative examples of GSV across the survey units.

Figure 10-2 and **Figure 10-3** illustrates the pedestrian transects and landforms of the Phase 3 assessment area and **Figure 10-4** shows the locations of all recorded artefacts and features in relation to the survey units.

Figure 10-1: Examples of GSV throughout the landforms of the Phase 3 assessment area.

1. Example of GSV across the Sandplains and Dunes landform in the southwest of the Phase 3 assessment area.

2. Example of GSV across the Sandplains and Dunes landform in the north of the Phase 3 assessment area.

3. View across a salt pan in the south of the Phase 3 assessment area.

4. Example of GSV on the Lunettes and Islands landform surrounding the salt pan.

5. Example of GSV on the Lunettes and Islands in the southeast portion of the Phase 3 assessment area.

6. Example of GSV on the Lake Footslopes landform in the southern portion of the Phase 3 assessment area.

Figure 10-2: Pedestrian transects across the Phase 3 assessment area.

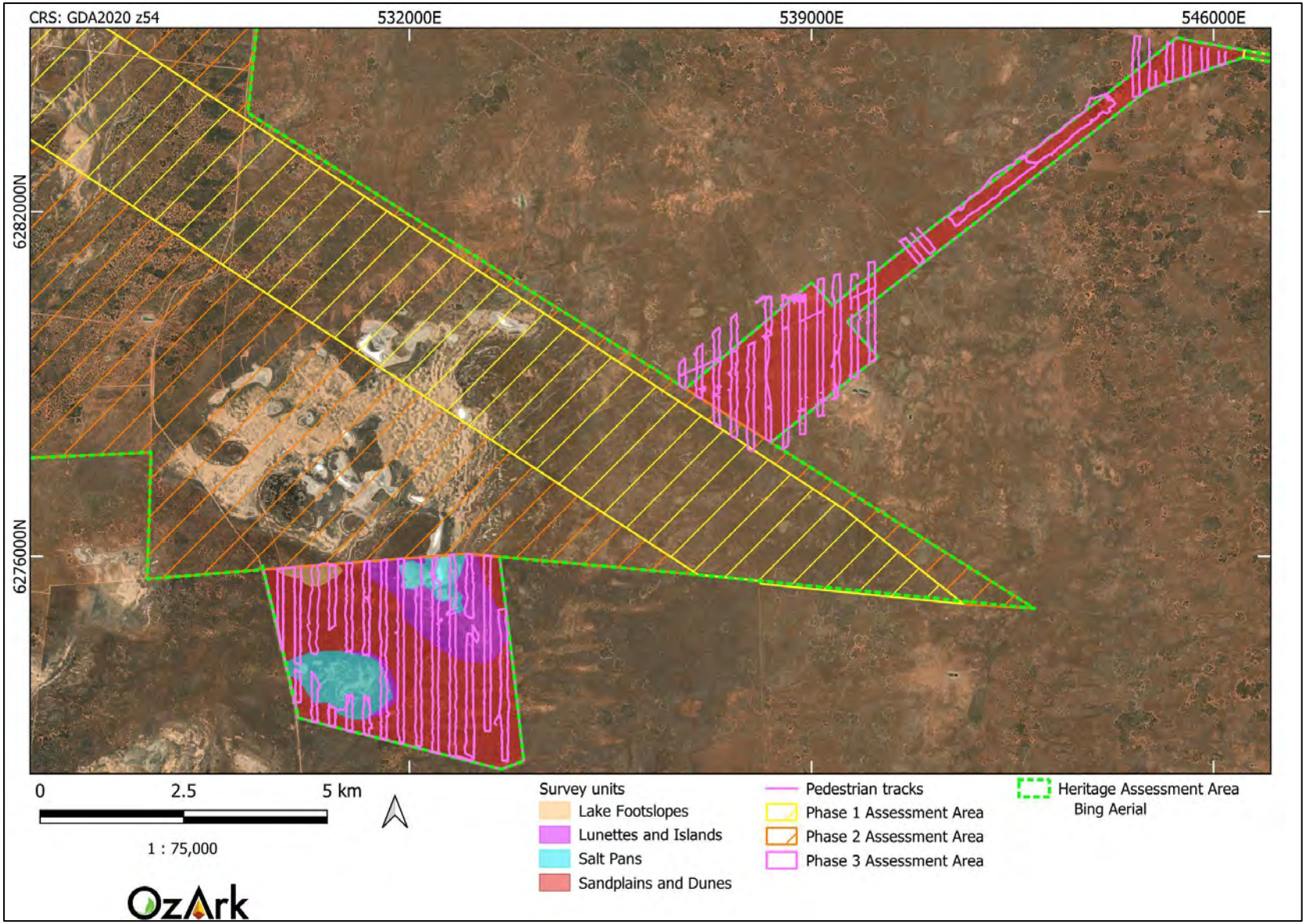


Figure 10-3: Pedestrian transects across the eastern extent of the Phase 3 assessment area (Anabranch Mail Road).

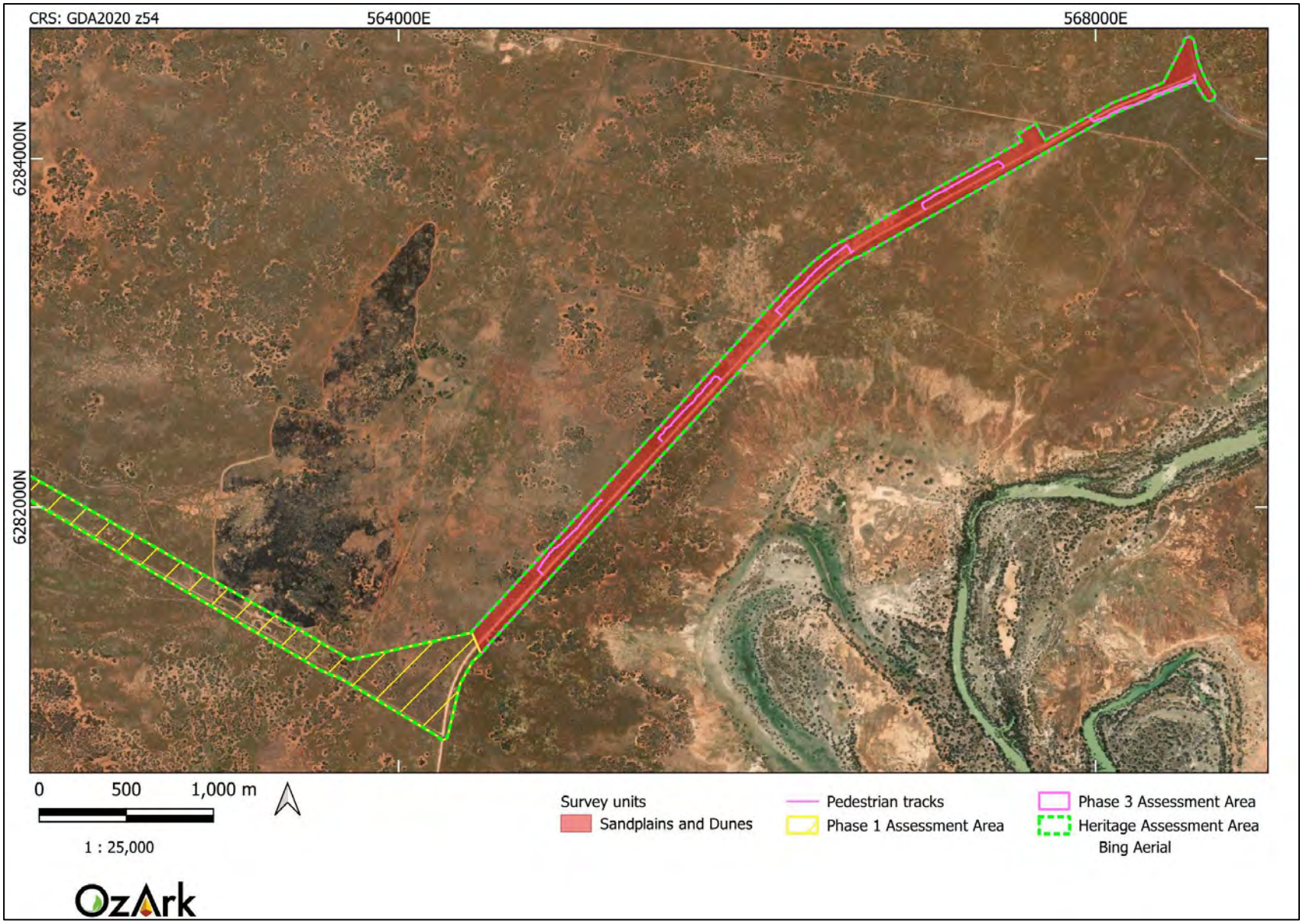
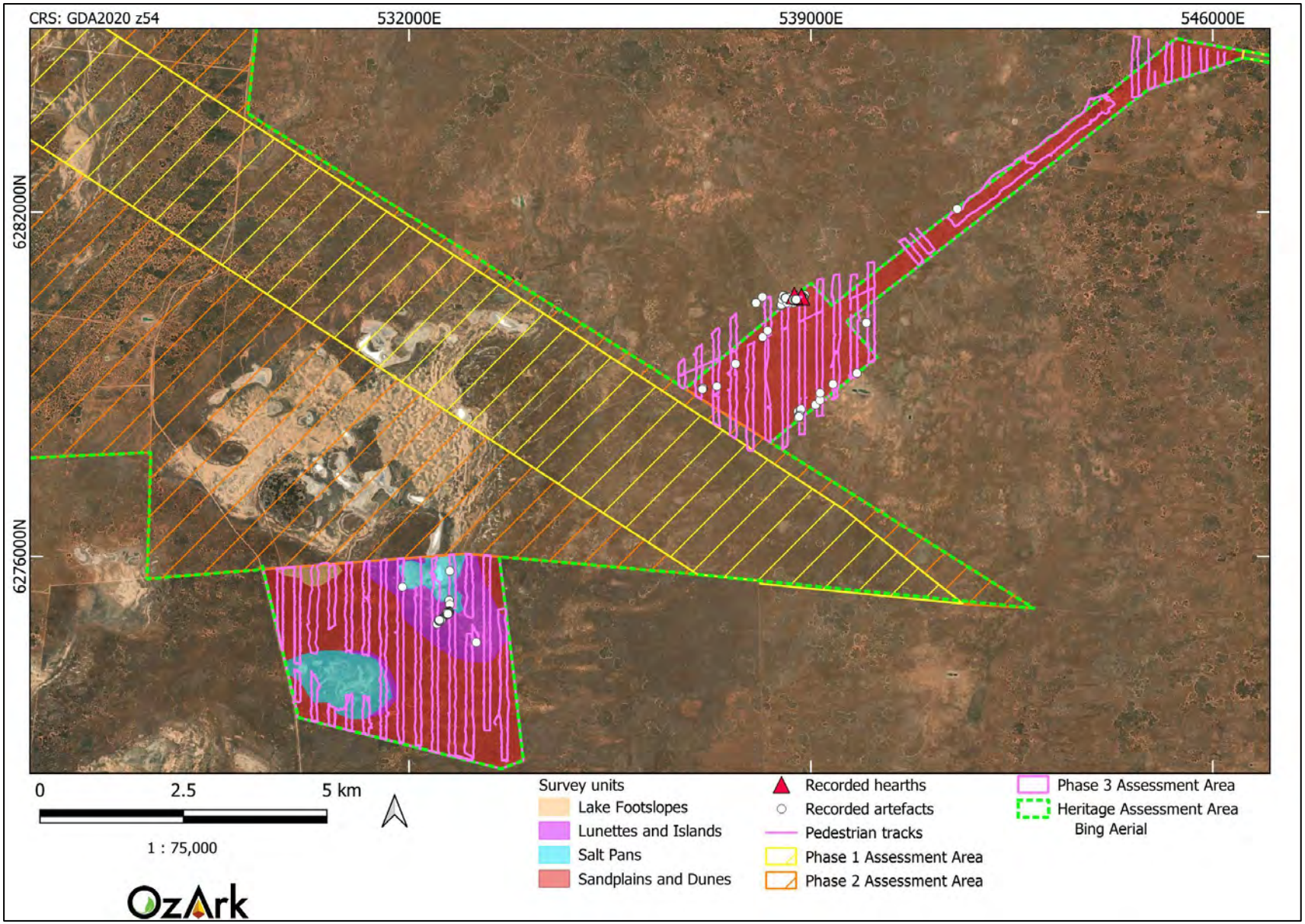


Figure 10-4: Location of recorded artefacts and features in relation to the landforms within the Phase 3 assessment area.



10.3 ABORIGINAL SITES RECORDED

Table 10-3 summarises the 21 Aboriginal cultural heritage sites recorded during the Phase 3 survey. Further details on each site follow.

Table 10-3: Aboriginal cultural heritage sites recorded during the Phase 3 survey.

ID	AHIMS ID	Site name	GDA Zone 54 Easting	GDA Zone 54 Northing	Feature(s)	Landform
Isolated finds						
123	39-4-0846	Copi IF-72	539967	6280069	Isolated find	Sandplains and Dunes
124	39-4-0845	Copi IF-73	539385	6278999	Isolated find	Sandplains and Dunes
125	39-4-0844	Copi IF-74	539161	6278843	Isolated find	Sandplains and Dunes
126	39-4-0843	Copi IF-75	539159	6278721	Isolated find	Sandplains and Dunes
127	39-4-0842	Copi IF-76	539080	6278638	Isolated find	Sandplains and Dunes
128	39-4-0841	Copi IF-77	538248	6279932	Isolated find	Sandplains and Dunes
129	39-4-0840	Copi IF-78	537688	6279351	Isolated find	Sandplains and Dunes
130	39-4-0839	Copi IF-79	537362	6278961	Isolated find	Sandplains and Dunes
131	39-4-0847	Copi IF-80	533171	6274497	Isolated find	Lunettes and Islands
132	39-4-0849	Copi IF-81	532708	6275741	Isolated find	Salt pans
133	39-4-0848	Copi IF-82	531883	6275462	Isolated find	Lunettes and Islands
134	39-4-0851	Copi IF-83	541550	6282054	Isolated find	Sandplains and Dunes
135	39-4-0850	Copi IF-84	532709	6275156	Isolated find	Lunettes and Islands
Open sites						
136	39-4-0858	Copi OS-52	538617	6280466	Artefact scatter; hearths	Sandplains and Dunes
137	39-4-0852	Copi OS-53	539802	6279189	Artefact scatter	Sandplains and Dunes
138	39-4-0853	Copi OS-54	538797	6278490	Artefact scatter	Sandplains and Dunes
139	39-4-0854	Copi OS-55	538160	6279814	Artefact scatter	Sandplains and Dunes
140	39-4-0857	Copi OS-56	537112	6278921	Artefact scatter	Sandplains and Dunes
141	39-4-0856	Copi OS-57	532698	6275226	Artefact scatter	Lunettes and Islands
142	39-4-0855	Copi OS-58	532677	6275012	Artefact scatter with PAD	Lunettes and Islands
143	39-4-0859	Copi OS-59	532527	6274859	Artefact scatter with PAD	Lunettes and Islands

10.3.1 Isolated finds

An additional 13 isolated finds were recorded during the Phase 3 survey. These are listed in **Table 10-4** and shown on **Figure 10-5** and **Figure 10-6**. Full details of each isolated find follow.

Table 10-4: Isolated finds recorded during the Phase 3 survey: artefact attributes.

Site name	AHIMS ID	GDA Zone 54 Easting	GDA Zone 54 Northing	Artefact type	Material	Size (LxWxD) mm	Additional detail
Copi IF-72	39-4-0846	539967	6280069	Flake	Quartzite	54 x 27 x 12	Longitudinal break; tertiary
Copi IF-73	39-4-0845	539385	6278999	Flake	Silcrete	33 x 38 18	Complete; tertiary
Copi IF-74	39-4-0844	539161	6278843	Core	Silcrete	Max. 54 mm	60% cortex; tested cobble

Site name	AHIMS ID	GDA Zone 54 Easting	GDA Zone 54 Northing	Artefact type	Material	Size (LxWxD) mm	Additional detail
Copi IF-75	39-4-0843	539159	6278721	Flaked piece	Silcrete	28 x 25 x 12	Secondary
Copi IF-76	39-4-0842	539080	6278638	Core	Silcrete	Max. 66 mm	Uni-directional; reduced
Copi IF-77	39-4-0841	538248	6279932	Flake	Quartzite	40 x 21 x 8	Complete; tertiary; severely weathered
Copi IF-78	39-4-0840	537688	6279351	Flake	Silcrete	18 x 18 x 4	Proximal fragment; tertiary
Copi IF-79	39-4-0839	537362	6278961	Flake	Silcrete	25 x 21 x 5	Complete; tertiary
Copi IF-80	39-4-0847	533171	6274497	Manuport	Quartzite	55 x 47 x 22	
Copi IF-81	39-4-0849	532708	6275741	Grindstone fragment	Quartzite	63 x 49 x 27	
Copi IF-82	39-4-0848	531883	6275462	Flake	Silcrete	11 x 11 x 3	Complete; tertiary
Copi IF-83	39-4-0851	541550	6282054	Flake	Mudstone	24 x 21 x 3	Proximal fragment; tertiary
Copi IF-84	39-4-0850	532709	6275156	Flake	Silcrete	43 x 31 x 10	Distal fragment; tertiary

Figure 10-5: Overview of the location of all recorded isolated finds within the northeastern portion of the Phase 3 assessment area.

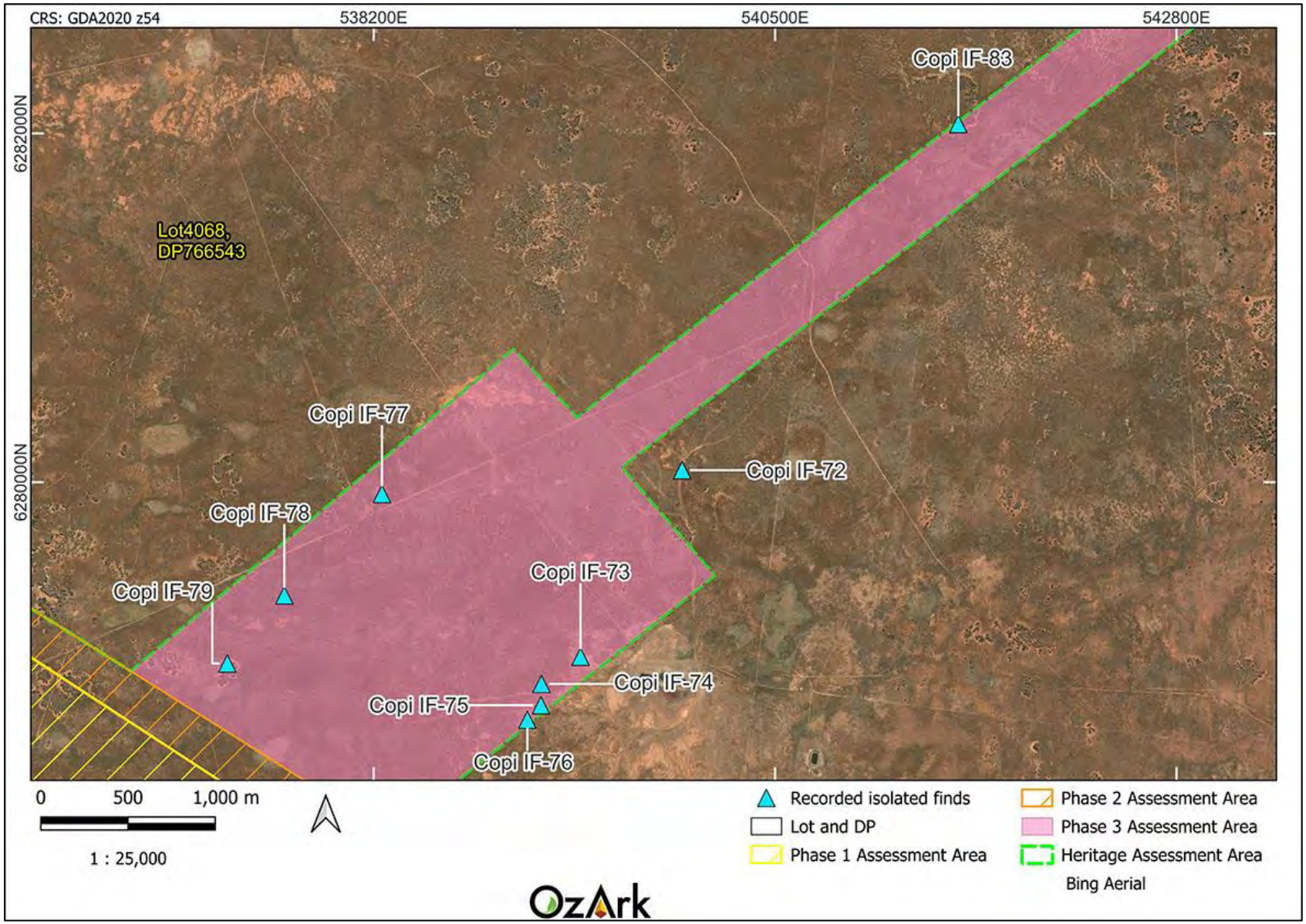
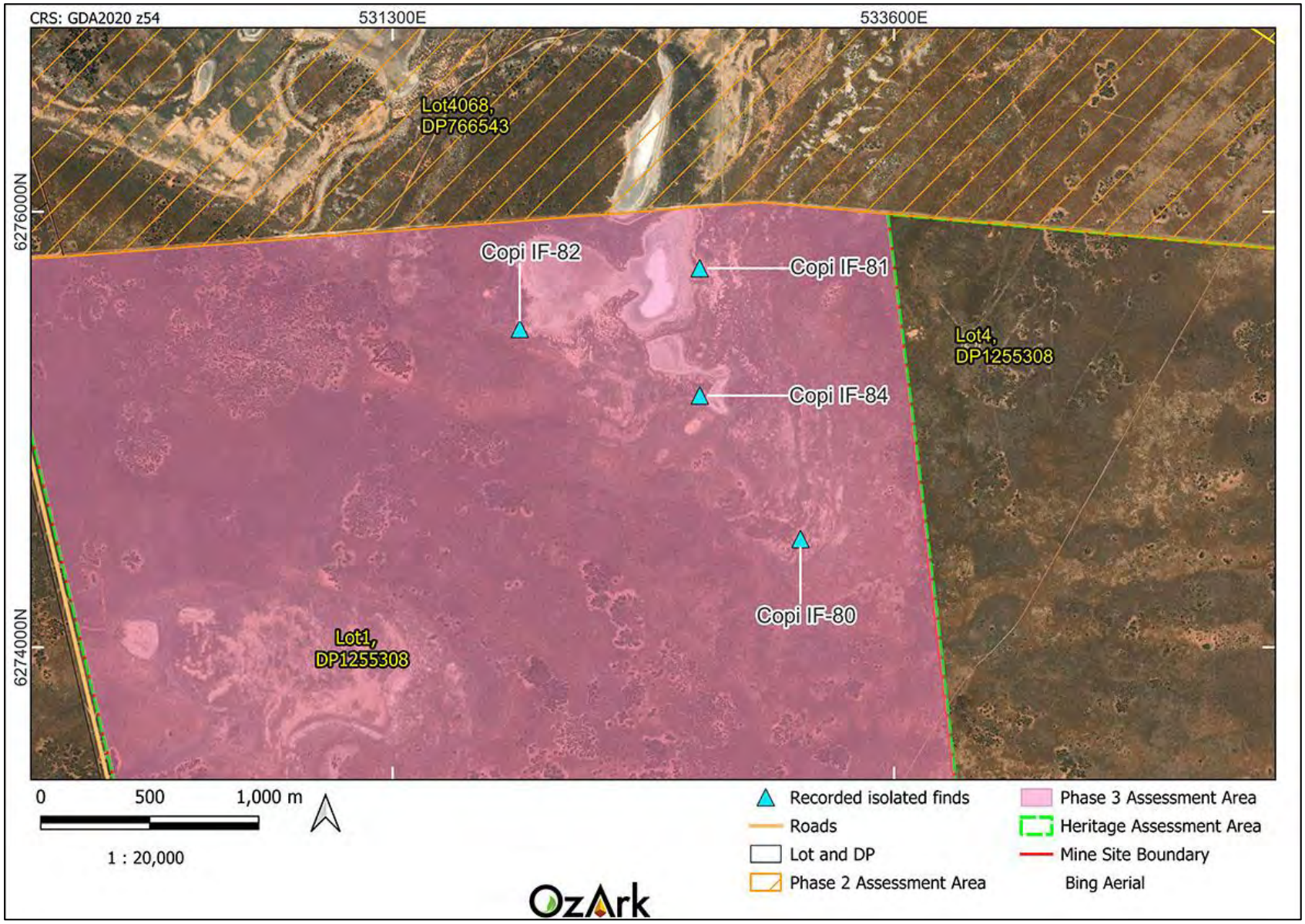


Figure 10-6: Overview of the location of all recorded isolated finds within the southern portion of the Phase 3 assessment area.



Copi IF-72

Site type: Isolated find

GPS coordinates: GDA Zone 54 539967E 6280069N

Location of site: Copi IF-72 is located approximately 11 km from the western boundary, 7.8 km from the eastern boundary, and 4.7 km from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 10-5** and **Figure 10-7**). The site is located 12.2 km directly east of Nulla Road and 4.1 km southeast of Warwick homestead.

Description of site: Copi IF-72 is a quartzite flake located adjacent to an artificial drainage channel on a deflated sandplain (**Figure 10-8**). The flake measures 54 x 27 x 12 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange sand. Surrounding vegetation at the site is comprised of scattered saltbush and trees. The GSE at the time of recording was high (70%) with a GSV of 90% within the large area of exposure. Identified disturbances include grazing and subsequent soil loss (deflation) and construction of the channel.

Copi IF-72 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 10-7: Location of Copi IF-72.

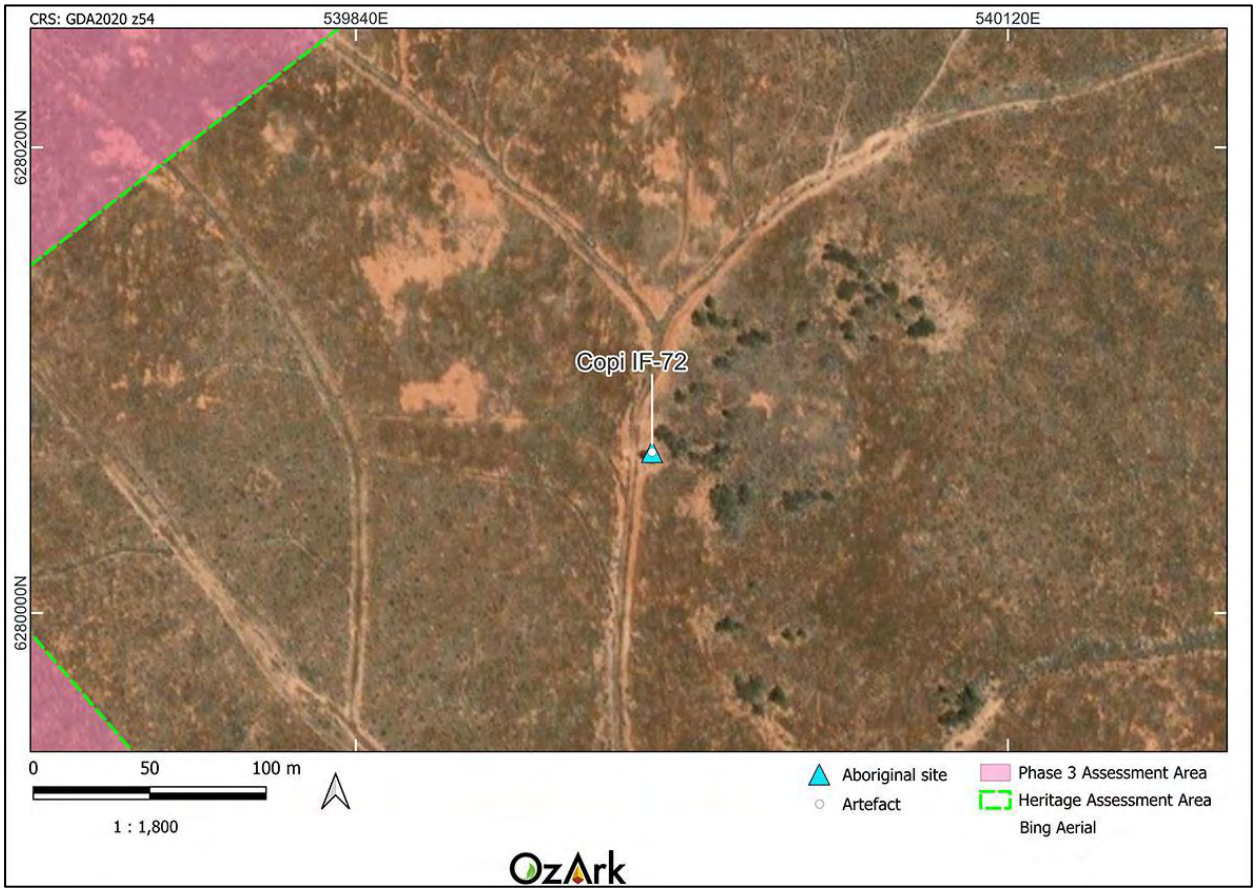


Figure 10-8: Copi IF-72. View of site and recorded artefact.

1. View east to the location of Copi IF-72 along a drainage channel.

2. Copi IF-72 artefact: a quartzite flake.

Copi IF-73

Site type: Isolated find

GPS coordinates: GDA Zone 54 539385E 6278999N

Location of site: Copi IF-73 is located approximately 10.6 km from the western boundary, 8.2 km from the eastern boundary, and 3.5 km from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 10-5** and **Figure 10-9**). The site is located 11.8 km directly east of Nulla Road and 4.9 km southeast of Warwick homestead.

Description of site: Copi IF-73 is a single silcrete flake located on a deflated sand plain (**Figure 10-10**). The flake measures 33 x 38 x 18 mm and is at tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange sand. Surrounding vegetation at the site is comprised of shrubs, predominantly saltbush and bluebush. The GSE at the time of recording was moderate-high (60%) with a GSV of 80% within the large area of exposure. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-73 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 10-9: Location of Copi IF-73 to IF-76.

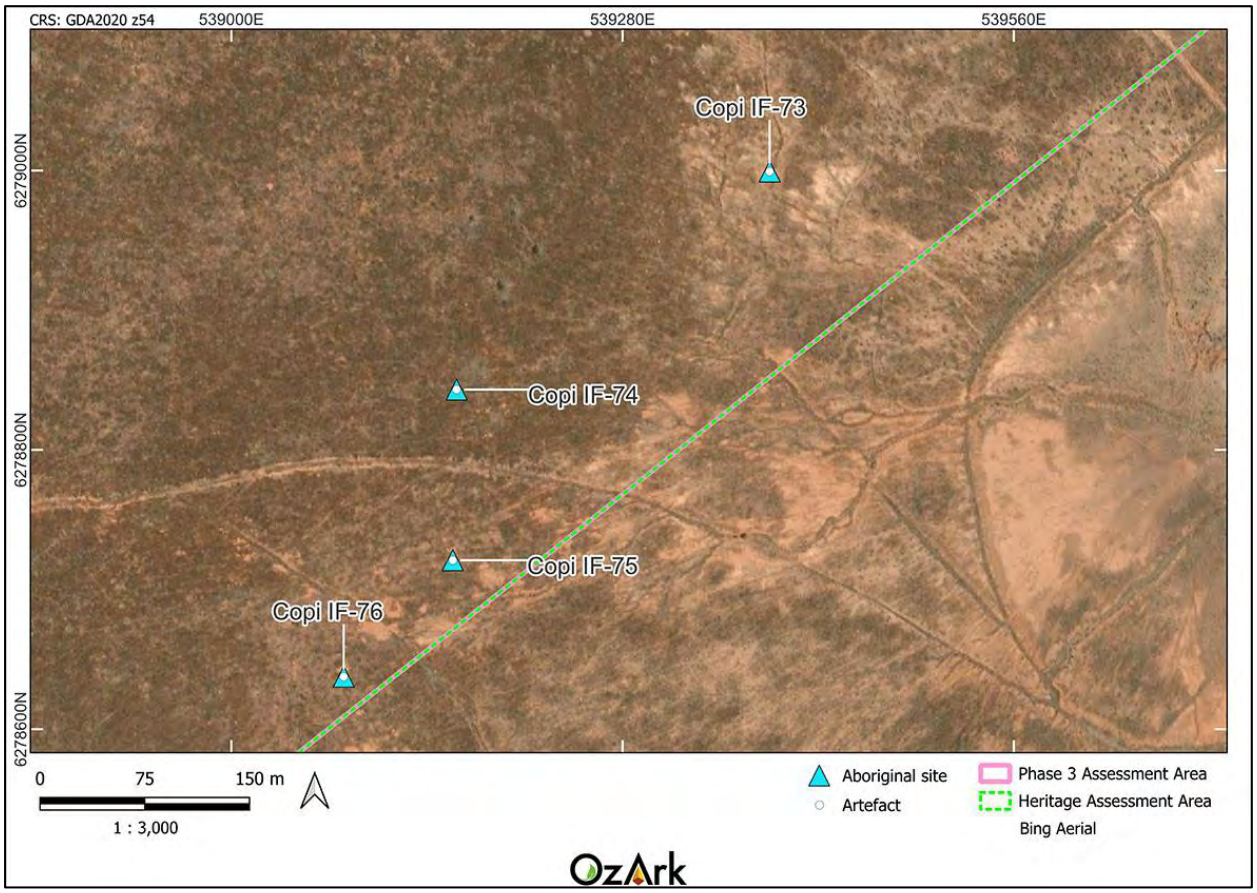


Figure 10-10: Copi IF- 73. View of site and recorded artefact.

1. View east to Copi IF-73 at the location where the people are standing.

2. Copi IF-73 artefact: a silcrete flake.

Copi IF-74

Site type: Isolated find

GPS coordinates: GDA Zone 54 539161E 6278843N

Location of site: Copi IF-74 is approximately 10.4 km from the western boundary, 8.5 km from the eastern boundary, and 3.3 km from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 10-5** and **Figure 10-9**). The site is located 11.6 km directly east of Nulla Road and 5 km southeast of Warwick homestead.

Description of site: Copi IF-74 is a silcrete core located on a flat sand plain (**Figure 10-11**). The core reflects opportunistic testing of the cobble's material, with a relatively high percentage of original cortex. The maximum dimension is 54 mm. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange sand. Surrounding vegetation at the site comprises of scattered saltbush and grasses. Due to dense ground cover, GSV was low at 10%. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-74 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 10-11: Copi IF-74. View of site and recorded artefact.

1. View of Copi IF-74.

2. Copi IF-74 artefact: a silcrete core.

Copi IF-75

Site type: Isolated find

GPS coordinates: GDA Zone 54 539159E 6278721N

Location of site: Copi IF-75 is located approximately 10.3 km from the western boundary, 8.5 km from the eastern boundary, and 3.2 km from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 10-5** and **Figure 10-9**). The site is located 11.6 km directly east of Nulla Road and 5.1 km southeast of Warwick homestead.

Description of site: Copi IF-75 is a silcrete flaked piece located in a small erosional scald in a flat sand plain (**Figure 10-12**). The artefact measures 28 x 25 x 12 mm and is at a secondary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange sand. Surrounding vegetation at the site comprises scattered saltbush and grasses. The GSE at the time of recording was low (20%) with a GSV of 90% within the area of exposure. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-75 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 10-12: Copi IF-75. View of site and recorded artefact.

1. View of Copi IF-75 at the location of the bag.

2. Copi IF-75 artefact: a silcrete flaked piece.

Copi IF-76

Site type: Isolated find

GPS coordinates: GDA Zone 54 539080E 6278638N

Location of site: Copi IF-76 is located approximately 10.2 km from the western boundary, 8.5 km from the eastern boundary and 3.1 km from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 10-5** and **Figure 10-9**). The site is located 11.5 km directly east of Nulla Road and 5.2 km southeast of Warwick homestead.

Description of site: Copi IF-76 is a silcrete core located within a series of erosion scalds in a flat sand plain (**Figure 10-13**). The maximum dimension is 66 mm and shows unidirectional flaking scars. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange sand. Surrounding vegetation at the site comprises scattered saltbush and grasses. The GSE at the time of recording was moderate (40%) with a GSV of 90% within the area of exposure. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-76 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 10-13: Copi IF-76. View of site and recorded artefact.

	
1. View of Copi IF-76 located where the person is standing.	2. Copi IF-76 artefact: a silcrete core.

Copi IF-77

Site type: Isolated find

GPS coordinates: GDA Zone 54 538248E 6278638N

Location of site: Copi IF-77 is located approximately 9.5 km from the western boundary, 9.5 km from the eastern boundary, and 4.3 km from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 10-5** and **Figure 10-14**). The site is located 10.5 km directly east of Nulla Road and 3.7 km south southeast of Warwick homestead.

Description of site: Copi IF-77 is a silcrete flake located in an erosional scald within a sand plain (**Figure 10-15**). The artefact measures 40 x 21 x 8 mm and is at a tertiary stage of reduction. It appears to have been severely weathered. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange sand. Surrounding vegetation at the site is comprised predominantly of saltbush. The GSE at the time of recording was high (70%) with a GSV of 90% within the large area of exposure. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-77 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 10-14: Location of Copi IF-77 to IF-79.

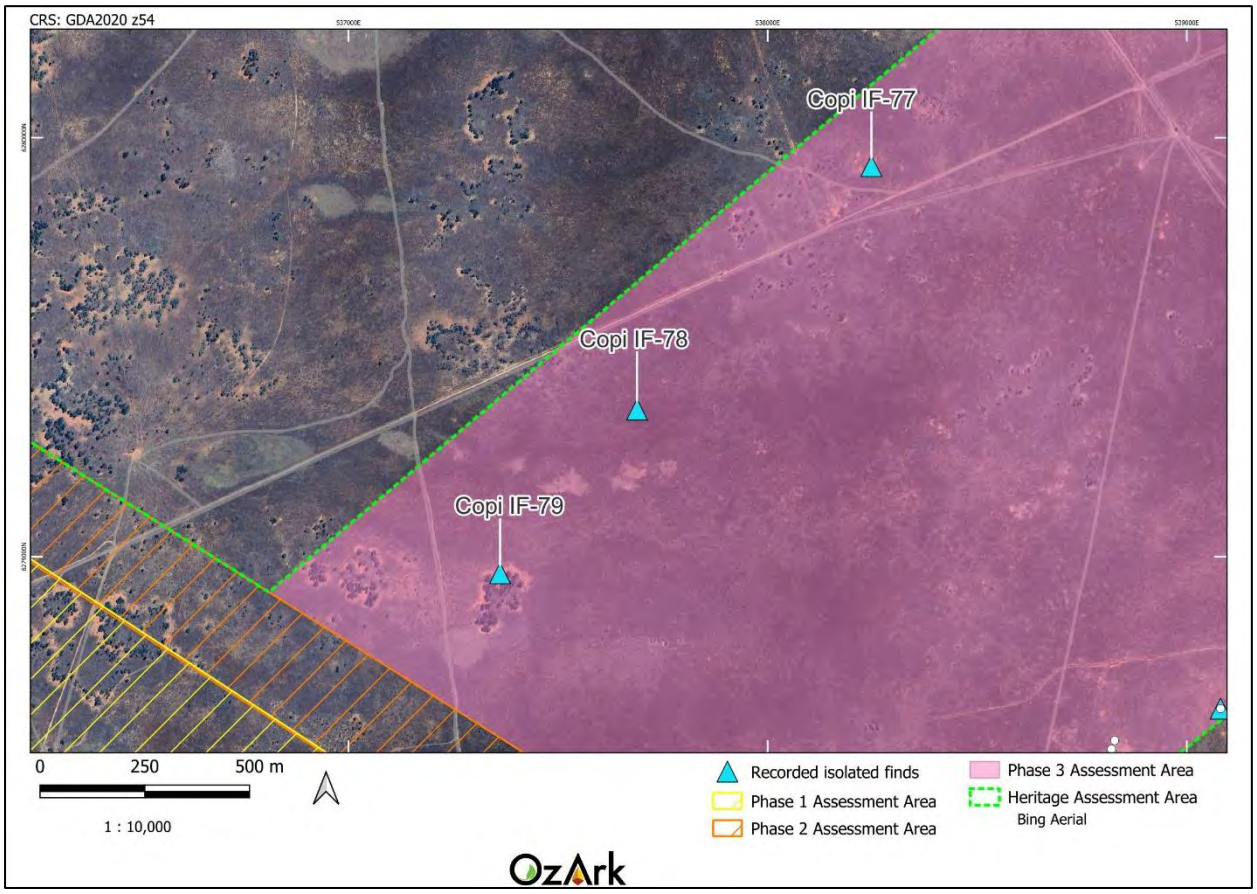


Figure 10-15: Copi IF-77. View of site and recorded artefact.

1. View of Copi IF-77 where the person stands.

2. Copi IF-77 artefact: a quartzite flake (dorsal surface).

Copi IF-78

Site type: Isolated find

GPS coordinates: GDA Zone 54 537688E 6279351N

Location of site: Copi IF-78 is located approximately 8.9 km from the western boundary, 10 km from the eastern boundary, and 3.7 km from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 10-5** and **Figure 10-14**). The site is located 10.1 km directly east of Nulla Road and 4.3 km south of Warwick homestead.

Description of site: Copi IF-78 is a silcrete flake fragment located on a long, southerly receding gentle slope within a sand plain landform (**Figure 10-16**). The artefact measures 18 x 18 x 4 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange sand. Surrounding vegetation at the site comprises shrubs, predominately saltbush, and grass. At the time of recording the ground cover was dense and GSV was low at 0-5%. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-78 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 10-16: Copi IF-78. View of site and recorded artefact.

3. View of Copi IF-78 showing the silcrete artefact flagged.

4. Copi IF-78 artefact: a silcrete flake (dorsal surface).

Copi IF-79

Site type: Isolated find

GPS coordinates: GDA Zone 54 537362E 6278961N

Location of site: Copi IF-79 is located approximately 8.5 km from the western boundary, 10.3 km from the eastern boundary, and 3.3 km from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 10-5** and **Figure 10-14**). The site is

situated 9.8 km directly east of Nulla Road and 4.7 km south southwest of the Warwick homestead.

Description of site: The site is comprised of a silcrete flake located in an erosional scald associated with an isolated group of trees (**Figure 10-17**). The flake measures 25 x 21 x 5 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of orange sand. Surrounding vegetation at the site consists of shrubs, predominantly saltbush, grasses, and an adjacent group of trees. The GSE at the time of recording was moderate-high (60%) with a GSV of 90% within the exposed area. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-79 is not considered to be associated with subsurface archaeological deposits as it is likely located within secondary context.

Figure 10-17: Copi IF-79. View of site and recorded artefact.

<table>
<tr>
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<td> 
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</tr>
<tr>
<td>1. View of Copi IF-79 showing the silcrete artefact flagged.</td>
<td>2. Copi IF-79 artefact: a silcrete flake (ventral surface).</td>
</tr>
</table>

Copi IF-80

Site type: Isolated find

GPS coordinates: GDA Zone 54 533170E 6274497N

Location of site: Copi IF-80 is located approximately 3.4 km from the western boundary, 574 m from the eastern boundary, and 1.5 km south of the northern boundary of Lot 1 DP1255308 (**Figure 10-6** and **Figure 10-18**). The site is located 3.4 km directly east of Nulla Road and 10.2 km southwest of Warwick homestead.

Description of site: Copi IF-80 is a quartzite manuport located on a flat plain (**Figure 10-19**). The artefact measures 55 x 47 x 22 mm and is at a tertiary stage of reduction. Although stone was very rare in the area of the recording, the artefact displays minimal flake attributes. The extent of the site is defined by a 5 m buffer around the

artefact. Soils consist of orange/yellow sand. Surrounding vegetation at the site comprises open shrubs including saltbush, grasses, and scattered trees. The GSE at the time of recording was moderate (40%) with a GSV of 70% within the area of exposure. Identified disturbances include grazing and subsequent soil loss (deflation).

Copi IF-80 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 10-18: Location of Copi IF-80 to IF-82 and Copi IF-84.

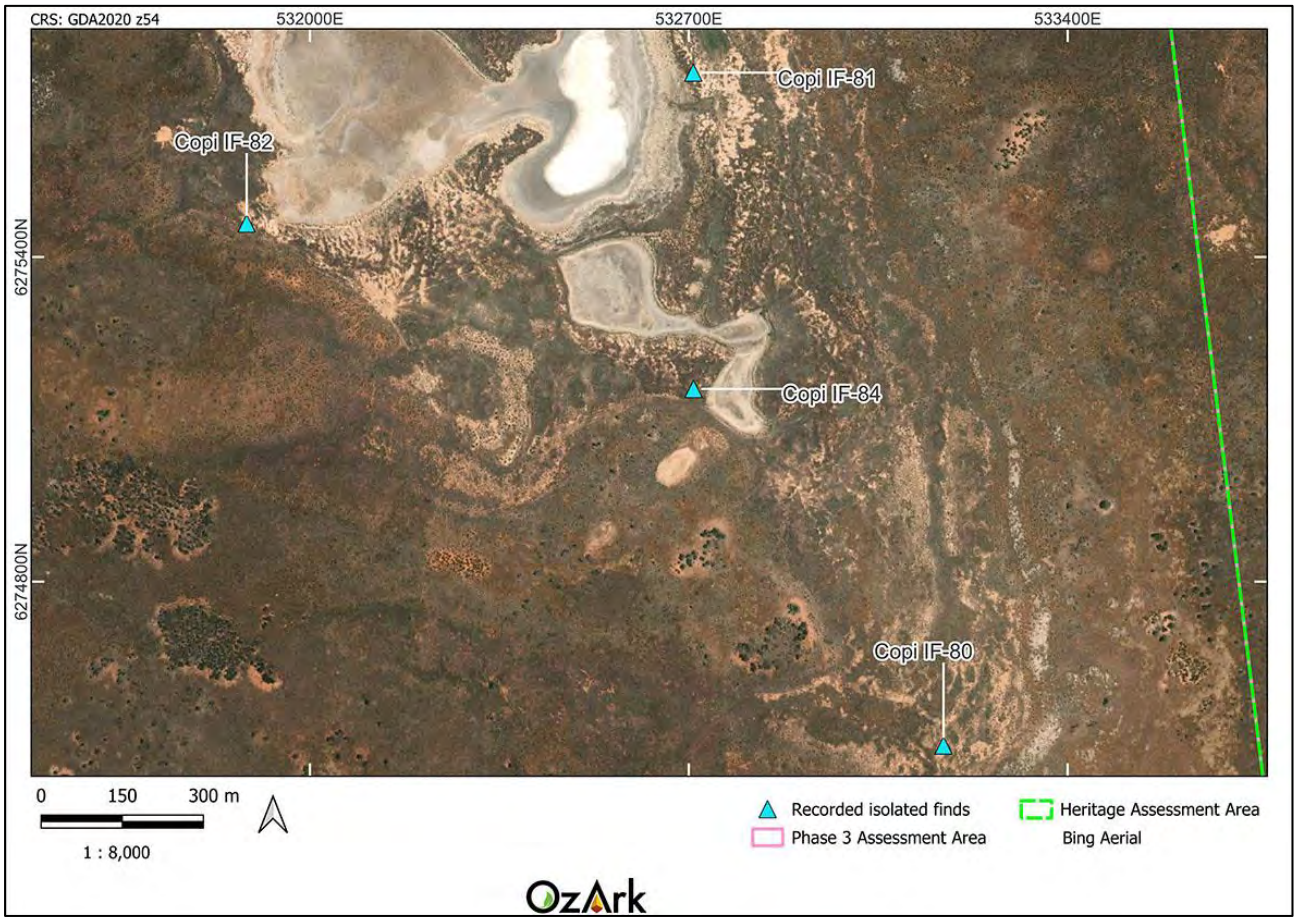


Figure 10-19: Copi IF-80. View of site and recorded artefact.

	
1. View north to the location of Copi IF-80 (red circle).	2. Copi IF-80 artefact: a quartzite manuport.

Copi IF-81

Site type: Isolated find

GPS coordinates: GDA Zone 54 532708E 6275741N

Location of site: Copi IF-81 is located approximately 3.2 km from the western boundary, 891 m from the eastern boundary, and 280 m south of the northern boundary of Lot 1 DP1255308 (**Figure 10-6** and **Figure 10-18**). The site is located 3.2 km directly east of Nulla Road and 9.4 km southwest of Warwick homestead.

Description of site: Copi IF-81 is a quartzite grindstone fragment located on an eastern dune edge of an extensive salt pan depression (**Figure 10-20**). The artefact measures 63 x 49 x 27 mm and is horizontally broken. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of yellow sand. Surrounding vegetation at the site comprises shrubs including saltbush and bluebush. The GSE at the time of recording was moderate (40%) with a GSV of 90% within the area of exposure. Identified disturbances include grazing and water wash erosion.

Copi IF-81 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 10-20: Copi IF-81. View of site and recorded artefact.

	
3. View of Copi IF-81 where the person stands.	4. Copi IF-81 artefact: a quartzite grindstone fragment.

Copi IF-82

Site type: Isolated find

GPS coordinates: GDA Zone 54 531883E 6275462N

Location of site: Copi IF-82 is located approximately 2.3 km from the western boundary, 1.7 km from the eastern boundary, and 497 m south of the northern boundary of Lot 1 DP1255308 (**Figure 10-6** and **Figure 10-18**). The site is located 2.3 km directly east of Nulla Road and 10 km southwest of Warwick homestead.

Description of site: Copi IF-82 is a silcrete flake located on an erosional scald adjacent to an extensive salt pan depression (**Figure 10-21**). The artefact measures 11 x 11 x 3 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils consist of yellow sand. Surrounding vegetation at the site was comprised of shrubs, predominantly saltbush. The GSE at the time of recording was moderate (60%) with a GSV of 90% within the large area of exposure. Identified disturbances include grazing and water wash erosion.

Copi IF-82 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 10-21: Copi IF-82. View of site and recorded artefact.

	
1. View of Copi IF-82 located at foregrounded flag. Note the salt pan depression visible in the background.	2. Copi IF-82 artefact: a silcrete flake (dorsal surface).

Copi IF-83

Site type: Isolated find

GPS coordinates: GDA Zone 54 541550E 6282054N

Location of site: Copi IF-83 is located approximately 12.5 km from the western boundary, 6.5 km from the eastern boundary, and 960 m from the northern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 10-5** and **Figure 10-22**). The site is located 12.5 km directly east of Nulla Road and 4.1 km southeast of Warwick homestead.

Description of site: Copi IF-83 is a chert flake fragment located on an undulating sand plain adjacent to a group of trees (**Figure 10-23**). The artefact measures 24 x 21 x 3 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of orange sand. Surrounding vegetation at the site primarily comprises shrubs, grasses, and scattered trees. The GSE at the time of recording was high (70%) with a GSV of 70%. Identified disturbances include soil loss through erosion and grazing.

Copi IF-83 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 10-22: Location of Copi IF-83.

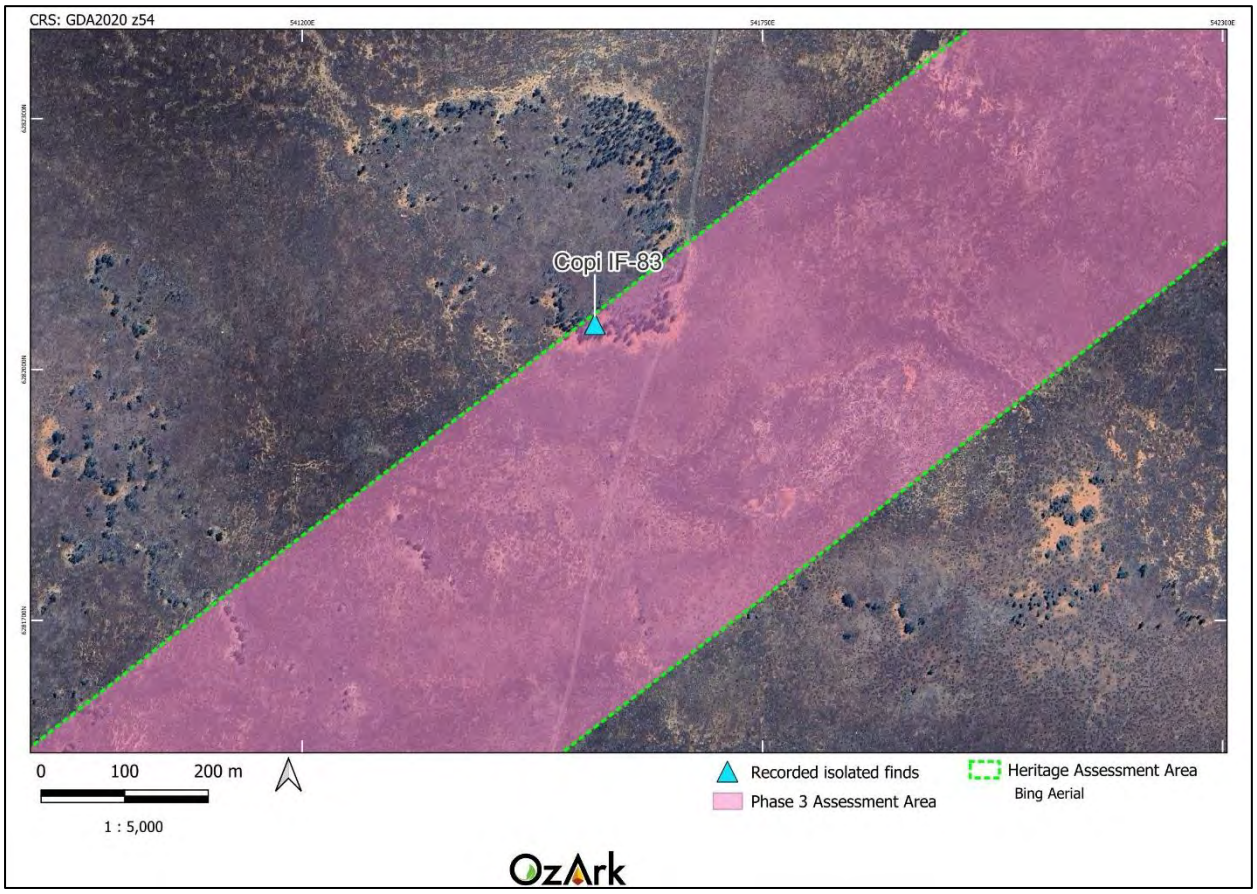
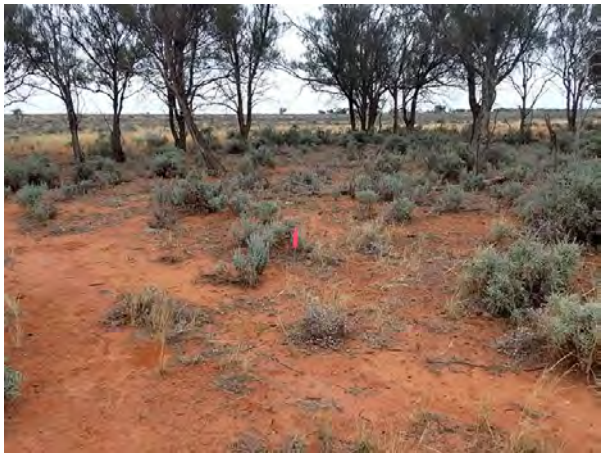


Figure 10-23: Copi IF-83. View of site and recorded artefact.



1. View of Copi IF-83 at the location of the flag.

2. Copi IF-83 artefact: a mudstone flake (dorsal surface).

Copi IF-84

Site type: Isolated find

GPS coordinates: GDA Zone 54 532709E 6275156N

Location of site: Copi IF-84 is located approximately 3.1 km from the western boundary, 960 m from the eastern boundary, and 865 m south of the northern boundary of Lot 1 DP1255308 (**Figure 10-6** and **Figure 10-18**). The site is located 3.1 km directly east of Nulla Road and 9.8 km southwest of Warwick homestead.

Description of site: Copi IF-84 is a silcrete flake fragment located on a sandy flat just west of an extensive salt pan (**Figure 10-25**). The artefact measures 43 x 31 x 10 mm and is at a tertiary stage of reduction. The extent of the site is defined by a 5 m buffer around the artefact. Soils at the site consist of yellow sand. Surrounding vegetation at the site is comprised of shrubs, predominantly saltbush. The GSE at the time of recording was low (10%) with a GSV of 80%. Identified disturbances include erosion and grazing.

Copi IF-84 is not considered to be associated with subsurface archaeological deposits as it is likely located within a secondary context.

Figure 10-24: Copi IF-84. View of site and recorded artefact.

1. View of Copi IF-84 showing the landscape.

2. Copi IF-84 artefact: a silcrete flake fragment (dorsal surface).

10.3.2 Open sites

An additional eight open sites were recorded during the Phase 3 survey. These are listed in **Table 10-5** and shown on **Figure 10-25** and **Figure 10-26**. Full details of each open site follow.

Table 10-5: Open sites recorded during the Phase 3 survey.

ID	AHIMS ID	Site name	GDA Zone 54 Easting	GDA Zone 54 Northing	Feature(s)	Landform
136	39-4-0858	Copi OS-52	538617	6280466	Artefact scatter; hearths	Sandplains and Dunes

ID	AHIMS ID	Site name	GDA Zone 54 Easting	GDA Zone 54 Northing	Feature(s)	Landform
137	39-4-0852	Copi OS-53	539802	6279189	Artefact scatter	Sandplains and Dunes
138	39-4-0853	Copi OS-54	538797	6278490	Artefact scatter	Sandplains and Dunes
139	39-4-0854	Copi OS-55	538160	6279814	Artefact scatter	Sandplains and Dunes
140	39-4-0857	Copi OS-56	537112	6278921	Artefact scatter	Sandplains and Dunes
141	39-4-0856	Copi OS-57	532698	6275226	Artefact scatter	Lunettes and Islands
142	39-4-0855	Copi OS-58	532677	6275012	Artefact scatter with PAD	Lunettes and Islands
143	39-4-0859	Copi OS-59	532527	6274859	Artefact scatter with PAD	Lunettes and Islands

Figure 10-25: Overview of the location of all recorded artefact scatters and areas of PAD within the southern portion of the Phase 3 assessment area.

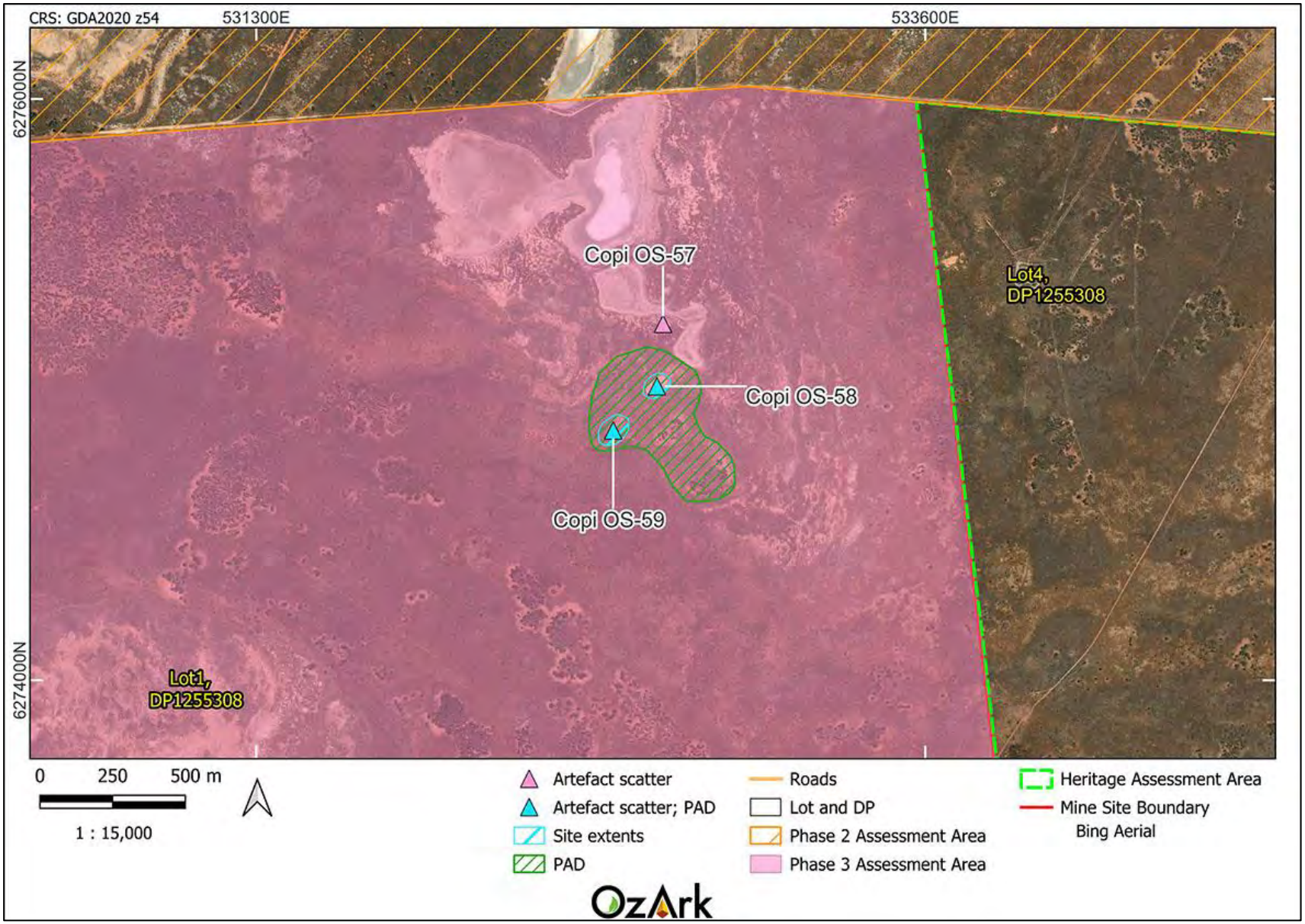
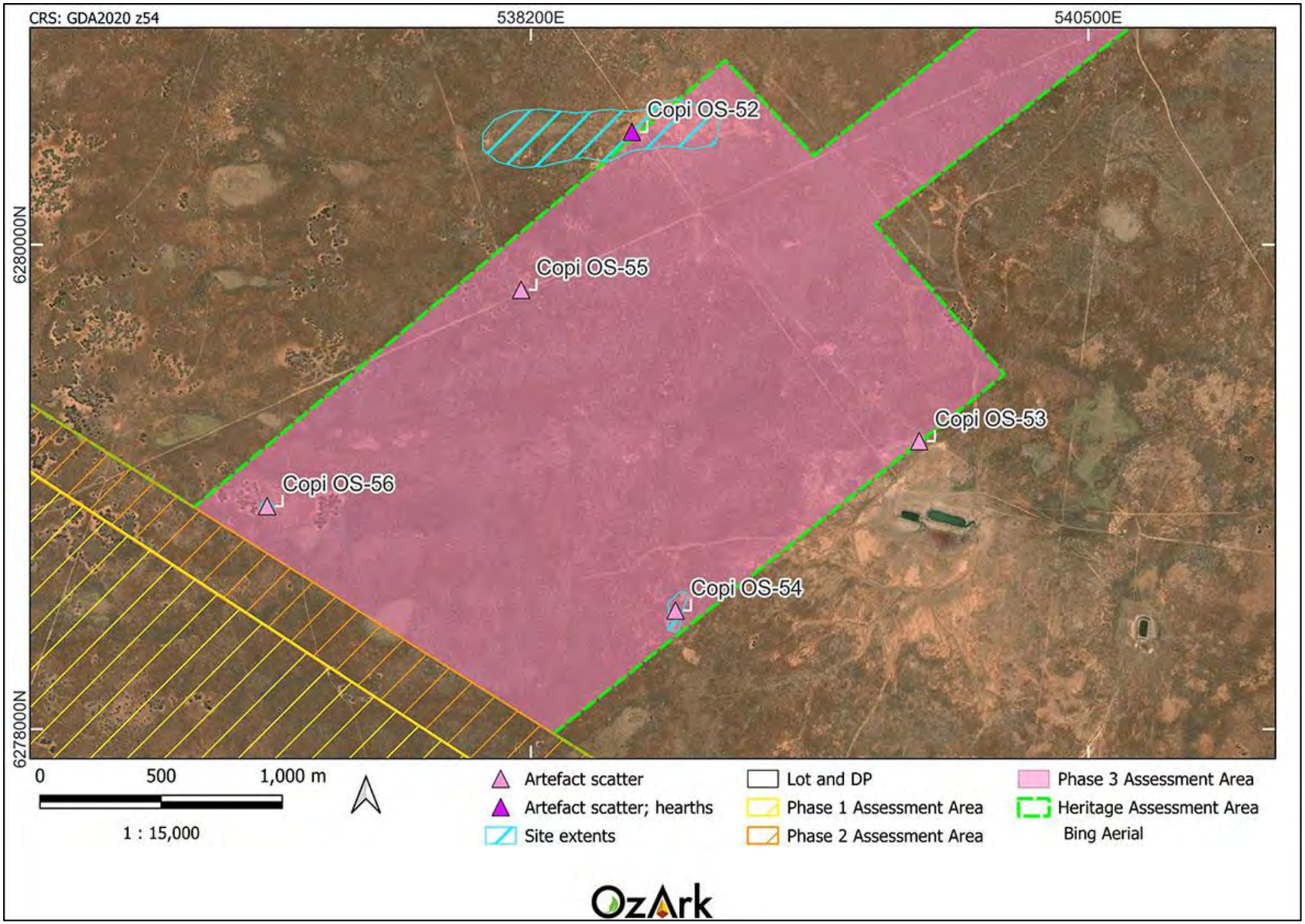


Figure 10-26: Overview of the location of all recorded open sites within the northeastern portion of the Phase 3 assessment area.



Copi OS-52

Site type: Artefact scatter, hearths

GPS coordinates: Site centroid - GDA Zone 54 538617E 6280466N

Location of site: Copi OS-52 is in the centre of Lot 4068 DP766543 on the Warwick property, 9.1 km from the western boundary and 8.9 km from the eastern boundary (**Figure 10-26**). The site is 10 km directly east of Nulla Road and 3.2 km south southeast of the Warwick homestead.

Description of site: Copi OS-52 is an artefact scatter consisting of more than 100 artefacts and two hearths located on an extensive erosional scald on a flat sand plain (**Figure 10-27** and **Figure 10-28**). The artefact assemblage primarily consists of flakes as well as including cores, flake fragments, blades, shatter, and grindstones (**Table 10-6**). The site extent is 975 x 230 m, encompassing an area of 18 ha of land. The extent of the site is defined by the artefact spread and the breadth of the erosional scald. The GSE at the site was high (70%) with a GSV of 90% within the site extent. Soil on consists of orange sand. Vegetation includes sparse shrub cover, predominately saltbush. Identified disturbances include severe erosion and soil loss (deflation), in part due to grazing of invasive species.

Copi OS-52 is not considered to be associated with subsurface archaeological deposits except at the location of the hearths. The lack of potential for subsurface artefacts is attributed to the levels of erosion across the site which has stripped the A-horizon soils.

Figure 10-27: Copi OS-52. Site extent.

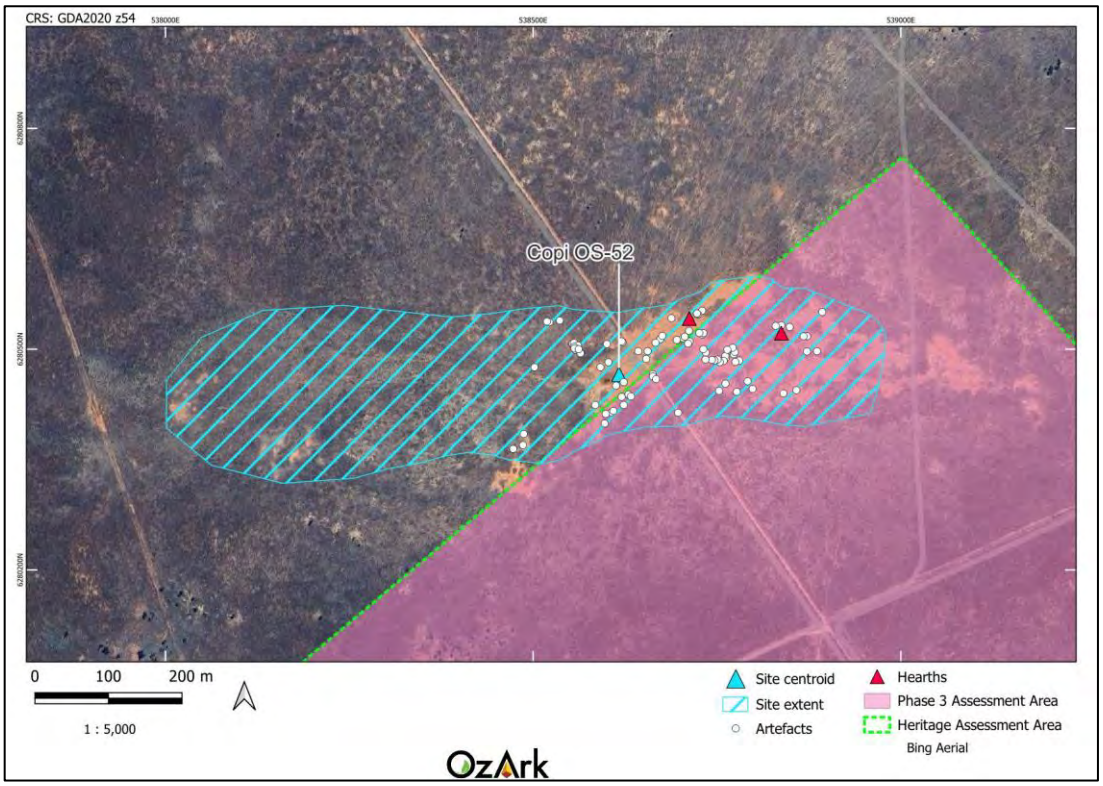


Figure 10-28: Copi OS-52. View of site and selection of recorded artefacts.

1. View of the landscape at Copi OS-52.

2. Selection of artefacts from Copi OS-52.

Table 10-6: Sample of Copi OS-52 artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Core	Chert	Nil	Nil	33 x 33 x 25
Core	Quartzite	Nil	Nil	53 x 43 x 26
Flake	Silcrete	Distal fragment	Tertiary	38 x 28 x 11
Flake	Quartzite	Complete	Tertiary	16 x 11 x 3
Flake	Quartzite	Distal fragment	Tertiary	17 x 12 x 6
Flake	Quartzite	Proximal fragment	Tertiary	33 x 23 x 10
Flake	Quartzite	Proximal fragment	Tertiary	24 x 10 x 3
Flake	Silcrete	Distal fragment	Tertiary	30 x 15 x 5
Flake	Quartzite	Proximal fragment	Secondary	29 x 17 x 10
Flake	Quartzite	Medial fragment	Tertiary	21 x 26 x 5
Flake	Silcrete	Complete	Tertiary	30 x 17 x 8
Flake	Silcrete	Complete	Tertiary	23 x 14 x 6
Flake	Quartzite	Complete	Tertiary	39 x 15 x 8
Flake	Quartzite	Complete	Tertiary	34 x 15 x 9
Flake	Quartzite	Complete	Secondary	30 x 19 x 6
Flake	Quartzite	Distal fragment	Tertiary	12 x 12 x 6
Flake	Silcrete	Complete	Tertiary	32 x 22 x 10
Flake fragment	Silcrete	Proximal fragment	Tertiary	30 x 22 x 8
Flaked piece	Silcrete	Complete	Tertiary	39 x 20 x 22
Flaked piece	Quartzite	Complete	Tertiary	33 x 30 x 13
Grinding top stone (muller)	Quartzite	Fragmentary	Tertiary	28 x 26 x 25
Shatter	Silcrete	Nil	Tertiary	20 x 11 x 10
Shatter	Quartzite	Nil	Tertiary	14 x 8 x 2

Table 10-7:

Copi OS-53

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 539802E 6279189N

Location of site: Copi OS-53 is located approximately 11 km from the western boundary, 7.9 km from the eastern boundary, and 3.7 km from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 10-26**). The site is 12.2 km directly east of Nulla Road and 4.9 km southeast of the Warwick homestead.

Description of site: Copi OS-53 is an artefact scatter consisting of two artefacts located on a gently undulating sand plain (**Figure 10-32** and **Figure 10-30**).The site contains one grinding dish and grinding top stone (muller), both manufactured from quartzite (**Figure 10-8**). The site extent is 5 x 5 m. Soils consist of orange sand with surrounding vegetation including shrubs and low-lying grasses. The GSE was low (20%) at the time of recording with a GSV of 50%. Disturbances include erosion and grazing.

Copi OS-53 is not considered to be associated with subsurface archaeological deposits.

Figure 10-29: Copi OS-53. Site extent.

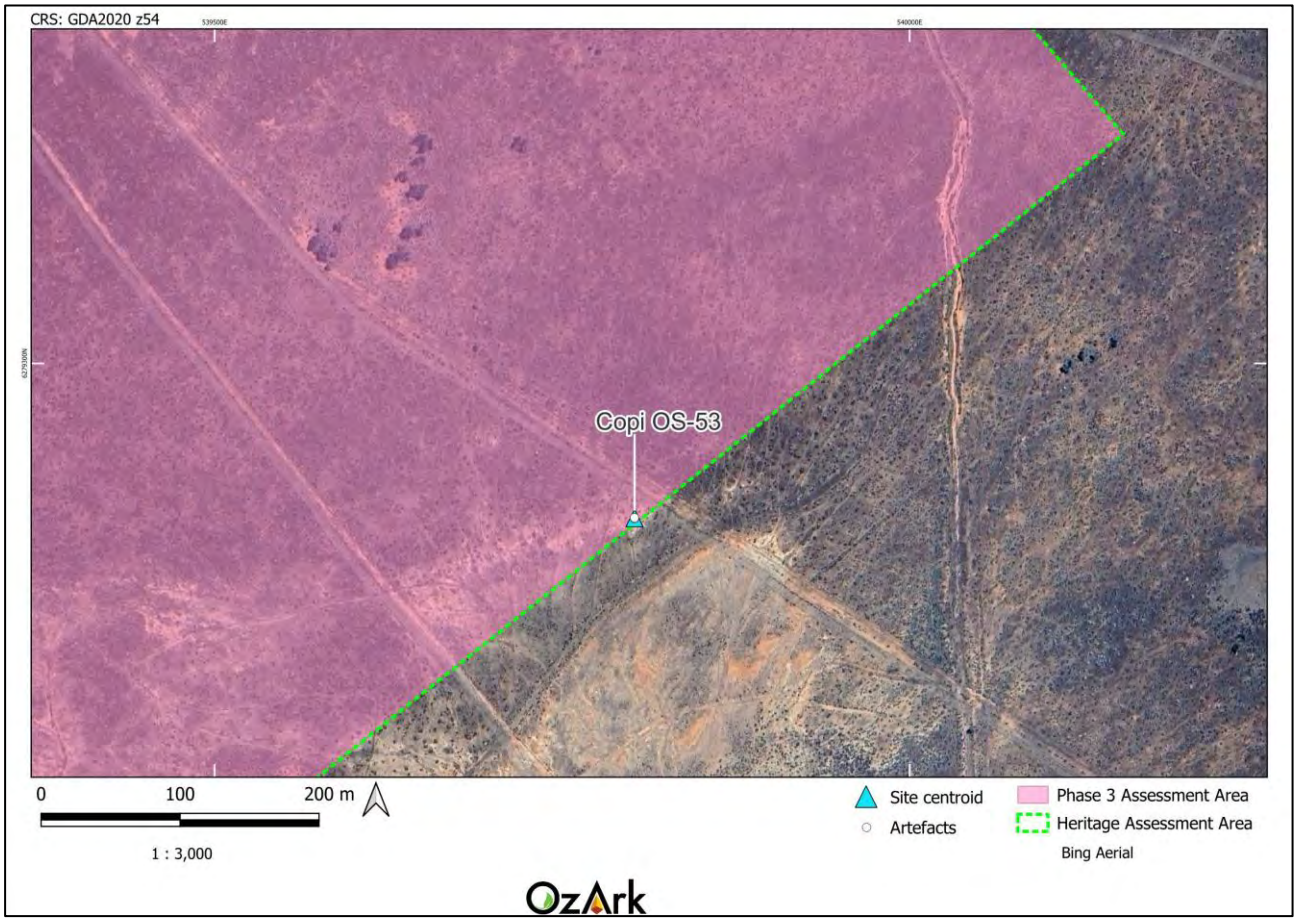


Figure 10-30: Copi OS-53. View of site and selection of recorded artefacts.

1. View of Copi OS-53 showing the location of the artefacts (where the person stands).

2. Recorded artefacts at Copi OS-53.

Table 10-8: Copi OS-53 artefact attributes.

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm
Grinding dish	Quartzite	Complete	Nil	160 x 110 x 35
Grindstone (muller)	Quartzite	Complete	Nil	80 x 70 x 52

Copi OS-54

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 538797E 6278490N

Location of site: Copi OS-53 is located approximately 9.9 km from the western boundary, 8.7 km from the eastern boundary, and 2.9 km from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 10-26**). The site is 1.1 km directly east of Nulla Road and 5.2 km south southeast of the Warwick homestead.

Description of site: Copi OS-54 is an artefact scatter consisting of ten artefacts located across a series of erosion scalds on a sand plain (**Figure 10-31** and **Figure 10-32**). Artefacts include two cores, four flakes, and two flake fragments (**Table 10-9**). The site extent is 172 x 67 m, encompassing an area of 0.88 ha. At the time of recording, GSE was moderate (50%) with a GSV of 70% within the site extent. Soils consist of orange sand. Vegetation is comprised of sparse shrubs with low-lying grass and weed ground cover through the erosion scald. Identified disturbances include erosion and grazing with subsequent soil loss (deflation).

Copi OS-35 is not considered to be associated with subsurface archaeological deposits.

Figure 10-31: Copi-OS54. Site extent.

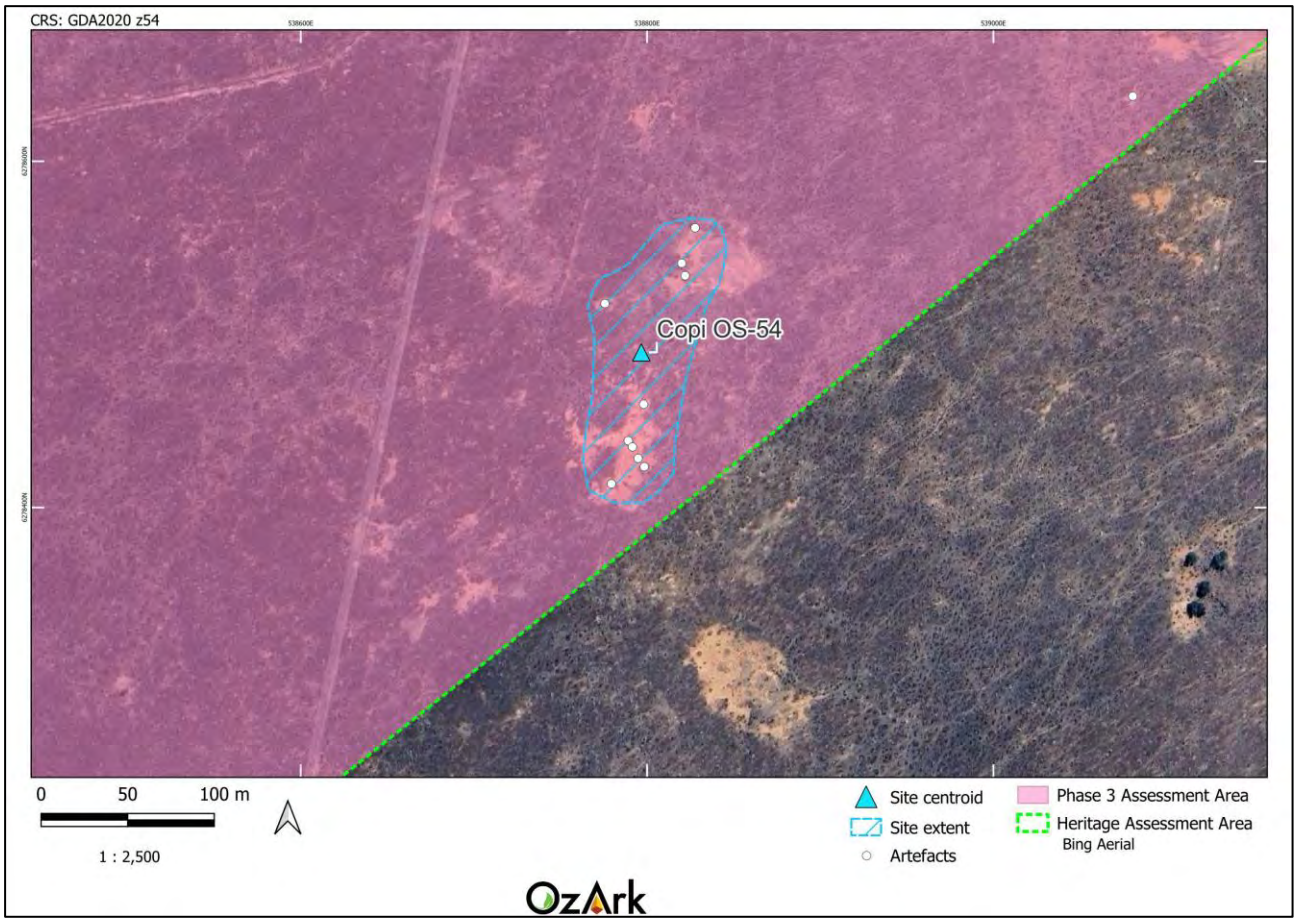


Figure 10-32: Copi OS-54. View of site and a sample of recorded artefacts.

1. View of the landscape at Copi OS-54.

2. Silcrete core from Copi OS-54.

Table 10-9: Sample of Copi OS-54 artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Core	Silcrete	n/a	n/a	Max. dimension 59

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Core	Quartzite	n/a	n/a	Max. dimension 30
Flake	Silcrete	Distal fragment	Tertiary	41 x 38 x 15
Flake	Chert	Proximal fragment	Tertiary	24 x 11 x 10
Flake	Quartz	Proximal fragment	Tertiary	25 x 10 x 19
Flake	Chert	Complete	Tertiary	20 x 12 x 3
Flake fragments	Quartzite	Proximal fragment	Tertiary	67 x 59 x 35
Flake fragments	Silcrete	Proximal fragment	Tertiary	32 x 28 x 12

Copi OS-55

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 538160E 6279814N

Location of site: Copi OS-55 is located approximately 9.9 km from the western boundary, 9.3 km from the eastern boundary, and 4.2 km from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 10-26**). The site is 10.5 km directly east of Nulla Road and 3.8 km south of the Warwick homestead.

Description of site: Copi OS-55 is an artefact scatter consisting of two artefacts located on erosion scald on a flat sand plain (**Figure 10-33** and **Figure 10-34**). The artefacts are both flakes, one manufactured from quartz and the other from silcrete (**Table 10-10**). The site extent is 7 x 10 m, encompassing an approximate area of 70 m^2. Soils at the site consist of an orange sand. Vegetation surrounding the site is comprised of shrubs, predominantly saltbush, and grasses. GSE at the time of recording was relatively high at 60%, with a GSV of 100% in the exposed area within the site. Disturbance primarily includes grazing and erosion.

Copi OS-55 is not considered to be associated with subsurface archaeological deposits.

Figure 10-33: Copi-OS55. Site extent.

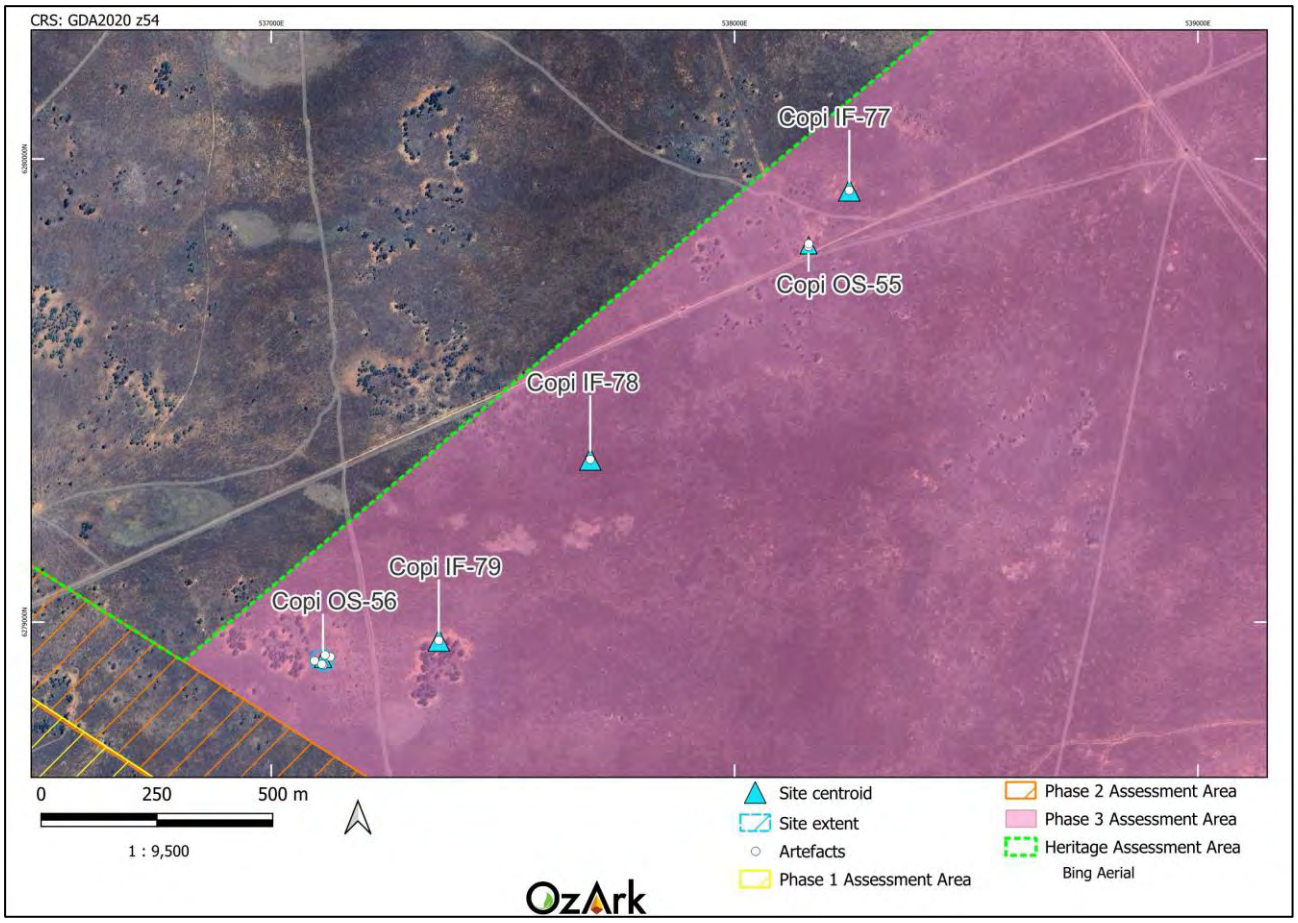


Figure 10-34: Copi OS-55. View of site and recorded artefacts.

1. View of Copi OS-55 showing the location of one of the artefacts recorded (where the person stands).

2. Artefacts recorded at OS-55 (ventral surfaces).

Table 10-10: Copi OS-55 artefact attributes.

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm
Flake	Silcrete	Proximal fragment	Tertiary	18 x 16 x 2
Flake	Quartz	Complete	Tertiary	15 x 18 x 7

Copi OS-56

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 537112E 6278921N

Location of site: Copi OS-56 is located approximately 9.9 km from the western boundary, 10.5 km from the eastern boundary, and 3.2 km from the southern boundary of Lot 4068 DP766543 on the Warwick property (**Figure 10-26**). The site is 9.5 km directly east of Nulla Road and 4.2 km south southwest of the Warwick homestead.

Description of site: Copi OS-56 is an artefact scatter consisting of six artefacts located in a bowl formation on a hill crest (**Figure 10-33** and **Figure 10-35**). Artefacts include three cores and three flakes, all manufactured from silcrete (**Table 10-11**). The site extent is 45 x 50 m, encompassing an approximate area of 0.18 ha of land. The extent of the site is defined by the artefact distribution and the approximate circumference of the bowl formation. The GSE at the site was low (20%) with a GSV of 50% within the site extent. Soils consist of orange sand. Vegetation surrounding the site includes shrubs, primarily saltbush, and grass and weed ground cover. Identified disturbances include grazing and erosion.

Copi OS-56 is not considered to be associated with subsurface archaeological deposits.

Figure 10-35: Copi OS-56. View of site and a sample of recorded artefacts.

1. View of the landscape at Copi OS-56.

2. Silcrete core from Copi OS-56.

Table 10-11: Copi OS-56 artefact attributes.

Artefact type	Material	Integrity	Reduction	Size (L x W x D) mm
Core	Silcrete	Nil	Nil	Max. dimension 39
Core	Silcrete	Nil	Nil	Max. dimension 30
Core	Silcrete	Nil	Nil	Max. dimension 30
Flake	Silcrete	Complete	Tertiary	30 x 26 x 12
Flake	Silcrete	Distal fragment	Secondary	50 x 30 x 15
Flake	Silcrete	Nil	Secondary	50 x 25 x 15

Copi OS-57

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 532698E 6275226N

Location of site: Copi OS-57 is in the northeastern portion of Lot 1 DP1255308, 795 m from the northern boundary and 960 m from the eastern boundary (**Figure 10-25**). The site is located 3.1 km directly east of Nulla Road and 9.8 km southwest of Warwick homestead.

Description of site: The site consists of four artefacts located in a sandy exposure along a small crest overlooking large salt pan from the south (**Figure 10-36** and **Figure 10-37**). All the artefacts were manufactured from quartzite and included two cores, one flake and one piece of shatter (**Figure 10-12**). The extent of the site is 9 x 10 m, encompassing 90 m^2. Soils consist of yellow sand with surrounding vegetation consisting of shrubs, predominantly saltbush. GSE at the time of recording was low at 10% with a GSV of 75% within the small, exposed areas. Disturbances primarily involve erosional processes and grazing.

Copi OS-57 is not considered to be associated with subsurface archaeological deposits.

Figure 10-36: Copi OS-57 to Copi OS-59 site extents.

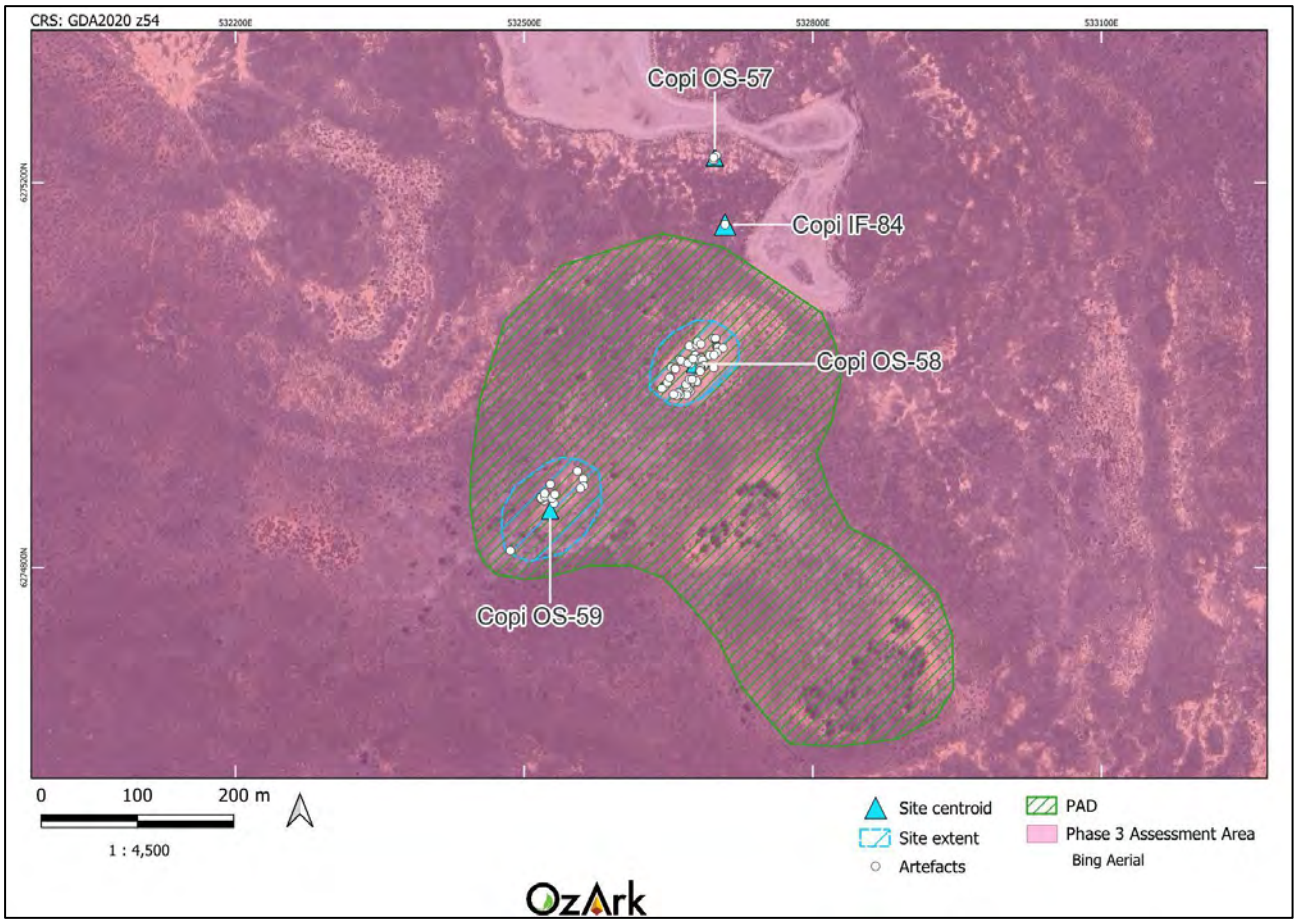


Figure 10-37: Copi OS-57. View of site and selection of recorded artefacts.

1. View to the north of Copi OS-58 showing a selection of recorded artefacts flagged in the foreground and the adjacent salt pan beyond.

2. Quartzite core from Copi OS-57.

Table 10-12: Copi OS-57 artefact attributes.

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm
Core	Quartzite	Nil	Nil	109 x 74 x 49
Core	Quartzite	Nil	Nil	78 x 48 x 52

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm
Flake	Quartzite	Complete	Tertiary	52 x 35 x 32
Shatter	Quartzite	Nil	Tertiary	41 x 14 x 11

Copi OS-58

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 532677E 6275012N

Location of site: Copi OS-58 is in the northeastern portion of Lot 1 DP1255308, 1 km from the northern boundary and 1 km from the eastern boundary (**Figure 10-25**). The site is located 3 km directly east of Nulla Road and 10 km southwest of Warwick homestead.

Description of site: Copi OS-58 is a density artefact scatter located in a blowout on top a hill crest that extends south of an extensive salt lake system (**Figure 10-36** and **Figure 10-38**). The landform is interpreted as having developed out of a remnant dune system associated with the lakes and is understood to include the same landform in which Copi OS-59 is situated. Due to time restraints during the survey, the number of recorded artefacts (n=62) reflects a sample of the site, however, the site is considered to be associated with up to 200 artefacts. All recorded artefacts were stone tools, the majority being flakes, with smaller numbers of shatter, flake fragments, cores, and core fragments. Raw materials represented in the assemblage include quartzite, silcrete, and chert. Some of the artefacts were wholly coated in a white patina, most likely the result of weathering, which obscured the original material. The extent of the site is 90 x 87 m, encompassing the entirety of the blowout and the surrounding crest. Soils consist of orange/yellow sand with surrounding vegetation including saltbush and grass. GSE at the time of recording was high at 90% with a GSV of 95% within the basin. Disturbances primarily involve erosional processes.

Copi OS-58 has been assessed as having potential to be associated with subsurface archaeological deposits and will be the subject of a test excavation program.

Figure 10-38: Copi OS-58. View of site and selection of recorded artefacts.

1. View to the southeast of Copi OS-58 showing the site location in the basin formation.

2. Selection of artefacts from Copi OS-58.

Table 10-13: Sample of Copi OS-58 artefact attributes.

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm
Flake	Quartzite	Complete	Tertiary	50 x 41 x 16
Flake	Quartzite	Complete	Tertiary	53 x 26 x 12
Flake	Quartzite	Complete	Secondary	60 x 47 x 20
Flake	Quartzite	Complete	Secondary	42 x 40 x 12
Flake	Quartzite	Complete	Tertiary	26 x 18 x 5
Flake	Quartzite	Medial break	Tertiary	39 x 21 x 8
Flake	Other (patina)	Complete	Tertiary	61 x 31 x 10
Shatter	Other (patina)	Nil	Tertiary	22 x 20 x 8

Copi OS-59

Site type: Artefact scatter

GPS coordinates: Site centroid - GDA Zone 54 532527E 6274859N

Location of site: Copi OS-59 is in the northeastern portion of Lot 1 DP1255308, 1.1 km from the northern boundary and 1.2 km from the eastern boundary (**Figure 10-25**). The site is located 2.8 km directly east of Nulla Road and 10.1 km southwest of Warwick homestead.

Description of site: Copi OS-59 is an artefact scatter consisting of 15 artefacts located within a blowout on a hill crest extending south of an extensive salt lake system (**Figure 10-36** and **Figure 10-39**). The landform is interpreted as having developed out of a remnant dune system associated with the lakes and is understood to include the same landform in which OS-58 is situated. Most artefacts are manufactured from quartzite (n=8), with silcrete, chert, quartz, and other (patina coated) also represented (**Table 10-14**). The extent of the site is 110 x 100 m, encompassing the blowout and surrounding crest. Soils consist of orange/yellow sand with surrounding vegetation including shrubs, primarily saltbush, as well

as weeds and grasses. Despite the wide area impacted by erosion, visibility was heavily impacted by low-lying grass and weed ground cover. GSV was approximately 30% across the site extent. Disturbances primarily involve erosional processes and grazing.

Copi OS-59 has been assessed as having potential to be associated with subsurface archaeological deposits and will be the subject of a test excavation program.

Figure 10-39: Copi OS-59. View of site and selection of recorded artefacts.

1. View to the east of Copi OS-59 showing two recorded artefacts flagged.

2. Chert core from Copi OS-59.

Table 10-14: Copi OS-59 artefact attributes.

Artefact type	Material	Artefact integrity	Reduction	Size (LxWxD) mm
Core	Chert	Nil	Nil	27 x 22 x 23
Core	Silcrete	Nil	Nil	38 x 33 x 23
Core	Silcrete	Nil	Nil	33 x 38 x 30
Core	Quartzite	Nil	Nil	90 x 50 x 37
Flake	Silcrete	Proximal fragment	Secondary	22 x 20 x 7
Flake	Other (patina)	Distal fragment	Tertiary	41 x 43 x 22
Flake	Quartz	Complete	Tertiary	31 x 29 x 16
Flake	Quartzite	Complete	Tertiary	48 x 17 x 8
Flake	Quartzite	Distal fragment	Tertiary	20 x 19 x 10
Flake	Quartzite	Medial fragment	Tertiary	29 x 20 x 6
Flake	Quartzite	Proximal fragment	Tertiary	28 x 26 x 12
Flake	Quartzite	Complete	Tertiary	23 x 27 x 5
Flaked piece	Quartzite	Complete	Tertiary	53 x 47 x 20
Shatter	Silcrete	Nil	Tertiary	32 x 22 x 7
Shatter	Quartzite	Nil	Tertiary	18 x 12 x 4

10.4 DISCUSSION OF SURVEY RESULTS

This section reviews the results of the Phase 3 survey and places the results in the context of previous research that has taken place across the broader Heritage Assessment Area.

10.4.1 Summary of survey results

The Phase 3 survey recorded 43 sites (**Section 10.3**) including:

- 13 isolated finds
- Five artefact scatters
- Two artefact scatters with PAD
- One artefact scatter with hearths.

10.4.2 Research questions

Several research questions were posed for the Phase 3 assessment (**Appendix 7**). These will be answered below.

- Are there resources available to the Aboriginal people using the land within the Phase 3 Assessment Area (food, stone, and water) not present within the Phase 1 and 2 Assessment Areas?
    - Similar to the Phase 1 and 2 assessment areas, no specific resources were noted within the Phase 3 assessment area. No stone resources were identified, nor were any specific food resource locations. With regards to freshwater, the southern portion of the Phase 3 assessment area contains the southern extent of the eastern salt pan and a discrete former lake (now saline) which could have potentially contained freshwater soaks. The northern portion of the Phase 3 assessment area contains ephemeral drainages which drain into a slightly more substantial drainage line further to the east. These drainages are unlikely to have held water except immediately after rainfall, but it is noted that several sites were identified near these drainage features. The very eastern extent of the Phase 3 assessment area, near Anabranch Mail Road, is the closets point of the Heritage Assessment Area to the Great Darling Anabranch. While several previously recorded sites have been identified along the Great Darling Anabranch, the landforms on which these sites have been recorded do not extend into the Heritage Assessment Area.
- Do the findings within the Phase 3 Assessment Area (if any) accord with the regional archaeological context examined in **Section 5.2** and the predictive model set out in **Section 5.4.6**?

  The main elements of the predictive model are presented below, with each element followed by the observations based on the survey of the Phase 3 assessment area:
    - Sites would be most commonly located on the Lake Footslopes and Lunettes and Islands as they border ephemeral water sources (the salt pans)
        - Most sites were recorded on the Lunettes and Islands and Sandplains and Dunes landforms during the Phase 3 assessment. The lack of recorded sites within the Lake Footslopes landform in the Phase 3 assessment area is unsurprising given it accounts for only a small portion of the landforms and during the survey it was confirmed the area mapped as ‘Lake

Footslopes' is more consistent with the landforms of the Sandplains and Dunes rather than the landform associated with the western side of the salt pans.

- The most common site type would be stone artefact sites, either low density artefact scatters or isolated finds
    - Artefact sites (scatters and isolated finds) were the only site types recorded across the Phase 3 assessment area, although one scatter (Copi OS-53) was recorded in association with two hearths. Most artefact scatter were again low-density sites; however, two sites (Copi OS-52 and Copi OS-58) are associated with approximately 100 and 200 artefacts, respectively. Recorded artefacts were again largely manufactured from silcrete, quartz, chert, and quartzite as predicted.
- Artefact scatters have increased likelihood of being associated with hearths and/or middens
    - The two recorded hearths within the Phase 3 assessment area were identified in association with one of the largest stone artefact sites (Copi OS-52). Both hearths were recorded within the Sandplains and Dunes which differs to the result of the Phase 1 assessment where 91.5% of the recorded hearths were identified across the Lake Footslopes landform but is consistent with the findings from the Phase 2 assessment where all six hearths were identified in the Sandplains and Dunes landforms. Both hearths are comprised of clay nodules and are lagging on pedestals as predicted by Witter (2004).
    - No middens were identified within the Phase 3 assessment area which accords with the results of the Phase 1 and 2 assessment results.
- Artefact sites would likely be in a secondary context due to soil loss and deflation across the Heritage Assessment Area
    - Most sites were again situated within erosion scalds or what was considered likely to be the lower soil strata across the landscape and therefore artefacts would likely be located within secondary contexts. The northern portion of the Sandplains and Dunes landforms has been subject to slightly greater levels of erosion than in the south and east which may be why more sites were identified in this area.
- Culturally modified trees would be extremely rare due to the distance to semi- or permanent water sources and a lack of suitable vegetation

- No scarred trees were recorded in the Phase 3 assessment area which is consistent with the predictive model which indicated that scarred trees are a rare site type in the landscape of the Heritage Assessment Area. The possibility of scarred trees was considered slightly higher in the eastern of the Phase 3 assessment area which is approximately 800 m from the Great Darling Anabranch, however, no suitable species were present.

- Quarries would not likely be present, but if identified would be located on outcrops and consist of silcrete
  - No quarries were identified across the Phase 3 assessment area which accords with the results of the Phase 1 and 2 assessment results.
- Burials would likely not be present within the Heritage Assessment Area as it lacks typical source-bordering dunes and lunettes.
  - No particular landforms were identified as having high likelihood of containing burials.

11 PHASE 3 – TEST EXCAVATION PROGRAM

This section documents the results of the test excavation within the Phase 3 assessment area. The Phase 3 test excavation was completed over four days from 30 January to 2 February 2024 (see **Section 1.2**).

Please refer to **Section 7.4** for context of the recording regime used during the Phase 3 test excavation program.

11.1 BACKGROUND TO THE PHASE 3 TEST EXCAVATION PROGRAM

The test excavation program followed a program of surface survey completed across the Phase 3 assessment area. The initial Aboriginal heritage surface survey was undertaken by three teams on 20 to 23 November 2023 with each team consisting of two archaeologists and two RAPs. The assessment consisted of full survey inspection of all landforms in the Phase 3 assessment area, concentrating on landforms with greater archaeological potential (previously shown to include Lake Footslopes and Lunettes and Islands).

The survey identified an area of PAD associated with the Lunettes and Islands landform in which Copi OS-58 and Copi OS-59 had been identified. The artefacts at Copi OS-58 are concentrated within an area measuring 0.5 ha which is the densest concentration of artefacts identified across the Phase 1 to 3 assessment areas. The areas across the PAD, excluding the delineated site extents of Copi OS-58 and 59, retain a greater amount of A horizon soils (although it is acknowledged that the landform has been stripped of a large amount of soil), which are considered likely to contain subsurface artefacts given the presence of artefacts in the two deflated areas (blowouts). This landform differs from the landforms that have been previously subject to test excavation, therefore subsurface investigations were required investigate the nature of the landform and confirm whether the surface artefacts at Copi OS 58 and 59 are associated with intact subsurface deposits.

The location of these two sites and the associated PAD are shown on **Figure 10-36**.

11.2 SAMPLING METHODOLOGY FOR COPI OS-58 AND COPI OS-59 PAD

The PAD subject to test excavation was identified in the southern section of the Phase 3 assessment area where two open artefact scatters (Copi OS-58 and Copi OS-59) are situated in separate blowouts within the broader aeolian landform. The PAD is entirely within the Lunettes and Island landform unit.

Variations to the proposed sampling methodology outlined in the test excavation methodology (**Appendix 8**) were made during the fieldwork. All changes to the sampling methodology were done in consultation with RAPs. The completed sampling methodology is outlined in **Table 11-1** and shown on **Figure 11-1** and **Figure 11-2**.

Two additional transects (Tr8 and Tr9) each consisting of three TUs were placed in the centre of each blowout at the request of the present RAPs to further understand the nature of the exposures (**Figure 11-1**).

Table 11-1: Sampling methodology for the text excavation program.

Transect	Sampling strategy
Transect 1	Located between Copi OS-58 and OS-59 90 m transect = 10 TUs spaced 10 m apart.
Transect 2	Along the northwestern rim of Copi OS-58 exposure 70 m transect = 8 TUs spaced 10 m apart.
Transect 3	Along the southwestern rim of Copi OS-58 exposure. 70 m transect = 8 TUs spaced 10 m apart.
Transect 4	Along the southeastern rim of Copi OS-59 exposure 70 m transect = 8 TUs spaced 10 m apart.
Transect 5a and 5b	Across the northwestern section of the dune. Split into two 40 m transects = 5 TUs spaced 10 m apart. Transect 5a testing the northern extent of the PAD, north of Copi-OS58 and Transect 5b completed to the north of Copi-OS59.
Transect 6	Across the southeastern section of the dune which retains greater A Horizon soils. 70 m transect = 8 TUs spaced 10 m apart.
Transect 7	Across the southeastern section of the dune which retains greater A Horizon soils. 70 m transect = 8 TUs spaced 10 m apart.
Transect 8	Located within Copi OS-59 at the centre of the exposure 20 m transect = 3 TUs spaced 10 m apart.
Transect 9	Located within Copi OS-58 at the centre of the exposure 20 m transect = 3 TUs spaced 10 m apart.

11.3 TEST EXCAVATION RESULTS

11.3.1 Preamble

A total of 66 TUs (0.5 x 0.5 m) were excavated at the PAD identified within the Phase 3 assessment area: a total of 16.5 m^2. From the 66 TUs only three artefacts were recovered: an average of 0.2 artefacts per square metre. The maximum number of artefacts recorded in one excavation square was two (Tr8 Sq1). This density of artefacts is extremely low.

The sparsity of subsurface artefacts across the test excavation areas shows that, because of the extensive soil loss, intact subsurface deposits are extremely rare within the Phase 3 assessment area and that the visible surface artefacts are the remnants of sites that have been exposed as a result of extensive erosion and deflation.

Due to the low artefact numbers, it is difficult to draw many conclusions from the test excavation assemblage as any one location did not record artefacts in sufficient quantities to allow for any meaningful analysis.

Table 11-2 summarises the location and results from each excavation square.

Table 11-2. Summary of results from each excavation square in the Phase 3 assessment area.

Transect	Square	GDA Zone 54 East	GDA Zone 54 North	Artefacts (total)
Transect 1	1	532639	6274977	0
Transect 1	2	532633	6274969	0
Transect 1	3	532624	6274963	0
Transect 1	4	532619	6274955	0
Transect 1	5	532613	6274951	0
Transect 1	6	532605	6274945	0
Transect 1	7	532595	6274938	0
Transect 1	8	532588	6274932	0
Transect 1	9	532581	6274927	0
Transect 1	10	532573	6274916	0
Transect 2	1	532680	6275045	0
Transect 2	2	532674	6275038	0
Transect 2	3	532666	6275032	0
Transect 2	4	532656	6275021	0
Transect 2	5	532650	6275016	0
Transect 2	6	532643	6275005	0
Transect 2	7	532640	6275001	0
Transect 2	8	532632	6274993	0
Transect 3	1	532722	6275015	0
Transect 3	2	532716	6275009	0
Transect 3	3	532710	6275001	0
Transect 3	4	532701	6274995	0
Transect 3	5	532696	6274987	0
Transect 3	6	532687	6274977	0
Transect 3	7	532682	6274971	0
Transect 3	8	532675	6274964	0
Transect 4	1	532588	6274878	0
Transect 4	2	532580	6274869	0
Transect 4	3	532572	6274863	0
Transect 4	4	532564	6274856	0
Transect 4	5	532556	6274849	0
Transect 4	6	532550	6274843	0
Transect 4	7	532540	6274836	0
Transect 4	8	532533	6274830	0
Transect 5a	1	532624	6275037	0
Transect 5a	2	532619	6275029	0
Transect 5a	3	532611	6275022	0
Transect 5a	4	532605	6275010	0
Transect 5a	5	532593	6275004	0
Transect 5b	1	532524	6274903	0
Transect 5b	2	532519	6274897	0
Transect 5b	3	532511	6274890	0

Transect	Square	GDA Zone 54 East	GDA Zone 54 North	Artefacts (total)
Transect 5b	4	532506	6274883	0
Transect 5b	5	532502	6274873	0
Transect 6	1	532732	6274833	0
Transect 6	2	532726	6274826	0
Transect 6	3	532720	6274822	0
Transect 6	4	532712	6274814	0
Transect 6	5	532704	6274809	0
Transect 6	6	532697	6274802	0
Transect 6	7	532689	6274796	0
Transect 6	8	532681	6274789	0
Transect 7	1	532868	6274737	0
Transect 7	2	532862	6274729	0
Transect 7	3	532856	6274722	0
Transect 7	4	532848	6274714	0
Transect 7	5	532845	6274705	0
Transect 7	6	532835	6274695	0
Transect 7	7	532828	6274690	0
Transect 7	8	532824	6274681	0
Transect 8	1	532540	6274892	2
Transect 8	2	532533	6274882	1
Transect 8	3	532529	6274872	0
Transect 9	1	532673	6274991	0
Transect 9	2	532670	6274986	0
Transect 9	3	532663	6274980	0

11.3.2 Description of the Copi OS-58 and Copi OS-59 PAD

The PAD surrounding Copi OS-58 and Copi OS-59 encompasses an aeolian dune to the south of the southern extent of the eastern salt pan. Two surface scatters, Copi OS-58 and Copi OS-59, are located within two discrete deflated blowouts at the northern end of the PAD.

All transects were oriented southwest-to-northeast across the landform's rises with a concentration on the landforms surrounding the recorded sites (**Figure 11-1** to **Figure 11-4**).

Figure 11-1: Location of Tr1 to 6 and Tr8 to 9.

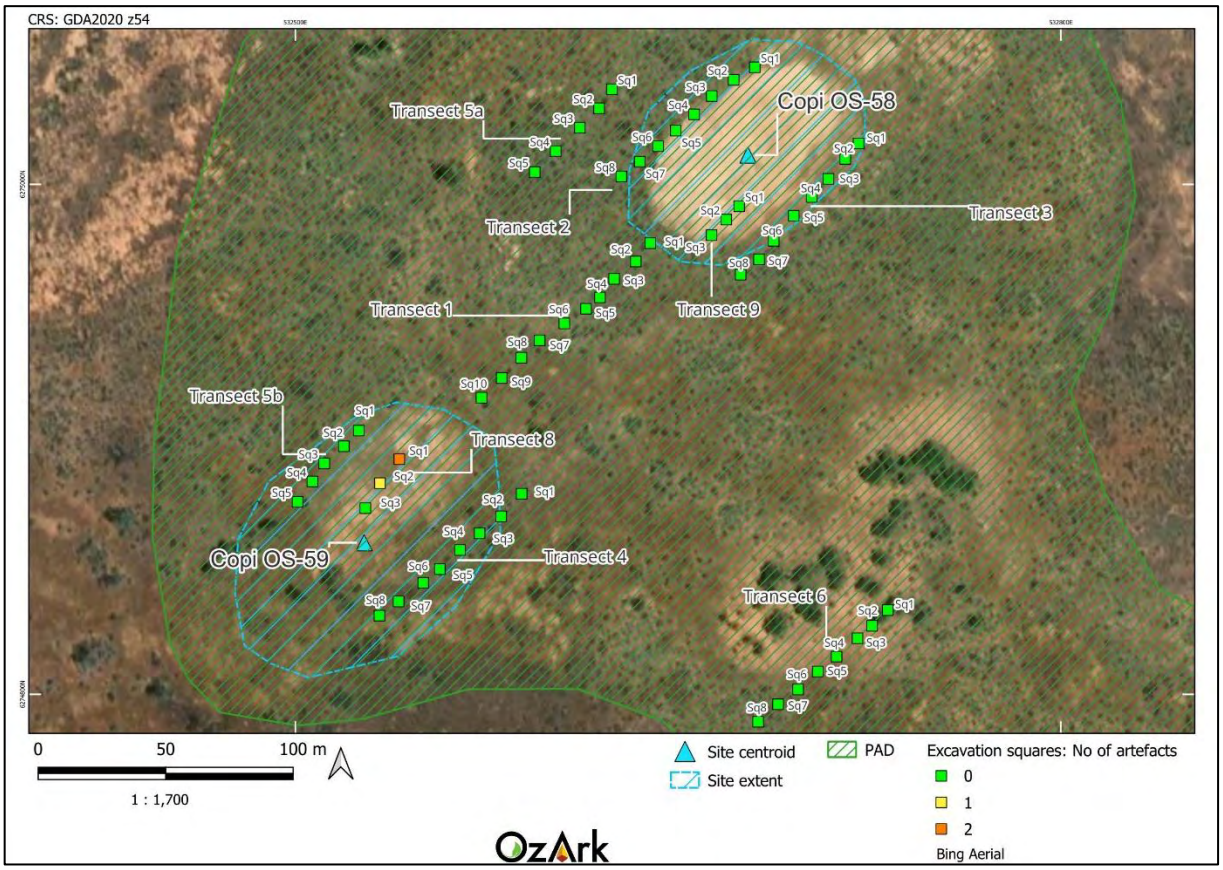


Figure 11-2: Location of Tr7.

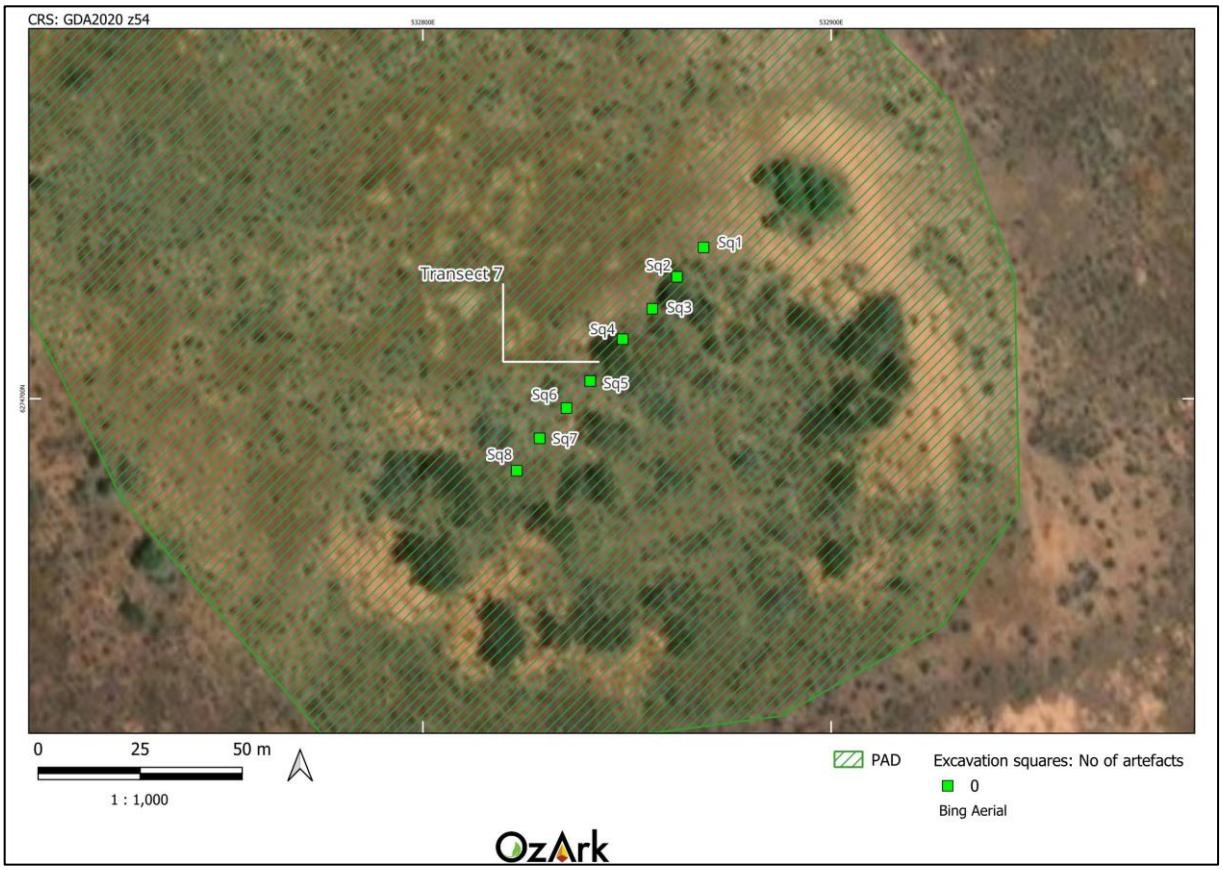


Figure 11-3. Copi OS-58 and Copi OS-59 PAD. Close up aerial showing transect locations.

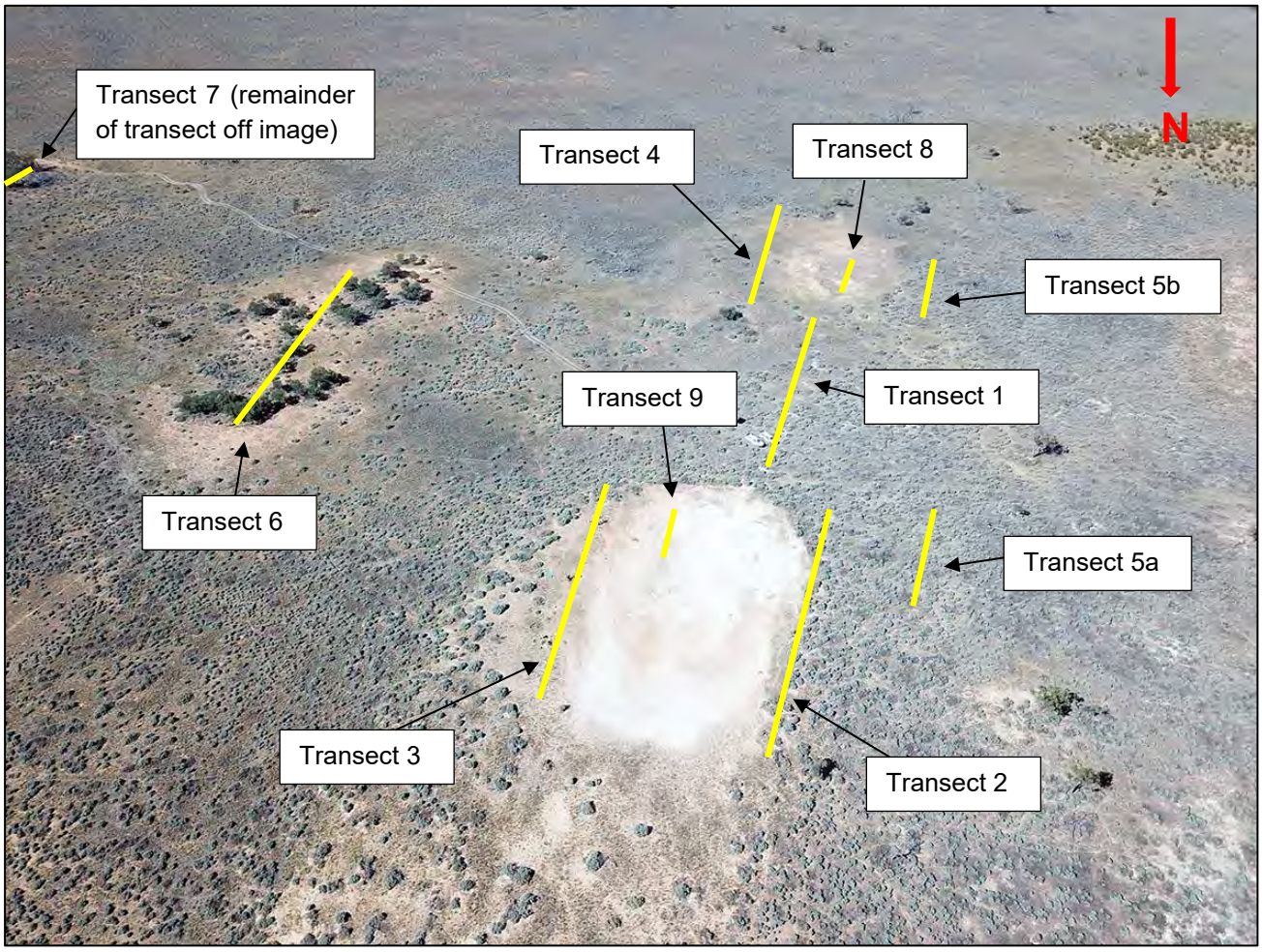
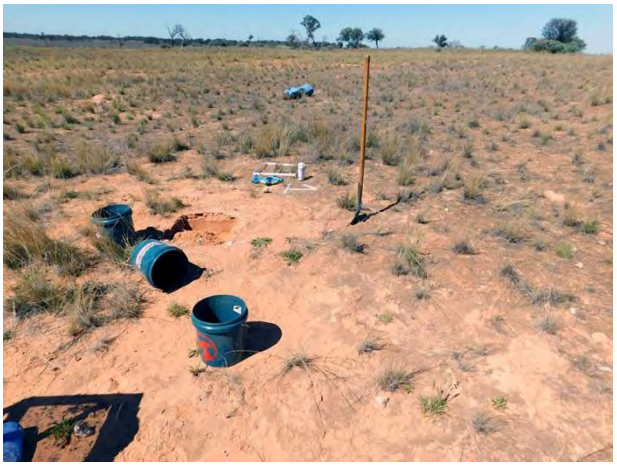


Figure 11-4: Copi OS-58 and Copi OS-59 PAD. View of transects.

1. View southwest across Transect 1.

2. View northeast across Transect 2.

	
3. View northeast across Transect 3.	4. View southwest across Transect 4.
	
5. View northwest across Transect 5a.	6. View northeast across Transect 5b.
	
7. Aerial view northeast overlooking Transect 6.	8. Aerial view east overlooking Transect 7.



9. View southwest across Transect 8 in the southern blowout (Copi OS-58).

10. View southwest across Transect 9 in the northern blowout (Copi OS-59).

11.3.3 Stratigraphy of the Copi OS-58 and Copi OS-59 PAD

The TUs at Tr 1 to 7 were initially excavated in 5 cm spits until a depth of 20 cm and then were excavated in 10 cm spits. All TUs across Tr8 and Tr9 were excavated in 5cm spits. **Table 11-3** provides detail on soil profiles across the PAD and **Figure 11-5** shows a sample of excavated soil profiles from across each transect.

The soil profiles in each pit were generally consistent across the transects. Orange sands were the dominant soil type, with subtle variations in colour from pale orange to darker orange. There were occasional root inclusions across the transects (**Figure 11-5**; images 4, 14, and 16), but the general trend was no inclusions or disturbances. Tr4 Sq4 contained a minor layer of charcoal flecks at around 30 cm (**Figure 11-5**; image 8).

Texture was similarly uniform across the transects, and was generally soft although regularly becoming finer and slightly compact, usually from 10-20 cm onward. Tr3 Sq 3 to 7 were outliers in this trend, developing a darker, wetter quality to the sand from 50 cm (**Figure 11-5**; image 7). Few squares reached a natural base with both soft and more compact sands continuing to further depths.

Three stone artefacts were recovered from the test excavation program, all within Tr8 located in the extent of Copi OS-59. Two artefacts were recovered from Tr8 Sq1 Spit 1 (0–5cm) (**Figure 11-5**; image 17) and one from Tr8 Sq2 Spit 3 (10–15cm) (**Figure 11-5**; image 18). Based on the soil profile, it is evident that the artefacts within Spit 1 are within a recent layer of water deposited sediment.

Table 11-3. Copi OS-58 and Copi OS-59 PAD: Sample excavation log.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	60	Slightly coarse, orange sand to 20 cm. Fine, orange sand to 60+ cm. Burrow at base.
Tr1 Sq2	50	Slightly coarse, orange sand to 20 cm. Orange sand to 50+ cm.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq3	45	Coarse, orange sand up to 23 cm then orange sand to 45+ cm. Becoming more compact with depth.
Tr1 Sq4	60	Light orange sandy layer to 8 cm. Orange sand down to a compact white sand from 40 cm and continuing.
Tr1 Sq5	40	Dark orange sand to 11 cm. Whiteish sand up to 40 cm. Gritty orange sand at 40+ cm.
Tr1 Sq6	50	Slightly gritty orange sand to 40 cm then fine, light orange sand to 50+ cm.
Tr1 Sq7	50	Darkish orange sand, gritty, to 15 cm. Light orange sand to 40-50 cm. White compact sand at 50 cm.
Tr1 Sq8	25	Dark orange gritty sand to 15 cm. Sudden change to white compact sand at 15 cm. White compact sand layer continues beyond the final spit.
Tr1 Sq9	50	Orange sand to 40 cm. Light orange sand to 50+ cm.
Tr1 Sq10	50	Slightly gritty orange sand to 10-15cm. Orange sand to 50+ cm.
Tr2 Sq1	50	Soft orange sand consistent through to 50 cm and continuing.
Tr2 Sq2	50	Orange sand to 50 cm +.
Tr2 Sq3	50	Orange sand to 40 cm. Dark orange sand to 50+ cm.
Tr2 Sq4	55	Orange sand to 39 cm. Dark orange sand to 55+ cm.
Tr2 Sq5	50	Orange sand to 45 cm. Darker orange sand through to 50 cm and continuing.
Tr2 Sq6	50	Orange sand to 50+ cm.
Tr2 Sq7	50	Orange sand to 50+ cm.
Tr2 Sq8	48	Orange sandy layer to 14 cm. Darker orange sand through to 48 cm and continuing.
Tr3 Sq1	65	Soft orange sand consistent through to 65 cm. Layer continues beyond the final spit.
Tr3 Sq2	65	Orange sand to 53 cm then darker / wetter orange sand to 65+ cm.
Tr3 Sq3	60	Orange sand to 50 cm. Darker orange wet sands from 50 cm and continuing.
Tr3 Sq4	75	Orange sand to 55 cm then darker / wetter orange sand to 70+ cm.
Tr3 Sq5	70	Orange sand to 50 cm then darker / wetter orange sand to 70+ cm.
Tr3 Sq6	70	Orange sand to 40 cm then darker / wetter orange sand to 70+ cm.
Tr3 Sq7	70	Orange sand to 45 cm then darker / wetter orange sand to 70+ cm.
Tr3 Sq8	70	Orange sand to 70+ cm.
Tr4 Sq1	70	Orange sand to 70+ cm.
Tr4 Sq2	70	Orange sand to 48 cm. Fine, orange sand (slightly compact) to 70+ cm.
Tr4 Sq3	65	Orange sand to 20 cm. Fine, orange sand (slightly compact) to 65+ cm.
Tr4 Sq4	60	Orange sand down to 15 cm. Finer, slightly compact, orange sand through to 60 cm with minor charcoal flecking around 30 cm.
Tr4 Sq5	70	Orange sand down to 38 cm. Finer, slightly compact, orange sand through to 70 cm and continuing.
Tr4 Sq6	65	Orange sand to 20 cm. Fine, orange sand (slightly compact) to 65+ cm.
Tr4 Sq7	60	Orange sand to 20 cm. Fine, orange sand (slightly compact) to 60+ cm.
Tr4 Sq8	57	Orange sand to 10 cm then fine, slightly compact orange sand to 57+ cm.
Tr5a Sq1	55	Orange sand to 28 cm then pale orange sand, slightly compacted, to 55+ cm.
Tr5a Sq2	65	Orange sand to 14 cm. Variegated sand layers to 46 cm then darker orange sand to 65+ cm.
Tr5a Sq3	65	Orange sand to 25 cm then pale orange sand to 48 cm. Pale orange fine sand continues to 65+ cm.
Tr5a Sq4	50	Orange sand to 25 cm then pale orange sand to 48 cm. White compact sand to 50+ cm.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr5a Sq5	65	Orange sand down to 24 cm. Slightly compact, pale orange sand layer to 65 cm.
Tr5b Sq1	60	Orange sand to 28 cm then slightly compact pale orange sand to 60+ cm.
Tr5b Sq2	65	Orange sand down to 21 cm. Slightly compact, pale orange sand layer to 65 cm and continuing.
Tr5b Sq3	65	Orange sand down to 25 cm. Slightly compact, pale orange sand layer to 65 cm and continuing.
Tr5b Sq4	60	Orange sand down to 44 cm. Slightly compact, pale orange sand layer to 60 cm and continuing.
Tr5b Sq5	55	Orange sand down to 33 cm. Slightly compact, pale orange sand layer to 55 cm and continuing.
Tr6 Sq1	70	Orange sand down to 45 cm. Slightly compact, darker orange sand down to 70 cm and continuing.
Tr6 Sq2	60	Orange sand to 46 cm then fine orange sand (slightly compact) to 60+ cm.
Tr6 Sq3	55	Orange sand to 29 cm then fine orange sand (slightly compact) to 55+ cm.
Tr6 Sq4	56	Orange sand to 37 cm then fine orange sand (slightly compact) to 56+ cm.
Tr6 Sq5	60	Orange sand to 37 cm then fine orange sand (slightly compact) to 60+ cm.
Tr6 Sq6	55	Orange sand to 40 cm then fine orange sand (slightly compact) to 50 to 55+ cm.
Tr6 Sq7	50	Orange sand to 42 cm then fine orange sand (slightly compact) to 50+ cm.
Tr6 Sq8	60	Orange sand down to 37 cm. Compact, fine orange sand to 60 cm and continuing.
Tr7 Sq1	50	Orange sand layer down to 41 cm. Fine orange sand to 50 cm and continuing.
Tr7 Sq2	35	Orange sand to 21 cm. Fine orange sand 35+ cm.
Tr7 Sq3	53	Orange sand to 35 cm. Fine orange sand 53+ cm.
Tr7 Sq4	60	Orange sand to 33 cm. Fine orange sand 60+ cm.
Tr7 Sq5	55	Orange sand layer with root inclusions to 41 cm. Fine orange sand to 55 cm and continuing.
Tr7 Sq6	48	Orange sand to 40 cm then fine orange sand to 48+ cm.
Tr7 Sq7	60	Orange sand to 40 cm then fine orange sand to 60+ cm.
Tr8 Sq1	53	Dark orange gritty sand to 8 cm. Fine, pale orange sand to 23 cm. Coarse orange sands to 38 cm. Compact orange sand with white flecking continues to 53 cm and beyond the final spit.
Tr8Sq2	60	Dark orange sand with minor white flecking to 28 cm. Fine orange sand to 60 cm overlaying compacted, white flecked base.
Tr8 Sq3	60	Orange sand to 28 cm, then fine pale orange sand to 49 cm. Fine, orange sand with white flecks to 60+ cm.
Tr9 Sq1	65	Orange sands with root inclusions down to 8 cm. Pale orange sand to 48 cm. Dark orange wet sands to 65 cm over a mottled compact base layer.
Tr9 Sq2	65	Compact sand crust to 8 cm then sand orange to 65+ cm.
Tr9 Sq3	60	Fine, pale orange sand to 25 cm. Darker orange wet sands through to 60 cm over a mottled compact base layer.

Figure 11-5. Test excavation Copi OS-58 and Copi OS-59 PAD. Sample stratigraphy.

	
1. Tr1 Sq4, south profile.	2. Tr1 Sq8, north profile.
	
3. Tr2 Sq1, east profile.	4.Tr2 Sq5, east profile, showing root inclusions.

5. Tr2 Sq8, east profile.

6. Tr3 Sq1, south profile.

7. Tr3 Sq3, north profile.

8. Tr4 Sq4, east profile.

9. Tr4 Sq5, east profile.

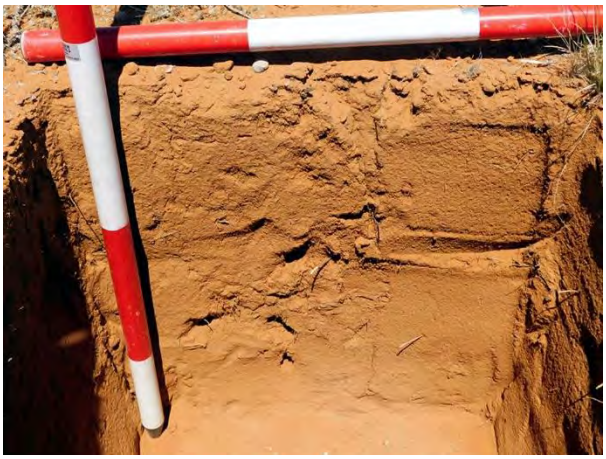
10. Tr5a Sq5, north profile.

11. Tr5b Sq2, north profile.

12. Tr5b Sq3, north profile.

13. Tr6 Sq1, north profile.

14. Tr6 Sq8, east profile.



15. Tr7 Sq1, east profile.

16. Tr7 Sq5, east profile, showing root inclusions.

	
17. Tr8 Sq1, east profile.	18. Tr8 Sq2, east profile.
	
19. Tr9 Sq1, south profile.	20. Tr9 Sq3, south profile.

11.3.4 Artefact assemblage

Three artefacts were recovered from the test excavation, all within the extent of Copi OS-59. Artefacts include two silcrete flakes and one quartzite flake (**Figure 11-6**).

Artefact attributes are presented in **Appendix 10**.

Figure 11-6. Test Excavation. Copi OS-59 artefacts.

	
1. Phase 3: Tr8 Sq1 Spit 1 (0–5cm) artefacts.	2. Phase 3: Tr8 Sq2 Spit 3 (10–15cm) artefact.

11.4 RESEARCH QUESTIONS

In the test excavation methodology several research questions were posed for the Phase 3 test excavation program.

- How does the artefactual material and stratigraphy identified at the site compare to other archaeological excavations undertaken in the Phase 1 Assessment Area and the broader region?
    - The artefact assemblage is not substantial enough to form adequate comparison with other sites in the local area or broader region. However, the materials (silcrete and quartzite) recovered during the Phase 3 test excavation program is consistent with those commonly found during excavations within the broader region.
- Is there evidence providing insight into the tasks were Aboriginal people undertaking across this landform?
    - The results of the Phase 3 test excavation do not provide evidence into the tasks undertaken across this landform.

11.5 RESEARCH CONSIDERATIONS

Section 7.4.2 provides some research considerations that should be applied to any excavation. Some concluding remarks will be made in this section about the considerations raised in **Section 7.4.2**.

Statistically useful sample size

66 TUs (0.5 x 0.5 m) were excavated at the PAD surrounding Copi OS-58 and OS-59: a total of 16.5 m^2. From these 66 TUs, three artefacts were recovered, an average of 0.2 artefacts per square metre. Similar to the results of the Phase 1 and Phase 2 test excavation, this density of artefacts is extremely low and not robust enough for statistical analysis.

Condition

The TUs did not have overt evidence of disturbance although it is evident that the landform is an aeolian dune landform that has been stripped of A-Horizon soils.

11.6 CONCLUSION

The test excavation program in the Phase 3 assessment area investigated an aeolian dune landform containing two discrete exposures with surface artefacts (Copi OS-58 and Copi OS-59).

A total of 66 TUs (0.5 x 0.5 m) were excavated at the PAD: a total of 16.5 m^2. Three stone artefacts were recovered, all within the extent of Copi-OS59. Two artefacts were recovered from Tr8 Sq1 and one from Tr8 Sq2. Both sites are now 'partially destroyed'.

No further archaeological excavation is deemed unwarranted at Copi OS-58 and Copi OS-59 or the broader dune landform. Both Copi OS-58 and Copi OS-59 have been shown not to have associated PAD.

12 SUMMARY OF THE PHASES 1 TO 3 ASSESSMENT RESULTS

12.1 SUMMARY OF RESULTS

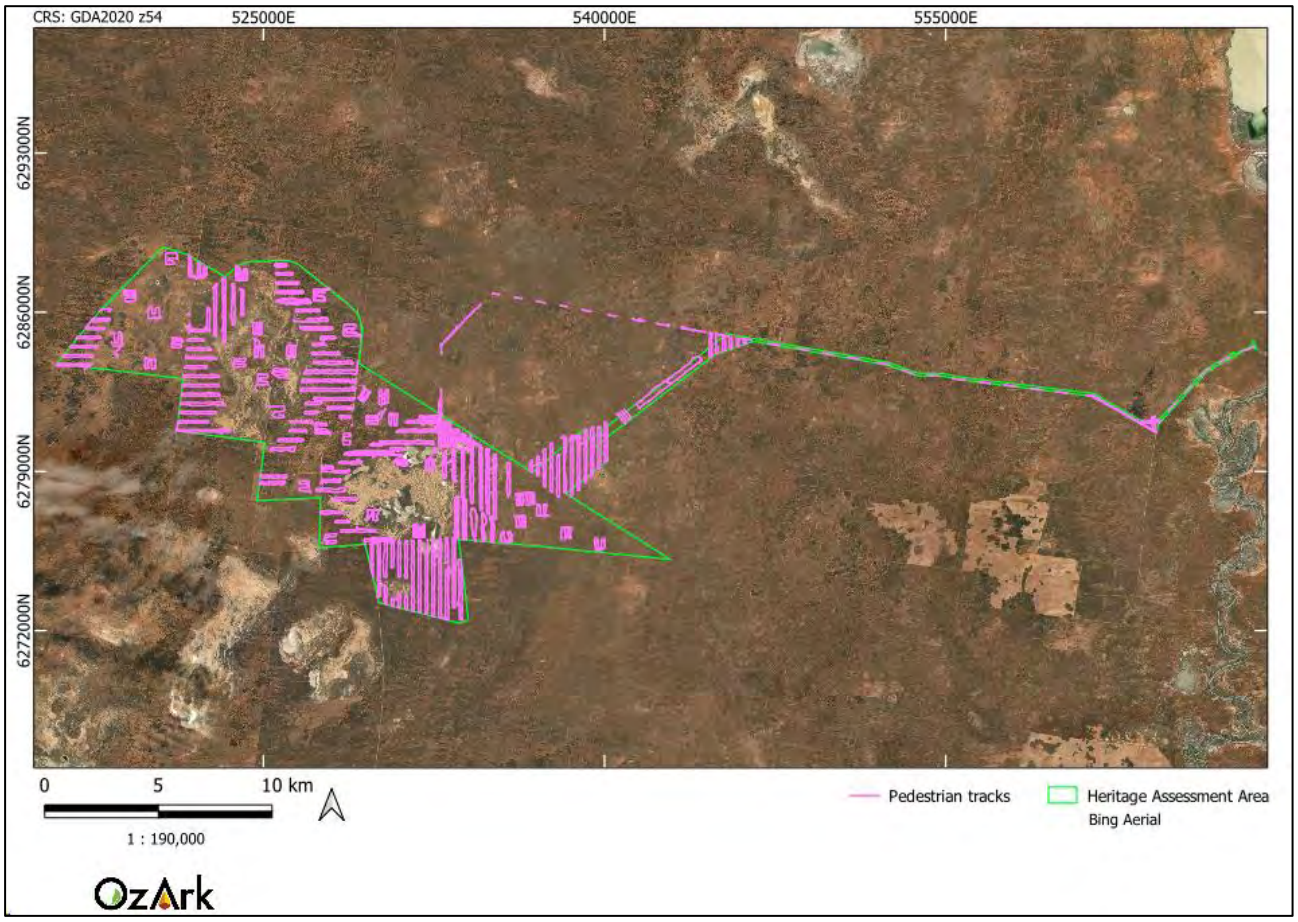
12.1.1 Survey summary

The field surveys for the Phases 1 to 3 assessment areas were completed over 21 days by OzArk and representatives from the Dareton LALC and Barkandji #8 Native Title Determinants. **Figure 12-1** shows the pedestrian tracks captured during the survey by the OzArk archaeologists across the Heritage Assessment Area from the three phases of the assessment.

The total number of recorded Aboriginal sites during the Phases 1 to 3 assessments is 143, including:

- 84 isolated finds
- 52 artefact scatters (including one PAD with a confirmed low-density subsurface scatter)
- Six artefact scatters with hearth/s
- One artefact scatter with a scarred tree.

Figure 12-1: Pedestrian transects across the Heritage Assessment Area.



12.1.2 Test excavation summary

The test excavations for the Phases 1 to 3 assessment areas were completed over 12 days by OzArk and representatives from the Dareton LALC and Barkandji #8 Native Title Determinants.

A total of 188 TUs (0.5 x 0.5 m) were excavated: a total of 47 m^2. From the 188 TUs only 17 artefacts were recovered: an average of 0.09 artefacts per square metre. The maximum number of artefacts recorded in single excavation square was two. This density of artefacts is extremely low.

12.2 DISCUSSION

12.2.1 Settlement strategies

As noted in **Section 5.4.1**, water is a significant predictor of site location (Clarke 1983a, Witter 2004, and Cupper 2007). Previous investigations within the region indicate that landforms distant from permanent or semi-permanent water sources would contain low-density sites and where sites were identified, they would likely be in proximity to any ephemeral water sources.

There are very few hydrological features within the Heritage Assessment Area today that hold freshwater. All drainage lines are ephemeral, and the salt pans and discharge basins are now highly saline.

The results of the Phase 1 survey show a distinct clustering of surface artefacts around the eastern salt pan, with a continuation of artefacts recorded along the south of the eastern salt pan during the Phase 3 assessment. Given the recording of these sites, it is clear the landforms adjacent to the eastern salt pan were a focus of occupation when compared to other landforms across the Heritage Assessment Area. Dating of hearths along the eastern salt pan would provide further insight into when occupation of these landforms took place and when freshwater may have been available.

The results of the Phases 2 and 3 assessments show a greater number of sites recorded across the Sandplains and Dunes landforms which are distant to the eastern and western salt pans when compared to the Lunettes and Islands. These landforms are generally associated with the ephemeral drainage lines.

Overall, all artefact sites recorded across the Heritage Survey Area are low-density sites, except for Copi OS-59 which is considered a medium density scatter (consisting of up to 200 artefacts within 0.5 ha). This indicates the landforms within the Heritage Assessment Area were sporadically occupied, likely when specific resources were available drawing Aboriginal people away from the more reliable resources associated with the Great Darling Anabranch, the Darling River, and associated lake systems.

12.2.2 ASDST modelling

In **Section 5.4.4.1** the ASDST models were used to develop a predictive model for site location. **Figure 12-2** and **Figure 12-3** show the location of artefact and hearths recorded across the Phases 1 to 3 assessment areas against the ASDST models.

The ASDST model predicting the likelihood of an area recording an artefact site were found to be largely accurate with regards to the Phase 1 assessment results, particularly in the eastern portion of the Phase 1 assessment area when the sites recorded during the assessment are plotted against the model. While areas modelling as with moderate-high potential for artefact sites continue further south along the eastern salt pan into the Phase 2 assessment area, the density of artefacts in this area did not continue. Instead, the highest density of artefacts in the Phase 2 assessment area was recorded in the west which models as an area of low potential. This result continued during the Phase 3 assessment with a large number of artefacts (around 100) being recorded further northeast of the eastern salt pan. Overall, the site with the greatest density (Copi OS-59) was recorded south of the eastern salt pan and contains up to 200 artefacts. This site is in areas mapped as having moderate potential.

The ASDST model predicting the likelihood of an area recording a hearth was accurate with regards to the Phase 1 assessment results, however, this is not the case for the hearths recorded as part of the Phase 2 assessment. All hearths recorded in the Phase 1 assessment area are in the areas of moderate-high potential around the eastern salt pan. Most hearths recorded during the Phase 2 assessment were identified in areas of low potential distant from the western salt pan while one was identified in an area mapped as having moderate potential. Two hearths were identified during the Phase 3 assessment in areas of low to moderate potential. These hearths were recorded as part of Copi OS-52 which also contains approximately 100 artefacts.

As noted in **Section 6.5.3**, the ASDST model predicting the likelihood of an area recording a scarred tree was accurate. While a scarred tree was identified in an area with low potential, the remainder of the Heritage Assessment Area also had low potential and only one scarred tree was identified.

Figure 12-2: Phase 1 to 3 recorded stone artefacts from and the ASDST model of artefact site probability.

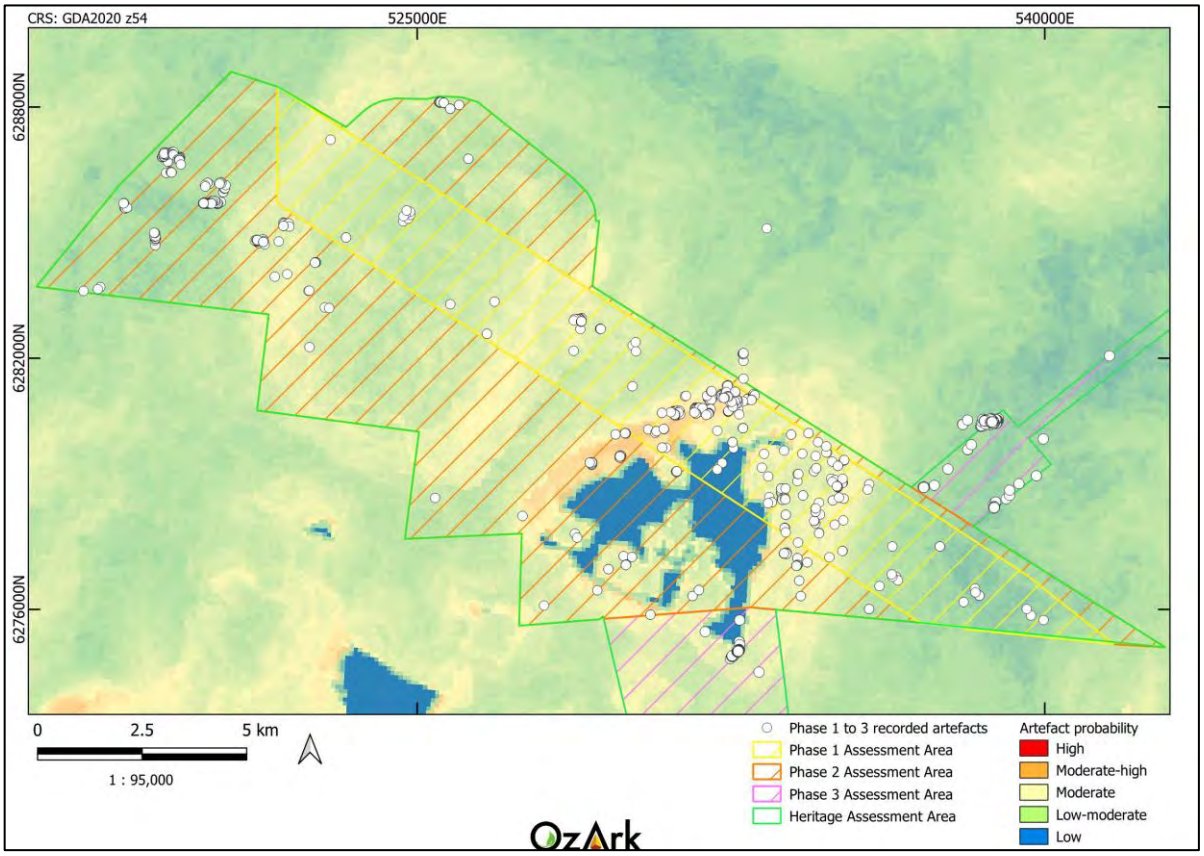
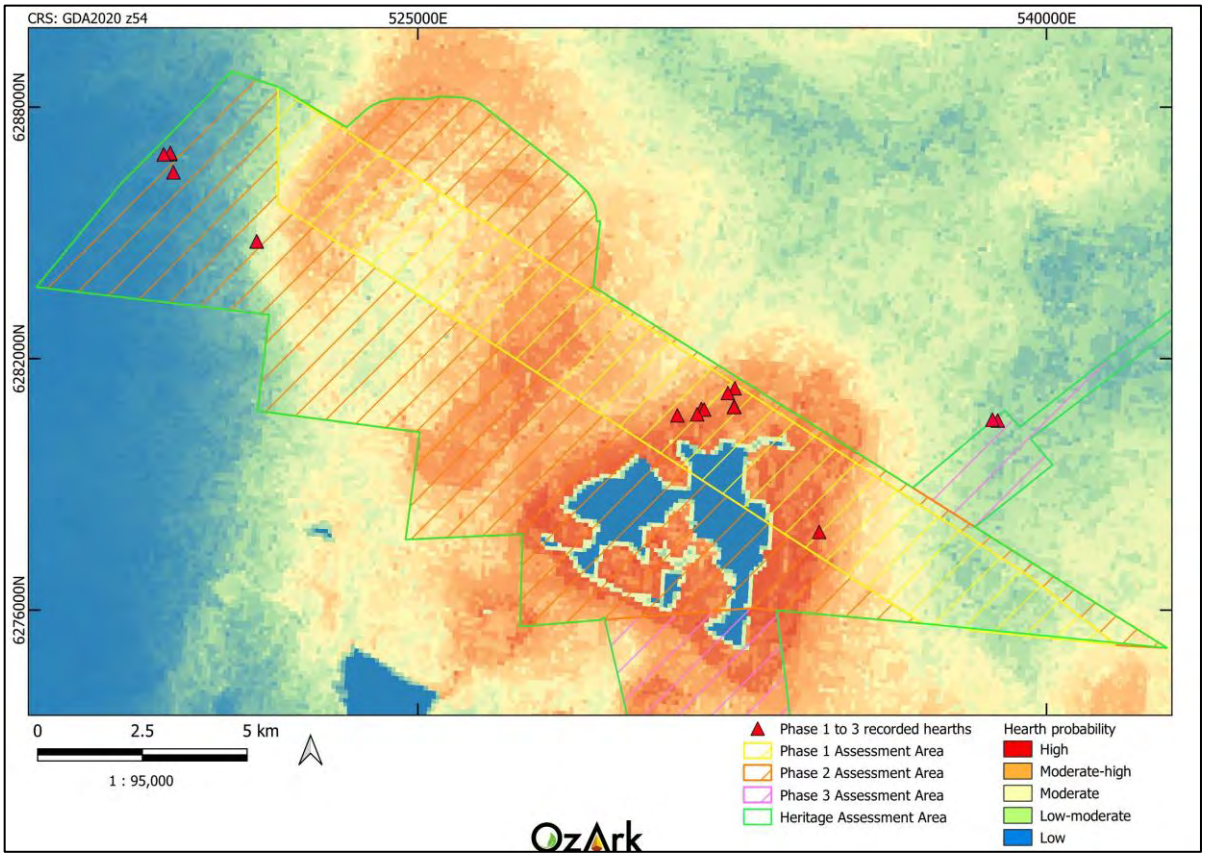


Figure 12-3: Phase 1 to 3 recorded hearths and the ASDST model of hearth probability.



12.2.3 Land use

An examination of land uses within the Heritage Assessment Area supports the observations made in **Section 5.4.2** that grazing, and vegetation clearance is likely to have affected the Aboriginal site patterning seen today because of degradation of the soils. Most artefacts and hearths recorded were identified in erosion scalds or what was considered likely to be the lower soil strata, particularly across the Lake Footslopes landforms which comprises a long gentle, slope therefore making it more susceptible to erosion.

As a result of soil loss across the Heritage Assessment Area, general site integrity is very low. Most recorded sites were assessed to have no associated archaeological deposits and are therefore surface manifestations and possibly, on an individual artefact level, displaced. Those sites considered to have potential for subsurface deposits, largely due to their association with hearths, were confirmed as not being associated with substantial deposits during the Phase 1 to 3 test excavation programs.

This result is consistent with the findings of previous assessments which highlight that the integrity of sites across western NSW have been heavily impacted by widespread soil movement and are predominately located in secondary contexts. (Witter 2004 and Holdaway and Fanning 2008).

13 SIGNIFICANCE ASSESSMENT

13.1 INTRODUCTION TO SIGNIFICANCE ASSESSMENT

13.1.1 Identifying cultural significance

The concept of cultural significance is used in Australian heritage practice and legislation to encompass all the cultural values and meanings that might be recognised in a place. The *Burra Charter*'s definition of cultural significance is broad and encompasses places that are significant to Indigenous cultures (Burra Charter 2013).

The *Burra Charter* definition of 'place' is also broad and encompasses Indigenous places of cultural significance. 'Place' includes locations that embody spiritual value (such as Dreaming places, sacred landscapes, and stone arrangements), social and historical value (such as massacre sites), as well as scientific value (such as archaeological sites). In fact, one place may be all these things or may embody all these values at the same time.

In some cases, the find-spot of a single artefact may constitute a 'place'. Equally, a suite of related locations may together comprise a single 'place', such as the many individual elements that make up a Songline. These more complex places are sometimes called a cultural landscape or cultural route.

The Guide (OEH 2011: 8–9) notes that cultural significance is comprised of an assessment of social values, scientific values, aesthetic values, and historic values. These values are described below.

13.1.1.1 Social or cultural value

Social or cultural value refers to the spiritual, traditional, historical, or contemporary associations and attachments the place or area has for Aboriginal people. Social or cultural value is how people express their connection with a place and the meaning that place has for them.

Places of social or cultural value have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods, or events. Communities can experience a sense of loss should a place of social or cultural value be damaged or destroyed.

There is not always consensus about a place's social or cultural value. Because people experience places and events differently, expressions of social or cultural value do vary and, in some instances, will be in direct conflict. When identifying values, it is not necessary to agree with or acknowledge the validity of each other's values, but it is necessary to document the range of values identified.

Social or cultural value can only be identified through consultation with Aboriginal people. This could involve a range of methodologies, such as cultural mapping, oral histories, archival documentation, and specific information provided by Aboriginal people specifically for the investigation.

Cultural value involves both traditional links with specific areas, as well as an overall concern by Aboriginal people for their sites generally and the continued protection of these. This type of value may not be in accord with interpretations made by the archaeologist: a site may have low archaeological value but high social value, or vice versa.

13.1.1.2 Scientific (archaeological) value

This refers to the importance of a landscape, area, place or object because of its rarity, representativeness, and the extent to which it may contribute to further understanding and information (Burra Charter 2013).

Assessing a site in this context involves placing it into a broader regional framework, as well as assessing the site's individual merits in view of current archaeological discourse. This type of value relates to the ability of a site to answer current research questions and is also based on a site's condition (integrity), content and representativeness.

The overriding aim of cultural heritage management is to preserve a representative sample of the archaeological resource. This will ensure that future research within the discipline can be based on a valid sample of the past. Establishing whether a site can contribute to current research also involves defining 'research potential'. Questions regularly asked when determining significance are: can this site contribute information that no other site can? Is this site representative of other sites in the region?

Information about scientific values will be gathered through any archaeological investigation undertaken. Archaeological investigations must be carried out according to Heritage NSW’s Code of Practice (DECCW 2010b).

Often scientific values are informed by social values that allow a contemporary understanding of the archaeological data to be understood.

13.1.1.3 Aesthetic value

This refers to the sensory, scenic, architectural, and creative aspects of the place. It is often closely linked with the social values. It may consider form, scale, colour, texture and material of the fabric or landscape, and the smell and sounds associated with the place and its use (Burra Charter 2013).

13.1.1.4 Historic value

Historic value refers to the associations of a place with a historically important person, event, phase, or activity in an Aboriginal community. Historic places do not always have physical evidence of their historical importance (such as structures, planted vegetation or landscape modifications). They may have ‘shared’ historic values with other (non-Aboriginal) communities.

Places of post-contact Aboriginal history have generally been poorly recognised in investigations of Aboriginal heritage. Consequently, the Aboriginal involvement and contribution to important regional historical themes is often missing from accepted historical narratives. This means it is often necessary to collect oral histories along with archival or documentary research to gain enough understanding of historic values.

13.2 ASSESSED SIGNIFICANCE OF THE RECORDED SITES

Table 13-1 presents a summary of the significance assessment of the 143 Aboriginal cultural heritage sites recorded during this assessment. Further details of each of the assessment criteria are provided below.

Table 13-1: Aboriginal cultural heritage: significance assessment.

AHIMS ID	Site Name	Social or Cultural Value	Archaeological / Scientific Value	Aesthetic Value	Historic Value
39-4-0653	Copi IF-1	High	Low	Low	None
39-4-0652	Copi IF-2	High	Low	Low	None
39-4-0651	Copi IF-3	High	Low	Low	None
39-4-0650	Copi IF-4	High	Low	Low	None
39-4-0649	Copi IF-5	High	Low	Low	None
39-4-0648	Copi IF-6	High	Low	Low	None
39-4-0647	Copi IF-7	High	Low	Low	None
39-4-0646	Copi IF-8	High	Low	Low	None
39-4-0645	Copi IF-9	High	Low	Low	None
39-4-0644	Copi IF-10	High	Low	Low	None
39-4-0643	Copi IF-11	High	Low	Low	None
39-4-0642	Copi IF-12	High	Low	Low	None
39-4-0641	Copi IF-13	High	Low	Low	None
39-4-0640	Copi IF-14	High	Low	Low	None
39-4-0639	Copi IF-15	High	Low	Low	None
39-4-0638	Copi IF-16	High	Low	Low	None
39-4-0637	Copi IF-17	High	Low	Low	None
39-4-0636	Copi IF-18	High	Low	Low	None
39-4-0634	CopiI IF-19	High	Low	Low	None
39-4-0633	Copi IF-20	High	Low	Low	None
39-4-0632	Copi IF-21	High	Low	Low	None
39-4-0635	Copi IF-22	High	Low	Low	None
39-4-0631	Copi IF-23	High	Low	Low	None
39-4-0630	Copi IF-25	High	Low	Low	None
39-4-0629	Copi IF-25	High	Low	Low	None
39-4-0628	Copi IF-26	High	Low	Low	None
39-4-0627	Copi IF-27	High	Low	Low	None
39-4-0626	Copi IF-28	High	Low	Low	None
39-4-0625	Copi IF-29	High	Low	Low	None

AHIMS ID	Site Name	Social or Cultural Value	Archaeological / Scientific Value	Aesthetic Value	Historic Value
39-4-0624	Copi IF-30	High	Low	Low	None
39-4-0623	Copi IF-31	High	Low	Low	None
39-4-0622	Copi IF-32	High	Low	Low	None
39-4-0621	Copi IF-33	High	Low	Low	None
39-4-0620	Copi IF-34	High	Low	Low	None
39-4-0619	Copi IF-35	High	Low	Low	None
39-4-0618	Copi IF-36	High	Low	Low	None
39-4-0617	Copi IF-37	High	Low	Low	None
39-4-0616	Copi IF-38	High	Low	Low	None
39-4-0615	Copi IF-39	High	Low	Low	None
39-4-0614	Copi IF-40	High	Low	Low	None
39-4-0599	Copi IF-41	High	Low	Low	None
39-4-0600	Copi IF-42	High	Low	Low	None
39-4-0601	Copi IF-43	High	Low	Low	None
39-4-0602	Copi IF-44	High	Low	Low	None
39-4-0604	Copi IF-45	High	Low	Low	None
39-4-0603	Copi IF-46	High	Low	Low	None
39-4-0605	Copi IF-47	High	Low	Low	None
39-4-0606	Copi IF-48	High	Low	Low	None
39-4-0607	Copi IF-49	High	Low	Low	None
39-4-0806	Copi IF-50	High	Low	Low	None
39-4-0807	Copi IF-51	High	Low	Low	None
39-4-0808	Copi IF-52	High	Low	Low	None
39-4-0809	Copi IF-53	High	Low	Low	None
39-4-0810	Copi IF-54	High	Low	Low	None
39-4-0811	Copi IF-55	High	Low	Low	None
39-4-0786	Copi IF-56	High	Low	Low	None
39-4-0787	Copi IF-57	High	Low	Low	None
39-4-0788	Copi IF-58	High	Low	Low	None
39-4-0789	Copi IF-59	High	Low	Low	None
39-4-0790	Copi IF-60	High	Low	Low	None
39-4-0791	Copi IF-61	High	Low	Low	None
39-4-0792	Copi IF-62	High	Low	Low	None
39-4-0793	Copi IF-63	High	Low	Low	None
39-4-0794	Copi IF-64	High	Low	Low	None
39-4-0795	Copi IF-65	High	Low	Low	None
39-4-0796	Copi IF-66	High	Low	Low	None
39-4-0797	Copi IF-67	High	Low	Low	None
39-4-0798	Copi IF-68	High	Low	Low	None
39-4-0799	Copi IF-69	High	Low	Low	None
39-4-0800	Copi IF-70	High	Low	Low	None
39-4-0801	Copi IF-71	High	Low	Low	None
39-4-0846	Copi IF-72	High	Low	Low	None

AHIMS ID	Site Name	Social or Cultural Value	Archaeological / Scientific Value	Aesthetic Value	Historic Value
39-4-0845	Copi IF-73	High	Low	Low	None
39-4-0844	Copi IF-74	High	Low	Low	None
39-4-0843	Copi IF-75	High	Low	Low	None
39-4-0842	Copi IF-76	High	Low	Low	None
39-4-0841	Copi IF-77	High	Low	Low	None
39-4-0840	Copi IF-78	High	Low	Low	None
39-4-0839	Copi IF-79	High	Low	Low	None
39-4-0847	Copi IF-80	High	Low	Low	None
39-4-0849	Copi IF-81	High	Low	Low	None
39-4-0848	Copi IF-82	High	Low	Low	None
39-4-0851	Copi IF-83	High	Low	Low	None
39-4-0850	Copi IF-84	High	Low	Low	None
39-4-0608	Copi OS-1	High	Moderate	Moderate	None
39-4-0609	Copi OS-2	High	Low	Low	None
39-4-0610	Copi OS-3	High	Low	Low	None
39-4-0611	Copi OS-4	High	Low	Low	None
39-4-0612	Copi OS-5	High	Low	Low	None
39-4-0613	Copi OS-6	High	Moderate	Low	None
39-4-0579	Copi OS-7	High	Low	Low	None
39-4-0580	Copi OS-8	High	Low	Low	None
39-4-0581	Copi OS-9	High	Low	Low	None
39-4-0582	Copi OS-10	High	Low	Low	None
39-4-0583	Copi OS-11	High	Low	Low	None
39-4-0584	Copi OS-12	High	Moderate	Low	None
39-4-0585	Copi OS-13	High	Low	Low	None
39-4-0586	Copi OS-14	High	Low	Low	None
39-4-0587	Copi OS-15	High	Low	Low	None
39-4-0588	Copi OS-16	High	Low	Low	None
39-4-0589	Copi OS-17	High	Low	Low	None
39-4-0590	Copi OS-18	High	Low	Low	None
39-4-0591	Copi OS-19	High	Low	Low	None
39-4-0592	Copi OS-20	High	Moderate	Low	None
39-4-0593	Copi OS-21	High	Low	Low	None
39-4-0595	Copi OS-22	High	Low	Low	None
39-4-0594	Copi OS-23	High	Low	Low	None
39-4-0596	Copi OS-24	High	Low	Low	None
39-4-0597	Copi OS-25	High	Low	Low	None
39-4-0598	Copi OS-26	High	Low	Low	None
39-4-0578	Copi OS-27	High	Low	Low	None
39-4-0577	Copi OS-28	High	Low	Low	None
39-4-0576	Copi OS-29	High	Low	Low	None
39-4-0575	Copi OS-30	High	Low	Low	None
39-4-0574	Copi OS-31	High	Low	Low	None

AHIMS ID	Site Name	Social or Cultural Value	Archaeological / Scientific Value	Aesthetic Value	Historic Value
39-4-0573	Copi OS-32	High	Low	Low	None
39-4-0802	Copi OS-33	High	Low	Low	None
39-4-0803	Copi OS-34	High	Low	Low	None
39-4-0804	Copi OS-35	High	Low	Low	None
39-4-0805	Copi OS-36	High	Low	Low	None
39-4-0771	Copi OS-37	High	Low	Low	None
39-4-0772	Copi OS-38	High	Low	Low	None
39-4-0773	Copi OS-39	High	Low	Low	None
39-4-0774	Copi OS-40	High	Low	Low	None
39-4-0775	Copi OS-41	High	Low	Low	None
39-4-0776	Copi OS-42	High	Low	Low	None
39-4-0777	Copi OS-43	High	Low	Low	None
39-4-0778	Copi OS-44	High	Low	Low	None
39-4-0779	Copi OS-45	High	Low	Low	None
39-4-0780	Copi OS-46	High	Low	Low	None
39-4-0781	Copi OS-47	High	Low	Low	None
39-4-0782	Copi OS-48	High	Low	Low	None
39-4-0784	Copi OS-49	High	Moderate	Low	None
39-4-0783	Copi OS-50	High	Low	Low	None
39-4-0785	Copi OS-51	High	Moderate	Low	None
39-4-0858	Copi OS-52	High	Moderate	Low	None
39-4-0852	Copi OS-53	High	Low	Low	None
39-4-0853	Copi OS-54	High	Low	Low	None
39-4-0854	Copi OS-55	High	Low	Low	None
39-4-0857	Copi OS-56	High	Low	Low	None
39-4-0856	Copi OS-57	High	Low	Low	None
39-4-0855	Copi OS-58	High	Low	Low	None
39-4-0859	Copi OS-59	High	Low	Low	None

13.2.1 Social or cultural value

The assessment of cultural or social value concerns the importance of a site or features to the relevant cultural group – in this case the Aboriginal community. Aspects of social value include assessment of sites, items, and landscapes that are traditionally significant or that have contemporary importance to the Aboriginal community. This importance involves both traditional links with specific areas, as well as an overall concern by Aboriginal people for their sites generally and the continued protection of these. This type of value may not be in accord with interpretations made by the archaeologist: a site may have low archaeological value but high social value, or vice versa.

A copy of the initial draft ACHAR was sent to all RAPs on 27 July 2020 with a 28-day review period closing 26 August 2020. No comments were received on the draft ACHAR from any of the RAPs regarding the cultural significance of the recorded sites.

A copy of the revised draft ACHAR was sent to all RAPs on 17 November 2022 with a 28-day review period closing 16 December 2022 (**Appendix 1 Figure 17**). No comments were received on the revised draft ACHAR from any of the RAPs regarding the cultural significance of the recorded sites.

As such, all sites have been accorded high cultural significance.

A copy of the second revised draft ACHAR was sent to all RAPs on 18 March 2024 with a 28-day review period closing 19 April 2024. No comments were received on the revised draft ACHAR from any of the RAPs regarding the cultural significance of the additional recorded sites.

13.2.2 Scientific (archaeological) v*alue*

In terms of scientific significance, locations will primarily be assessed on their ability to add reliable archaeological information which can further our understanding of the archaeology at a local and regional level or a site type's rarity within the landscape. This assessment has been informed through surface observations/survey, subsurface archaeological testing, and a review of previous site-specific reports.

Considerations taken in this scientific assessment include an understanding that a part of the archaeological value of a place is the general community's association to that place. This is often distinct from the social, aesthetic, and historical criteria used to assess heritage significance as it relates to a person's relationship to the archaeology of the place. For the Aboriginal participants on the survey, for example, an archaeological site was appreciated as much for its archaeological values as it was for its cultural values. A site displaying either many artefacts or a number of interesting artefacts would engender fascination and discussion on purely archaeological grounds (Where did people live / eat? How did they live? How did they use the artefact and what does it tell us about the people who made it?).

It is therefore understood that many Aboriginal people, or people generally interested in pre-history, would see the sites recorded in this assessment to have higher archaeological values than may be given in this assessment. However, this assessment has attempted to distinguish between an artefact scatter with potential to yield further information (moderate–high scientific significance) and an artefact scatter in an eroded context that would yield little meaningful further information (low scientific significance).

Incorporating research on the rarity, representativeness and integrity or condition of a site, along with the considerations outlined above, this assessment defines the following categories when assessing scientific significance:

<u>High scientific significance</u>

Locations displaying this value would include one or more of the following features:

- The location would contain known areas of undisturbed archaeological deposits that are likely to add significantly to our knowledge concerning Aboriginal archaeology in the region
- The site would contain archaeological information to address complex research questions about the region
- The site contains outstanding features that can be appreciated by non-specialists / enthusiasts
- The site type is rare in the region and / or in danger of becoming unrepresented in the region.

Moderate scientific significance

Locations displaying this value would include one or more of the following features:

- The location would contain areas of archaeological deposits, sometimes disturbed, that are likely to add to our knowledge about the Aboriginal archaeology of the local area only
- The site would contain archaeological information to address general research questions about the region
- The site contains features that would be appreciated by a specialist / enthusiast
- Portions of the site have been lost due to erosion or the landscape context of the site has been impacted.

Low scientific significance

Locations displaying this value would include one or more of the following features:

- The location may contain areas of archaeological deposits, but they are likely to be disturbed and any information gained would only address limited research questions
- The site is largely displaced by erosion
- The landscape context of the site has been heavily modified
- The site exists in areas where A-Horizon soil loss is extensive
- The site contains features that would be difficult to interpret in a meaningful way.

The archaeological or scientific significance assessment of the 143 recorded Aboriginal cultural heritage sites is evaluated and summarised in **Table 13-2**.

Table 13-2: The archaeological or scientific significance of sites.

AHIMS ID	Site name	Site type	Scientific significance	Justification
39-4-0653	Copi IF-1	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.

AHIMS ID	Site name	Site type	Scientific significance	Justification
39-4-0652	Copi IF-2	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0651	Copi IF-3	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0650	Copi IF-4	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0649	Copi IF-5	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0648	Copi IF-6	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0647	Copi IF-7	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0646	Copi IF-8	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0645	Copi IF-9	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0644	Copi IF-10	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0643	Copi IF-11	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0642	Copi IF-12	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0641	Copi IF-13	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0640	Copi IF-14	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0639	Copi IF-15	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0638	Copi IF-16	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.

AHIMS ID	Site name	Site type	Scientific significance	Justification
39-4-0637	Copi IF-17	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0636	Copi IF-18	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0634	Copil IF-19	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0633	Copi IF-20	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0632	Copi IF-21	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0635	Copi IF-22	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0631	Copi IF-23	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0630	Copi IF-25	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0629	Copi IF-25	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0628	Copi IF-26	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0627	Copi IF-27	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0626	Copi IF-28	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0625	Copi IF-29	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0624	Copi IF-30	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0623	Copi IF-31	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.

AHIMS ID	Site name	Site type	Scientific significance	Justification
39-4-0622	Copi IF-32	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0621	Copi IF-33	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0620	Copi IF-34	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0619	Copi IF-35	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0618	Copi IF-36	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0617	Copi IF-37	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0616	Copi IF-38	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0615	Copi IF-39	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0614	Copi IF-40	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0599	Copi IF-41	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0600	Copi IF-42	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0601	Copi IF-43	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0602	Copi IF-44	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0604	Copi IF-45	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0603	Copi IF-46	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.

AHIMS ID	Site name	Site type	Scientific significance	Justification
39-4-0605	Copi IF-47	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0606	Copi IF-48	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0607	Copi IF-49	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0806	Copi IF-50	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0807	Copi IF-51	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0808	Copi IF-52	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0809	Copi IF-53	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0810	Copi IF-54	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0811	Copi IF-55	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0786	Copi IF-56	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0787	Copi IF-57	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0788	Copi IF-58	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0789	Copi IF-59	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0790	Copi IF-60	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0791	Copi IF-61	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.

AHIMS ID	Site name	Site type	Scientific significance	Justification
39-4-0792	Copi IF-62	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0793	Copi IF-63	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0794	Copi IF-64	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0795	Copi IF-65	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0796	Copi IF-66	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0797	Copi IF-67	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0798	Copi IF-68	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0799	Copi IF-69	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0800	Copi IF-70	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0801	Copi IF-71	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0846	Copi IF-72	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0845	Copi IF-73	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0844	Copi IF-74	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0843	Copi IF-75	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0842	Copi IF-76	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.

AHIMS ID	Site name	Site type	Scientific significance	Justification
39-4-0841	Copi IF-77	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0840	Copi IF-78	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0839	Copi IF-79	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0847	Copi IF-80	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0849	Copi IF-81	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0848	Copi IF-82	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0851	Copi IF-83	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0850	Copi IF-84	Isolated find	Low	Site integrity has been affected by disturbance and the landform is assessed as eroding with low potential for intact subsurface deposits. The site contains a fair representation of an artefact type and material, which are common in the region.
39-4-0608	Copi OS-1	Artefact scatter; scarred tree	Moderate	The site contains low numbers and poor representations of artefacts, which are common in the region and subsurface investigation have confirmed the site is not associated with any subsurface deposits. The site contains a fair representation of a scarred tree which is rare across landforms distant from permanent water.
39-4-0609	Copi OS-2	Artefact scatter	Low	The site contains low numbers and poor representations of artefacts, which are common in the region. The landform is assessed as eroding however it is considered to have some subsurface potential in the less eroded areas to the southwest. A re-evaluation of its archaeological significance would be required following subsurface investigations.
39-4-0610	Copi OS-3	Artefact scatter	Low	The landform is assessed as eroding. The site contains low numbers and poor representations of artefacts, which are common in the region. Further, test excavation confirmed the site is not associated with subsurface deposits.
39-4-0611	Copi OS-4	Artefact scatter	Low	The landform is assessed as eroding. The site contains low numbers and poor representations of artefacts, which are common in the region. Further, test excavation confirmed the site is not associated with subsurface deposits.
39-4-0612	Copi OS-5	Artefact scatter	Low	The landform is assessed as eroding. The site contains low numbers and poor representations of artefacts, which are common in the region. Further, test excavation confirmed the site is not associated with subsurface deposits.
39-4-0613	Copi OS-6	Artefact scatter; hearth	Moderate	Site integrity has been affected by erosion and test excavation has confirmed the site is associated with a very low density of subsurface deposits. Overall, the site has a low density of surface artefacts, and which are common in the region. The site contains a fair representation of a hearth which has potential to address general research questions about the region.

AHIMS ID	Site name	Site type	Scientific significance	Justification
39-4-0579	Copi OS-7	Artefact scatter	Low	The landform is assessed as eroding. The site contains low numbers and poor representations of artefacts, which are common in the region. Further, test excavation confirmed the site is not associated with subsurface deposits.
39-4-0580	Copi OS-8	Artefact scatter	Low	The landform is assessed as eroding. The site contains low numbers and poor representations of artefacts, which are common in the region. Further, test excavation confirmed the site is not associated with subsurface deposits.
39-4-0581	Copi OS-9	Artefact scatter	Low	The landform is assessed as eroding. The site contains low numbers and poor representations of artefacts, which are common in the region. Further, test excavation confirmed the site is not associated with subsurface deposits.
39-4-0582	Copi OS-10	Artefact scatter	Low	The landform is assessed as eroding. The site contains low numbers and poor representations of artefacts, which are common in the region. Further, test excavation confirmed the site is not associated with subsurface deposits.
39-4-0583	Copi OS-11	Artefact scatter	Low	The site was initially considered to be part of a knapping floor eroding from the edge of the landform, however subsurface investigations did not recover any subsurface artefacts. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0584	Copi OS-12	Artefact scatter; hearths	Moderate	Site integrity has been affected by erosion and test excavation has confirmed the site is associated with a very low density of subsurface deposits. Overall, the site has a low density of surface artefacts, and which are common in the region. The site contains a fair representation of hearths which have potential to address general research questions about the region.
39-4-0585	Copi OS-13	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0586	Copi OS-14	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0587	Copi OS-15	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0588	Copi OS-16	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0589	Copi OS-17	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0590	Copi OS-18	Artefact scatter	Low	The landform is assessed as eroding. The site contains low numbers overall (both surface and subsurface) and poor representations of artefacts, which are common in the region. Any information gained is unlikely to be able to answer any research questions.
39-4-0591	Copi OS-19	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0592	Copi OS-20	Artefact scatter; hearth	Moderate	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region. However, the site contains a fair representation of a hearth which has potential to address general research questions about the region.
39-4-0593	Copi OS-21	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0595	Copi OS-22	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.

AHIMS ID	Site name	Site type	Scientific significance	Justification
39-4-0594	Copi OS-23	Artefact scatter	Low	The landform is assessed as eroding. The site contains low numbers overall (both surface and subsurface) and poor representations of artefacts, which are common in the region. Any information gained is unlikely to be able to answer any research questions.
39-4-0596	Copi OS-24	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0597	Copi OS-25	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0598	Copi OS-26	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0578	Copi OS-27	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0577	Copi OS-28	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0576	Copi OS-29	Artefact scatter	Low	The site contains low numbers and poor representations of artefacts, which are common in the region. The landform is assessed as eroding however it is considered to have some subsurface potential in the less eroded areas. A re-evaluation of its archaeological significance would be required following subsurface investigations.
39-4-0575	Copi OS-30	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0574	Copi OS-31	Artefact scatter	Low	The landform is assessed as eroding. The site contains low numbers overall (both surface and subsurface) and poor representations of artefacts, which are common in the region. Any information gained is unlikely to be able to answer any research questions.
39-4-0573	Copi OS-32	Artefact scatter (subsurface)	Low	Subsurface excavations across the landform have confirmed contains only a background scatter. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0802	Copi OS-33	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0803	Copi OS-34	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0804	Copi OS-35	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0805	Copi OS-36	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0771	Copi OS-37	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0772	Copi OS-38	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0773	Copi OS-39	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.

AHIMS ID	Site name	Site type	Scientific significance	Justification
39-4-0774	Copi OS-40	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0775	Copi OS-41	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0776	Copi OS-42	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0777	Copi OS-43	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0778	Copi OS-44	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0779	Copi OS-45	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0780	Copi OS-46	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0781	Copi OS-47	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0782	Copi OS-48	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0784	Copi OS-49	Artefact scatter; hearths	Moderate	Site integrity has been affected by erosion. Overall, the site has a relatively low density of surface artefacts which are common in the region. The site contains a fair representation of hearths which have potential to address general research questions about the region.
39-4-0783	Copi OS-50	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0785	Copi OS-51	Artefact scatter; hearths	Moderate	Site integrity has been affected by erosion. Overall, the site has a relatively low density of surface artefacts which are common in the region. The site contains a fair representation of hearths which have potential to address general research questions about the region.
39-4-0858	Copi OS-52	Artefact scatter; hearths	Moderate	Site integrity has been affected by erosion and is unlikely to be associated with subsurface deposits except at the location of the hearths. Overall, the site has a low density of surface artefacts, and which are common in the region. The site contains a fair representation of hearths which have potential to address general research questions about the region.
39-4-0852	Copi OS-53	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0853	Copi OS-54	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0854	Copi OS-55	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0857	Copi OS-56	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.
39-4-0856	Copi OS-57	Artefact scatter	Low	The landform is assessed as eroding with low potential for intact subsurface deposits. The site contains low numbers and poor representations of artefacts, which are common in the region.

AHIMS ID	Site name	Site type	Scientific significance	Justification
39-4-0855	Copi OS-58	Artefact scatter	Low	Site integrity has been affected by erosion and test excavation has confirmed the site is not associated with subsurface deposits. While the site has a moderate density, it contains artefact types and materials which are common in the region.
39-4-0859	Copi OS-59	Artefact scatter	Low	Site integrity has been affected by erosion and test excavation has confirmed the site is associated with a very low density of subsurface deposits, although these subsurface artefacts are subsurface due to more recent aeolian deposition. Overall, the site has a low density of surface artefacts, and which are common in the region.

13.2.3 Aesthetic value

All recorded sites have been assessed as having low aesthetic value, except for the scarred tree recorded at Copi-OS1 which is considered to have moderate aesthetic value. None of the Aboriginal sites recorded have significant aesthetic value as the integrity of the sensory landscape has been altered in historic and modern times. Additionally, the artefacts themselves are generally not remarkable.

13.2.4 Historic value

None of the Aboriginal sites recorded in the Heritage Assessment Area have an apparent direct relationship to known historic Aboriginal sites (e.g. missions, massacre sites, etc.) or display clear evidence consistent with ‘contact’ or ‘post-contact’ Aboriginal sites. To that end, all recorded sites are assessed as having no historic value.

13.2.5 Statement of significance

The intangible Aboriginal cultural values across the wider district relate to several important places and themes associated with non-archaeological cultural values. These places mainly relate to spiritual and ceremonial connections across the broader landscape that may encompass areas of culturally significant geographical features. There may be places with intangible cultural significance within the Heritage Assessment Area, although no specific locations have so far been identified by the Aboriginal community. Surrounding areas with known intangible cultural values include the *Paaka* (the Darling River), the Great Darling Anabranch, and Lake Victoria, although these, except the Great Darling Anabranch, are all located over 24 km from the Heritage Assessment Area.

The scientific value of the sites within the Heritage Assessment Area have varying degrees potential to yield further information regarding occupation across the landforms across the Heritage Assessment Area and allow for meaningful comparison to other similar landforms across the region.

Apart from the general understanding of the aesthetic qualities of the Heritage Assessment Area. there are no known places with identified aesthetic values except for the scarred tree recorded at Copi-OS1.

14 AVOIDING HARM

14.1 AVOIDING AND MINIMISING HARM

14.1.1 Conserving significant Aboriginal cultural heritage

An object of the NPW Act is the '*conservation of objects places and features… of cultural value within the landscape, including… places, objects and features of significance to Aboriginal people*' (s.2A(1(b)(i)).

As heritage professionals, OzArk strives for good conservation outcomes. In particular, OzArk is primarily concerned with the conservation and protection of Aboriginal cultural heritage that is of significance to Aboriginal people.

Two primary objectives when managing harm to an Aboriginal object are:

- Impacts to significant Aboriginal objects and places should always be avoided wherever possible
- Where impacts to Aboriginal objects and places cannot be avoided, proposals should be amended to reduce the extent and severity of impacts to significant Aboriginal objects and places using reasonable and feasible measures.

14.1.2 Opportunities to conserve Aboriginal cultural heritage values

A total of 143 Aboriginal sites were recorded during the assessment, including:

- 84 isolated finds
- 52 artefact scatters (including one PAD with a confirmed low-density subsurface scatter)
- Six artefact scatters with hearth/s
- One artefact scatter and a scarred tree.

Seventy-seven of the 143 Aboriginal sites recorded during the assessment are wholly located outside of the Limit of Disturbance of the Project and will not be harmed.

Sixty-two Aboriginal sites are wholly located within the Limit of Disturbance and will be totally harmed by the Project.

Four Aboriginal sites are partially located outside of the Limit of Disturbance and will be managed through fencing during the construction of the Project to ensure the portions of the sites outside of the Limit of Disturbance are not inadvertently harmed (**Section 15.3.4**). Further, all sites within 50 m of the Limit of Disturbance will be managed through fencing to ensure that they are not harmed during the construction of the Project.

14.2 LIKELY IMPACTS TO ABORIGINAL HERITAGE FROM THE PROJECT

Table 14-1 presents a summary of potential impacts to Aboriginal cultural heritage associated with the Project. **Figure 14-1** to **Figure 14-4** shows the location of the recorded Aboriginal sites in relation to the Project components.

While Copi OS-1 is partially located within the Limit of Disturbance, the entire site will be avoided from harm.

In total, there are 65 sites that will be harmed by the Project. Of these sites, 62 will be totally harmed and three will be partially harmed. The remaining 78 sites will remain extant.

Table 14-1: Aboriginal cultural heritage: impact assessment.

AHIMS ID	Site Name	Site Type	Type of Harm (Direct/Indirect/ None)	Degree of Harm (Total/Partial/None)	Consequence of Harm (Total/Partial/No Loss of Value)
39-4-0653	Copi IF-1	Isolated find	None	None	No loss of value
39-4-0652	Copi IF-2	Isolated find	Direct	Total	Total loss of value
39-4-0651	Copi IF-3	Isolated find	Direct	Total	Total loss of value
39-4-0650	Copi IF-4	Isolated find	Direct	Total	Total loss of value
39-4-0649	Copi IF-5	Isolated find	Direct	Total	Total loss of value
39-4-0648	Copi IF-6	Isolated find	Direct	Total	Total loss of value
39-4-0647	Copi IF-7	Isolated find	Direct	Total	Total loss of value
39-4-0646	Copi IF-8	Isolated find	Direct	Total	Total loss of value
39-4-0645	Copi IF-9	Isolated find	Direct	Total	Total loss of value
39-4-0644	Copi IF-10	Isolated find	Direct	Total	Total loss of value
39-4-0643	Copi IF-11	Isolated find	Direct	Total	Total loss of value
39-4-0642	Copi IF-12	Isolated find	Direct	Total	Total loss of value
39-4-0641	Copi IF-13	Isolated find	Direct	Total	Total loss of value
39-4-0640	Copi IF-14	Isolated find	Direct	Total	Total loss of value
39-4-0639	Copi IF-15	Isolated find	None	None	No loss of value
39-4-0638	Copi IF-16	Isolated find	None	None	No loss of value
39-4-0637	Copi IF-17	Isolated find	Direct	Total	Total loss of value
39-4-0636	Copi IF-18	Isolated find	Direct	Total	Total loss of value
39-4-0634	Copil IF-19	Isolated find	None	None	No loss of value
39-4-0633	Copi IF-20	Isolated find	None	None	No loss of value
39-4-0632	Copi IF-21	Isolated find	None	None	No loss of value
39-4-0635	Copi IF-22	Isolated find	None	None	No loss of value
39-4-0631	Copi IF-23	Isolated find	None	None	No loss of value
39-4-0630	Copi IF-24	Isolated find	None	None	No loss of value
39-4-0629	Copi IF-25	Isolated find	None	None	No loss of value
39-4-0628	Copi IF-26	Isolated find	None	None	No loss of value
39-4-0627	Copi IF-27	Isolated find	Direct	Total	Total loss of value
39-4-0626	Copi IF-28	Isolated find	Direct	Total	Total loss of value
39-4-0625	Copi IF-29	Isolated find	Direct	Total	Total loss of value
39-4-0624	Copi IF-30	Isolated find	Direct	Total	Total loss of value

AHIMS ID	Site Name	Site Type	Type of Harm (Direct/Indirect/ None)	Degree of Harm (Total/Partial/None)	Consequence of Harm (Total/Partial/No Loss of Value)
39-4-0623	Copi IF-31	Isolated find	Direct	Total	Total loss of value
39-4-0622	Copi IF-32	Isolated find	Direct	Total	Total loss of value
39-4-0621	Copi IF-33	Isolated find	Direct	Total	Total loss of value
39-4-0620	Copi IF-34	Isolated find	Direct	Total	Total loss of value
39-4-0619	Copi IF-35	Isolated find	Direct	Total	Total loss of value
39-4-0618	Copi IF-36	Isolated find	None	None	No loss of value
39-4-0617	Copi IF-37	Isolated find	None	None	No loss of value
39-4-0616	Copi IF-38	Isolated find	None	None	No loss of value
39-4-0615	Copi IF-39	Isolated find	None	None	No loss of value
39-4-0614	Copi IF-40	Isolated find	Direct	Total	Total loss of value
39-4-0599	Copi IF-41	Isolated find	Direct	Total	Total loss of value
39-4-0600	Copi IF-42	Isolated find	None	None	No loss of value
39-4-0601	Copi IF-43	Isolated find	None	None	No loss of value
39-4-0602	Copi IF-44	Isolated find	None	None	No loss of value
39-4-0604	Copi IF-45	Isolated find	None	None	No loss of value
39-4-0603	Copi IF-46	Isolated find	None	None	No loss of value
39-4-0605	Copi IF-47	Isolated find	None	None	No loss of value
39-4-0606	Copi IF-48	Isolated find	None	None	No loss of value
39-4-0607	Copi IF-49	Isolated find	None	None	No loss of value
39-4-0806	Copi IF-50	Isolated find	Direct	Total	Total loss of value
39-4-0807	Copi IF-51	Isolated find	Direct	Total	Total loss of value
39-4-0808	Copi IF-52	Isolated find	Direct	Total	Total loss of value
39-4-0809	Copi IF-53	Isolated find	Direct	Total	Total loss of value
39-4-0810	Copi IF-54	Isolated find	Direct	Total	Total loss of value
39-4-0811	Copi IF-55	Isolated find	Direct	Total	Total loss of value
39-4-0786	Copi IF-56	Isolated find	Direct	Total	Total loss of value
39-4-0787	Copi IF-57	Isolated find	Direct	Total	Total loss of value
39-4-0788	Copi IF-58	Isolated find	None	None	No loss of value
39-4-0789	Copi IF-59	Isolated find	None	None	No loss of value
39-4-0790	Copi IF-60	Isolated find	None	None	No loss of value
39-4-0791	Copi IF-61	Isolated find	None	None	No loss of value
39-4-0792	Copi IF-62	Isolated find	None	None	No loss of value
39-4-0793	Copi IF-63	Isolated find	None	None	No loss of value
39-4-0794	Copi IF-64	Isolated find	Direct	Total	Total loss of value
39-4-0795	Copi IF-65	Isolated find	None	None	No loss of value
39-4-0796	Copi IF-66	Isolated find	None	None	No loss of value
39-4-0797	Copi IF-67	Isolated find	None	None	No loss of value
39-4-0798	Copi IF-68	Isolated find	None	None	No loss of value
39-4-0799	Copi IF-69	Isolated find	None	None	No loss of value
39-4-0800	Copi IF-70	Isolated find	None	None	No loss of value
39-4-0801	Copi IF-71	Isolated find	None	None	No loss of value
39-4-0846	Copi IF-72	Isolated find	None	None	No loss of value
39-4-0845	Copi IF-73	Isolated find	None	None	No loss of value

AHIMS ID	Site Name	Site Type	Type of Harm (Direct/Indirect/ None)	Degree of Harm (Total/Partial/None)	Consequence of Harm (Total/Partial/No Loss of Value)
39-4-0844	Copi IF-74	Isolated find	None	None	No loss of value
39-4-0843	Copi IF-75	Isolated find	None	None	No loss of value
39-4-0842	Copi IF-76	Isolated find	None	None	No loss of value
39-4-0841	Copi IF-77	Isolated find	None	None	No loss of value
39-4-0840	Copi IF-78	Isolated find	None	None	No loss of value
39-4-0839	Copi IF-79	Isolated find	None	None	No loss of value
39-4-0847	Copi IF-80	Isolated find	Direct	Total	Total loss of value
39-4-0849	Copi IF-81	Isolated find	Direct	Total	Total loss of value
39-4-0848	Copi IF-82	Isolated find	Direct	Total	Total loss of value
39-4-0851	Copi IF-83	Isolated find	None	None	No loss of value
39-4-0850	Copi IF-84	Isolated find	Direct	Total	Total loss of value
39-4-0608	Copi OS-1	Artefact scatter; scarred tree	None	None	No loss of value
39-4-0609	Copi OS-2	Artefact scatter	None	None	No loss of value
39-4-0610	Copi OS-3	Artefact scatter	None	None	No loss of value
39-4-0611	Copi OS-4	Artefact scatter	None	None	No loss of value
39-4-0612	Copi OS-5	Artefact scatter	None	None	No loss of value
39-4-0613	Copi OS-6	Artefact scatter; hearth	Direct	Total	Total loss of value
39-4-0579	Copi OS-7	Artefact scatter	Direct	Total	Total loss of value
39-4-0580	Copi OS-8	Artefact scatter	Direct	Total	Total loss of value
39-4-0581	Copi OS-9	Artefact scatter	Direct	Total	Total loss of value
39-4-0582	Copi OS-10	Artefact scatter	Direct	Total	Total loss of value
39-4-0583	Copi OS-11	Artefact scatter	None	None	No loss of value
39-4-0584	Copi OS-12	Artefact scatter; hearths	Direct	Partial	Partial loss of value
39-4-0585	Copi OS-13	Artefact scatter	None	None	No loss of value
39-4-0586	Copi OS-14	Artefact scatter	None	None	No loss of value
39-4-0587	Copi OS-15	Artefact scatter	None	None	No loss of value
39-4-0588	Copi OS-16	Artefact scatter	None	None	No loss of value
39-4-0589	Copi OS-17	Artefact scatter	Direct	Total	Total loss of value
39-4-0590	Copi OS-18	Artefact scatter	Direct	Total	Total loss of value
39-4-0591	Copi OS-19	Artefact scatter	Direct	Total	Total loss of value
39-4-0592	Copi OS-20	Artefact scatter; hearth	Direct	Total	Total loss of value
39-4-0593	Copi OS-21	Artefact scatter	Direct	Total	Total loss of value
39-4-0595	Copi OS-22	Artefact scatter	Direct	Total	Total loss of value
39-4-0594	Copi OS-23	Artefact scatter	None	None	No loss of value
39-4-0596	Copi OS-24	Artefact scatter	None	None	No loss of value
39-4-0597	Copi OS-25	Artefact scatter	None	None	No loss of value
39-4-0598	Copi OS-26	Artefact scatter	None	None	No loss of value
39-4-0578	Copi OS-27	Artefact scatter	None	None	No loss of value
39-4-0577	Copi OS-28	Artefact scatter	Direct	Total	Total loss of value
39-4-0576	Copi OS-29	Artefact scatter	Direct	Total	Total loss of value

AHIMS ID	Site Name	Site Type	Type of Harm (Direct/Indirect/ None)	Degree of Harm (Total/Partial/None)	Consequence of Harm (Total/Partial/No Loss of Value)
39-4-0575	Copi OS-30	Artefact scatter	None	None	No loss of value
39-4-0574	Copi OS-31	Artefact scatter	None	None	No loss of value
39-4-0573	Copi OS-32	Artefact scatter (subsurface)	None	None	No loss of value
39-4-0802	Copi OS-33	Artefact scatter	Direct	Total	Total loss of value
39-4-0803	Copi OS-34	Artefact scatter	Direct	Total	Total loss of value
39-4-0804	Copi OS-35	Artefact scatter	None	None	No loss of value
39-4-0805	Copi OS-36	Artefact scatter	None	None	No loss of value
39-4-0771	Copi OS-37	Artefact scatter	Direct	Total	Total loss of value
39-4-0772	Copi OS-38	Artefact scatter	Direct	Total	Total loss of value
39-4-0773	Copi OS-39	Artefact scatter	Direct	Total	Total loss of value
39-4-0774	Copi OS-40	Artefact scatter	Direct	Total	Total loss of value
39-4-0775	Copi OS-41	Artefact scatter	None	None	No loss of value
39-4-0776	Copi OS-42	Artefact scatter	None	None	No loss of value
39-4-0777	Copi OS-43	Artefact scatter	Direct	Total	Total loss of value
39-4-0778	Copi OS-44	Artefact scatter	None	None	No loss of value
39-4-0779	Copi OS-45	Artefact scatter	None	None	No loss of value
39-4-0780	Copi OS-46	Artefact scatter	None	None	No loss of value
39-4-0781	Copi OS-47	Artefact scatter	None	None	No loss of value
39-4-0782	Copi OS-48	Artefact scatter	None	None	No loss of value
39-4-0784	Copi OS-49	Artefact scatter; hearths	None	None	No loss of value
39-4-0783	Copi OS-50	Artefact scatter	Direct	Partial	Partial loss of value
39-4-0785	Copi OS-51	Artefact scatter; hearths	Direct	Partial	Partial loss of value
39-4-0858	Copi OS-52	Artefact scatter; hearths	None	None	No loss of value
39-4-0852	Copi OS-53	Artefact scatter	None	None	No loss of value
39-4-0853	Copi OS-54	Artefact scatter	None	None	No loss of value
39-4-0854	Copi OS-55	Artefact scatter	None	None	No loss of value
39-4-0857	Copi OS-56	Artefact scatter	None	None	No loss of value
39-4-0856	Copi OS-57	Artefact scatter	Direct	Total	Total loss of value
39-4-0855	Copi OS-58	Artefact scatter	Direct	Total	Total loss of value
39-4-0859	Copi OS-59	Artefact scatter	Direct	Total	Total loss of value

Figure 14-1: Location of recorded Aboriginal sites in the west of the Heritage Assessment Area in relation to the Limit of Disturbance.

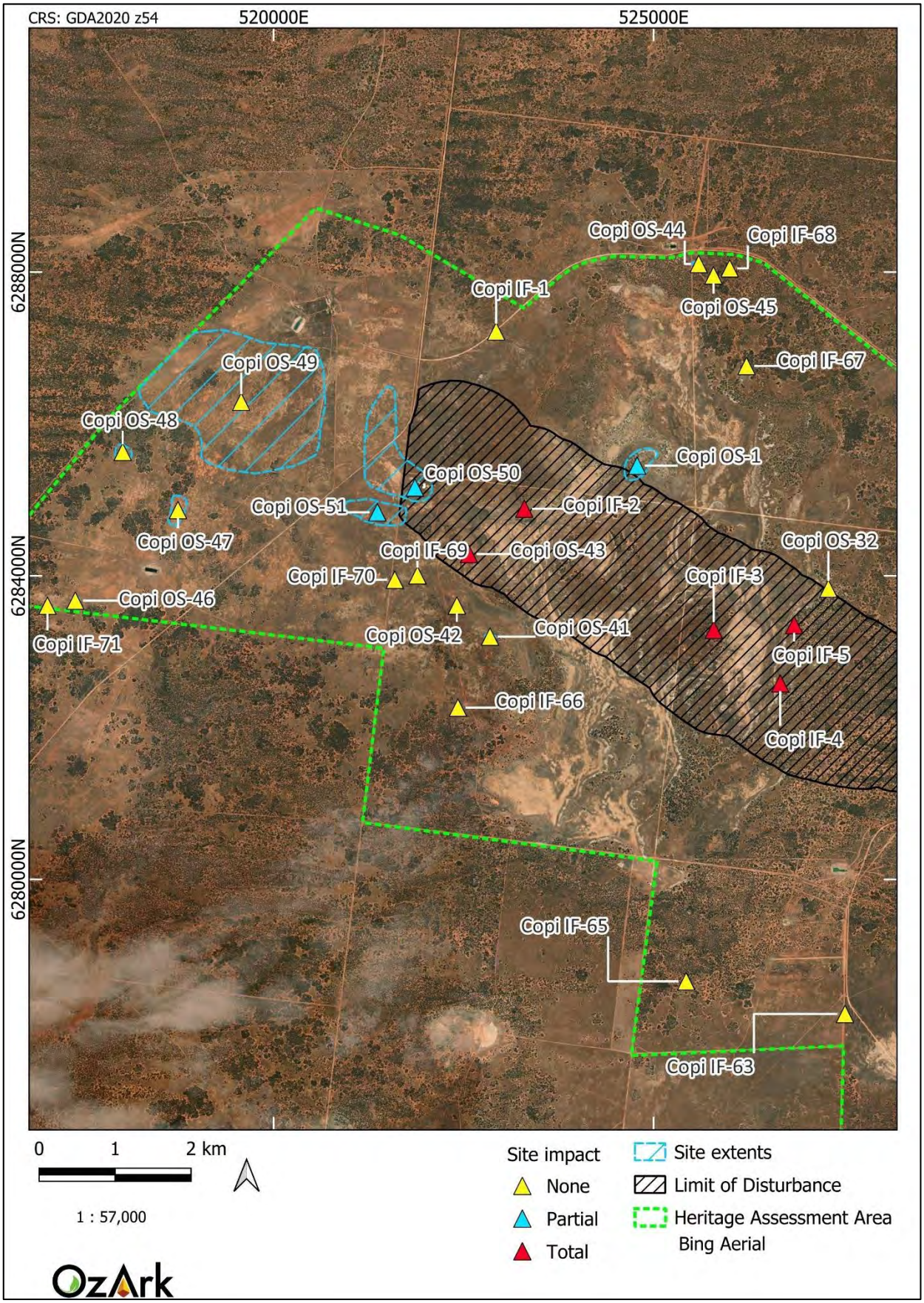


Figure 14-2: Location of recorded Aboriginal sites in the western central portion of the Heritage Assessment Area in relation to the Limit of Disturbance.

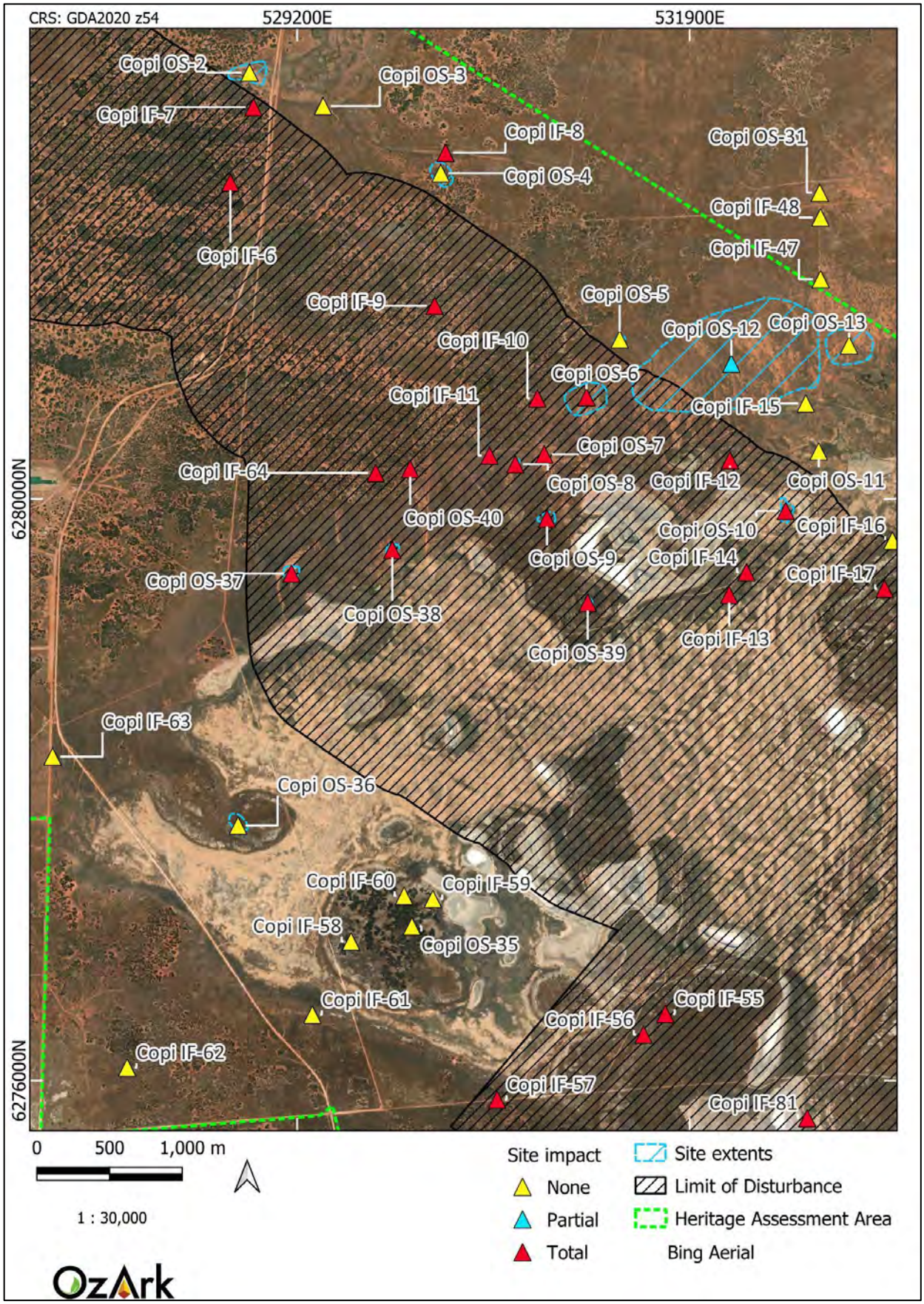


Figure 14-3: Location of recorded Aboriginal sites in the eastern central portion of the Heritage Assessment Area in relation to the Limit of Disturbance.

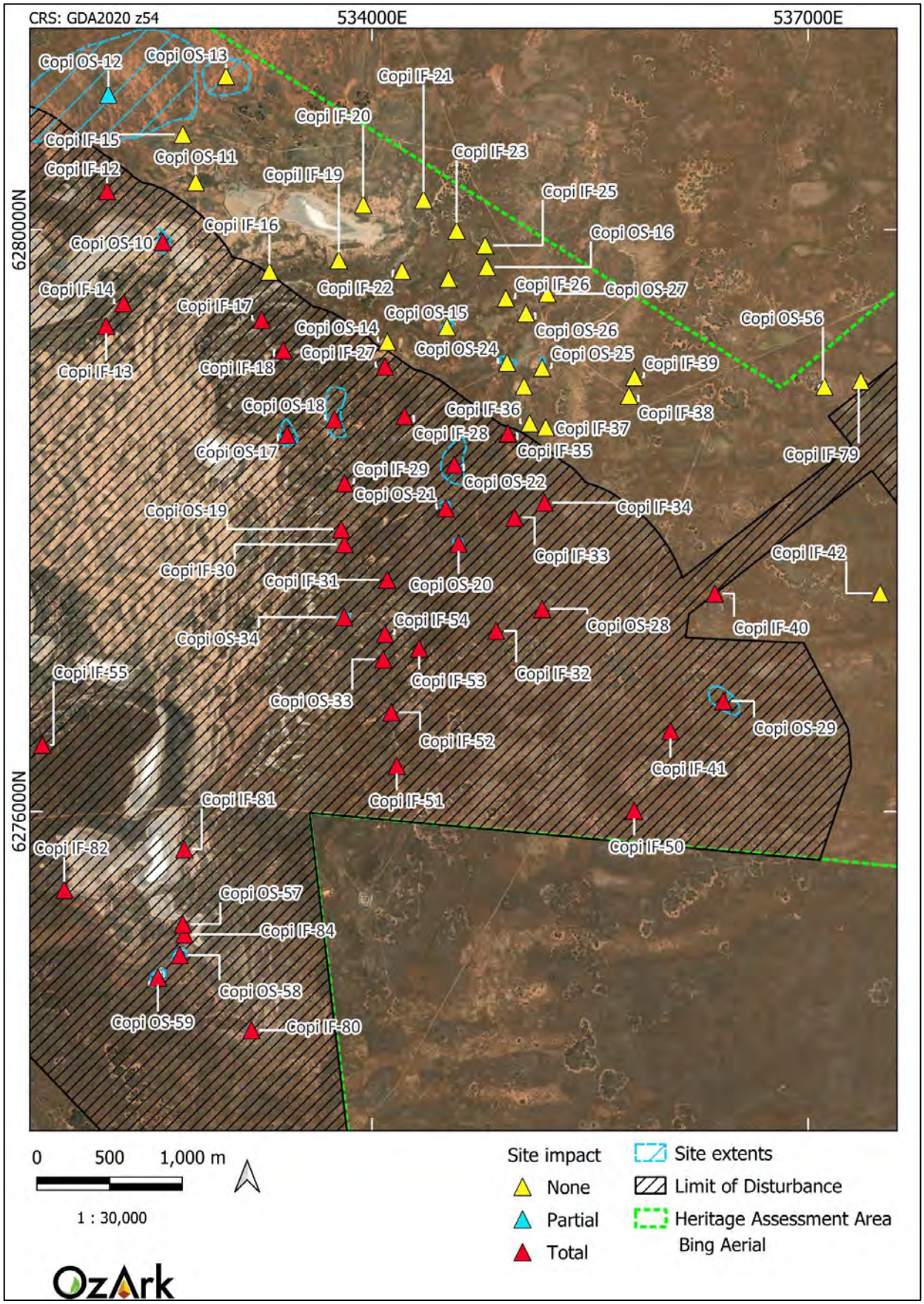
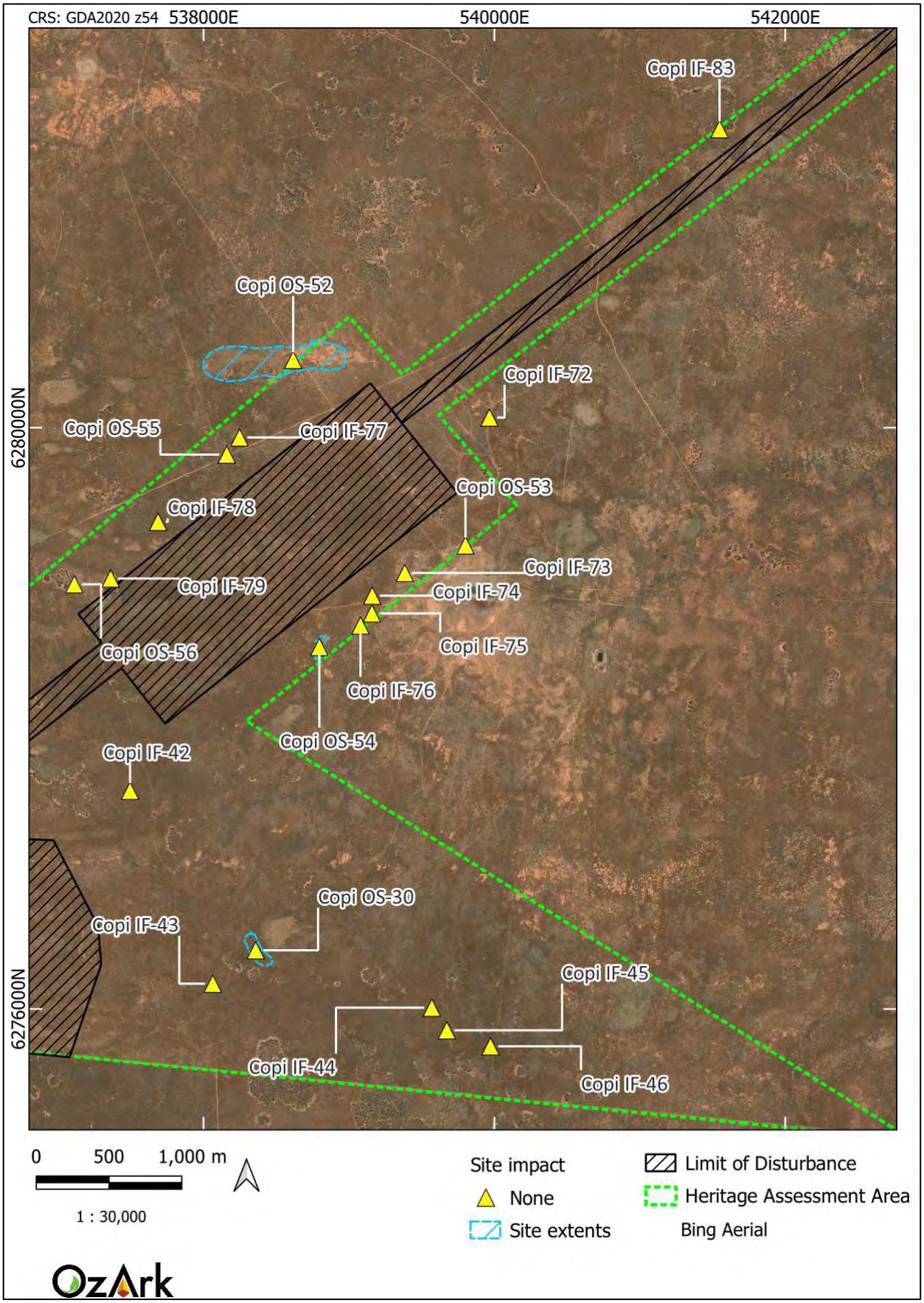


Figure 14-4: Location of recorded Aboriginal sites in the eastern portion of the Heritage Assessment Area in relation to the Limit of Disturbance.



14.3 ECOLOGICALLY SUSTAINABLE DEVELOPMENT PRINCIPLES

Ecologically sustainable development principles (ESD) (defined in s.6 of the *Protection of the Environment Administration Act 1991*) requires the integration of economic and environmental considerations (including cultural heritage) in the decision-making process. Regarding Aboriginal cultural heritage, ESD can be achieved by applying the principle of intergenerational equity and the precautionary principle.

14.3.1.1 Intergenerational equity

Intergenerational equity is the principle whereby the present generation should ensure the health, diversity, and productivity of the environment for the benefit of future generations.

In terms of Aboriginal heritage, intergenerational equity can be considered in terms of the cumulative impacts to Aboriginal objects and places in a region. If few Aboriginal objects and places remain in a region (for example, because of impacts under previous permits), fewer opportunities remain for future generations of Aboriginal people to enjoy the cultural benefits of those Aboriginal objects and places.

Information about the integrity, rarity or representativeness of the Aboriginal objects and places proposed to be impacted, and how they illustrate the occupation and use of land by Aboriginal people across the region, will be relevant to the consideration of intergenerational equity and the understanding of the cumulative impacts of the project.

Where there is uncertainty, the precautionary principle should also be followed.

14.3.1.2 The precautionary principle

The precautionary principle states that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

In relation to Aboriginal cultural heritage values, the precautionary principle should be guided by:

- The proposal involves a risk of serious or irreversible damage to Aboriginal objects or places or to the value of those objects or places
- There is uncertainty about the Aboriginal cultural heritage values or scientific or archaeological values, including in relation to the integrity, rarity or representativeness of the Aboriginal objects or places proposed to be impacted.

14.3.1.3 Principle of Integration

The Plan of Implementation of the World Summit on Sustainable Development held in Johannesburg, 2002, noted the need to "*promote the integration of the three components of sustainable development- economic development, social development and environmental protection- as interdependent and mutually reinforcing pillars*".

The principle of integration ensures mutual respect and reciprocity between economic and environmental considerations:

- Environmental considerations are to be integrated into economic and other development plans, programs, and projects
- Development needs are to be considered in applying environmental objectives.

14.3.2 Applicability to the Project

There are 65 Aboriginal sites which will be harmed by the Project (**Section 14.1.2**). Of these, 62 sites will be totally harmed and three will be partially harmed. Management strategies will be implemented to mitigate the harm to Aboriginal cultural heritage at all sites within the Limit of Disturbance.

The Aboriginal sites located within the Limit of Disturbance which will be harmed by the Project consist of 39 isolated finds; 22 artefacts scatters and four artefact scatters with hearths. Four of these sites have been assessed as having moderate archaeological significance (Copi OS-6, Copi OS-12, Copi OS-20, and Copi OS-51). The remaining sites that will be harmed have been assessed as having low archaeological significance.

Stone artefact sites are the most common site types proposed to be impacted and are not considered a rare site type in the region. As such, numerous examples will continue to be available to future generations (including stone artefact sites within the Mine Site). In addition, surface collection of stone artefacts is proposed to mitigate the impact from the Project and loss of value (**Section 15.3.1** and **15.3.2**).

Several hearths associated with sites Copi OS-6, Copi OS-12 and Copi OS-20 will also be impacted by the Project. None of the hearths identified at Copi OS-51 are within the Limit of Disturbance. While hearths are less common than stone artefact sites, there are up to 20 previously recorded hearths within 20 km of the Heritage Assessment Area and several hearths will remain intact within the Heritage Assessment Area. To mitigate the impact from the Project and loss of value, the hearths within the Limit of Disturbance are proposed to be excavated to obtain a sample suitable for dating (if present) to allow a chronology of occupation within the Heritage Assessment Area to be understood (**Section 15.3.3**).

The scarred tree recorded at Copi OS-1 is a rare site type given the landforms within the Heritage Assessment Area. While Copi OS-1 is partially located within the Limit of Disturbance, the Applicant has chosen to avoid the entire site extent.

Table 14-2 examines the application of ESD principles to the Project.

Table 14-2: Application of ESD principles to the Project.

ESD principle	Response
Avoiding and minimising harm	**Section 15.3.4** sets out mechanisms by which Aboriginal sites located within the Heritage Assessment Area, but outside of the Limit of Disturbance, will be excluded from harm.
The integration principle	The Project will seek to minimise environmental and heritage harm wherever possible. While some Aboriginal objects and features may be harmed by the Project, including five assessed as having moderate significance, measures will be implemented to mitigate the loss of value of the sites.
The precautionary principle	The Project has followed the precautionary principle though undertaking a robust impact assessment to ensure that harm to Aboriginal objects is minimised. The survey adopted a precautionary principle when it came to describing and assessing the archaeological potential of landforms within the Heritage Assessment Area.
The intergenerational equity principle	While it is acknowledged that the loss of 65 sites is a diminution of inter-generational equity, the archaeological measures contained in this ACHAR are designed to mitigate, as much as is possible, this loss of inter-generational equity. Of the 143 sites considered in this report, 78 sites will be totally avoided by the Project, including Copi OS-1, Copi OS-49 and Copi OS-52 which have been assessed as having moderate archaeological significance. A further two sites also assessed as having moderate archaeological significance (Copi OS-12, and Copi OS-51) would be partially conserved in the landscape. This would allow for some of the most significant sites in the Heritage Assessment Area to remain extant and available for future research and interpretation.

15 MANAGEMENT OF ABORIGINAL CULTURAL HERITAGE SITES

15.1 GENERAL MANAGEMENT PRINCIPLES

Appropriate management of cultural heritage items is primarily determined based on their assessed significance as well as the likely impacts of the proposed development. **Section 13.2** and **Section 14.2** describe, respectively, the significance / potential of the recorded sites and the likely impacts of the development. The following management options are general principles, in terms of best practice and desired outcomes, rather than mitigation measures against individual site disturbance.

- Avoid impact by altering the development Project or in this case by avoiding impact to a recorded Aboriginal site. If this can be done, then a suitable curtilage around the site must be provided to ensure its protection both during the short-term construction phase of development and in the long-term use of the area. If plans are altered, care must be taken to ensure that impacts do not occur to areas not previously assessed.

- If impact is unavoidable then approval to disturb sites under the authority of an HMP will be required. The HMP will be developed in consultation with the RAPs and will include the management recommendations of this ACHAR. It would be in the HMP when the final tally of sites to be impacted would be presented, along with any appropriate management protocols. The HMP would also define the nature of the additional fieldwork that is required, as well as the salvage strategies to be employed at each site. The HMP would set out the long-term management and curation of any salvaged material.

15.2 MANAGEMENT AND MITIGATION OF RECORDED ABORIGINAL SITES

15.2.1 Archaeological salvage

As a result of the current assessment, 143 sites have been recorded. Of these 143 sites, 65 are either located wholly (n=62) or partially (n=3) within the Limit of Disturbance and are unable to be avoided by the Project.

The remaining 78 sites will not be harmed.

Table 15-1 shows that the most common management strategy is for the salvage of a site through the recording and collection of surface artefacts. This recommendation is made due to:

- The nature of the recorded sites (either isolated finds or low-density artefact scatters, some with hearths)

- Background scatter of subsurface archaeological deposits

- Being generally located in landforms of lower archaeological potential (i.e. in areas distant to reliable water)

- Disturbance from a range of factors including erosion and land use practices
- The low archaeological values assigned to the sites.

Sites designated for surface artefact collection have a very limited ability to further inform the community about the history and culture of the area. While any potential research questions are limited, some information can nevertheless be gained (see **Section 15.3.1** and **Section 15.3.2**).

Section 15.3.3 sets out the protocol for the limited archaeological excavation that is proposed at three sites within the Limit of Disturbance.

Table 15-1 sets out the recommended archaeological management of all sites within or adjacent to the Limit of Disturbance of the Project. The management groups are detailed in **Section 15.3** but the following summary will aid the understanding of **Table 15-1**:

- Group 1: Targeted surface artefact collection
- Group 2: Surface artefact collection via walked transects
- Group 3: Limited archaeological excavation of hearths
- Group 4: Sites that require management to be conserved in the landscape.

Table 15-1: Management and mitigation measures for sites within the Heritage Assessment Area.

AHIMS ID	Site Name	Site Type	Scientific significance	Degree of Harm	Comment	Management strategy
39-4-0653	Copi IF-1	Isolated find	Low	None	Isolated artefact	**Group 4:** The site is located on the edge of Nulla Road which may be used to access the Heritage Assessment Area and must be fenced to ensure no indirect harm arises from the Project **Section 15.3.4**).
39-4-0652	Copi IF-2	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0651	Copi IF-3	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0650	Copi IF-4	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0649	Copi IF-5	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0648	Copi IF-6	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).

AHIMS ID	Site Name	Site Type	Scientific significance	Degree of Harm	Comment	Management strategy
39-4-0647	Copi IF-7	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0646	Copi IF-8	Isolated find	Low	None	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0645	Copi IF-9	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0644	Copi IF-10	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0643	Copi IF-11	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0642	Copi IF-12	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0641	Copi IF-13	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0640	Copi IF-14	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0639	Copi IF-15	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 160 m from the Limit of Disturbance.
39-4-0638	Copi IF-16	Isolated find	Low	None	Isolated artefact	**Group 4**: The site is located 11 m from the Limit of Disturbance and must be fenced to ensure no indirect harm arises from the Project (Section **15.3.4**).
39-4-0637	Copi IF-17	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0636	Copi IF-18	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0634	CopiI IF-19	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 350 m from the Limit of Disturbance.
39-4-0633	Copi IF-20	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 770 m from the Limit of Disturbance.
39-4-0632	Copi IF-21	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 1 km from the Limit of Disturbance.

AHIMS ID	Site Name	Site Type	Scientific significance	Degree of Harm	Comment	Management strategy
39-4-0635	Copi IF-22	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 510 m from the Limit of Disturbance.
39-4-0631	Copi IF-23	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 950 m from the Limit of Disturbance.
39-4-0630	Copi IF-24	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 645 m from the Limit of Disturbance.
39-4-0629	Copi IF-25	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 1 km from the Limit of Disturbance.
39-4-0628	Copi IF-26	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 720 m from the Limit of Disturbance.
39-4-0627	Copi IF-27	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0626	Copi IF-28	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0625	Copi IF-29	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0624	Copi IF-30	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0623	Copi IF-31	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0622	Copi IF-32	Isolated find	Low	None	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0621	Copi IF-33	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0620	Copi IF-34	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0619	Copi IF-35	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0618	Copi IF-36	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 85 m from the Limit of Disturbance.

AHIMS ID	Site Name	Site Type	Scientific significance	Degree of Harm	Comment	Management strategy
39-4-0617	Copi IF-37	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 120 m from the Limit of Disturbance.
39-4-0616	Copi IF-38	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 630 m from the Limit of Disturbance.
39-4-0615	Copi IF-39	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 755 m from the Limit of Disturbance.
39-4-0614	Copi IF-40	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0599	Copi IF-41	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0600	Copi IF-42	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 630 m from the Limit of Disturbance.
39-4-0601	Copi IF-43	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 780 m from the Limit of Disturbance.
39-4-0602	Copi IF-44	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 2.3 km from the Limit of Disturbance.
39-4-0604	Copi IF-45	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 2.4 km from the Limit of Disturbance.
39-4-0603	Copi IF-46	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 2.7 km from the Limit of Disturbance.
39-4-0605	Copi IF-47	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 1.2 km from the Limit of Disturbance.
39-4-0606	Copi IF-48	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 1.5 km from the Limit of Disturbance.
39-4-0607	Copi IF-49	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 4.4 km from the Limit of Disturbance.
39-4-0806	Copi IF-50	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0807	Copi IF-51	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).

AHIMS ID	Site Name	Site Type	Scientific significance	Degree of Harm	Comment	Management strategy
39-4-0808	Copi IF-52	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0809	Copi IF-53	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0810	Copi IF-54	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0811	Copi IF-55	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0786	Copi IF-56	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0787	Copi IF-57	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0788	Copi IF-58	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 1 km from the Limit of Disturbance.
39-4-0789	Copi IF-59	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 470 m from the Limit of Disturbance.
39-4-0790	Copi IF-60	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 570 m from the Limit of Disturbance.
39-4-0791	Copi IF-61	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 1.2 km from the Limit of Disturbance.
39-4-0792	Copi IF-62	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 2.2 km from the Limit of Disturbance.
39-4-0793	Copi IF-63	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 1.6 km from the Limit of Disturbance.
39-4-0794	Copi IF-64	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0795	Copi IF-65	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 3.4 km from the Limit of Disturbance.
39-4-0796	Copi IF-66	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 1.5 km from the Limit of Disturbance.

AHIMS ID	Site Name	Site Type	Scientific significance	Degree of Harm	Comment	Management strategy
39-4-0797	Copi IF-67	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 2 km from the Limit of Disturbance.
39-4-0798	Copi IF-68	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 3 km from the Limit of Disturbance.
39-4-0799	Copi IF-69	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 360 m from the Limit of Disturbance.
39-4-0800	Copi IF-70	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 610 m from the Limit of Disturbance.
39-4-0801	Copi IF-71	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 4.7 km from the Limit of Disturbance
39-4-0846	Copi IF-72	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 330 m from the Limit of Disturbance.
39-4-0845	Copi IF-73	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 200 m from the Limit of Disturbance.
39-4-0844	Copi IF-74	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 190 m from the Limit of Disturbance.
39-4-0843	Copi IF-75	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 280 m from the Limit of Disturbance.
39-4-0842	Copi IF-76	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 300 m from the Limit of Disturbance.
39-4-0841	Copi IF-77	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 265 m from the Limit of Disturbance.
39-4-0840	Copi IF-78	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 150 m from the Limit of Disturbance.
39-4-0839	Copi IF-79	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 53 m from the Limit of Disturbance.
39-4-0847	Copi IF-80	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0849	Copi IF-81	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).

AHIMS ID	Site Name	Site Type	Scientific significance	Degree of Harm	Comment	Management strategy
39-4-0848	Copi IF-82	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0851	Copi IF-83	Isolated find	Low	None	Isolated artefact	No management warranted. The site is located 150 m from the Limit of Disturbance.
39-4-0850	Copi IF-84	Isolated find	Low	Total	Isolated artefact	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0608	Copi OS-1	Artefact scatter; scarred tree	Moderate	None	Low density artefact scatter and scarred tree Test excavation revealed the site is not associated with any subsurface deposit.	**Group 4:** The site partially extends into the Limit of Disturbance but will be totally avoided from harm. The site extent within the Limit of Disturbance must be fenced to ensure no indirect harm arises from the Project (**Section 15.3.4**).
39-4-0609	Copi OS-2	Artefact scatter	Low	None	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts.	**Group 4**: The site is located 5 m from the Limit of Disturbance and must be fenced to ensure no indirect harm arises from the Project (**Section 15.3.4**).
39-4-0610	Copi OS-3	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 225 m from the Limit of Disturbance.
39-4-0611	Copi OS-4	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 95 m from the Limit of Disturbance.
39-4-0612	Copi OS-5	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 70 m from the Limit of Disturbance.
39-4-0613	Copi OS-6	Artefact scatter; hearth; PAD	Moderate	Total	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts.	**Group 2:** Mapping, description, and collection of surface artefacts by transecting the site (**Section 15.3.2**). **Group 3:** Excavation of hearths to obtain dating sample (**Section 15.3.3**).
39-4-0579	Copi OS-7	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0580	Copi OS-8	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).

AHIMS ID	Site Name	Site Type	Scientific significance	Degree of Harm	Comment	Management strategy
39-4-0581	Copi OS-9	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefact (**Section 15.3.1**).
39-4-0582	Copi OS-10	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).
39-4-0583	Copi OS-11	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 155 m from the Limit of Disturbance.
39-4-0584	Copi OS-12	Artefact scatter; hearths; PAD	Moderate	Partial	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts.	**Group 2:** Mapping, description, and collection of surface artefacts by transecting the site (**Section 15.3.2**). **Group 3:** Excavation of hearth to obtain dating sample (**Section 15.3.3**). **Group 4:** The portion of the site outside of the Limit of Disturbance must be fenced to ensure no indirect harm arises from the Project (**Section 15.3.4**).
39-4-0585	Copi OS-13	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 740 m from the Limit of Disturbance.
39-4-0586	Copi OS-14	Artefact scatter	Low	None	Low density artefact scatter	**Group 4**: The site is located 40 m from the Limit of Disturbance and must be fenced to ensure no indirect harm arises from the Project (**Section 15.3.4**).
39-4-0587	Copi OS-15	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 310 m from the Limit of Disturbance.
39-4-0588	Copi OS-16	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 910 m from the Limit of Disturbance.
39-4-0589	Copi OS-17	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).
39-4-0590	Copi OS-18	Artefact scatter	Low	Total	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts.	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).
39-4-0591	Copi OS-19	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).

AHIMS ID	Site Name	Site Type	Scientific significance	Degree of Harm	Comment	Management strategy
39-4-0592	Copi OS-20	Artefact scatter; hearth	Moderate	Total	Low density artefact scatter and hearth	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**). **Group 3:** Excavation of hearth to obtain dating sample (**Section 15.3.3**).
39-4-0593	Copi OS-21	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).
39-4-0595	Copi OS-22	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).
39-4-0594	Copi OS-23	Artefact scatter	Low	None	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts.	No management warranted. The site is located 300 m from the Limit of Disturbance.
39-4-0596	Copi OS-24	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 330 m from the Limit of Disturbance.
39-4-0597	Copi OS-25	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 425 m from the Limit of Disturbance.
39-4-0598	Copi OS-26	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 475 m from the Limit of Disturbance.
39-4-0578	Copi OS-27	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 940 m from the Limit of Disturbance.
39-4-0577	Copi OS-28	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).
39-4-0576	Copi OS-29	Artefact scatter	Low	Total	Low density artefact scatter with PAD (although likely at a low density based on excavation results at nearby sites)	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).
39-4-0575	Copi OS-30	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 1 km from the Limit of Disturbance.

AHIMS ID	Site Name	Site Type	Scientific significance	Degree of Harm	Comment	Management strategy
39-4-0574	Copi OS-31	Artefact scatter	Low	None	Low density artefact scatter. Further archaeological excavation deemed unwarranted due to very low density of subsurface artefacts.	No management warranted. The site is located 1.8 km from the Limit of Disturbance.
39-4-0573	Copi OS-32	Artefact scatter (subsurface)	Low	None	Very low-density subsurface deposit.	No management warranted. The site is a low-density subsurface deposit.
39-4-0802	Copi OS-33	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).
39-4-0803	Copi OS-34	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).
39-4-0804	Copi OS-35	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 700 m from the Limit of Disturbance.
39-4-0805	Copi OS-36	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 730 m from the Limit of Disturbance.
39-4-0771	Copi OS-37	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).
39-4-0772	Copi OS-38	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).
39-4-0773	Copi OS-39	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).
39-4-0774	Copi OS-40	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).
39-4-0775	Copi OS-41	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 500 m from the Limit of Disturbance.
39-4-0776	Copi OS-42	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 350 m from the Limit of Disturbance.
39-4-0777	Copi OS-43	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).
39-4-0778	Copi OS-44	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 3 km from the Limit of Disturbance.

AHIMS ID	Site Name	Site Type	Scientific significance	Degree of Harm	Comment	Management strategy
39-4-0779	Copi OS-45	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 2.8 km from the Limit of Disturbance.
39-4-0780	Copi OS-46	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 4.3 km from the Limit of Disturbance.
39-4-0781	Copi OS-47	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 2.8 km from the Limit of Disturbance.
39-4-0782	Copi OS-48	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 3.6 km from the Limit of Disturbance.
39-4-0784	Copi OS-49	Artefact scatter; hearths	Moderate	None	Low density artefact scatter with hearths	No management warranted. The site is located 1.1 km from the Limit of Disturbance.
39-4-0783	Copi OS-50	Artefact scatter	Low	Partial	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**). **Group 4:** The portion of the site outside of the Limit of Disturbance must be fenced to ensure no indirect harm arises from the Project (**Section 15.3.4**).
39-4-0785	Copi OS-51	Artefact scatter; hearths	Moderate	Partial	Low density artefact scatter with hearths	**Group 2:** Mapping, description, and collection of surface artefacts by transecting the site (**Section 15.3.2**). **Group 4:** The portion of the site outside of the Limit of Disturbance must be fenced to ensure no indirect harm arises from the Project (**Section 15.3.4**).
39-4-0858	Copi OS-52	Artefact scatter; hearths	Moderate	None	Low density artefact scatter with hearths	No management warranted. The site is located 210 m from the Limit of Disturbance.
39-4-0852	Copi OS-53	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 320 m from the Limit of Disturbance.
39-4-0853	Copi OS-54	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 200 m from the Limit of Disturbance.
39-4-0854	Copi OS-55	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 210 m from the Limit of Disturbance.
39-4-0857	Copi OS-56	Artefact scatter	Low	None	Low density artefact scatter	No management warranted. The site is located 145 m from the Limit of Disturbance.

AHIMS ID	Site Name	Site Type	Scientific significance	Degree of Harm	Comment	Management strategy
39-4-0856	Copi OS-57	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).
39-4-0855	Copi OS-58	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).
39-4-0859	Copi OS-59	Artefact scatter	Low	Total	Low density artefact scatter	**Group 1:** Mapping, description, and collection of surface artefacts (**Section 15.3.1**).

15.2.2 Protocols related to the discovery of new sites

15.2.2.1 New sites within the Limit of Disturbance

The following procedure will be implemented for any newly identified sites within the Limit of Disturbance in the HMP:

- The site will be assessed by a qualified archaeologist and a RAP
- The site will be temporarily fenced
- The site location will be registered with AHIMS, and a site card submitted
- Depending on the Aboriginal cultural heritage values at the site and the degree of immediate threat to the site, the site will be salvaged according to the appropriate management process (**Section 15.3.1**)
- A brief report of the salvage will be produced to record the findings
- On the completion of salvage at such sites, an AHIMS *Aboriginal Site Impact Recording Form* (ASIRF) will be completed. Copies of the forms will be archived. Digital copies will be submitted to the AHIMS Registrar soon after completion of salvage fieldwork. The form will be lodged within a reasonable time of fieldwork completion and certainly within four months
- All artefacts salvaged will be subject to the approved long-term management process (**Section 15.2.4**).

15.2.2.2 New sites outside of the Limit of Disturbance

Any new Aboriginal site identified outside the approved impact footprint will be managed in accordance with the following procedure in the HMP:

- The site will be assessed by a qualified archaeologist and a RAP
- The site will be considered for fencing depending on its proximity to the Limit of Disturbance
- The site location will be registered with AHIMS, and a site card submitted.

15.2.3 Protocols related to the discovery of human skeletal material

Protocols related to the discovery of suspected human skeletal material will follow Requirement 25 of the Code of Practice and be set out in the approved HMP.

The protocol will include:

1. Cordon off area with a minimum buffer of 10 m in all directions from the visible remains. Do not disturb any skeletal material that remains in place. If some skeletal remains have been removed from the ground, store these in a dry location on site. Do not remove any skeletal material or associated artefacts from site.
2. If bones are suspected to be human, the site supervisor should immediately contact the nearest police station. Heritage NSW should also be contacted (02 9873 8500) to assist with the identification of the burial. Police will make an initial assessment to determine if the remains are part of crime scene or possible ancient Aboriginal remains. Such an assessment will usually involve sending photographs of the find to a physical anthropologist to determine the ethnic origin of the skeleton.
3. If the skeletal material is determined to be ancient Aboriginal remains, Heritage NSW would send a Compliance and Regulation Officer to the scene and then issue an Advisory Letter setting out the required process from this point.
4. Notify the Aboriginal community.
5. The Aboriginal ancestral remains must be recorded under the direct supervision of a specialist anthropologist or other suitably qualified person.
6. The location of the burial must be registered as an Aboriginal site on the AHIMS database.
7. Work cannot recommence in the cordoned off area until authorised in writing by Heritage NSW.

15.2.4 Care of salvaged artefacts

Following the completion of analysis and reporting, the location and type of final repository for the salvaged artefacts will be the subject of further consultation with the RAPs, DPHI and Heritage NSW. Any such arrangements will be determined with reference to Section 85 of the NPW Act and the requirements outlined in the Code of Practice (Section 3.7). This may include the requirement for a Care Agreement to be submitted and endorsed by Heritage NSW for final artefact care arrangements or artefacts being reburied or relocated within the Heritage Assessment Area.

15.3 MANAGEMENT PROCESS

15.3.1 Group 1: Archaeological salvage: targeted surface artefact collection

Research aim: Is there any variation, on a macro level, in the distribution of certain artefact attributes such as raw material type and artefact type across the Limit of Disturbance?

Action: To conduct an analysis of the raw materials and basic artefact features to determine whether there is site to site variation across the Limit of Disturbance.

Aim: Archaeological data obtained will allow a local level analysis of distribution patterns within the Limit of Disturbance.

Research Design: All visible artefacts would be flagged in the field. On hand-held GIS units, the location, artefact class and artefact type will be catalogued in the field. A representative sample of artefacts and views of site and *in situ* artefacts will be photographed. When recorded, all artefacts from the surface of the site will be collected.

Stone artefact sites managed under this archaeological salvage will contribute to the research aim in that the sites will have surface artefacts mapped, catalogued, selectively photographed, collected, and moved to a place agreed to by the RAPs. The final fate of any salvaged objects will be determined through consultation for the HMP.

It is envisioned that these investigations would include the following methodology although the final form of any investigation would be determined in consultation with the RAPs as part of development of an HMP.

Archaeological salvage: surface collection of artefacts

To fulfil the research aim, the following program is suggested:

- All visible artefacts at a site should be flagged in the field
- The site should be photographed after flagging and before recording
- All artefacts should have the following artefact information entered directly into a GPS unit, albeit one set up with all variable fields already entered to make the field recording job more efficient:
    - Location
    - Artefact Class
    - Artefact Type
    - Size
    - Reduction level
    - Raw Material

    - Notes.
  - A selection of indicative and / or unusual artefacts from each site will be photographed
  - If required, a sketch plan of the site will be completed indicating zones for the surface collection of artefacts
  - Once all recording is complete, the artefacts will be collected according to site zones with artefacts from each zone being kept separate.
- The recording of the artefacts recovered will largely be completed in the field and this data would be incorporated into a report
- Analysis will attempt to answer the research aim which is to record a statistically valid artefact assemblage from across the impact footprint in order to better understand inter-site variations.

The sites recommended for archaeological salvage by means of surface collection are detailed in **Table 15-1**.

15.3.2 Group 2: Archaeological salvage: surface artefact collection via transects

The methodology for Group 2 will follow the program outlined above for Group 1 and will aim to answer the same research question.

Sites within this group have been separated from Group 1 as they have large extents, and it was clear during the survey that all erosion scalds across these site extents have potential to contain artefacts albeit at a low density.

Salvage across these sites will be performed by archaeologists and RAPs completing transects across the site extents with surveyors spaced 10 m apart to identify and collect as much artefactual material as possible.

The sites recommended for archaeological salvage by means of surface collection through the completion of transects are Copi OS-6, Copi OS-12, and Copi OS-50 (**Table 15-1**).

15.3.3 Group 3: Archaeological salvage: limited manual excavation (hearths)

Research aim: To develop a chronology of Aboriginal occupation within the Heritage Assessment Area.

Action: To conduct targeted, limited archaeological excavations at identified hearths.

Aim: Archaeological data obtained will provide an understanding of when the Heritage Assessment Area was occupied and compare these dates to others gained in the arid margins of south-eastern Australia.

Research Design: At locations indicated in **Table 15-1**, all hearths within the Limit of Disturbance will be excavated to collect a sample of material and the material will be sent away for dating purposes.

These investigations would include the following methodology although the final form of any investigation would be determined in consultation with the RAPs as part of development of an HMP.

The sites recommended for limited archaeological excavation of hearths are Copi OS-6, Copi OS-12, and Copi OS-20 (**Table 15-1**).

Archaeological salvage: excavation of hearths

To fulfil the research aim, the following program is suggested:

- All hearths will be sectioned into four quadrants
- Each hearth will be photographed prior to being excavated. The photographs will be taken with a scale and a compass to provide orientation
- A plan will be drawn before excavation commences. The plan will include the following details:
    - An identifying number
    - The date the excavation took place
    - The name of the excavator
    - A scale
    - The centreline of hearths marked and orientation relative to magnetic north clearly shown
    - The extent of the clay nodules marked
    - A note of which quadrant will be excavated first.
- To begin excavation, the exposed nodules will be removed and placed on a piece of tarpaulin
- Surface sediment will be brushed away from the surface. Charcoal present on the surface will also be removed as it is likely to be contaminated and not suitable for dating
- Evidence of bioturbation will be noted. This could include animal burrows, ant nests and roots
- Only one quarter of the hearths will be excavated at a time, until a suitable charcoal sample is retrieved
- All excavated sediment will be passed through a 1 mm sieve (or a 2-3 mm sieve if this is more practical for the type of sediment present) to remove sand sized particles. Any charcoal removed must be placed in a plastic sealed bag to avoid contamination (Burke

and Smith 2004). Any charcoal samples will not be handled but will be placed in the plastic bag using a trowel or similar implement

- If feasible (if the fragments are large enough and observable in the hearth) the location of the sample in relation to the hearth (x, y, and z) will be recorded
- Once a suitable sample has been retrieved, the surface of the excavated quadrant will be cleaned. The sample should be from a more secure, deeper part of the feature
- A top down and side photograph of the excavation will be taken to scale and with a compass to provide orientation
- Any pieces of clay from the sample will be removed. The fine sediments will be sieved, and any large pieces of charcoal will be bagged
- If only small pieces of charcoal are recovered, the sample may require flotation to obtain as much as possible. If this method is required, the sediment will be sprinkled on the surface of deionised water and lightly stirred. The sediment will be allowed time to settle and decant. This method may need to be repeated to get the last of the charcoal if present
- The charcoal will then be allowed sufficient time to dry in a dust free environment. Any remaining visible contaminants may be removed from the sample with tweezers (Holdaway and Fanning 2014)
- The clean sample will then be clearly labelled and packed into a heavy grade polythene bag (University of Waikato 2020)
- The sample will be sent to the University of Waikato in New Zealand for dating. Radiocarbon dating can be carried out to a minimum weight of 1 gram (g), however, the ideal weight is between 8–12 g. If only very small charcoal fragments have been obtained, Accelerator Mass Spectrometry (AMS) dating may be the more appropriate than radiocarbon dating. The minimum weight of a charcoal sample required for AMS dating is 100 milligrams (mg) (University of Waikato 2020).

15.3.4 Group 4: Sites that require management to be conserved in the landscape

There are three Aboriginal sites that are located within 50 m of the Limit of Disturbance and may be unintentionally harmed by the Project unless specific management is undertaken to avoid harm.

The extent of Copi OS-1 partially extends into the Limit of Disturbance, but the Applicant has chosen to avoid harm to the site. As such, the extent of the site which extends into the Limit of Disturbance needs to be fenced to ensure the site is not harmed.

In addition, Copi IF-1 is located along the edge of Nulla Road which may be used to access the Mine Site and will require management.

A further three Aboriginal sites are partially located within the Limit of Disturbance (shaded in green in **Table 15-2**). Therefore, fencing is required for the portion of the site extent which is outside of the Limit of Disturbance.

Due to their proximity to proposed works, these sites are at greater risk of unintentional impact when compared to sites located further away. These sites must be permanently fenced and signed prior to works beginning to provide adequate protection.

Table 15-2: Sites requiring specific management to ensure conservation.

AHIMS ID	Site name	GDA Zone 54 Easting	GDA Zone 54 Northing	Site type
39-4-0653	Copi IF-1	522927	6287219	Isolated find
39-4-0638	Copi IF-16	533294	6279713	Isolated find
39-4-0608	Copi OS-1	524782	6285450	Artefact scatter; scarred tree
39-4-0609	Copi OS-2	528872	6282931	Artefact scatter
39-4-0584	Copi OS-12	532186	6280930	Artefact scatter; hearths
39-4-0586	Copi-OS14	534105	6279230	Artefact scatter
39-4-0783	Copi OS-50	521858	6285163	Artefact scatter
39-4-0785	Copi OS-51	521364	6284836	Artefact scatter; hearths
Note: green shaded sites are partially located within the Limit of Disturbance. Fencing is required for the portion of these sites extending outside of the Limit of Disturbance.				

16 CONCLUSION AND RECOMMENDATIONS

Under Section 89A of the NPW Act it is mandatory that all previously unrecorded Aboriginal sites be registered with AHIMS. As a professional in the field of cultural heritage management it is the responsibility of OzArk to ensure this process is undertaken.

The following recommendations are made based on these impacts and with regard to:

- Legal requirements under the terms of the NPW Act whereby it is illegal to damage, deface or destroy an Aboriginal place or object without the prior written consent of Heritage NSW
- The findings of the current investigations undertaken within the Heritage Assessment Area
- The interests of the Aboriginal community.

The following recommendations are made based on:

- A total of 143 Aboriginal sites were recorded during the assessment, including:
    - 84 isolated finds
    - 52 artefact scatters (including one PAD with a confirmed low-density subsurface scatter)
    - Six artefact scatters with hearth/s
    - One artefact scatter and a scarred tree.
- Of the 143 sites in the Heritage Assessment Area. 136 (95 per cent) were assessed as having low scientific significance. Seven sites were assessed as having moderate significance due to the presence of hearths or a scarred tree
- There are 65 Aboriginal sites which will be harmed by the Project. Of these, 62 sites will be totally harmed and three will be partially harmed.
- The Aboriginal sites located within the Limit of Disturbance which will be harmed by the Project consist of 39 isolated finds; 22 artefacts scatters and four artefact scatters with hearths.
- 78 sites are located wholly outside of the Limit of Disturbance and will not be harmed by the Project.

Table 15-1 lists all sites that are likely to be impacted by the Project and tabulates the associated scientific values assessment and recommended archaeological management strategies.

Following granting of a development consent for the Project and because of the proposed impacts to Aboriginal cultural heritage sites within the Limit of Disturbance, the following recommendations are made to responsibly mitigate the loss of cultural heritage in the Limit of Disturbance:

1. A HMP will be prepared in consultation with the RAPs and the DPHI (with input from Heritage NSW). The archaeological management recommendations within this ACHAR should be incorporated into the HMP. Works cannot commence until the HMP has been approved by the DPHI.
2. The Aboriginal sites within the Limit of Disturbance that will be harmed by the Project are recommended to be salvaged through artefact collection. The protocol for this collection is set out in **Section 15.3.1** and **Section 15.3.2**.
3. Three Aboriginal sites within the Limit of Disturbance (Copi OS-6, Copi OS-12 and Copi OS-20) are also recommended to be salvaged through a program of limited archaeological salvage of the identified hearths. The protocol for this salvage is set out in **Section 15.3.3**.
4. Eight Aboriginal sites (see **Table 15-2**) as set out in **Section 15.3.4** require fencing and signage to prevent inadvertent harm from the Project.
5. Following the completion of analysis and reporting, the location and type of final repository for the salvaged artefacts will be the subject of further consultation with the RAPs, DPHI and Heritage NSW. This may include the requirement for a Care Agreement to be submitted and endorsed by Heritage NSW for final artefact care arrangements or artefacts being reburied or relocated within the Heritage Assessment Area.

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APPENDIX 1: ABORIGINAL COMMUNITY CONSULTATION

Community consultation log

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
2.8.18	Sunraysia Daily	Rebecca Hardman (RH) rang - newspaper is printed everyday with Wednesday and Saturday biggest editions, add is paid and published each day separately.	Phone
2.8.18	Sunraysia Daily	RH sent ad for proof and quote	Email
2.8.18	Office of Environment & Heritage (OEH)	RH sent stage1 agency letter requesting potential stakeholders. Closing date 17.8.18	Email
2.8.18	OEH	RH received email with updated contact details	Email
2.8.18	Dareton Local Aboriginal Land Council	RH sent stage1 agency letter requesting potential stakeholders. Closing date 17.8.18	Email
2.8.18	Office of The Registrar, ALRA	RH sent stage1 agency letter requesting potential stakeholders. Closing date 17.8.18	Email
2.8.18	National Native Title Tribunal	RH sent stage1 agency letter requesting potential stakeholders. Closing date 17.8.18	Email
2.8.18	NTSCORP	RH sent stage1 agency letter requesting potential stakeholders. Closing date 17.8.18	Email
2.8.18	Wentworth Shire Council	RH sent stage1 agency letter requesting potential stakeholders. Closing date 17.8.18	Email
2.8.18	Western Local Land Services	RH sent stage1 agency letter requesting potential stakeholders. Closing date 17.8.18	Email
2.8.18	Dareton Local Aboriginal Land Council	Email undeliverable	Email
2.8.18	Dareton Local Aboriginal Land Council	RH phoned and spoke to pam to clarify email address; new address was given	Email
2.8.18	Dareton Local Aboriginal Land Council	RH re sent stage 1 documents to new email address	Email
2.8.18	Sunraysia Daily	RH received proof from newspaper	Email
2.8.18	Sunraysia Daily	RH confirmed proof and sent payment advice	Email
2.8.18	Sunraysia Daily	RH received receipt for ad	Email
2.8.18	Western Local Land Services	RH received letter advising to contact NTSCORP	Post
3.8.18	Office of The Registrar, ALRA	SB received letter suggesting contacting Dareton LALC	Email
6.8.18	Sunraysia Daily	RH received tear sheet	Email
6.8.18	National Native Title Tribunal	RH received notification *Records held by the National Native Title Tribunal as at 1st August 2017 indicate that there are Native Title Determination Applications, Determinations of Native Title, or Indigenous Land Use Agreements over the identified area of the* Shire of Wentworth. The native title group are Barkandji Traditional Owners #8.	Email
9.8.18	Dareton Local Aboriginal Land Council	RH received phone call from Jason, will talk to Pam and let us know who we should get in contact with.	Phone
14.8.18	Barkindji-Maraura Elders Council	RH received email expressing interest to become a RAP, saw advert in paper	Email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
15.8.18	NSW LALC Western Region	RH left message asking to phone back - wanting to check who a contact for Ivanhoe LALC is	Phone
15.8.18	Dareton Local Aboriginal Land Council	RH sent stage 1 round 2 community letters. Stage 1 ends Friday 31st August	Email
15.8.18	Menindee Local Aboriginal Land Council	RH sent stage 1 round 2 community letters. Stage 1 ends Friday 31st August	Email
15.8.18	Ms Mary Ann Marton	RH sent stage 1 round 2 community letters. Stage 1 ends Friday 31st August	Post
15.8.18	WLRWHA Aboriginal Advisory Group	RH sent stage 1 round 2 community letters. Stage 1 ends Friday 31st August	Email
15.8.18	Pappin Family Aboriginal Corporation	RH sent stage 1 round 2 community letters. Stage 1 ends Friday 31st August	Post
15.8.18	Gary Pappin	RH sent stage 1 round 2 community letters. Stage 1 ends Friday 31st August	post
15.8.18	Wakool Indigenous Corporation	RH sent stage 1 round 2 community letters. Stage 1 ends Friday 31st August	Email
15.8.18	Barkandji #8 Native title Determinants	RH sent stage 1 round 2 community letters. Stage 1 ends Friday 31st August	Email
15.8.18	Ta-Ru Board of Management/Mauraua Barkintji Traditiional Owners	RH sent stage 1 round 2 community letters. Stage 1 ends Friday 31st August	Email
15.8.18	Wakool Indigenous Corporation	Email undeliverable	Email
15.8.18	Wakool Indigenous Corporation	RH phoned to get updated email address	Phone
15.8.18	Wakool Indigenous Corporation	RH resent Stage 1 round 2 community letter to new email address	Email
15.8.18	Wakool Indigenous Corporation	Email undeliverable	Email
15.8.18	Wakool Indigenous Corporation	RH tried resending with different spelling to what was given	Email
15.8.18	Wakool Indigenous Corporation	Email undeliverable	Email
15.8.18	Wakool Indigenous Corporation	RH phoned to get updated email address again. No answer, could not leave a message.	Phone
15.8.18	Wakool Indigenous Corporation	RH sent via post instead of email	Post
16.8.18	NSW LALC Western Region	RH spoke to Narelle, Ivanhoe no longer in Western Region, now under Far west	Phone
16.8.18	NSW LALC Far West Region	RH rang could not leave a message as mailbox is full	Phone
16.8.18	Ivanhoe Local Aboriginal Land Council c/- NSW LALC Far West Region	RH sent letter on behalf on Ivanhoe LALC due to not having any contact details or knowledge if still functioning	post
22.8.18	Wentworth Shire Council	RH received late response recommending contacting Frank Russo - NTSCORP and Pam Handy - Dareton Aboriginal Land Council	Email
29.8.18	Wakool Indigenous Corporation	Letter RTS	Returned to Sender
29.8.18	Gary Pappin	Letter RTS	Returned to Sender
30.8.18	Barkandji #8 Native title Determinants	RH phoned to see if would like to be a RAP, not available	Phone
30.8.18	Dareton Local Aboriginal Land Council	RH phoned to see if would like to be a RAP - no answer	Phone
30.8.18	Barkandji #8 Native title Determinants	RH phoned to see if would like to be a RAP, not available, in meeting, left contact number and asked to be called back	Phone

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
30.8.18	Dareton Local Aboriginal Land Council	RH phoned to see if would like to be a RAP - no answer	Phone
31.8.18	Barkandji #8 Native title Determinants	RH received letter registering as a RAP	Email
31.8.18	Maraura / Thangkaali (Pooncarie) First Nations Owners Association	RH received email registering as a RAP	Email
31.8.18	Dareton Local Aboriginal Land Council	RH phoned to see if would like to be a RAP - no answer	Phone
3.9.18	WLRWHA Aboriginal Advisory Group	RH received response stating *As this work does not fall within or adjacent to the Willandra Lakes Region World Heritage Area the WLRWHA Aboriginal Advisory Group will not form part of the project consultation group.*	Email
3.9.18	WLRWHA Aboriginal Advisory Group	RH received email advising will not be a RAP as project does not fall in their area	Email
12.9.18	Dareton Local Aboriginal Land Council	RH sent letter notifying of RAPs	Email
12.9.18	OEH	RH sent letter notifying of RAPs	Email
19.2.19	Dareton Local Aboriginal Land Council	RH Sent Project Update letter	Email
19.2.19	Barkandji #8 Native title Determinants	RH Sent Project Update letter	Email
19.2.19	Maraura / Thangkaali (Pooncarie) First Nations Owners Association	RH Sent Project Update letter	Email
19.2.19	Barkindji-Maraura Elders Council	RH Sent Project Update letter	Email
20.2.19	Barkindji-Maraura Elders Council	RH received phone call from Kingsley checking if there is a map to go with the letter. RH advised letter is just a project update and map with confirmed footprint will be in stage 2 when the project proceeds	Phone
15.8.19	Multiple	Project update letter sent as BCC to all RAPs	Email
16.8.19	Barkindji-Maraura Elders Council	RH received email: *Can I confirm this is for the Barkindji-Maraura Elders Council (BMEC)? If so, I will pass it along to the Chair of that group.*	Email
16.8.19	Barkindji-Maraura Elders Council	RTS from Pamela email	RTS
16.8.19	Dareton Local Aboriginal Land Council	RTS, email rejected	RTS
19.8.19	Barkindji-Maraura Elders Council	RH responded: *Yes you are correct, thank you for passing it on*	Email
4.9.19	Barkandji #8 Native title Determinants	RH received email from Derek noting he could not open the link to the document.	Email
4.9.19	Barkandji #8 Native title Determinants	RH resent email with Word document re attached	Email
4.9.19	Barkandji #8 Native title Determinants	RH received email saying attachment still not received	Email
4.9.19	Barkandji #8 Native title Determinants	RH offered to post instead if Derek can send through postal address	Email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
4.9.19	Barkandji #8 Native title Determinants	RH received email: *I received it this time* *Thanks*	Email
Recommencement of Project. Restart of ACHCRs from Stage 1			
16.12.19	Sunraysia Daily	RH sent new advert for proof and quote	Email
16.12.19	OEH	RH sent email requesting stakeholder list	Email
17.12.19	Sunraysia Daily	RH confirmed advert received and that they will send through proof in an hour	Phone
17.12.19	Sunraysia Daily	RH received proof from newspaper	Email
17.12.19	Sunraysia Daily	RH approved proof, sent back Credit card authorisation and requested receipt and tear sheet	Email
17.12.19	Sunraysia Daily	RH received receipt for ad	Email
18.12.19	Sunraysia Daily	RH received tear sheet	Email
18.12.19	Amanda Whitton	RH received call, registered as a RAP	Phone
18.12.19	Clair Bates	RH received call registered as a RAP. Mentioned she is a TO	Phone
9.1.20	OEH	RH received stakeholder list, only one new contact listed	Email
9.1.20	Arthur Kirby	RH sent Community letter. EOI ends 23.1.20	Post
16.1.20	Barkindji-Maraura Elders Council	RH sent Stage 2, feedback due 13.2.20 RH sent FW application, Application Due 31.1.20	Email
16.1.20	Barkandji #8 Native title Determinants	RH sent Stage 2, feedback due 13.2.20 RH sent FW application, Application Due 31.1.20	Email
16.1.20	Dareton Local Aboriginal Land Council	RH sent Stage 2, feedback due 13.2.20 RH sent FW application, Application Due 31.1.20	Email
16.1.20	Maraura / Thangkaali (Pooncarie) First Nations Owners Association	RH sent Stage 2, feedback due 13.2.20 RH sent FW application, Application Due 31.1.20	Email
16.1.20	Amanda Whitton	RH sent Stage 2, feedback due 13.2.20 RH sent FW application, Application Due 31.1.20	Email
16.1.20	Clair Bates	RH sent Stage 2, feedback due 13.2.20 RH sent FW application, Application Due 31.1.20	Email
20.1.20	Arthur Kirby	SR received a call from Arthur wishing to register	Email
30.1.20	Barkindji-Maraura Elders Council	RH sent reminder for Fieldwork applications due tomorrow	Email
30.1.20	Barkandji #8 Native title Determinants	RH sent reminder for Fieldwork applications due tomorrow	Email
30.1.20	Dareton Local Aboriginal Land Council	RH sent reminder for Fieldwork applications due tomorrow	Email
30.1.20	Maraura / Thangkaali (Pooncarie) First Nations Owners Association	RH sent reminder for Fieldwork applications due tomorrow	Email
30.1.20	Amanda Whitton	RH sent reminder for Fieldwork applications due tomorrow	Email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
30.1.20	Clair Bates	RH sent reminder for Fieldwork applications due tomorrow	Email
30.1.20	Arthur Kirby - Barkandji Maraura Environmental Team	RH called to see if has received stage 2 package, Arthur has not checked post box recently, will check tonight and give RH a call tomorrow to let know. Also asked if received can he read and advise if he will be sending the fieldwork application back so RH can make sure he is considered or not.	Phone
4.2.20	Barkindji-Maraura Elders Council	RH phoned Kingsley and left message for call back	Phone
4.2.20	Barkindji-Maraura Elders Council	RH phoned Pamela and left message for call back	Phone
4.2.20	Barkindji-Maraura Elders Council	RH received call back from Kingsley, updated contact details and asked for FE application to be re sent to him as Ash has not forwarded it on. Noted he is interested in participating and would try get application back to RH by tomorrow	Phone
4.2.20	Barkindji-Maraura Elders Council	RH re sent stage 2 document and fieldwork application.	Email
4.2.20	Barkandji #8 Native title Determinants	RH phoned Derek and left message	Phone
4.2.20	Barkandji #8 Native title Determinants	RH phoned NTSCORP and was advised both email contacts are no longer working there. Was given alternative email to contact to try find who needs to be directed to	Phone
4.2.20	Barkandji #8 Native title Determinants	RH re sent stage 2 package and application to fieldwork	Email
4.2.20	Dareton Local Aboriginal Land Council	RH phoned and left a message asking for call back Re fieldwork application	Phone
4.2.20	Maraura / Thangkaali (Pooncarie) First Nations Owners Association	RH sent email asking for fieldwork application to be returned by tomorrow lunch if would like to be considered as do not have contact number to call.	Email
4.2.20	Amanda Whitton	RH phoned, Amanda has not yet looked at the documents as she is not at work. RH advised the fieldwork application closed last Friday so would need to know today if she is wanting to apply. Amanda said will log on and do it online now	Phone
4.2.20	Clair Bates	RH phoned and left message asking for call back RE fieldwork application	Phone
4.2.20	Clair Bates	RH received call back, Clair has been in hospital and had Knee surgery, has not yet read the documents but did notice FW application. RH mentioned the fieldwork would involve a lot of walking; Clair advised she probably would not be up to it but would call back tomorrow if she is interested.	Phone
4.2.20	Arthur Kirby - Barkandji Maraura Environmental Team	RH phoned, went to message bank saying invalid number, RH checked, number is same as spoke to Arthur on last week	Phone

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
4.2.20	Arthur Kirby - Barkandji Maraura Environmental Team	RH phoned from Jodie Benton (JB) mobile, Arthur has received the stage 2 document and FW application, is interested in participating in fieldwork. RH asked if he was able to get the application sent back via email. Arthur will have daughter help him send via email ASAP	Phone
4.2.20	Barkandji #8 Native title Determinants	RH received email from Derek advising he is out of the office until Monday and would do the paperwork then. Derek also copied in the group chair and solicitor for NTSCORP.	Email
5.2.20	Barkandji #8 Native title Determinants	RH sent email confirming Copi details and that she would put the group down as interested in attending	Email
5.2.20	Dareton Local Aboriginal Land Council	RH received call form Pam clarifying Fieldwork application and noting they always send 2 RAPs and usually work with Barkandji and one other group totalling 6 RAPs. Will send FW application back to RH tonight. RH said would be in touch next week with details of fieldwork and positions awarded	Phone
5.2.20	Dareton Local Aboriginal Land Council	RH received phone call clarifying FW applications, said will send in tomorrow morning	Phone
12.2.20	Barkandji #8 Native title Determinants	RH sent email chasing FW application	Email
12.2.20	Dareton Local Aboriginal Land Council	RH received FW application for Ernest Mitchell	Email
12.2.20	Dareton Local Aboriginal Land Council	RH received FW application for Hector Hudson	Email
12.2.20	Dareton Local Aboriginal Land Council	RH received FW application for Jason Smith	Email
12.2.20	Dareton Local Aboriginal Land Council	RH thanked Pam	Email
12.2.20	Barkandji #8 Native title Determinants	RH received FW application nominating himself	Email
13.2.20	Barkandji #8 Native title Determinants	RH responded thanking Derek for application, asked to confirm if he was nominating himself and if there is a 2nd site officer he could nominate	Email
14.2.20	Barkandji #8 Native title Determinants	RH received email noting Owen Whyman and one other to be confirmed will be nominated	Email
17.2.20	Barkandji #8 Native title Determinants	RH phoned and left message advising can no longer hold off on sending fieldwork invites. Need to hear back from him in half an hour otherwise will need to invite three from LALC and 1 from Barkandji	Phone
17.2.20	Barkandji #8 Native title Determinants	RH emailed advising can no longer hold off on sending fieldwork invites. Need to hear back from him in half an hour otherwise will need to invite three from LALC and one from Barkandji	Email
17.2.20	Barkandji #8 Native title Determinants	RH received call back, asked to hold off until Tuesday lunch time. RH agreed noted will send invites out at 12 and assume they only have one site officer available unless she hears otherwise from Derek. Derek agreed and will call RH tomorrow morning	Email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
17.2.20	Barkandji #8 Native title Determinants	RH received FW application for Owen Whyman and Jamin Whyman	Email
18.2.20	Dareton Local Aboriginal Land Council	RH sent invite to fieldwork for 2 RAPs. Confirmation RSVP 19.2.20	Email
18.2.20	Barkandji #8 Native title Determinants	RH sent invite to fieldwork for 2 RAPs. Confirmation RSVP 19.2.20	Email
19.2.20	BCD	RH sent email notifying of RAPs	Email
19.2.20	Dareton Local Aboriginal Land Council	RH sent email notifying of RAPs	Email
19.2.20	BCD	RH received email confirming receipt of RAP notification	Email
24.2.20	Dareton Local Aboriginal Land Council	Sheridan Baker (SB) rang land line and left a message asking for a return phone call	Phone
24.2.20	Dareton Local Aboriginal Land Council	SB rang and left a message on Pams mobile asking for contact numbers for Ernest Mitchell, Hector Hudson and Jason Smith.	Phone
27.2.20	Dareton Local Aboriginal Land Council	Coral Pearce (CP) received call asking for RH to phone Pam back	Phone
27.2.20	Dareton Local Aboriginal Land Council	RH phoned Pam back - N/A	Phone
27.2.20	Dareton Local Aboriginal Land Council	RH phoned Pam back - N/A	Phone
27.2.20	Dareton Local Aboriginal Land Council	RH received call back form Pam requesting higher rates for the site officers. RH noted she would talk to the client and get back to Pam.	Phone
27.2.20	Dareton Local Aboriginal Land Council	RH received invoice for site officers	Email
27.2.20	Dareton Local Aboriginal Land Council	RH emailed Pam asking her to send invoice to the client, provided copy of fieldwork letter with contact details	Email
4.3.20	Barkandji #8 Native title Determinants	RH forwarded copy of site officers timesheet to Derek	Email
9.4.20	Barkindji-Maraura Elders Council	RH sent Test Excavation methodology. Feedback ends 7.5.20	Email
9.4.20	Barkandji #8 Native title Determinants	RH sent Test Excavation methodology. Feedback ends 7.5.20	Email
9.4.20	Dareton Local Aboriginal Land Council	RH sent Test Excavation methodology. Feedback ends 7.5.20	Email
9.4.20	Maraura / Thangkaali (Pooncarie) First Nations Owners Association	RH sent Test Excavation methodology. Feedback ends 7.5.20	Email
9.4.20	Amanda Whitton	RH sent Test Excavation methodology. Feedback ends 7.5.20	Email
9.4.20	Clair Bates	RH sent Test Excavation methodology. Feedback ends 7.5.20	Email
9.4.20	Arthur Kirby - Barkandji Maraura Environmental Team	RH sent Test Excavation methodology. Feedback ends 7.5.20	Post
21.4.20	Barkandji #8 Native title Determinants	RH sent invite to test excavation	Email
21.4.20	Dareton Local Aboriginal Land Council	RH sent invite to test excavation	Email
22.4.20	Dareton Local Aboriginal Land Council	RH received call confirming attendance. RH requested copy of workers comp	Phone
22.4.20	Dareton Local Aboriginal Land Council	RH received copy of workers comp	Email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
22.4.20	Dareton Local Aboriginal Land Council	RH thanked Pam	Email
28.4.20	Barkandji #8 Native title Determinants	RH sent follow up email	Email
28.4.20	Barkandji #8 Native title Determinants	RH received response: *thought we already registered our interests as a RAP in this project. RSVP Barkandji Native Title PBC again*	Email
28.4.20	Barkandji #8 Native title Determinants	RH responded: *This is for an invite to fieldwork, not registration as a RAP*	Email
28.4.20	Barkandji #8 Native title Determinants	RH received response: *same thing we are part of the project from start to finish are we not*	Email
28.4.20	Barkandji #8 Native title Determinants	RH responded: *We do have you registered as a RAP for the duration of the project and the Initial email has the attached invite to fieldwork which I am seeking confirmation for.* *From your Email below I will assume you are confirming attendance for Site Officers Owen Whyman & Jamin Whyman as they have previously completed the fieldwork applications and attended site.* *I will assume they will be attending the test excavation scheduled from 7am, Tuesday 12th May to Monday 18th May 2020. Please note these dates will require work on both Saturday and Sunday, the 16th and 17th May 2020.* *All other conditions, meeting locations and rates are contained in the invite. I will assume you are in acceptance unless I hear otherwise.*	Email
4.5.20	Barkandji #8 Native title Determinants	RH phoned Owen and confirmed he and Jamin will be attending	Phone
4.5.20	Dareton Local Aboriginal Land Council	RH called - N/A	Phone
4.5.20	Dareton Local Aboriginal Land Council	RH sent email to Pam checking if still ok to attend and if site officers have been decided yet	Email
4.5.20	Dareton Local Aboriginal Land Council	Pam confirmed still attending	Email
4.5.20	Dareton Local Aboriginal Land Council	RH asked if they have a roster for their site officers	Email
4.5.20	Dareton Local Aboriginal Land Council	Pam said will send through on Wednesday as in on sick leave	Email
4.5.20	Dareton Local Aboriginal Land Council	RH thanked Pam	Email
11.5.20	Dareton Local Aboriginal Land Council	RH phoned and left message	Phone
11.5.20	Dareton Local Aboriginal Land Council	RH sent email with Phillip's contact number	Email
11.5.20	Barkandji #8 Native title Determinants	RH phoned Owen and gave him Phillip's number	Phone
11.5.20	Dareton Local Aboriginal Land Council	RH received call back, Pam had forgot to organise site officers, will do now. RH noted she had sent through Philips phone number	Phone

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
11.5.20	Barkindji-Maraura Elders Council	RH sent final copy of test excavation methodology for their records	Email
11.5.20	Barkandji #8 Native title Determinants	RH sent final copy of test excavation methodology for their records	Email
11.5.20	Dareton Local Aboriginal Land Council	RH sent final copy of test excavation methodology for their records	Email
11.5.20	Maraura / Thangkaali (Pooncarie) First Nations Owners Association	RH sent final copy of test excavation methodology for their records	Email
11.5.20	Amanda Whitton	RH sent final copy of test excavation methodology for their records	Email
11.5.20	Clair Bates	RH sent final copy of test excavation methodology for their records	Email
11.5.20	Arthur Kirby - Barkandji Maraura Environmental Team	RH sent final copy of test excavation methodology for their records	Email
28.7.20	Barkindji-Maraura Elders Council	RH sent stage 4. Feedback closes 26.8.20	Email
28.7.20	Barkandji #8 Native title Determinants	RH sent stage 4. Feedback closes 26.8.20	Email
28.7.20	Dareton Local Aboriginal Land Council	RH sent stage 4. Feedback closes 26.8.20	Email
28.7.20	Maraura / Thangkaali (Pooncarie) First Nations Owners Association	RH sent stage 4. Feedback closes 26.8.20	Email
28.7.20	Amanda Whitton	RH sent stage 4. Feedback closes 26.8.20	Email
28.7.20	Clair Bates	RH sent stage 4. Feedback closes 26.8.20	Email
28.7.20	Arthur Kirby - Barkandji Maraura Environmental Team	RH sent stage 4. Feedback closes 26.8.20	Post
23.3.21	Barkindji-Maraura Elders Council	RH sent project update letter	Email
28.9.21	Barkandji #8 Native title Determinants	Catherine Burrowes (CB) sent project update letter	Email
28.9.21	Dareton Local Aboriginal Land Council	CB sent project update letter	Email
28.9.21	Maraura / Thangkaali (Pooncarie) First Nations Owners Association	CB sent project update letter	Email
28.9.21	Amanda Whitton	CB sent project update letter	Email
28.9.21	Clair Bates	CB sent project update letter	Email
28.9.21	Arthur Kirby - Barkandji Maraura Environmental Team	CB sent project update letter	Post
28.9.21	Barkindji-Maraura Elders Council	CB sent project update letter	Email
24.11.21	Heritage NSW	CB sent agency letter requesting updated potential stakeholders. Closing date 9.12.21	Email
1.12.21	Heritage NSW	CB received stakeholder list	Email
21.12.21	Barkindji-Maraura Elders Council	CB sent Round 2 Stage 2/3 assessment methodology and cover letter with closing date of 24.1.22	Email
21.12.21	Barkandji #8 Native title Determinants	CB sent Round 2 Stage 2/3 assessment methodology and cover letter with closing date of 24.1.22	Email
21.12.21	Dareton Local Aboriginal Land Council	CB sent Round 2 Stage 2/3 assessment methodology and cover letter with closing date of 24.1.22	Email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
21.12.21	Maraura / Thangkaali (Pooncarie) First Nations Owners Association	CB sent Round 2 Stage 2/3 assessment methodology and cover letter with closing date of 24.1.22	Email
21.12.21	Amanda Whitton	CB sent Round 2 Stage 2/3 assessment methodology and cover letter with closing date of 24.1.22	Email
21.12.21	Clair Bates	CB sent Round 2 Stage 2/3 assessment methodology and cover letter with closing date of 24.1.22	Email
21.12.21	Arthur Kirby - Barkandji Maraura Environmental Team	CB sent Round 2 Stage 2/3 assessment methodology and cover letter with closing date of 24.1.22	Post
5.1.22	Barkandji #8 Native title Determinants	CB sent Round 2 Stage 2/3 assessment methodology and cover letter with closing date of 24.1.22	Email
18.1.22	Barkandji #8 Native title Determinants	CB received phone call from Derek - all good for the project - Invite to follow	Phone
18.1.22	Dareton Local Aboriginal Land Council	CB resent email from 21.12.21 to Pam	Email
19.1.22	Barkandji #8 Native title Determinants	CB sent FW invites	Email
19.1.22	Dareton Local Aboriginal Land Council	CB sent FW invites	Email
12.7.22	Barkindji-Maraura Elders Council	CB sent project email update for July 22	Email
12.7.22	Barkandji #8 Native title Determinants	CB sent project email update for July 22	Email
12.7.22	Dareton Local Aboriginal Land Council	CB sent project email update for July 22	Email
12.7.22	Maraura / Thangkaali (Pooncarie) First Nations Owners Association	CB sent project email update for July 22	Email
12.7.22	Amanda Whitton	CB sent project email update for July 22	Email
12.7.22	Clair Bates	CB sent project email update for July 22	Email
12.7.22	Arthur Kirby - Barkandji Maraura Environmental Team	CB sent project email update for July 22	Post
17.11.22	Barkindji-Maraura Elders Council	CB sent Stage 4 letter and draft ACHAR. Closing date 16.12.22	Email
17.11.22	Barkandji #8 Native title Determinants	CB sent Stage 4 letter and draft ACHAR. Closing date 16.12.22	Email
17.11.22	Dareton Local Aboriginal Land Council	CB sent Stage 4 letter and draft ACHAR. Closing date 16.12.22	Email
17.11.22	Maraura / Thangkaali (Pooncarie) First Nations Owners Association	CB sent Stage 4 letter and draft ACHAR. Closing date 16.12.22	Email
17.11.22	Amanda Whitton	CB sent Stage 4 letter and draft ACHAR. Closing date 16.12.22	Email
17.11.22	Clair Bates	CB sent Stage 4 letter and draft ACHAR. Closing date 16.12.22	Email
17.11.22	Arthur Kirby - Barkandji Maraura Environmental Team	CB sent Stage 4 letter and draft ACHAR. Closing date 16.12.22	Email
22.9.23	Barkindji-Maraura Elders Council	CB emailed project update	Email
22.9.23	Barkandji #8 Native title Determinants	CB emailed project update	Email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
22.9.23	Dareton Local Aboriginal Land Council	CB emailed project update	Email
22.9.23	Maraura / Thangkaali (Pooncarie) First Nations Owners Association	CB emailed project update	Email
22.9.23	Amanda Whitton	CB emailed project update	Email
22.9.23	Clair Bates	CB emailed project update	Email
22.9.23	Arthur Kirby - Barkandji Maraura Environmental Team	CB emailed project update	Email
3.10.23	Koori Digs Services	CB emailed community letter - closing date 18.10.23	Email
3.10.23	Patricia Winch	CB emailed community letter - closing date 18.10.23	Email
3.10.23	Thomas Dahlstrom	CB emailed community letter - closing date 18.10.23	Email
3.10.23	Kureinji Aboriginal Corporation	CB emailed community letter - closing date 18.10.23	Email
3.10.23	John Winch	CB emailed community letter - closing date 18.10.23	Email
11.10.23	Koori Digs Services	CB received email registering for the project	Email
11.10.23	Koori Digs Services	CB replied with thanks	Email
19.10.23	Barkindji-Maraura Elders Council	CB emailed Stage 2/3 Methodolgy and letter Phase 3 Closing date 16.11.23	Email
19.10.23	Barkandji #8 Native title Determinants	CB emailed Stage 2/3 Methodolgy and letter Phase 3 Closing date 16.11.23	Email
19.10.23	Dareton Local Aboriginal Land Council	CB emailed Stage 2/3 Methodolgy and letter Phase 3 Closing date 16.11.23	Email
19.10.23	Maraura / Thangkaali (Pooncarie) First Nations Owners Association	CB emailed Stage 2/3 Methodolgy and letter Phase 3 Closing date 16.11.23	Email
19.10.23	Amanda Whitton	CB emailed Stage 2/3 Methodolgy and letter Phase 3 Closing date 16.11.23	Email
19.10.23	Clair Bates	CB emailed Stage 2/3 Methodolgy and letter Phase 3 Closing date 16.11.23	Email
19.10.23	Arthur Kirby - Barkandji Maraura Environmental Team	CB emailed Stage 2/3 Methodolgy and letter Phase 3 Closing date 16.11.23	Email
19.10.23	Koori Digs Services	CB emailed Stage 2/3 Methodolgy and letter Phase 3 Closing date 16.11.23 New registration email also included link to revised ACHAR for the Phase 1 and 2 assessment	Email
23.10.23	Koori Digs Services	CB received email - Koori digs agrees with methodology	Email
2.11.23	Heritage NSW & LALC	CB advised via email of those who have registered	Email
20.12.23	Barkindji-Maraura Elders Council	CB emailed test excavation methodology - Closing date 23.1.2024	Email
20.12.23	Barkandji #8 Native title Determinants	CB emailed test excavation methodology - Closing date 23.1.2024	Email
20.12.23	Dareton Local Aboriginal Land Council	CB emailed test excavation methodology - Closing date 23.1.2024	Email
20.12.23	Maraura / Thangkaali (Pooncarie) First Nations Owners Association	CB emailed test excavation methodology - Closing date 23.1.2024	Email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
20.12.23	Amanda Whitton	CB emailed test excavation methodology - Closing date 23.1.2024	Email
20.12.23	Clair Bates	CB emailed test excavation methodology - Closing date 23.1.2024	Email
20.12.23	Arthur Kirby - Barkandji Maraura Environmental Team	CB emailed test excavation methodology - Closing date 23.1.2024	Email
20.12.23	Koori Digs Services	CB emailed test excavation methodology - Closing date 23.1.2024	Email
26.12.23	Koori Digs Services	CB received email - *Koori digs agrees with methodology, and would like to be apart of field work if possible*	Email

Appendix 1 Figure 1: Advertisement (Phase 1).

48 Sunraysia Daily Saturday, 4 August 2018

SunraysiaDaily Classifieds 5023 0211 We accept

Ph: Mon-Fri 8.30am-5.30pm Fax: 5021 0145 email: classads@sunraysiadaily.com.au

Gordon Agencies real estate & property management Phone 5024 6855

671 Koorlong Avenue, Irymple
Fax 5024 5855 | www.gordonagencies.com.au
admin@gordonagencies.com.au

133A Carey Street Red Cliffs

OPEN INSPECTION TODAY 10.30AM TO 11AM

IS THIS YOUR NEW HOME ON THE HILL? $315,000

If you are searching for a home that gives you your own privacy, room for the kids, opportunity to make money off the land and a lifestyle property that most would dream of owning.. Look no further!

* Consisting of 3 bedrooms, all with BIR's.
* Large lounge area.
* Good size kitchen with corner pantry.
* Wood fire heating, ducted evaporative cooling.
* Lino flooring through with carpet in bedrooms.
* Neat gardens with fully fenced backyard.
* Front porch overlooking property.
* Entertaining area with neat backyard and gardens.
* Large powered shed with concrete floor.
* 5 Acres of young mandarin tree's.
* Irrigation systems in place along with 3 acres of overheads.

8392 Calder Highway Red Cliffs

OPEN INSPECTION TODAY 11.30AM TO 12PM

THE ONE YOU HAVE BEEN WAITING FOR... $345,000–$365,000

17 Acres with Overhead Irrigation Sprays, 6.5 MLS High Security Water, 52.5 AUL Water Licence,2 Fenced Main Paddocks Oates Crop Sown, Pump Shed near Channel with Diesel Deutz Irrigation Pump. Shedding: 14 Mtrs X 5 Mtrs Corrugated Iron shed, Caters for Workshop & 1 Carport.Old Machinery Shed 17 Mtrs X 6 Mtrs for Machinery & Hay Storage.Residence: 4 Bedroom Weatherboard with Corrugated Iron Roof, 1 Bathroom with Shower, Laundry at side of Residence with door to Clothesline, Timber Kitchen with Electric Hotplates & Oven, Dining Area, 2 Toilets, Sheltered Outdoor Entertainment & BBQ Area. Wood Heater in Dining Area, Gas Heater in lounge room, Evaporative Air Con. Panel Fences partly surround the Residence, Palm Tree Driveway Entrance.Kids Pine Cubby House & Ornamental Windmill.

965 Wentworth Road Yelta

INSPECTION BY APPOINTMENT

ULTIMATE LIFESTYLE PROPERTY! $475,000

Only a stones throw away from the Murray River this property would suit anyone looking for the Ultimate Lifestyle Property. Located in Yelta and only a short 15 minute drive to Mildura you will find this neat 3 bdrm, 1 Bath home with multiple shedding sitting on 8.9 Acres.
The home consisting of the following:
3 good size Bedrooms - 2 with BIR's, main also with split system. Modern Kitchen with Laminated bench tops, wall oven and 6 burner gas cook top. Renovated bathroom, 2 Large dining areas and 1 spacious Lounge area. Wood fire heating with split system installed in dining area. Ducted cooling also throughout the home. Outside there is X2 5,500 Gallon water tanks, a 2,500 water tank and another 850 gallon water tank. Neat established gardens, 2 car carport plus a shed for the caravan. Numerous shedding on property with one consisting of a large cool room. The property has great infrastructure with overhead sprinklers and a pump on the river (30 second walk from home). Current owners have been producing quality lucerne for years so there is an opportunity for new owners to continue this also. Comes with a 10 Megalitre Victorian water share and a 60 Megalitre AUL.
This property is a must see please contact Gordon Agencies for inspection time or more information

Contact Peter Gordon on 0417 380 688

Contact Dustin Gordon on 0410 468 191

SITUATIONS VACANT

Mildura Base Hospital

POSITIONS VACANT

Mildura Base Hospital is a major health service provider with an extensive range of acute, sub-acute and community services, and has the following vacancies

Allied Health Assistant
Temporary Part Time position available
7.5 hours / week
Closing Date: 18 August, 2018
Contact: Dawn Gobbo (03) 5022 3200

Medical Administration
Part Time position available
20 hours / week
Experience in a GP Clinic or Health Service is essential
Closing Date: 18 August, 2018
Contact: Classy Lawn (03) 5051 1834

SITUATIONS VACANT

GLOBAL Rotomoulding

RECEPTIONIST

FULL TIME

Global Rotomoulding is a national supplier of Rotomoulded Products. We require a highly motivated, experienced receptionist to work in a full time position who has the ability to carry out sales.

Applicants need to have:

- Vibrant and positive communication, via phone and in person.
- Willing to undertake door sales.
- Good written communication skills.
- Ability to use a range of computer programs and willing to learn new programs.
- Willing to assist in a range of support tasks.
- Attention to detail in following processes consistently.
- Self-motived to learn and up skill.

SITUATIONS VACANT

Ritchies IGA

Have a position available for a

FULL TIME

QUALIFIED BUTCHER

to work in the Merbein store.

Applications can be sent to:

stephen.carmichael@ritchies.com.au

Phone Stephen on 0472 833 622 for further details.

SPARE PARTS INTERPRETER

PUBLIC NOTICES

Expression of Interest

CULTURAL HERITAGE MANAGEMENT

OzArk Environmental & Heritage Management P/L has been engaged by RW Corkery & Co Pty Limited (RWC) on behalf of the proponent Relentless Resources Limited (Relentless), and is seeking registrations of interest from Aboriginal groups or individuals of the Wentworth area, who wish to be consulted over the development of an open cut mineral sands mine, located approximately 75km to the northwest of Wentworth in southwestern NSW.

The purpose of this consultation is to identify stakeholders to assist in the Aboriginal cultural heritage assessment of the proposed development site. If you hold cultural knowledge relevant to determining the impacts to the cultural significance of the above mentioned area, please register your interest by post: OzArk EHM, PO Box 2069, Dubbo, NSW, 2830; email: **rebecca@ozarkehm.com.au** or by phoning OzArk between 9am and 5pm, weekdays on (02) 6882 0118.

All submissions should be received no later than **9am, Monday, August 20, 2018.**

Appendix 1 Figure 2: Stage 1 Agency letter (sample) (ACHCRs Phase 1).

2nd August 2018

Office of Environment and Heritage
Senior Team Leader, Planning
C: Peter Ewin
PO Box 544
512 Dean Street
Albury NSW 2640
T: 02 6022 0624
F: 06 6022 0610
E: rog.southwest@environment.nsw.gov.au

Dear Peter,

Aboriginal Cultural Heritage Assessment and Potential Aboriginal Heritage Impact Permit Application
Copi Mineral Sands Project in the Wentworth Local Government Area.

OzArk Environmental & Heritage Management P/L is undertaking Aboriginal community consultation as per the Office of Environment and Heritage (OEH) *Aboriginal cultural heritage consultation requirements for proponents 2010*, on behalf of the proponent; Relentless Resources Limited (Relentless).

Relentless intends to seek development consent under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) to develop an open cut mineral sands mine located approximately 75km to the northwest of Wentworth in southwestern NSW.

Accordingly, we are seeking Expressions of Interest from relevant Aboriginal groups and individuals in the Wentworth area, to form a consultation group. This consultation is to assist OzArk and Relentless in the identification of Aboriginal cultural heritage and/or values on the project site, for the purpose of ensuring appropriate management.

If your organisation can recommend and provide contact details for any known Aboriginal groups with a cultural interest in this area we can then include them in the consultation process with regards to the proposed heritage management for this proposal.

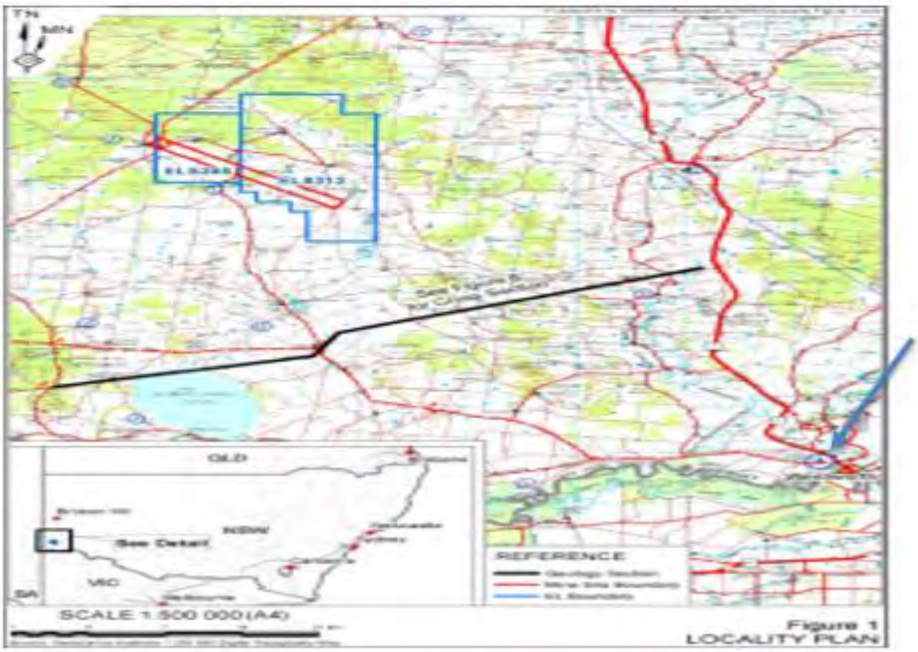
We would appreciate it if you could provide any feedback regarding these Aboriginal stakeholder groups by **COB Friday 17th August 2018** or sooner if possible.

Kind regards,

Sheridan Baker
Community Liaison

Figure 1. Proposed development site.

Figure 2. Site location



Appendix 1 Figure 3: Stage 1 community letter (sample) (ACHCRs Phase 1).

15th August 2018

Members
Dareton Local Aboriginal Land Council
PO Box 7
DARETON NSW 2717
daretonlandcouncil@bigpond.com
03 5027 4721
pam.handy@daretonlalc.com.au

Dear Members,

Aboriginal Cultural Heritage Assessment and Potential Aboriginal Heritage Impact Permit Application
Copi Mineral Sands Project in the Wentworth Local Government Area.

OzArk Environmental & Heritage Management P/L is undertaking Aboriginal community consultation as per the Office of Environment and Heritage (OEH) *Aboriginal cultural heritage consultation requirements for proponents 2010*, on behalf of the proponent; Relentless Resources Limited (Relentless).

Relentless intends to seek development consent under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A) to develop an open cut mineral sands mine located approximately 75km to the northwest of Wentworth in southwestern NSW.

Accordingly, we are seeking Expressions of Interest from relevant Aboriginal groups and individuals in the Wentworth area, to form a consultation group. This consultation is to assist OzArk and Relentless in an Aboriginal Cultural Heritage Assessment including the potential preparation of an AHIP application, and to assist the Director-General of the OEH in its consideration and determination.

If you hold cultural knowledge relevant to determining the impacts to the cultural significance of this project area, please register your interest by contacting our office. The closing date for expressions of interest is **5pm Thursday 30th August 2018.**

If you wish to register interest it is noteworthy that as per the OEH guidelines we are required to provide your details to the OEH unless advised you do not wish your details to be released.

Once relevant groups and individuals have been identified, they will form part of the formal consultation process for the project.

Kind regards,

Sheridan Baker
Community Liaison

Figure 1. Proposed development site.

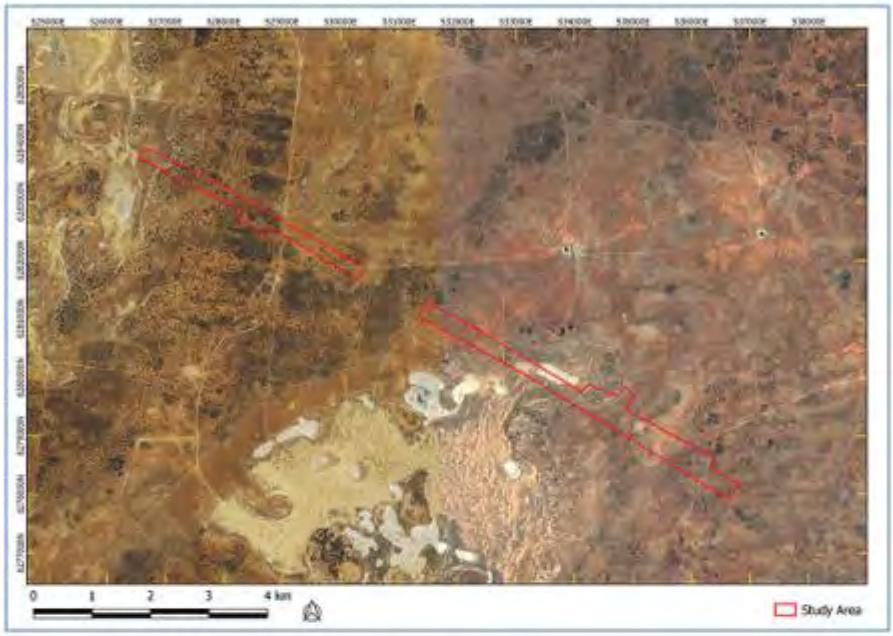
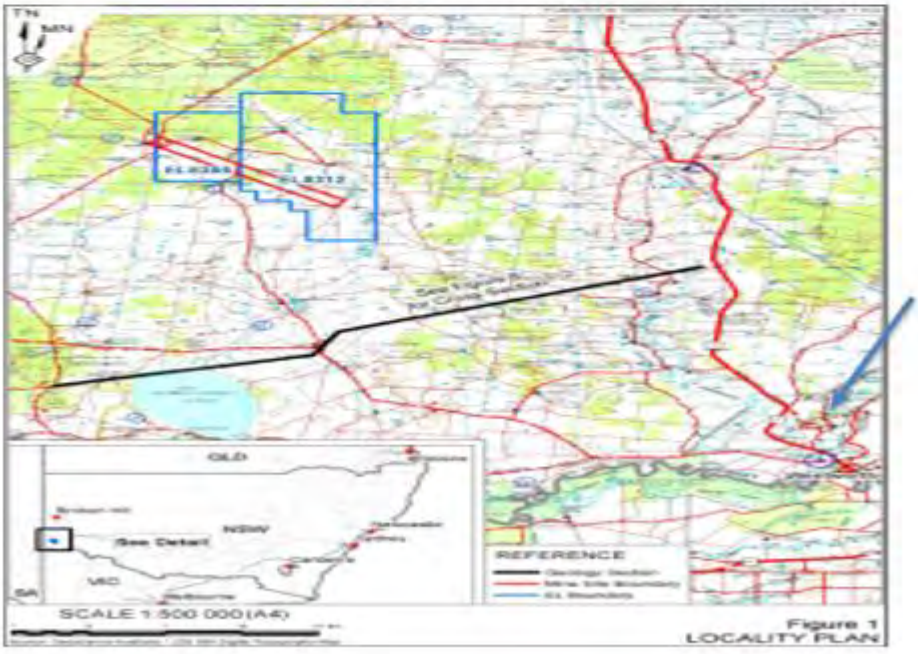
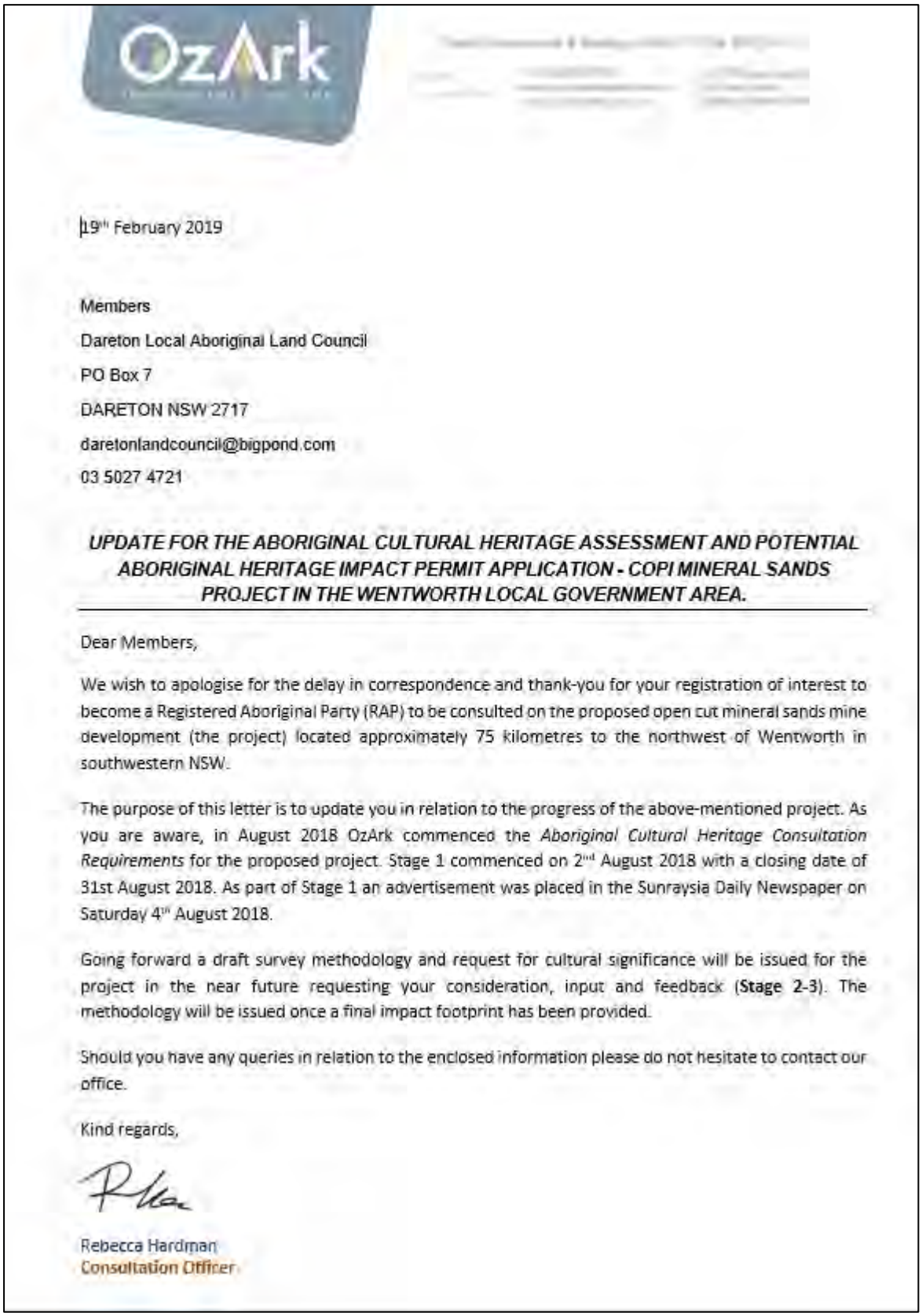


Figure 2. Site location



Appendix 1 Figure 4: Project update letter 1 (sample).



19th February 2019

Members

Dareton Local Aboriginal Land Council

PO Box 7

DARETON NSW 2717

daretonlandcouncil@bigpond.com

03 5027 4721

UPDATE FOR THE ABORIGINAL CULTURAL HERITAGE ASSESSMENT AND POTENTIAL ABORIGINAL HERITAGE IMPACT PERMIT APPLICATION - COPI MINERAL SANDS PROJECT IN THE WENTWORTH LOCAL GOVERNMENT AREA.

Dear Members,

We wish to apologise for the delay in correspondence and thank-you for your registration of interest to become a Registered Aboriginal Party (RAP) to be consulted on the proposed open cut mineral sands mine development (the project) located approximately 75 kilometres to the northwest of Wentworth in southwestern NSW.

The purpose of this letter is to update you in relation to the progress of the above-mentioned project. As you are aware, in August 2018 OzArk commenced the *Aboriginal Cultural Heritage Consultation Requirements* for the proposed project. Stage 1 commenced on 2nd August 2018 with a closing date of 31st August 2018. As part of Stage 1 an advertisement was placed in the Sunraysia Daily Newspaper on Saturday 4th August 2018.

Going forward a draft survey methodology and request for cultural significance will be issued for the project in the near future requesting your consideration, input and feedback (**Stage 2-3**). The methodology will be issued once a final impact footprint has been provided.

Should you have any queries in relation to the enclosed information please do not hesitate to contact our office.

Kind regards,

Rebecca Hardman
Consultation Officer

Appendix 1 Figure 5: Project update letter 2.

15th August 2019

UPDATE FOR THE ABORIGINAL CULTURAL HERITAGE ASSESSMENT AND POTENTIAL ABORIGINAL HERITAGE IMPACT PERMIT APPLICATION - COPI MINERAL SANDS PROJECT IN THE WENTWORTH LOCAL GOVERNMENT AREA.

Dear Members,

We wish to apologise for the delay in correspondence and thank-you for your registration of interest to become a Registered Aboriginal Party (RAP) to be consulted on the proposed open cut mineral sands mine development (the project) located approximately 75 kilometres to the northwest of Wentworth in southwestern NSW.

As you are aware this is the second project update letter with the initial being sent on the 19th February 2019. The purpose of this letter is to update you in relation to the progress of the above-mentioned project. In August 2018 OzArk commenced the *Aboriginal Cultural Heritage Consultation Requirements* for the proposed project. Stage 1 commenced on 2nd August 2018 with a closing date of 31st August 2018. As part of Stage 1 an advertisement was placed in the Sunraysia Daily Newspaper on Saturday 4th August 2018.

The project is currently still on hold as the impact footprint of the project is still being finalised.

Going forward a draft survey methodology and request for cultural significance will be issued for the project in the near future requesting your consideration, input and feedback (Stage 2 and 3). The methodology will be issued once a final impact footprint has been provided.

Should you have any queries in relation to the enclosed information please do not hesitate to contact our office.

Kind regards,

Rebecca Hardman
Consultation Officer

Appendix 1 Figure 6: Advertisement (following restart of ACHCRS, Phase 1).

Sunraysia Daily Wednesday, 18 December 2019 29

SunraysiaDaily Classifieds 5023 0211

Ph: Mon-Fri 8.30am-5.30pm Fax: 5021 0145 email: classads@sunraysiadaily.com.au

We accept

PUBLIC NOTICES

Expression of Interest

CULTURAL HERITAGE MANAGEMENT

OzArk Environmental & Heritage Management P/L has been engaged by RW Corkery & Co Pty Limited (RWC) on behalf of the proponent Relentless Resources Limited (Relentless), and is seeking registrations of interest from Aboriginal groups or individuals of the Wentworth area, who wish to be consulted over the development of an open cut mineral sands mine located approximately 75kms to the northwest of Wentworth in southwestern NSW.

The purpose of this consultation is to identify stakeholders to assist in the Aboriginal cultural heritage assessment of the proposed development site. If you hold cultural knowledge relevant to determining the impacts to the cultural significance of the above-mentioned area, please register your interest by post: OzArk EHM, PO Box 2069, Dubbo NSW 2830; email: rebecca@ozarkehm.com.au, or by phoning OzArk on 02 6882 0118. If phoning OzArk over the Christmas closure period, please leave a message with contact number and we will call you back when we return.

All submissions should be received no later than **9am, Thursday, January 9, 2020.**

PUBLIC NOTICES

Merbein Bowling Club Christmas raffle results:

1ST PRIZE
Pat Byrne
Ticket #0216

2ND PRIZE
Craig Cavanagh
Ticket #1243

3RD PRIZE
Ron Clark
Ticket #0152

Buying or Selling a car?

Advertise in the Used Vehicle section of SunraysiaDaily

Ph 5023 0211

MOTORCYCLES

HARLEY DAVIDSON

2008, soft tail, custom, 96Q 1.584CC (FXSTC), lots of extra, very good condition, 1L-4GH,

$15,500

Phone 0419 567 790

MOTORCYCLES

HARLEY DAVIDSON

2008 Dyna Super Glide, 96 Cub, 6 speed, sissy bar, Vance & Hines exhaust, stage 2 breather kit, chrome enhancements, 1R-3ZG.

$14,750 ride away

Phone 0417 113 887

MOTORCYCLES

TRIUMPH

Street Triple 660, 3 cycl, 2016, 5,700 kms, rego May 2020, exc cond, LAMS, includes leather jacket and helmet, great bike. 1U-3MA.

$9,500

Phone 0477 601 293

TRIUMPH

USED VEHICLES

206CC PEUGEOT

2006, hard cover convertible, 135,000kms, good tyres, road worthy certificate supplied, UOD-092.

$4,500 ono

Phone 0418 521 456

AUDI Q5

USED VEHICLES

FALCON UTE

2004, Cab Chassis, good condition, RWC. Vin number 6FPAAAJGCM4D4477.

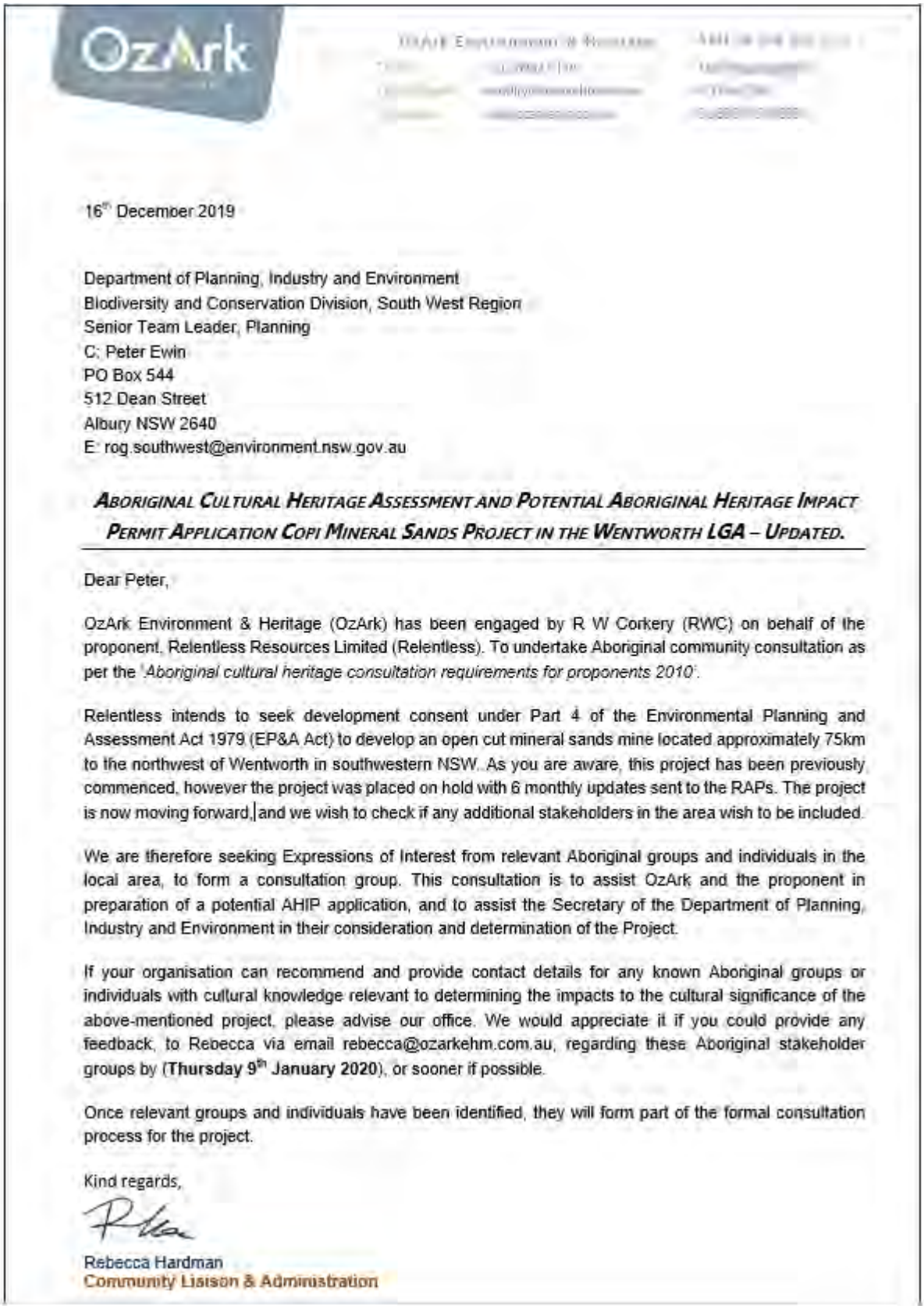
$5,800 neg

Phone Chris 0421 971 947

GREAT WALL

2011, 4x4WD, V200 2.0L TDI 6M, new canopy, cruise,

Appendix 1 Figure 7: Stage 1 letter to BCD (ACHCRs Phase 2).



16th December 2019

Department of Planning, Industry and Environment
Biodiversity and Conservation Division, South West Region
Senior Team Leader, Planning
C: Peter Ewin
PO Box 544
512 Dean Street
Albury NSW 2640
E: rog.southwest@environment.nsw.gov.au

ABORIGINAL CULTURAL HERITAGE ASSESSMENT AND POTENTIAL ABORIGINAL HERITAGE IMPACT PERMIT APPLICATION COPI MINERAL SANDS PROJECT IN THE WENTWORTH LGA – UPDATED.

Dear Peter,

OzArk Environment & Heritage (OzArk) has been engaged by R W Corkery (RWC) on behalf of the proponent, Relentless Resources Limited (Relentless). To undertake Aboriginal community consultation as per the '*Aboriginal cultural heritage consultation requirements for proponents 2010*'.

Relentless intends to seek development consent under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) to develop an open cut mineral sands mine located approximately 75km to the northwest of Wentworth in southwestern NSW. As you are aware, this project has been previously commenced, however the project was placed on hold with 6 monthly updates sent to the RAPs. The project is now moving forward, and we wish to check if any additional stakeholders in the area wish to be included.

We are therefore seeking Expressions of Interest from relevant Aboriginal groups and individuals in the local area, to form a consultation group. This consultation is to assist OzArk and the proponent in preparation of a potential AHIP application, and to assist the Secretary of the Department of Planning, Industry and Environment in their consideration and determination of the Project.

If your organisation can recommend and provide contact details for any known Aboriginal groups or individuals with cultural knowledge relevant to determining the impacts to the cultural significance of the above-mentioned project, please advise our office. We would appreciate it if you could provide any feedback, to Rebecca via email rebecca@ozarkehm.com.au, regarding these Aboriginal stakeholder groups by (**Thursday 9th January 2020**), or sooner if possible.

Once relevant groups and individuals have been identified, they will form part of the formal consultation process for the project.

Kind regards,

Rebecca Hardman
Community Liaison & Administration

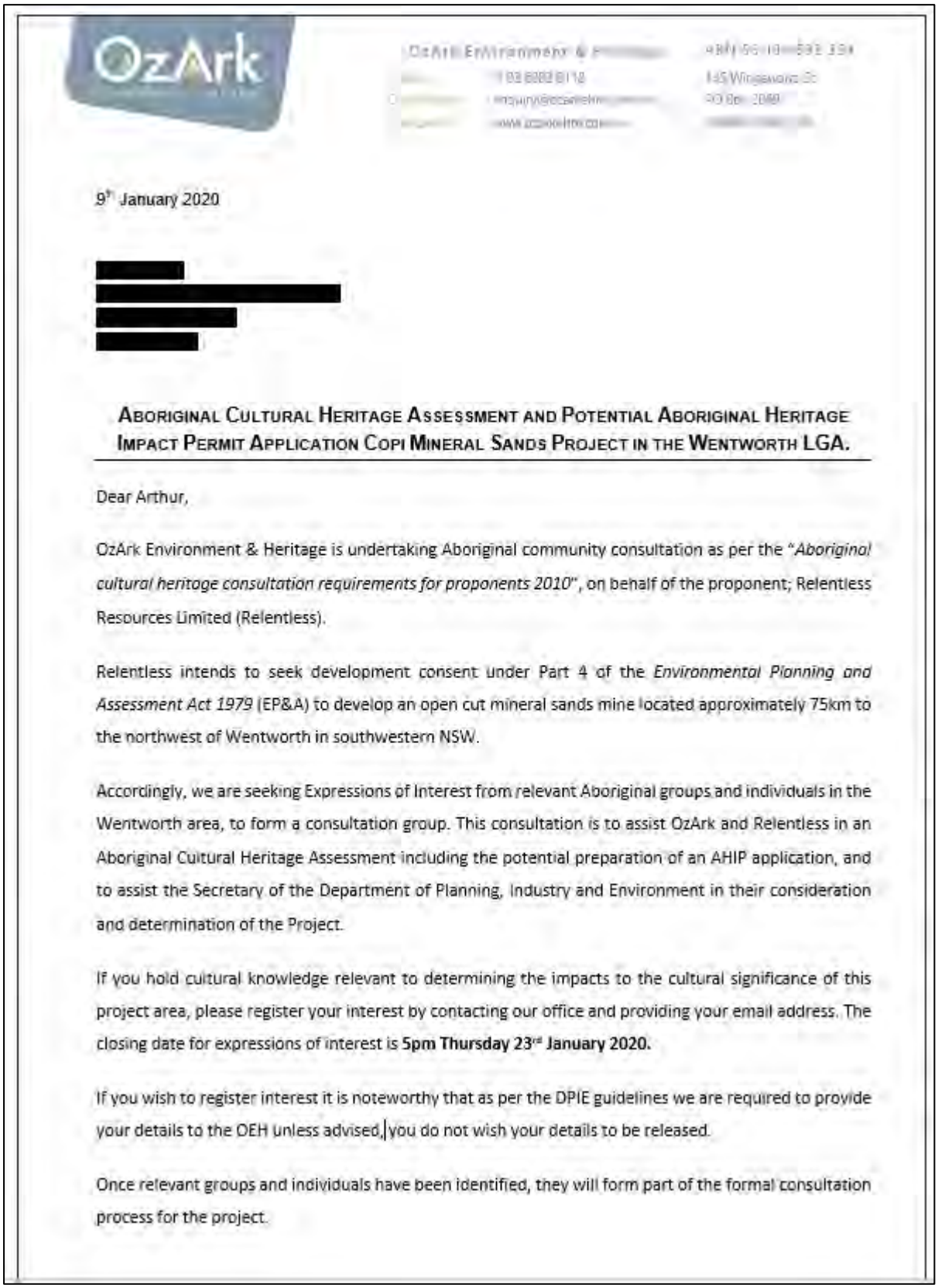
OzArk Environment & Heritage

Figure 1. Proposed Site Layout

Figure 2. Proposed Site Location

COPI MINERAL SANDS PROJECT IN THE WENTWORTH LOCAL GOVERNMENT AREA – UPDATED

Appendix 1 Figure 8: Stage 1 Community letter (sample) (ACHCRs Phase 2).



9th January 2020

[redacted]

ABORIGINAL CULTURAL HERITAGE ASSESSMENT AND POTENTIAL ABORIGINAL HERITAGE IMPACT PERMIT APPLICATION COPI MINERAL SANDS PROJECT IN THE WENTWORTH LGA.

Dear Arthur,

OzArk Environment & Heritage is undertaking Aboriginal community consultation as per the "*Aboriginal cultural heritage consultation requirements for proponents 2010*", on behalf of the proponent; Relentless Resources Limited (Relentless).

Relentless intends to seek development consent under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A) to develop an open cut mineral sands mine located approximately 75km to the northwest of Wentworth in southwestern NSW.

Accordingly, we are seeking Expressions of Interest from relevant Aboriginal groups and individuals in the Wentworth area, to form a consultation group. This consultation is to assist OzArk and Relentless in an Aboriginal Cultural Heritage Assessment including the potential preparation of an AHIP application, and to assist the Secretary of the Department of Planning, Industry and Environment in their consideration and determination of the Project.

If you hold cultural knowledge relevant to determining the impacts to the cultural significance of this project area, please register your interest by contacting our office and providing your email address. The closing date for expressions of interest is **5pm Thursday 23rd January 2020.**

If you wish to register interest it is noteworthy that as per the DPIE guidelines we are required to provide your details to the OEH unless advised, you do not wish your details to be released.

Once relevant groups and individuals have been identified, they will form part of the formal consultation process for the project.

OzArk Environment & Heritage

Kind regards,

Rebecca Hardman
Consultation Officer

Figure 1. Proposed development site.

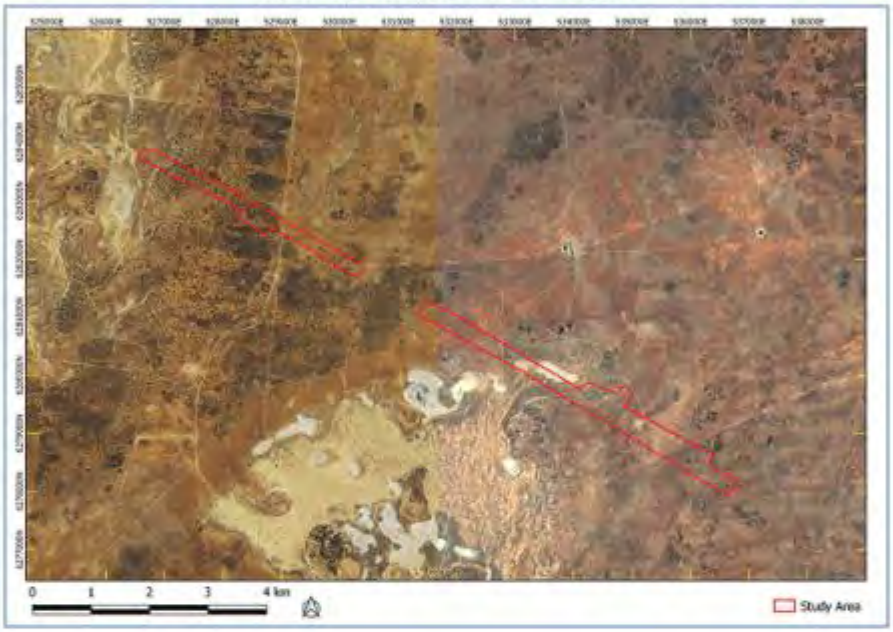
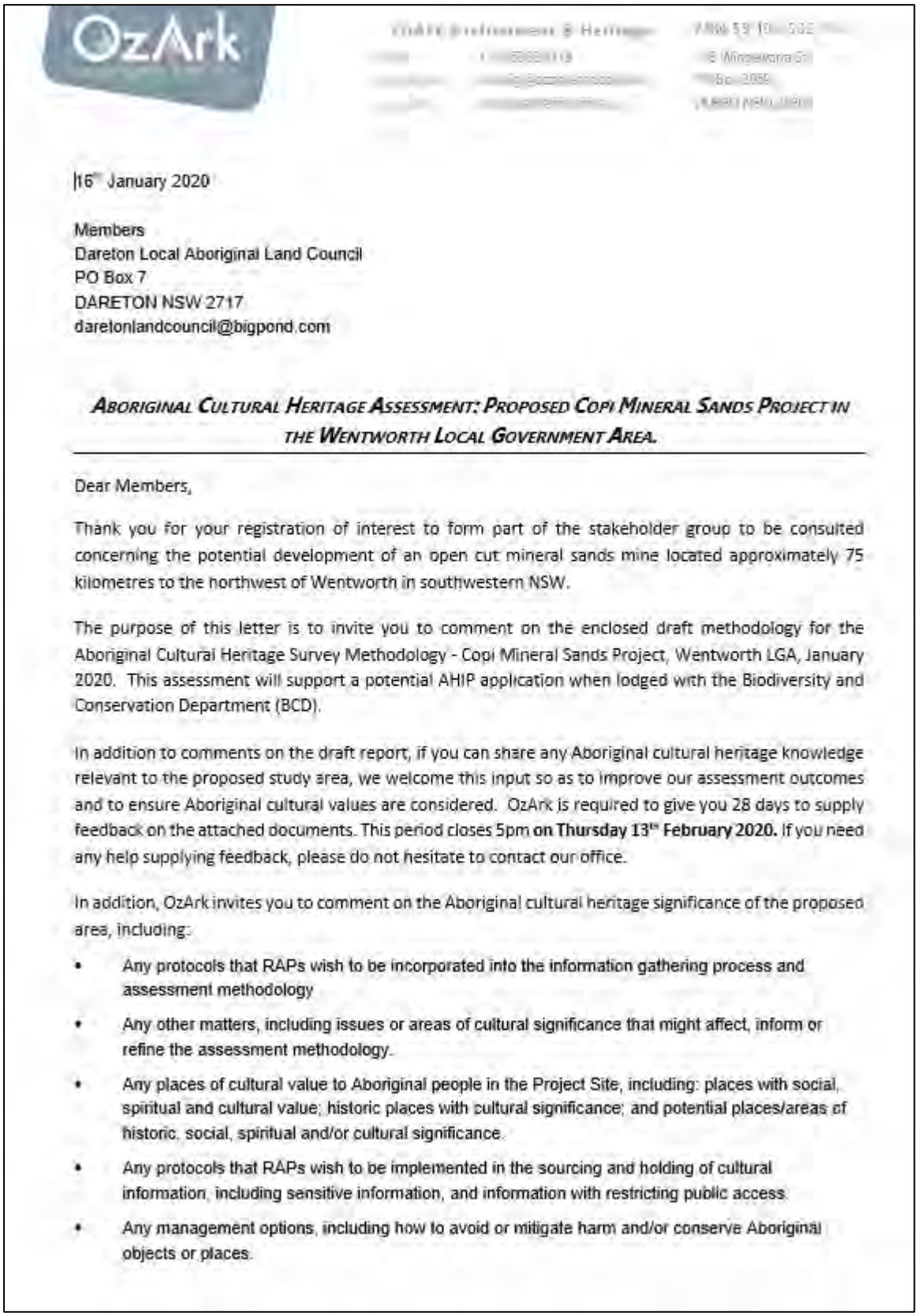


Figure 2. Site location

Appendix 1 Figure 9: Stage 2/3 cover letter for survey methodology (sample) (ACHCRs Phase 2).



16th January 2020

Members
Dareton Local Aboriginal Land Council
PO Box 7
DARETON NSW 2717
daretonlandcouncil@bigpond.com

ABORIGINAL CULTURAL HERITAGE ASSESSMENT: PROPOSED COPI MINERAL SANDS PROJECT IN THE WENTWORTH LOCAL GOVERNMENT AREA.

Dear Members,

Thank you for your registration of interest to form part of the stakeholder group to be consulted concerning the potential development of an open cut mineral sands mine located approximately 75 kilometres to the northwest of Wentworth in southwestern NSW.

The purpose of this letter is to invite you to comment on the enclosed draft methodology for the Aboriginal Cultural Heritage Survey Methodology - Copi Mineral Sands Project, Wentworth LGA, January 2020. This assessment will support a potential AHIP application when lodged with the Biodiversity and Conservation Department (BCD).

In addition to comments on the draft report, if you can share any Aboriginal cultural heritage knowledge relevant to the proposed study area, we welcome this input so as to improve our assessment outcomes and to ensure Aboriginal cultural values are considered. OzArk is required to give you 28 days to supply feedback on the attached documents. This period closes 5pm **on Thursday 13th February 2020.** If you need any help supplying feedback, please do not hesitate to contact our office.

In addition, OzArk invites you to comment on the Aboriginal cultural heritage significance of the proposed area, including:

- Any protocols that RAPs wish to be incorporated into the information gathering process and assessment methodology
- Any other matters, including issues or areas of cultural significance that might affect, inform or refine the assessment methodology.
- Any places of cultural value to Aboriginal people in the Project Site, including: places with social, spiritual and cultural value; historic places with cultural significance; and potential places/areas of historic, social, spiritual and/or cultural significance.
- Any protocols that RAPs wish to be implemented in the sourcing and holding of cultural information, including sensitive information, and information with restricting public access.
- Any management options, including how to avoid or mitigate harm and/or conserve Aboriginal objects or places.

OzArk Environment & Heritage

Should you have any queries in relation to the enclosed information or require any assistance supplying feedback, please do not hesitate to contact our office.

Kind regards,

Rebecca Hardman
Community Liaison & Administration

Appendix 1 Figure 10: Stage 3 cover letter for test excavation methodology (sample) (ACHCRs Phase 2).

9 April 2020

Members
Dareton Local Aboriginal Land Council
PO Box 7
DARETON NSW 2717
daretonlandcouncil@bigpond.com
03 5027 4721
pam.handy@daretonlalc.com.au

ABORIGINAL CULTURAL HERITAGE ASSESSMENT TEST EXCAVATION FOR THE PROPOSED COPI MINERAL SANDS PROJECT IN THE WENTWORTH LOCAL GOVERNMENT AREA.

Dear Members,

Thank you for your registration of interest to form part of the stakeholder group to be consulted concerning the potential development of an open cut mineral sands mine located approximately 75 kilometres to the northwest of Wentworth in south-western NSW.

The purpose of this letter is to invite you to comment on the enclosed draft test excavation methodology for the Archaeological Test Excavation Methodology - Copi Mineral Sands Project, Wentworth LGA, April 2020. This consultation is to assist OzArk and the proponent in preparing the ACHAR, and to assist the Secretary of the Department of Planning, Industry and Environment (DPIE) in its assessment of the Project.

In addition to comments on the draft report, if you can share any Aboriginal cultural heritage knowledge relevant to the proposed study area, we welcome this input so as to improve our assessment outcomes and to ensure Aboriginal cultural values are considered. OzArk is required to give you 28 days to supply feedback on the attached documents. This period closes **5pm on Thursday 7th May 2020.** If you need any help supplying feedback, please do not hesitate to contact our office.

Should you have any queries in relation to the enclosed information or require any assistance supplying feedback, please do not hesitate to contact our office.

Kind regards,

Rebecca Hardman
Community Liaison & Administration

Appendix 1 Figure 11: Stage 4 cover letter (sample) (ACHCRs Phase 2).

OzArk Environment & Heritage

28 July 2020

Members
Dareton Local Aboriginal Land Council
PO Box 7
DARETON NSW 2717
daretonlandcouncil@bigpond.com
03 5027 4721
pam.handy@daretonlalc.com.au

ABORIGINAL CULTURAL HERITAGE ASSESSMENT: PROPOSED COPI MINERAL SANDS PROJECT IN THE WENTWORTH LOCAL GOVERNMENT AREA.

Dear Members,

Thank-you for your continued participation as a Registered Aboriginal Party (RAP) and involvement in the above-mentioned project.

Relentless Resources Limited (Relentless) would like to offer you the opportunity to provide feedback on the draft report that has been undertaken in accordance with stage four (4) of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCR).

As per the ACHCRs we are required to give you twenty-eight (28) days to supply feedback on the attached documents. This period closes on the **Wednesday 26th August 2020**. Should our office not be contacted within this time frame, we will presume that you are satisfied with the contents of the report as it stands.

Should you need any help supplying feedback or have any queries, please do not hesitate to contact our office.

Kind regards,

Rebecca Hardman
Community Liaison & Administration

Appendix 1 Figure 12: Project update letter 3 (sample).

OzArk Environment & Heritage ABN 59 104 582 354

Dubbo
Queanbeyan
Newcastle

T: 02 6882 0118
enquiry@ozarkehm.com.au
www.ozarkehm.com.au

145 Wingewarra St
PO Box 2069
DUBBO NSW 2830

23 March 2021

Members
Dareton Local Aboriginal land Council
PO Box 7
Dareton NSW 2717
daretonlandcouncil@bigpond.com
pam.handy@daretonlalc.com.au
03 5027 4721

ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT: COPI MINERALS SANDS PROJECT. WENTWORTH LOCAL GOVERNMENT AREA

Dear Members,

The purpose of this letter is to update you in relation to the progress of the Copi Minerals Sands Project. As you are aware, on 28 July 2020, a copy of the draft Aboriginal Cultural Heritage Assessment Report (ACHAR) was provided for comment in accordance with Stage 4 of the *Aboriginal Cultural Heritage Consultation Requirements* (ACHCRs). Stage 4 ended on 26 August 2020.

Since this time, Relentless Resources (the proponent) have been reviewing the current disturbance area and are now proposing changes to the disturbance area. This will result in the need to revise the ACHAR to reflect these changes.

Further details will be provided once the proposed changes are known. At this stage OzArk would just like to inform you that the project is ongoing, and we will be in touch once we have further information.

Should you have any queries in relation to the enclosed information please do not hesitate to contact our office.

Kind regards,

Rebecca Hardman
Office Manager
rebecca@ozarkehm.com.au

Appendix 1 Figure 13: Project update letter 4 (sample).

OzArk Environment & Heritage ABN 59 104 582 354

Dubbo
Queanbeyan
Newcastle

T: 02 6882 0118
enquiry@ozarkehm.com.au
www.ozarkehm.com.au

145 Wingewarra St
PO Box 2069
DUBBO NSW 2830

28 September 2021

Members
Dareton Local Aboriginal Land Council
PO Box 7
Dareton NSW 2717

ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT: COPI MINERALS SANDS PROJECT. WENTWORTH LOCAL GOVERNMENT AREA

Dear Members,

The purpose of this letter is to update you in relation to the progress of the Copi Minerals Sands Project (the project) since the last correspondence on 23 March 2021.

Relentless Resources (the proponent) is continuing with mining studies to finalise the disturbance area for the revised project. Once the disturbance area is finalised, we will provide details of the changes and an assessment methodology which will assist in the development of an addendum Aboriginal Cultural Heritage Assessment Report (ACHAR).

Should you have any queries in relation to the enclosed information please do not hesitate to contact our office.

Kind regards,

Catherine Burrows
Office Manager / Community Liaison
catherine@ozarkehm.com.au

Appendix 1 Figure 14: Heritage NSW stakeholder request letter (ACHCRs Phase 2).

OzArk Environment & Heritage ABN 59 104 582 354
Dubbo T: 02 6882 0118 145 Wingewarra St
Queanbeyan enquiry@ozarkehm.com.au PO Box 2069
Newcastle www.ozarkehm.com.au DUBBO NSW 2830

24 November 2021

Heritage NSW
Department of Premier and Cabinet
Locked Bag 5020
Parramatta NSW 2124
heritagemailbox@environment.nsw.gov.au

ABORIGINAL CULTURAL HERITAGE AND HISTORIC HERITAGE
ADDITIONAL ASSESSMENT AREA - COPI MINERAL SANDS PROJECT

Dear Sir/Madam,

OzArk Environment & Heritage (OzArk) has been engaged by Relentless Resources Limited (Relentless) who is planning to apply for development consent for the Copi Mineral Sands Project (the Project; SSD 9572). The Project is an open cut mineral sands mine located approximately 75 kilometres (km) to the northwest of Wentworth in southwestern NSW. Since the completion of the survey, test excavation program, and reporting in 2020, Relentless have identified an additional area will require assessment due to the revised impacts of the Project (**Figure 1**). This area encompasses 9,200 hectares (ha) of additional land.

The Project has an active RAP list which OzArk intends to continue to use for the additional investigation area. However, as OzArk last received the relevant stakeholder list from the then OEH on 10 August 2018, OzArk would like an updated Registered Interests list for the Wentworth Local Government Area. OzArk will use the updated list to contact any individuals/groups who have not previously been contacted to determine whether they wish to be consulted about the Project. Any new registrations will be included in the established RAP list and OzArk will provide them with information about investigations associated with the Project to date.

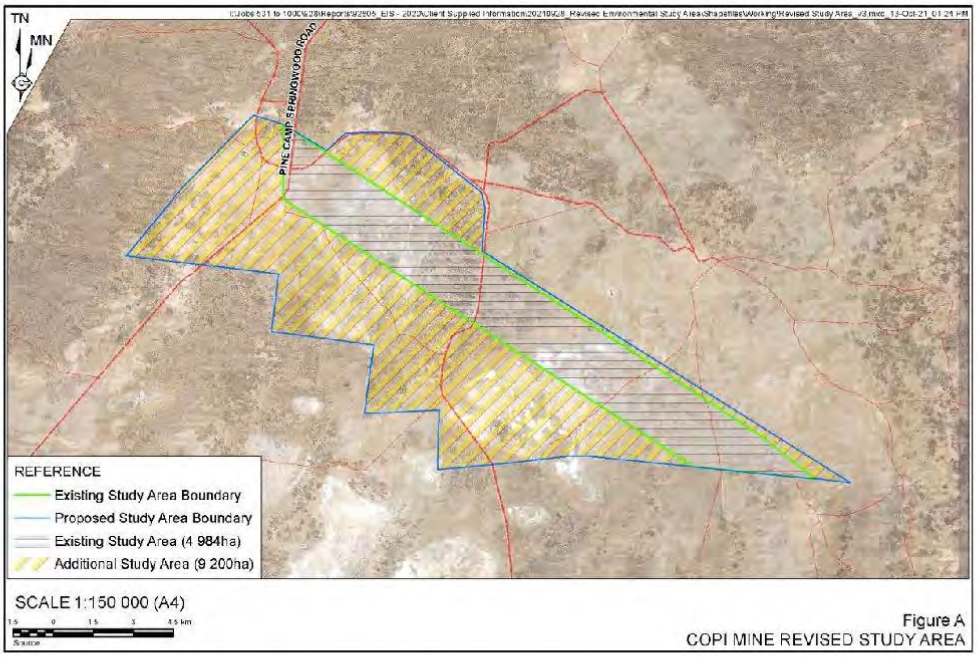
OzArk would appreciate it if Heritage NSW could provide the updated stakeholder list by **Thursday 9 December 2021**, or sooner if possible as we'd like to contact any potential new registrants prior to Christmas.

Once relevant groups and individuals have been identified, OzArk will provide Heritage NSW with an updated RAP list for the Project.

Kind regards,

Catherine Burrowes
Office Manager/ Community Liaison

Figure 1. Location of additional assessment area.



In this figure the grey hatched area has been previously assessed by field survey and a test excavation program. The yellow hatched area is the additional area that will be subjected to further survey, and potentially, test excavation.

Appendix 1 Figure 15: Stage 2/3 cover letter (sample) (ACHCRs Phase 2).

OzArk Environment & Heritage ABN 59 104 582 354

Dubbo T: 02 6882 0118 145 Wingewarra St
Queanbeyan enquiry@ozarkehm.com.au PO Box 2069
Newcastle www.ozarkehm.com.au DUBBO NSW 2830

20 December 2021

Members
Dareton Local Aboriginal Land Council
PO Box 7
DARETON NSW 2717
daretonlandcouncil@bigpond.com

Aboriginal Heritage Assessment for the proposed COPI Mineral Sands project additional assessment area

Dear Members,

Thank-you for your continued participation as a Registered Aboriginal Party (RAP) for the Copi Mineral Sands Project (the project). The project is located 75 kilometres (km) northwest of Wentworth and 180 kilometres south of Broken Hill in the Murray Basin region of southwestern NSW within the Wentworth Local Government Area.

The purpose of this letter is to invite you to comment on the enclosed draft assessment methodology for the additional assessment area for the project.

In addition to comments on the draft assessment methodology, if you can share any Aboriginal cultural heritage knowledge relevant to the additional assessment area, we welcome this input so as to improve our assessment outcomes and to ensure Aboriginal cultural values are considered. OzArk Environment & Heritage is required to give you 28 days to supply feedback on the attached documents. This period closes 5pm **on Monday 24th January 2022.**

If you need any help supplying feedback or have any queries in relation to the enclosed information, please do not hesitate to contact our office.

Kind regards,

Catherine Burrowes
Community Liaison

Appendix 1 Figure 16: Project update letter 5 (sample).

OzArk Environment & Heritage ABN 59 104 582 354

Dubbo T: 02 6882 0118 145 Wingewarra St
Queanbeyan enquiry@ozarkehm.com.au PO Box 2069
Newcastle www.ozarkehm.com.au DUBBO NSW 2830

12 July 2022

Members
Dareton Local Aboriginal Land Council
PO Box 7
Dareton NSW 2717

ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT: COPI MINERALS SANDS PROJECT. WENTWORTH LOCAL GOVERNMENT AREA

Dear Members,

The purpose of this letter is to update you in relation to the progress of the Copi Minerals Sands Project (the project).

The field survey and test excavation for the revised Project Site was completed by OzArk Environment & Heritage and Registered Aboriginal Parties (RAPs) in January and March 2022.

Relentless Resources (the proponent) has now commissioned a feasibility study to be completed to finalise the disturbance area for the revised Project. Once the disturbance area is finalised, we will provide a copy of the revised *Aboriginal Cultural Heritage Assessment Report* (ACHAR) to all RAPs for review in accordance with Stage 4 of the Aboriginal Cultural Heritage Consultation Requirements (ACHCRs).

Should you have any queries in relation to the enclosed information please do not hesitate to contact our office.

Kind regards,

Catherine Burrows
Office Manager / Community Liaison
catherine@ozarkehm.com.au

Appendix 1 Figure 17: Stage 4 cover letter (sample) (ACHCRs Phase 2).

OzArk Environment & Heritage ABN 59 104 582 354

Dubbo T: 02 6882 0118 145 Wingewarra St
Queanbeyan enquiry@ozarkehm.com.au PO Box 2069
Newcastle www.ozarkehm.com.au DUBBO NSW 2830

17 November 2022

Members
Dareton Local Aboriginal Land Council
PO Box 7
DARETON NSW 2717
pam.handy@daretonlalc.com.au

Aboriginal Cultural Heritage Assessment for the proposed Copi Mineral Sands Project

Dear Members,

Thank-you for your continued participation as a Registered Aboriginal Party (RAP) for the Copi Mineral Sands Project (the project). The project is located 75 kilometres (km) northwest of Wentworth and 180 kilometres south of Broken Hill in the Murray Basin region of southwestern NSW within the Wentworth Local Government Area.

RZ Resources Limited (the proponent) would like to offer you the opportunity to provide feedback on the draft *Aboriginal Cultural Heritage Assessment* in accordance with stage four (4) of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRs).

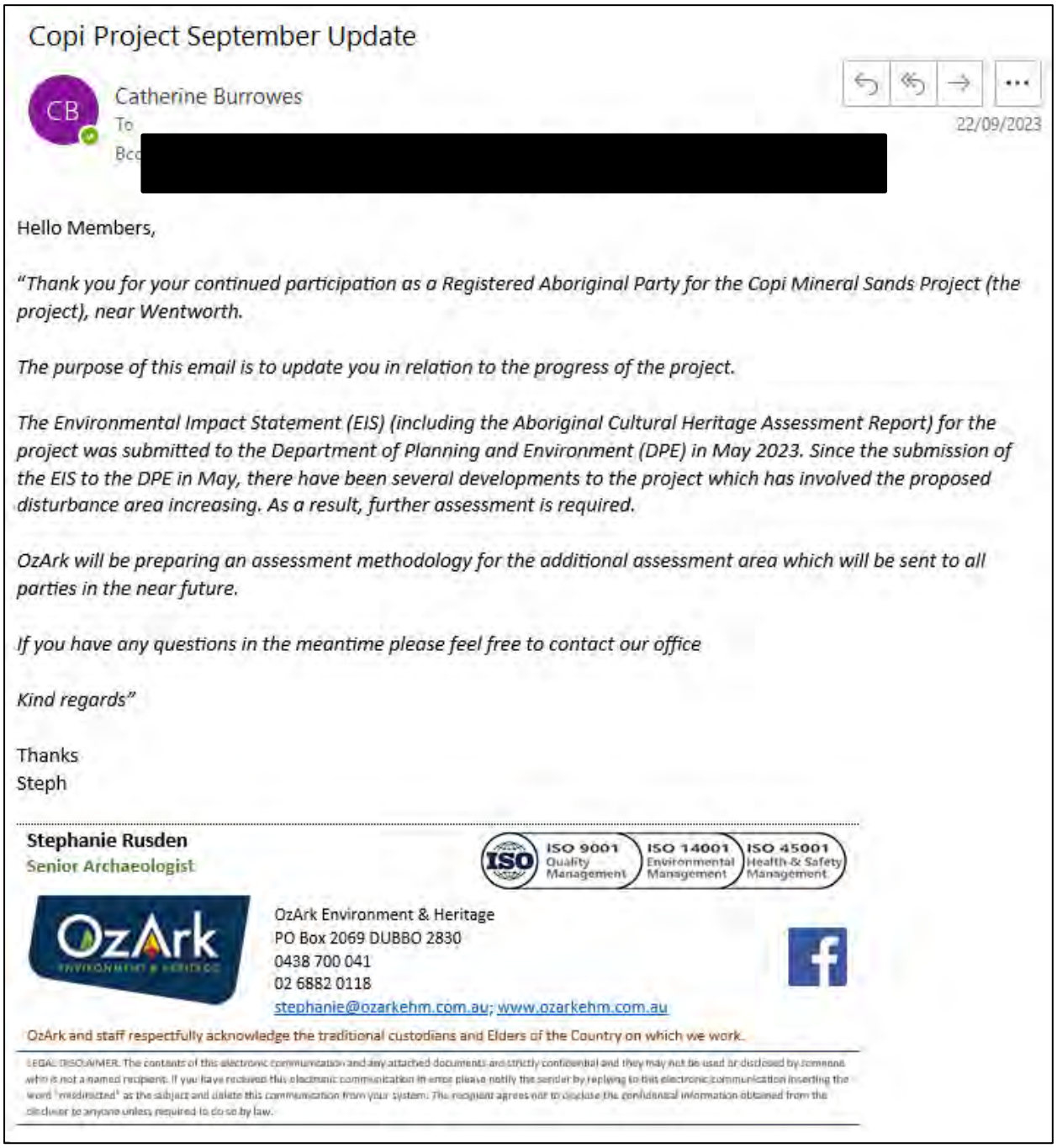
As per the ACHCRs we are required to give you twenty-eight (28) days to supply feedback on the attached documents. This period closes on **Friday 16 December 2022**. Should our office not be contacted within this time frame, we will presume that you are satisfied with the contents of the report as it stands.

Should you need any help supplying feedback or have any queries, please do not hesitate to contact our office.

Kind regards,

Catherine Burrowes
Community Liaison

Appendix 1 Figure 18: Project update email (22 September 2023).



Copi Project September Update

CB Catherine Burrowes
To
Bcc [redacted]
22/09/2023

Hello Members,

"Thank you for your continued participation as a Registered Aboriginal Party for the Copi Mineral Sands Project (the project), near Wentworth.

The purpose of this email is to update you in relation to the progress of the project.

The Environmental Impact Statement (EIS) (including the Aboriginal Cultural Heritage Assessment Report) for the project was submitted to the Department of Planning and Environment (DPE) in May 2023. Since the submission of the EIS to the DPE in May, there have been several developments to the project which has involved the proposed disturbance area increasing. As a result, further assessment is required.

OzArk will be preparing an assessment methodology for the additional assessment area which will be sent to all parties in the near future.

If you have any questions in the meantime please feel free to contact our office

Kind regards"

Thanks
Steph

Stephanie Rusden
Senior Archaeologist

ISO 9001 Quality Management | ISO 14001 Environmental Management | ISO 45001 Health & Safety Management

OzArk Environment & Heritage
PO Box 2069 DUBBO 2830
0438 700 041
02 6882 0118
stephanie@ozarkehm.com.au; www.ozarkehm.com.au

OzArk and staff respectfully acknowledge the traditional custodians and Elders of the Country on which we work.

LEGAL DISCLAIMER. The contents of this electronic communication and any attached documents are strictly confidential and they may not be used or disclosed by someone who is not a named recipient. If you have received this electronic communication in error please notify the sender by replying to this electronic communication inserting the word 'misdirected' as the subject and delete this communication from your system. The recipient agrees not to disclose the confidential information obtained from the discloser to anyone unless required to do so by law.

Appendix 1 Figure 19: Correspondence with Heritage NSW regarding an updated stakeholder list (ACHCRs Phase 3).

NSW GOVERNMENT Heritage NSW
Department of Planning and Environment

Our reference: Doc23/853914

Catherine Burrowes
Office Manager/ Community Liaison
Oz Ark Environment and Heritage
145 Wingewarra Street
Dubbo 2830

28/9/2023

Dear Catherine,

WRITTEN NOTIFICATION OF PROPOSAL AS REQUIRED UNDER DECCW ABORIGINAL CULTURAL HERITAGE CONSULTATION REQUIREMENTS FOR PROPONENTS 2010

Subject: Copi Mineral Sands Project.

Thank you for your correspondence dated 24 September 2023 to Heritage NSW (Department of Planning and Environment) regarding the above project.

Attached is a list of known Aboriginal Stakeholders for the proposed development at the **Wentworth** Local Government Area that Heritage NSW considers likely to have an interest in the activity.

Please note this list is not necessarily an exhaustive list of all interested Aboriginal Stakeholders.

Receipt of this list does not remove the requirement of a proponent/ consultant to advertise in local print media and contact other bodies seeking interested Aboriginal parties, in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (April 2010).

Under Section 4.1.6. of the Consultation Requirements, you must also provide a copy of the names of each Aboriginal person who registered an interest to the relevant Heritage NSW office and Local Aboriginal Land Council (LALC) within 28 days from the closing date for registering an interest.

Please note that the contact details in the list provided by Heritage NSW may be out of date as it relies on Aboriginal stakeholders advising Heritage NSW when their details need changing. If individuals/companies undertaking consultation are aware that any groups contact details are out of date, or letters are returned unopened, please contact either the relevant stakeholder group (if you know their more current details) and/or Heritage NSW. AHIP applicants should make a note of any group they are unable to contact as part of their consultation record.

Level 6, 10 Valentine Ave Parramatta NSW 2150 ■ Locked Bag 5020 Parramatta NSW 2124
P: 02 9873 8500 ■ E: heritagemailbox@environment.nsw.gov.au

If you have any questions about this advice, please email: heritagemailbox@environment.nsw.gov.au or contact (02) 9873 8500.

Yours sincerely

Barry Gunther, Aboriginal Senior Assessment Officer
Environment and Heritage – Heritage NSW
Department of Planning and Environment
Aboriginal Heritage Regulation Branch – South Heritage NSW

Attachment A:

Registered Aboriginal Interests DPE Aboriginal Stakeholders List for the **Wentworth** Local Government Area.

2

Appendix 1 Figure 20: Stage 1 community letter (sample) (ACHCRs Phase 3).

OzArk Environment & Heritage ABN 59 104 582 354
Dubbo T: 02 6882 0118 145 Wingewarra St
Queanbeyan enquiry@ozarkehm.com.au PO Box 2069
Newcastle www.ozarkehm.com.au DUBBO NSW 2830

3 October 2023

Koori Digs Services
[redacted]

ABORIGINAL CULTURAL HERITAGE ASSESSMENT:
COPI MINERAL SANDS PROJECT NEAR WENTWORTH

Dear Members,

OzArk Environment & Heritage Pty Ltd (OzArk) is undertaking Aboriginal community consultation as per the *"Aboriginal cultural heritage consultation requirements for proponents 2010"* (ACHCRs), for the proposed Copi Mineral Sands Project (the Project) on behalf of the proponent (RZ Resources Limited).

The proponent intends to seek development consent under the *Environmental Planning and Assessment Act 1979* (EP&A) to construct the Project. The Project is located 75 kilometres (km) northwest of Wentworth and 180 km south of Broken Hill in the Murray Basin region of southwestern NSW within the Wentworth Local Government Area (**Figure 1**).

Accordingly, we are seeking Expressions of Interest from relevant Aboriginal groups and individuals in the area, to form a consultation group. This consultation is to assist OzArk and the proponent, in preparation of an Aboriginal Cultural Heritage Assessment Report (ACHAR) to assist Heritage NSW and the Department of Planning and Environment (DPE) in their consideration of the Project.

It should be noted that ACHCRs for the Project have been ongoing since the Project commenced in August 2018. An initial ACHAR was prepared and sent for Stage 4 review in July 2020 and a revised ACHAR was sent for an additional Stage 4 review in December 2022 following an increase in the Project area. The proponent has now identified additional resources for the Project which has resulted in further increases. As such, OzArk is seeking any new registrations of interest to be involved in the remainder of the assessment for the Project. A copy of the revised ACHAR will be provided for your records should if you register for the Project.

If you hold cultural knowledge relevant to determining the impacts to the cultural significance of this project area, please register your interest by contacting our office. The closing date for expressions of interest is **COB Wednesday 18 October 2023.**

If you wish to register interest it is noteworthy that as per the Heritage NSW guidelines, we are required to provide your details to Heritage NSW and the Local Aboriginal Lands Council unless we are advised that you do not wish your details to be released.

Once relevant groups and individuals have been identified, they will form part of the formal consultation process for the project.

Kind regards,

Catherine Burrowes
Community Liaison

Figure 1. Mine Site boundary for the Project.

Appendix 1 Figure 21: Stage 2/3 assessment methodology cover letter (sample) (ACHCRs Phase 3).

OzArk Environment & Heritage ABN 59 104 582 354
Dubbo T: 02 6882 0118 145 Wingewarra St
Queanbeyan enquiry@ozarkehm.com.au PO Box 2069
Newcastle www.ozarkehm.com.au DUBBO NSW 2830

19 October 2023

Dareton Local Aboriginal Land Council

daretonlandcouncil@bigpond.com pam.handy@daretonlalc.com.au

Aboriginal Cultural Heritage Assessment for the proposed COPI Mineral Sands project Phase 3 assessment area

Dear Members,

Thank-you for your continued participation as a Registered Aboriginal Party (RAP) for the Copi Mineral Sands Project (the project). The project is located 75 kilometres (km) northwest of Wentworth and 180 kilometres south of Broken Hill in the Murray Basin region of southwestern NSW within the Wentworth Local Government Area.

The purpose of this letter is to invite you to comment on the enclosed draft assessment methodology for the additional assessment area for the project.

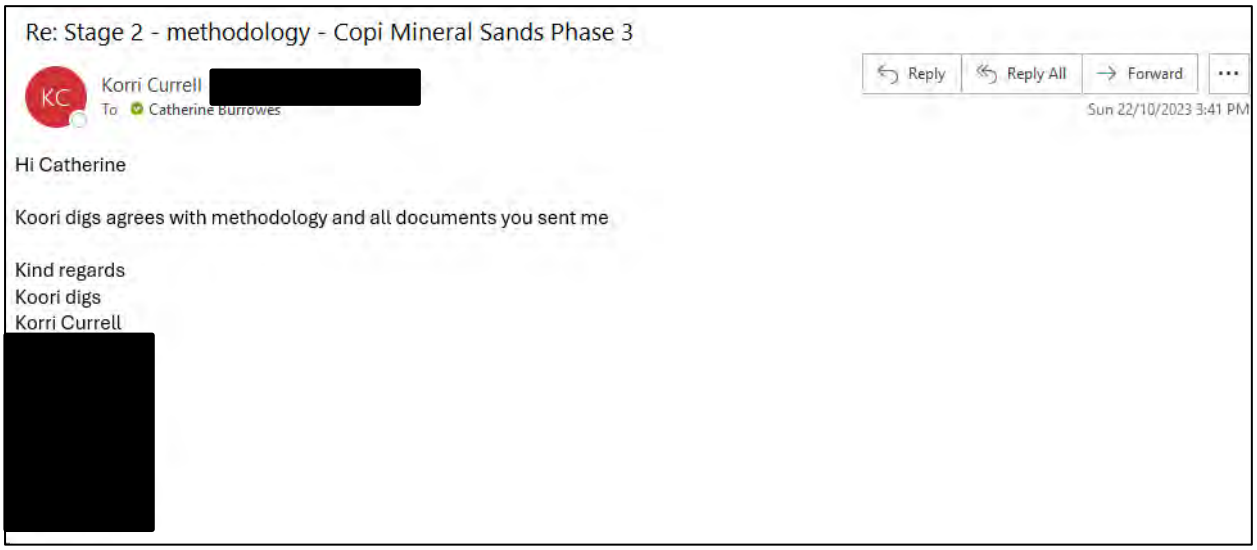
In addition to comments on the draft assessment methodology, if you can share any Aboriginal cultural heritage knowledge relevant to the additional assessment area, we welcome this input so as to improve our assessment outcomes and to ensure Aboriginal cultural values are considered. OzArk Environment & Heritage is required to give you 28 days to supply feedback on the attached documents. This period closes 5pm on **Thursday 16th November 2023.**

If you need any help supplying feedback or have any queries in relation to the enclosed information, please do not hesitate to contact our office.

Kind regards,

Catherine Burrowes
Community Liaison

Appendix 1 Figure 22: Stage 2/3 assessment methodology response (ACHCRs Phase 3).



Appendix 1 Figure 23: Stage 3 test excavation methodology cover letter (sample) (ACHCRs Phase 3).

OzArk Environment & Heritage
Dubbo | Queanbeyan
Newcastle | Wollongong
Katoomba
T: 02 6882 0118
enquiry@ozarkehm.com.au
www.ozarkehm.com.au
ABN 59 104 582 354
145 Wingewarra St
PO Box 2069
DUBBO NSW 2830

20 December 2023

Members
Dareton Local Aboriginal Land Council
PO Box 7
DARETON NSW 2717
pam.handy@daretonlalc.com.au

ARCHAEOLOGICAL TEST EXCAVATION METHODOLOGY:
COPI MINERAL SANDS PROJECT -
PHASE 3 ASSESSMENT

Dear Members,

Thank-you for your registration of interest to become a Registered Aboriginal Party (RAP) to be consulted regarding the Copi Mineral Sands Project Phase 3 assessment. In November 2023, OzArk and site officers from the Registered Aboriginal Parties (RAPs) completed the survey of the Phase 3 Assessment Area. As a result of the survey, an additional 21 Aboriginal sites were recorded.

The purpose of this letter is to invite you to comment on the enclosed draft methodology for the Copi Mineral Sands Project Phase 3 assessment. In addition to comments on the draft methodology, if you can share any Aboriginal cultural heritage knowledge relevant to the assessment areas, we welcome this input so as to improve our assessment outcomes and to ensure Aboriginal cultural values are considered.

OzArk Environment & Heritage is required to give you 28 days plus public holidays to supply feedback on the attached documents. This period closes 5pm on **Tuesday 23 January 2024.**

If you need any help supplying feedback or have any queries in relation to the enclosed information, please do not hesitate to contact our office.

Kind regards,

Catherine Burrowes
Customer Liaison

Appendix 1 Figure 24: Stage 3 test excavation methodology response (ACHCRs Phase 3).

From: [redacted]
Sent: Tuesday, December 26, 2023 11:29 AM
To: Catherine Burrowes <catherine@ozarkehm.com.au>
Subject: Re: Test Excavation methodology - Copi Mineral Sands Project Phase 3

Hi Catherine

Koori Digs agrees with methodology and would like to be apart of field work if possible

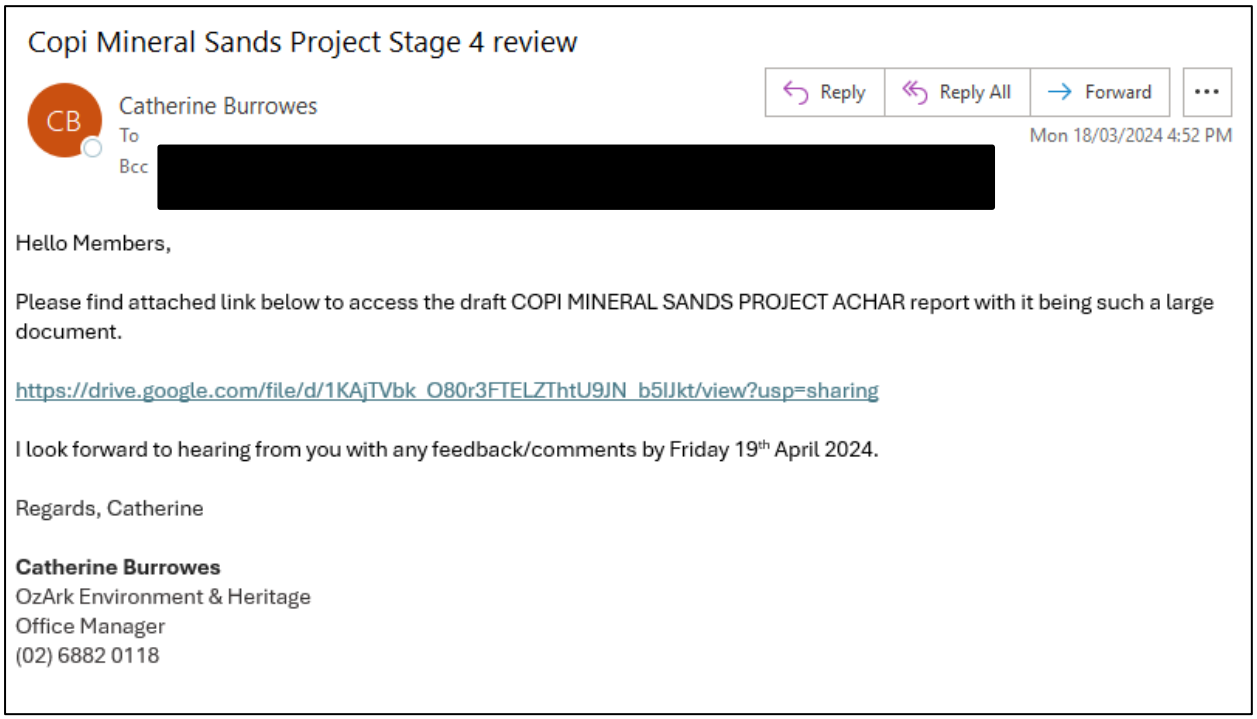
I have attached insurances

If you need anything else please let me know

Merry Christmas

Kind Regards
Korri Currell
[redacted]
Koori Digs

Appendix 1 Figure 25: Stage 4 email (ACHCRs Phase 3).



Copi Mineral Sands Project Stage 4 review

CB Catherine Burrowes

To

Bcc [redacted]

Reply | Reply All | Forward | ...

Mon 18/03/2024 4:52 PM

Hello Members,

Please find attached link below to access the draft COPI MINERAL SANDS PROJECT ACHAR report with it being such a large document.

https://drive.google.com/file/d/1KAjTVbk_O80r3FTELZThtU9JN_b5IJkt/view?usp=sharing

I look forward to hearing from you with any feedback/comments by Friday 19th April 2024.

Regards, Catherine

Catherine Burrowes
OzArk Environment & Heritage
Office Manager
(02) 6882 0118

APPENDIX 2: AHIMS SEARCH RESULT

12 January 2020 AHIMS search

Office of Environment & Heritage

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi
Client Service ID : 476210

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
39-4-0075	DUNEDIN PARK 2	AGD	54	541960	6251410	Open site	Valid	Hearth : -, Artefact : -		
	Contact	Recorders	Ms.Vanessa Edmonds					Permits		
39-4-0078	NULLA 7	AGD	54	527450	6251580	Open site	Valid	Artefact : -		
	Contact	Recorders	Ms.Vanessa Edmonds					Permits		
39-4-0079	NULLA 1	AGD	54	537040	6251400	Open site	Valid	Artefact : -		
	Contact	Recorders	Ms.Vanessa Edmonds					Permits		
39-4-0080	NULLA 8	AGD	54	523620	6251960	Open site	Valid	Artefact : -		
	Contact	Recorders	Ms.Vanessa Edmonds					Permits		
39-4-0020	Lake Victoria North 6;	AGD	54	522750	6251250	Open site	Valid	Shell : -, Artefact : -	Midden	1827
	Contact	Recorders	Mr.Allan Lance					Permits		
39-4-0021	Lake Victoria North 7;	AGD	54	522800	6251400	Open site	Valid	Shell : -, Artefact : -	Midden	1827
	Contact	Recorders	Mr.Allan Lance					Permits		
39-4-0022	Lake Victoria North 8;	AGD	54	522910	6252100	Open site	Valid	Shell : -, Artefact : -	Midden	1827
	Contact	Recorders	Mr.Allan Lance					Permits		
39-1-0015	Yanky Doodle Tank 1;Belvedere Station;	AGD	54	535463	6309127	Open site	Valid	Artefact : -	Open Camp Site	1028
	Contact	Recorders	Doctor.sarah martin					Permits		
39-1-0033	Tarawi 1;Tarawi Nature Reserve;	AGD	54	527480	6303790	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	R Dayman,Les Williams					Permits		
39-1-0034	Tarawi 2;Tarawi Nature Reserve;	AGD	54	526860	6303830	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	R Dayman,Les Williams					Permits		
39-1-0035	Tarawi 3;Tarawi Nature Reserve;	AGD	54	514690	6300260	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	R Dayman,Les Williams					Permits		
39-4-0074	Bells Grove Salt Lake	AGD	54	515500	6264500	Open site	Valid	Artefact : -		
	Contact	Recorders	Doctor.Matt Cupper					Permits		
39-4-0083	NULLA 3	AGD	54	530260	6251370	Open site	Valid	Artefact : -		
	Contact	Recorders	Ms.Vanessa Edmonds					Permits		
39-4-0085	NULLA 4	AGD	54	528680	6251450	Open site	Valid	Artefact : -		
	Contact	Recorders	Ms.Vanessa Edmonds					Permits		
39-4-0088	New Bluff 01	AGD	54	527500	6272500	Open site	Valid	Artefact : 76		
	Contact T Russell	Recorders	Doctor.Matt Cupper					Permits		
39-4-0263	Nulla Nulla Grinding Stones	GDA	54	533131	6257471	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.John Gilding,OEH					Permits	4231	

Report generated by AHIMS Web Service on 12/01/2020 for Stephanie Rusden for the following area at Datum :GDA, Zone : 54, Eastings : 499143 - 559143, Northings : 6251420 - 6311420 with a Buffer of 0 meters. Additional Info : Survey. Number of Aboriginal sites and Aboriginal objects found is 16

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Page 1 of 1

31 March 2022 AHIMS search

NSW GOVERNMENT

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi revised ACHAR
Client Service ID : 671823

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
39-4-0606	Copi IF 48	GDA	54	532799	6281935	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Stephanie Rusden					Permits		
39-4-0591	Copi OS 19	GDA	54	533788	6277941	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Stephanie Rusden					Permits		
39-4-0635	Copi IF 22	GDA	54	534206	6279718	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Stephanie Rusden					Permits		
39-4-0587	Copi OS 15	GDA	54	534515	6279352	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Stephanie Rusden					Permits		
39-4-0595	Copi OS 22	GDA	54	534566	6278385	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Stephanie Rusden					Permits		
39-4-0592	Copi OS 20	GDA	54	534595	6277843	Open site	Valid	Artefact : , Hearth : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Stephanie Rusden					Permits		
39-5-0094	DA122	AGD	54	569498	6283069	Open site	Valid	Artefact : 6		
	Contact Searle	Recorders	Doctor.Matt Cupper					Permits		
39-2-0007	Milkengay Lake M3;	AGD	54	577690	6293131	Open site	Valid	Shell : , Artefact : -	Midden	
	Contact	Recorders	ASRSYS					Permits		
39-4-0739	WDFEP132	GDA	54	500254	6287203	Open site	Valid	Artefact :		
	Contact	Recorders	Lantern Heritage Pty Ltd - Tathra,Miss Majella Hammersley					Permits		
39-5-0090	DA118	AGD	54	566695	6280654	Open site	Valid	Artefact : 5		
	Contact Searle	Recorders	Doctor.Matt Cupper					Permits		
39-4-0629	Copi IF 25	GDA	54	534778	6279892	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Stephanie Rusden					Permits		
39-4-0588	Copi OS 16	GDA	54	534790	6279744	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Stephanie Rusden					Permits		
39-4-0621	Copi IF 33	GDA	54	534980	6278021	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Stephanie Rusden					Permits		
39-4-0579	Copi OS 7	GDA	54	536899	6280307	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Stephanie Rusden					Permits		
39-4-0582	Copi OS 10	GDA	54	532560	6279916	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Stephanie Rusden					Permits		
39-4-0632	Copi IF 23	GDA	54	534502	6279994	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Stephanie Rusden					Permits		
39-4-0615	Copi IF 39	GDA	54	535805	6278986	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Stephanie Rusden					Permits		
39-5-0007	Milkengay Lake;Southwest Beach M9b;	AGD	54	576776	6288104	Open site	Valid	Artefact :	Open Camp Site	

Report generated by AHIMS Web Service on 31/03/2022 for Stephanie Rusden for the following area at Datum :GDA, Zone : 54, Eastings : 499162.0 - 579162.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 110

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AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi revised ACHAR
Client Service ID : 671823

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
39-4-0650	Copi IF-4	GDA	54	526665	6282582	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0583	Copi OS-11	GDA	54	532787	6280327	Open site	Partially Destroyed	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
39-4-0607	Copi IF-49	GDA	54	533355	6285101	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0634	Copi IF-19	GDA	54	533771	6279791	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0633	Copi IF-20	GDA	54	533939	6280173	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0623	Copi IF-31	GDA	54	534104	6277593	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-5-0006	Milkengay Lake;M9a;Windmill Tank;	AGD	54	577690	6287647	Open site	Valid	Artefact : -, Burial : -	Burial/s,Open Camp Site	
	Contact	Recorders	ASRSYS					Permits		
39-5-0095	DA121	AGD	54	567140	6282350	Open site	Valid	Artefact : 42		
	Contact Searle	Recorders	Doctor.Matt Cupper					Permits		
39-5-0097	DA28	AGD	54	567198	6279387	Open site	Valid	Artefact : 8		
	Contact T Rossell	Recorders	Doctor.Matt Cupper					Permits		
39-4-0601	Copi IF-43	GDA	54	538064	6276172	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0622	Copi IF-32	GDA	54	534853	6277242	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0596	Copi OS-24	GDA	54	534929	6279086	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0594	Copi OS-23	GDA	54	535045	6278925	Open site	Partially Destroyed	Artefact : , Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
39-4-0578	Copi OS-27	GDA	54	535206	6279561	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0641	Copi IF-13	GDA	54	532171	6279339	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0574	Copi OS-31	GDA	54	532794	6282105	Open site	Partially Destroyed	Artefact : -, Potential Archaeological Deposit (PAD) : -		

Report generated by AHIMS Web Service on 31/03/2022 for Stephanie Rusden for the following area at Datum :GDA, Zone : 54, Eastings : 499162.0 - 579162.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 110

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

Page 1 of 7

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi revised ACHAR
Client Service ID : 671823

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	ASRSYS					Permits		
39-4-0600	Copi IF-42	GDA	54	537495	6277500	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0575	Copi OS-30	GDA	54	538359	6276402	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0619	Copi IF-35	GDA	54	534935	6278600	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0597	Copi OS-25	GDA	54	535170	6279050	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0642	Copi IF-12	GDA	54	532177	6280266	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0605	Copi IF-47	GDA	54	537800	6281510	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0637	Copi IF-17	GDA	54	533240	6279382	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0638	Copi IF-16	GDA	54	533294	6279713	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0616	Copi IF-38	GDA	54	535768	6278859	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-5-0055	DA25	AGD	54	567863	6275347	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact S Scanlon	Recorders	M.Hetherington and K.Verbury					Permits		
39-5-0096	DA26	AGD	54	568019	6279461	Open site	Valid	Artefact : 3		
	Contact Searle	Recorders	Doctor.Matt Cupper					Permits		
39-5-0095	DA123	AGD	54	569466	6283034	Open site	Valid	Artefact : 3		
	Contact Searle	Recorders	Doctor.Matt Cupper					Permits		
39-5-0066	DA32	AGD	54	569802	6284211	Open site	Valid	Artefact : 5		
	Contact Searle	Recorders	Doctor.Matt Cupper					Permits		
39-5-0065	DA33	AGD	54	570204	6283586	Open site	Valid	Artefact : 4		
	Contact Searle	Recorders	Doctor.Matt Cupper					Permits		
39-5-0063	DA29	AGD	54	567026	6279396	Open site	Valid	Artefact : 2		
	Contact Searle	Recorders	Doctor.Matt Cupper					Permits		
39-5-0085	DA109	AGD	54	567198	6279387	Open site	Valid	Artefact : 7		
	Contact Searle	Recorders	Doctor.Matt Cupper					Permits		
39-4-0602	Copi IF-44	GDA	54	539571	6276007	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		

Report generated by AHIMS Web Service on 31/03/2022 for Stephanie Rusden for the following area at Datum :GDA, Zone : 54, Eastings : 499162.0 - 579162.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 110

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

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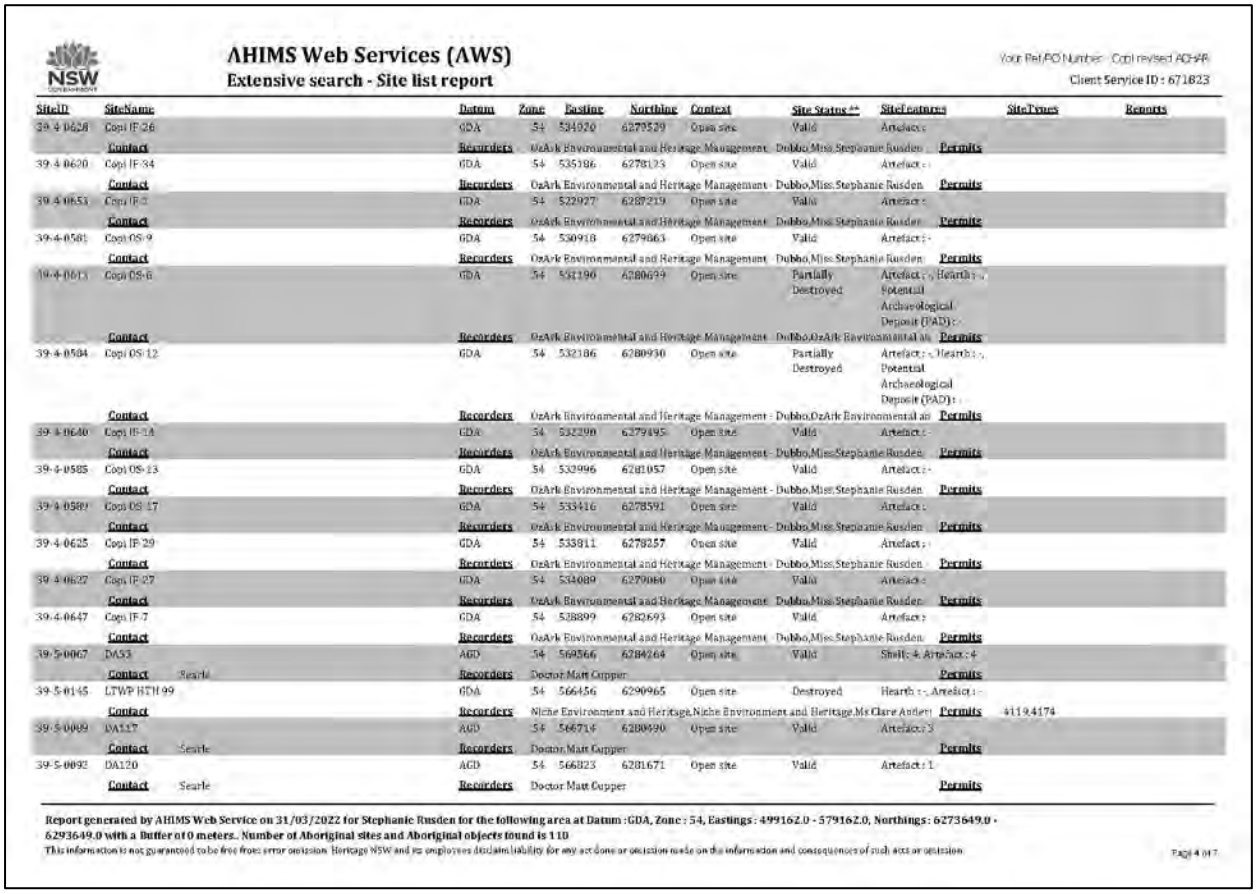

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number: Copi revised ACHR
Client Service ID : 671823

SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status **	SiteFeatures	SiteTypes	Reports
39-4-0628	Copi IF-26	GDA	54	534020	6279529	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0620	Copi IF-34	GDA	54	535186	6278123	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0653	Copi IF-5	GDA	54	522927	6287219	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0581	Copi OS-9	GDA	54	530918	6279863	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0613	Copi OS-6	GDA	54	531190	6280699	Open site	Partially Destroyed	Artefact: -, Hearth: -, Potential Archaeological Deposit (PAD): -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
39-4-0504	Copi OS-12	GDA	54	532186	6280930	Open site	Partially Destroyed	Artefact: -, Hearth: -, Potential Archaeological Deposit (PAD): -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
39-4-0640	Copi IF-14	GDA	54	532290	6279495	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0585	Copi OS-13	GDA	54	532996	6281057	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0589	Copi OS-17	GDA	54	533416	6278591	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0625	Copi IF-29	GDA	54	533811	6278257	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0627	Copi IF-27	GDA	54	534089	6279060	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0647	Copi IF-7	GDA	54	528899	6282693	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-5-0067	DA53	AGD	54	569566	6284264	Open site	Valid	Shell: 4, Artefact: 4		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-5-0145	LTWP HTH 99	GDA	54	566456	6290965	Open site	Destroyed	Hearth: -, Artefact: -		
	Contact	Recorders	Niche Environment and Heritage,Niche Environment and Heritage,Ms Clare Antler					Permits	4119,4174	
39-5-0069	DA127	AGD	54	566714	6280690	Open site	Valid	Artefact: 3		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-5-0092	DA120	AGD	54	566823	6281671	Open site	Valid	Artefact: 1		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		

Report generated by AHIMS Web Service on 31/03/2022 for Stephanie Rusden for the following area at Datum : GDA, Zone : 54, Eastings : 499162.0 - 579162.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 110

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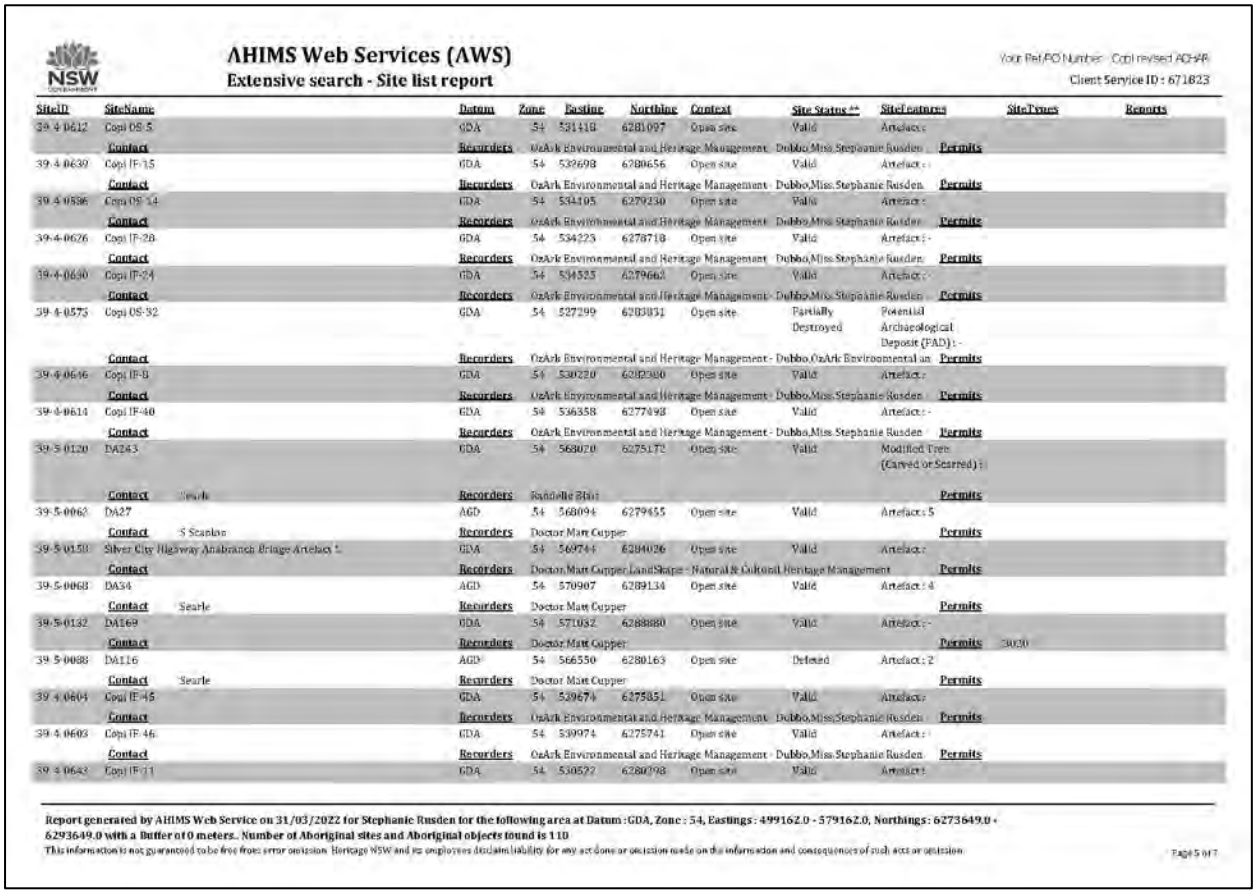

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number: Copi revised ACHR
Client Service ID : 671823

SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status **	SiteFeatures	SiteTypes	Reports
39-4-0612	Copi OS-5	GDA	54	531118	6281097	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0639	Copi IF-15	GDA	54	532698	6280656	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0586	Copi OS-14	GDA	54	534105	6279230	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0626	Copi IF-28	GDA	54	534223	6278718	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0630	Copi IF-24	GDA	54	534525	6279662	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0573	Copi OS-32	GDA	54	527299	6283831	Open site	Partially Destroyed	Potential Archaeological Deposit (PAD): -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
39-4-0646	Copi IF-8	GDA	54	530220	6282980	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0614	Copi IF-40	GDA	54	536358	6277498	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-5-0120	DA243	GDA	54	563020	6275172	Open site	Valid	Modified Tree (Carved or Scarred): -		
	Contact Searle	Recorders	Rachelle Blair					Permits		
39-5-0063	DA27	AGD	54	568094	6279455	Open site	Valid	Artefact: 5		
	Contact S Stanley	Recorders	Doctor Matt Cupper					Permits		
39-5-0150	Silver City Highway Anabranch Bridge Artefact 1	GDA	54	569744	6284026	Open site	Valid	Artefact: -		
	Contact	Recorders	Doctor Matt Cupper,LandSkape - Natural & Cultural Heritage Management					Permits		
39-5-0068	DA34	AGD	54	570907	6289134	Open site	Valid	Artefact: 4		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-5-0132	DA169	GDA	54	571032	6288880	Open site	Valid	Artefact: -		
	Contact	Recorders	Doctor Matt Cupper					Permits	3020	
39-5-0088	DA116	AGD	54	566550	6280163	Open site	Defaced	Artefact: 2		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-4-0604	Copi IF-45	GDA	54	529674	6275851	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0603	Copi IF-46	GDA	54	529974	6275741	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0643	Copi IF-11	GDA	54	530522	6280798	Open site	Valid	Artefact: -		

Report generated by AHIMS Web Service on 31/03/2022 for Stephanie Rusden for the following area at Datum : GDA, Zone : 54, Eastings : 499162.0 - 579162.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 110

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AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi revised ACHAR
Client Service ID : 671823

SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0644	Copi IF 10	GDA	54	530852	6280691	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0577	Copi OS 28	GDA	54	535170	6277392	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0649	Copi IF 5	GDA	54	526846	6283550	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0646	Copi IF 6	GDA	54	528740	6282175	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0645	Copi IF 9	GDA	54	530145	6281327	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0611	Copi OS 6	GDA	54	530187	6282240	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0599	Copi IF 41	GDA	54	536052	6276554	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0576	Copi OS 29	GDA	54	536416	6276759	Open site	Valid	Artefact : - ; Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-5-0004	Milkengoy Lake;SE Blowout Fossil Bone;MS;	AGD	54	577781	6287556	Open site	Valid	Artefact :	Open Camp Site	
	Contact	Recorders	ASRSYS					Permits		
39-4-0580	Copi OS 8	GDA	54	530700	6280248	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0598	Copi OS 26	GDA	54	535059	6279426	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0652	Copi IF 2	GDA	54	525397	6284063	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0651	Copi IF 3	GDA	54	525790	6283287	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0600	Copi OS 1	GDA	54	524782	6285450	Open site	Partially Destroyed	Artefact : - ; Potential Archaeological Deposit (PAD) : - ; Modified Tree (Carved or Scarred) :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
39-4-0636	Copi IF 18	GDA	54	533390	6279172	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		

Report generated by AHIMS Web Service on 31/03/2022 for Stephanie Rusden for the following area at Datum : GDA, Zone : 54, Eastings : 499162.0 - 579162.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 110

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NSW

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi revised ACHAR
Client Service ID : 671823

SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status **	SiteFeatures	SiteTypes	Reports
39-4-0590	Copi OS 18	GDA	54	533741	6278697	Open site	Partially Destroyed	Artefact : - ; Potential Archaeological Deposit (PAD) :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
39-4-0624	Copi IF 30	GDA	54	538810	6277838	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0632	Copi IF 23	GDA	54	534384	6280297	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0593	Copi OS 21	GDA	54	534507	6278085	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0609	Copi OS 2	GDA	54	528872	6282931	Open site	Valid	Artefact : - ; Potential Archaeological Deposit (PAD) :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0610	Copi OS 3	GDA	54	529378	6282701	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-5-0156	MBSD APT 9	GDA	54	570075	6284040	Open site	Destroyed	Artefact :		
	Contact	Recorders	Niche Environment and Heritage,Niche Environment and Heritage,Ms Clare Ander					Permits	4174	
39-4-0738	WDFEP133	GDA	54	500244	6286288	Open site	Valid	Artefact :		
	Contact	Recorders	Lantern Heritage Pty Ltd - Tathra,Miss Majella Hammersley					Permits		
39-5-0097	DA119	AGD	54	566854	6281592	Open site	Valid	Artefact : 2		
	Contact Mr	Recorders	Doctor Matt Cupper					Permits		
39-4-0618	Copi IF 36	GDA	54	535084	6278670	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0617	Copi IF 37	GDA	54	535195	6278642	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		

** Site Status
Valid - The site has been recorded and accepted onto the system as valid
Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution
Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground
Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 31/03/2022 for Stephanie Rusden for the following area at Datum : GDA, Zone : 54, Eastings : 499162.0 - 579162.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 110

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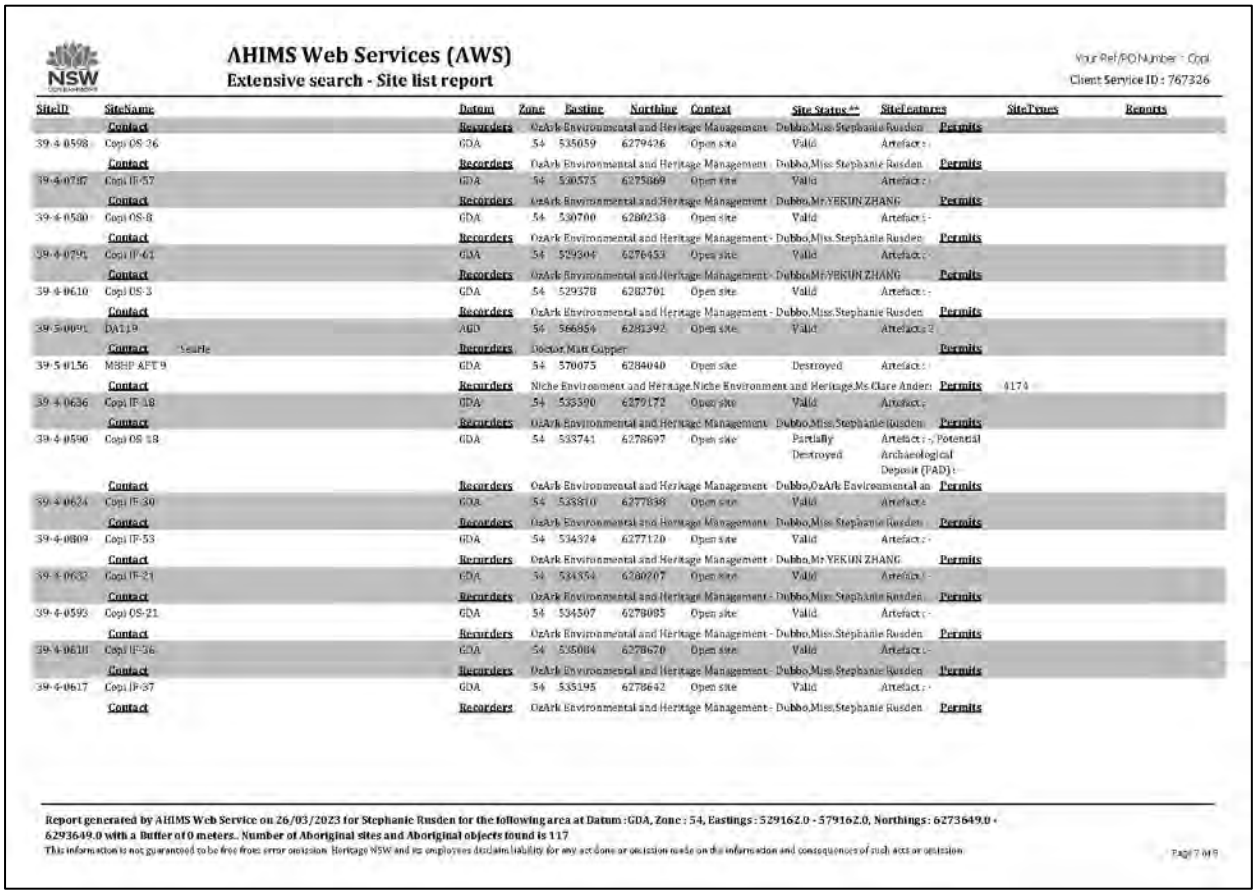
26 March 2023 AHIMS search



AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi
Client Service ID : 767326

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0598	Copi OS 26	GDA	54	535059	6279426	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0787	Copi IF-57	GDA	54	530575	6275869	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr YEKUN ZHANG					Permits		
39-4-0580	Copi OS-8	GDA	54	530700	6280238	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0791	Copi IF-61	GDA	54	529304	6276453	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr YEKUN ZHANG					Permits		
39-4-0610	Copi OS-3	GDA	54	529378	6283701	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-5-0091	DA119	AGD	54	566954	6281392	Open site	Valid	Artefact : 2		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-5-0156	MBHP AFT 9	GDA	54	570075	6284040	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Niche Environment and Heritage,Niche Environment and Heritage,Ms Clare Anders					Permits	4174	
39-4-0636	Copi IF-18	GDA	54	535390	6279172	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0590	Copi OS 18	GDA	54	533741	6278697	Open site	Partially Destroyed	Artefact : -; Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
39-4-0624	Copi IF-30	GDA	54	533810	6277838	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0809	Copi IF-53	GDA	54	534324	6277120	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr YEKUN ZHANG					Permits		
39-4-0632	Copi IF-21	GDA	54	534354	6280707	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0593	Copi OS-21	GDA	54	534507	6279085	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0611	Copi IF-36	GDA	54	535084	6278670	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0617	Copi IF-37	GDA	54	535195	6278642	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		

Report generated by AHIMS Web Service on 26/03/2023 for Stephanie Rusden for the following area at Datum : GDA, Zone : 54, Eastings : 529162.0 - 579162.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 117

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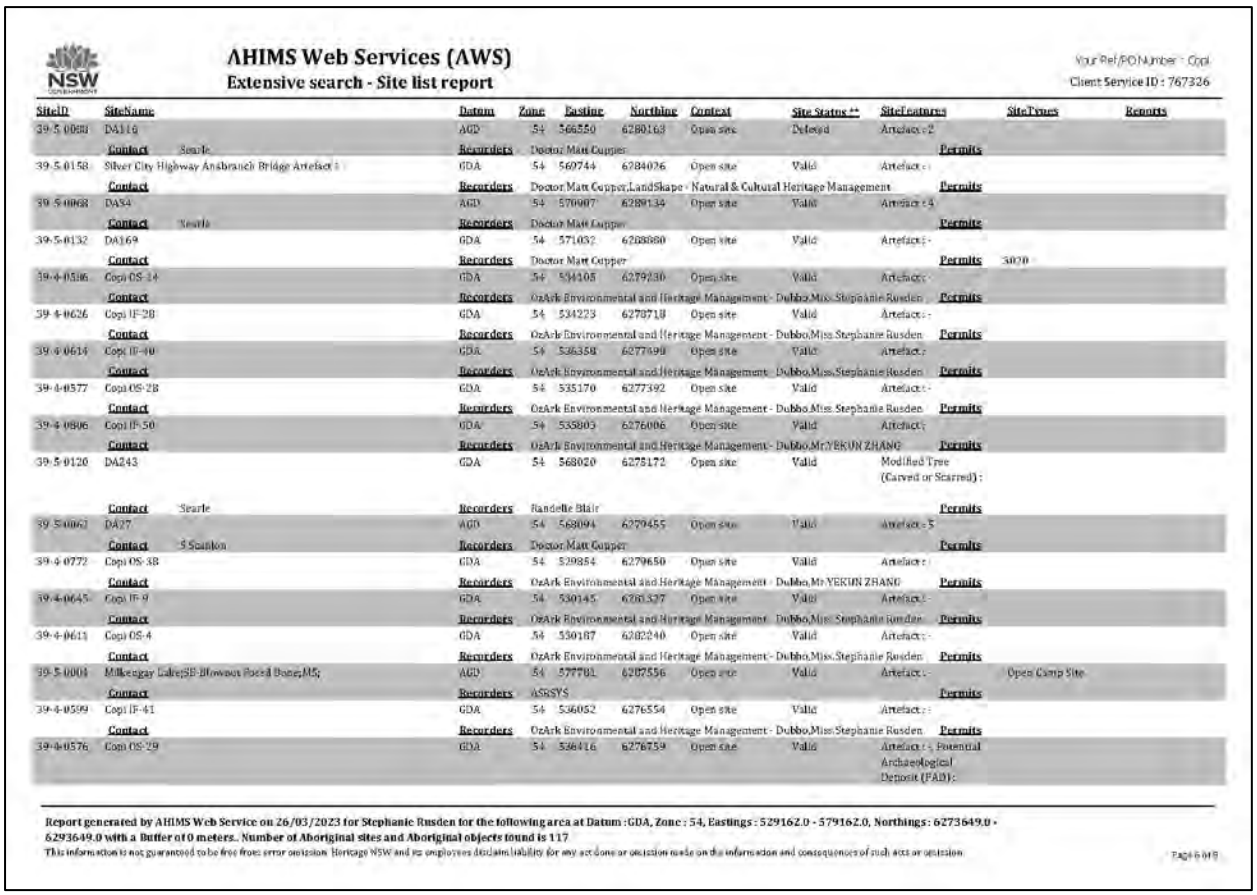

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi
Client Service ID : 767326

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
39-5-0088	DA116	AGD	54	566550	6280163	Open site	Deleted	Artefact : 2		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-5-0158	Silver City Highway Ansbranch Bridge Artefact 1	GDA	54	560744	6284026	Open site	Valid	Artefact : -		
	Contact	Recorders	Doctor Matt Cupper,LandSkape - Natural & Cultural Heritage Management					Permits		
39-5-0068	DA34	AGD	54	570007	6289134	Open site	Valid	Artefact : 4		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-5-0132	DA169	GDA	54	571032	6288880	Open site	Valid	Artefact : -		
	Contact	Recorders	Doctor Matt Cupper					Permits	3020	
39-4-0586	Copi OS-14	GDA	54	534108	6279230	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0626	Copi IF-28	GDA	54	534223	6278718	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0614	Copi IF-40	GDA	54	536358	6277699	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0577	Copi OS-28	GDA	54	535170	6277392	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0806	Copi IF-50	GDA	54	535803	6276006	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr YEKUN ZHANG					Permits		
39-5-0120	DA243	GDA	54	568020	6278172	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact Searle	Recorders	Randelle Blair					Permits		
39-5-0062	DA27	AGD	54	568094	6279455	Open site	Valid	Artefact : 5		
	Contact S Scanlon	Recorders	Doctor Matt Cupper					Permits		
39-4-0772	Copi OS-38	GDA	54	529854	6279650	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr YEKUN ZHANG					Permits		
39-4-0645	Copi IF-9	GDA	54	530145	6281527	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0611	Copi OS-4	GDA	54	530187	6282240	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-5-0004	Milkengay Lake;SB-Blowout Pocket Bone;MS;	AGD	54	577781	6287556	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	ASRSYS					Permits		
39-4-0599	Copi IF-41	GDA	54	536052	6276554	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0576	Copi OS-29	GDA	54	536416	6276759	Open site	Valid	Artefact : -; Potential Archaeological Deposit (PAD) : -		

Report generated by AHIMS Web Service on 26/03/2023 for Stephanie Rusden for the following area at Datum : GDA, Zone : 54, Eastings : 529162.0 - 579162.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 117

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AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi
Client Service ID : 767326

SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status **	SiteFeatures	SiteTypes	Reports
39-4-0585	Copi OS-13	GDA	54	532996	6281057	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-5-0145	LTWP HTH 09	GDA	54	566456	6290965	Open site	Destroyed	Hearth : , Artefact :		
	Contact	Recorders	Niche Environment and Heritage,Niche Environment and Heritage,Ms Clare Ander					Permits	4119,4174	
39-5-0080	DA117	AGD	54	566714	6280890	Open site	Valid	Artefact : 3		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-5-0092	DA120	AGD	54	566823	6281671	Open site	Valid	Artefact : 1,		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-5-0067	DA33	AGD	54	569566	6284264	Open site	Valid	Shell : 4, Artefact : 4		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-4-0589	Copi OS-17	GDA	54	533416	6278591	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0625	Copi IF-29	GDA	54	533811	6278257	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0627	Copi IF-27	GDA	54	534089	6279060	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0807	Copi IF-51	GDA	54	534170	6276514	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr YEKUN ZHANG					Permits		
39-4-0644	Copi IF-10	GDA	54	530852	6280691	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0617	Copi OS-5	GDA	54	529418	6281097	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0774	Copi OS-40	GDA	54	529977	6280205	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr YEKUN ZHANG					Permits		
39-4-0646	Copi IF-8	GDA	54	530220	6280480	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0643	Copi IF-11	GDA	54	530522	6280298	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0639	Copi IF-15	GDA	54	532698	6280656	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0630	Copi IF-24	GDA	54	534525	6279662	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0604	Copi IF-45	GDA	54	539674	6275851	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0603	Copi IF-46	GDA	54	539974	6275741	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		

Report generated by AHIMS Web Service on 26/03/2023 for Stephanie Rusden for the following area at Datum : GDA, Zone : 54, Eastings : 529162.0 - 537916.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 117

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AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi
Client Service ID : 767326

SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status **	SiteFeatures	SiteTypes	Reports
39-5-0065	DA31	AGD	54	570204	6283586	Open site	Valid	Artefact : 4		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-4-0637	Copi IF-17	GDA	54	532340	6279382	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0638	Copi IF-16	GDA	54	533294	6279713	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0628	Copi IF-26	GDA	54	534920	6279539	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0620	Copi IF-34	GDA	54	535186	6278123	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0616	Copi IF-38	GDA	54	536760	6278859	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-5-0055	DA25	AGD	54	567963	6275347	Open site	Valid	Modified Tree (Carved or Scarred) : 1,		
	Contact S Scanlon	Recorders	M.Hetherington and K.Yerbury					Permits		
39-5-0096	DA26	AGD	54	568019	6279461	Open site	Valid	Artefact : 3		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-4-0581	Copi OS-9	GDA	54	530918	6279963	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0615	Copi OS-6	GDA	54	531190	6280699	Open site	Partially Destroyed	Artefact : , Hearth : , Potential Archaeological Deposit (PAD) :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
39-4-0786	Copi IF-56	GDA	54	531582	6276516	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr YEKUN ZHANG					Permits		
39-4-0614	Copi OS-7	GDA	54	532186	6280930	Open site	Partially Destroyed	Artefact : , Hearth : , Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
39-4-0640	Copi IF-14	GDA	54	532290	6279495	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0790	Copi IF-60	GDA	54	529955	6277270	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr YEKUN ZHANG					Permits		
39-4-0804	Copi OS-55	GDA	54	529989	6277061	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr YEKUN ZHANG					Permits		

Report generated by AHIMS Web Service on 26/03/2023 for Stephanie Rusden for the following area at Datum : GDA, Zone : 54, Eastings : 529162.0 - 537916.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 117

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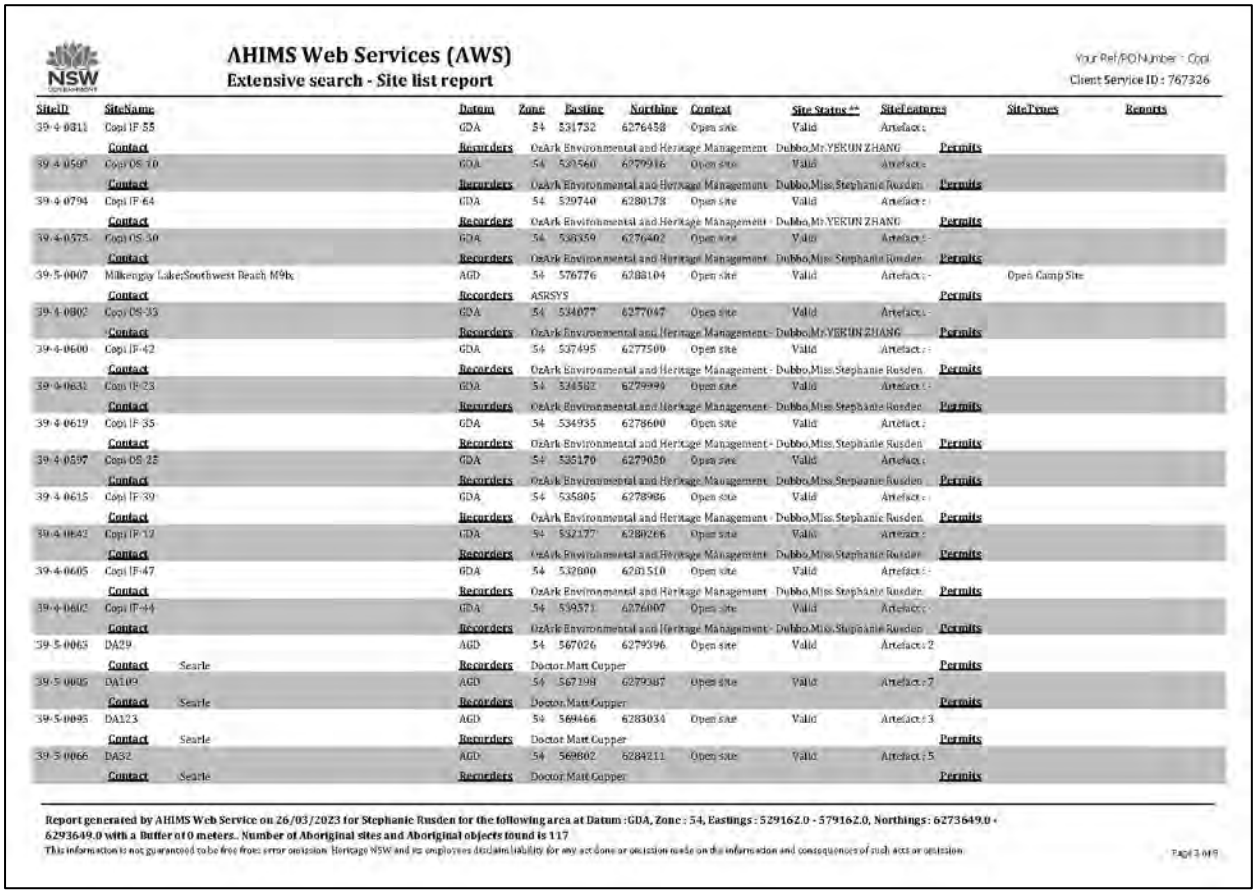

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi
Client Service ID : 767326

SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status **	SiteFeatures	SiteTypes	Reports
39-4-0311	Copi IF 55	GDA	54	531732	6276458	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management				Dubbo,Mr YEKUN ZHANG	Permits		
39-4-0597	Copi OS 10	GDA	54	529560	6279916	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management				Dubbo,Miss Stephanie Rusden	Permits		
39-4-0794	Copi IF 64	GDA	54	529740	6280178	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management				Dubbo,Mr YEKUN ZHANG	Permits		
39-4-0575	Copi OS 30	GDA	54	536359	6276402	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management				Dubbo,Miss Stephanie Rusden	Permits		
39-5-0007	Milkengay Lake;Southwest Beach M9b;	AGD	54	576776	6288104	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	ASRSYS					Permits		
39-4-0802	Copi OS 33	GDA	54	534077	6277047	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr YEKUN ZHANG					Permits		
39-4-0600	Copi IF 42	GDA	54	537495	6277509	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0632	Copi IF 23	GDA	54	534582	6279994	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0619	Copi IF 35	GDA	54	534935	6278600	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0597	Copi OS 25	GDA	54	535170	6279050	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0615	Copi IF 39	GDA	54	535805	6278986	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0642	Copi IF 12	GDA	54	532177	6280266	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0605	Copi IF 47	GDA	54	532600	6280510	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0602	Copi IF 44	GDA	54	533571	6276007	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-5-0063	DA29	AGD	54	567026	6279396	Open site	Valid	Artefact : 2		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-5-0065	DA109	AGD	54	567198	6279387	Open site	Valid	Artefact : 7		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-5-0095	DA123	AGD	54	569466	6283034	Open site	Valid	Artefact : 3		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-5-0066	DA32	AGD	54	569802	6284211	Open site	Valid	Artefact : 5		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		

Report generated by AHIMS Web Service on 26/03/2023 for Stephanie Rusden for the following area at Datum : GDA, Zone : 54, Eastings : 529162.0 - 537162.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 117

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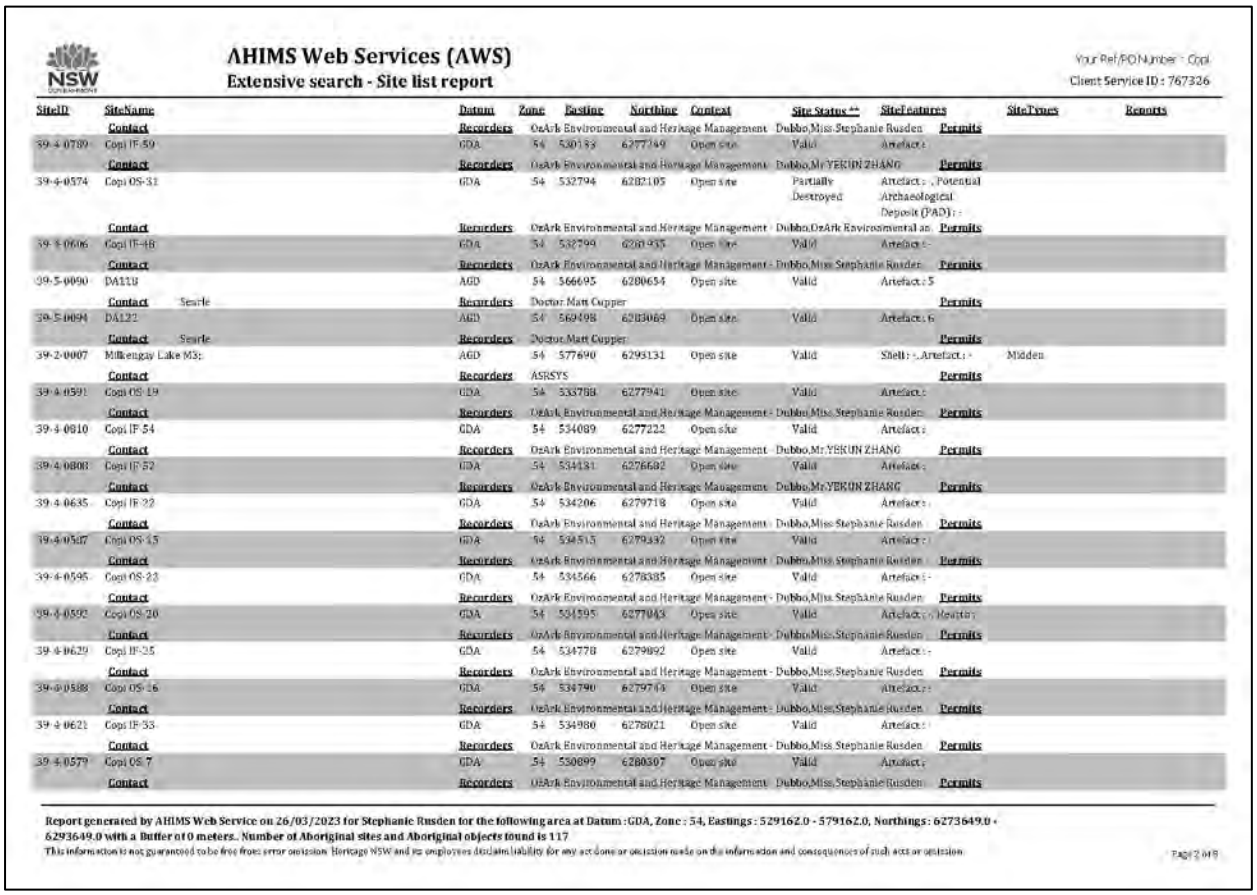

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi
Client Service ID : 767326

SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	OzArk Environmental and Heritage Management				Dubbo,Miss Stephanie Rusden	Permits		
39-4-0789	Copi IF 59	GDA	54	530183	6277349	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management				Dubbo,Mr YEKUN ZHANG	Permits		
39-4-0574	Copi OS 31	GDA	54	532794	6282105	Open site	Partially Destroyed	Artefact : , Potential Archaeological Deposit (PAD) : :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
39-4-0606	Copi IF 48	GDA	54	532799	6280435	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-5-0090	DA118	AGD	54	566695	6280654	Open site	Valid	Artefact : 5		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-5-0094	DA122	AGD	54	569498	6283069	Open site	Valid	Artefact : 6		
	Contact Searle	Recorders	Doctor Matt Cupper					Permits		
39-2-0007	Milkengay Lake M3;	AGD	54	577690	6293131	Open site	Valid	Shell : - ,Artefact : -	Midden	
	Contact	Recorders	ASRSYS					Permits		
39-4-0591	Copi OS 19	GDA	54	533788	6277941	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0810	Copi IF 54	GDA	54	534089	6277222	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management				Dubbo,Mr YEKUN ZHANG	Permits		
39-4-0808	Copi IF 52	GDA	54	534181	6276692	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management				Dubbo,Mr YEKUN ZHANG	Permits		
39-4-0635	Copi IF 22	GDA	54	534206	6279718	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0587	Copi OS 15	GDA	54	534515	6279332	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0595	Copi OS 23	GDA	54	534566	6278385	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0592	Copi OS 20	GDA	54	534595	6277043	Open site	Valid	Artefact : , Heritage		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0629	Copi IF 25	GDA	54	534778	6279892	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0588	Copi OS 16	GDA	54	534790	6279743	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0621	Copi IF 33	GDA	54	534980	6278021	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0579	Copi OS 7	GDA	54	530899	6280307	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management				Dubbo,Miss Stephanie Rusden	Permits		

Report generated by AHIMS Web Service on 26/03/2023 for Stephanie Rusden for the following area at Datum : GDA, Zone : 54, Eastings : 529162.0 - 537162.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 117

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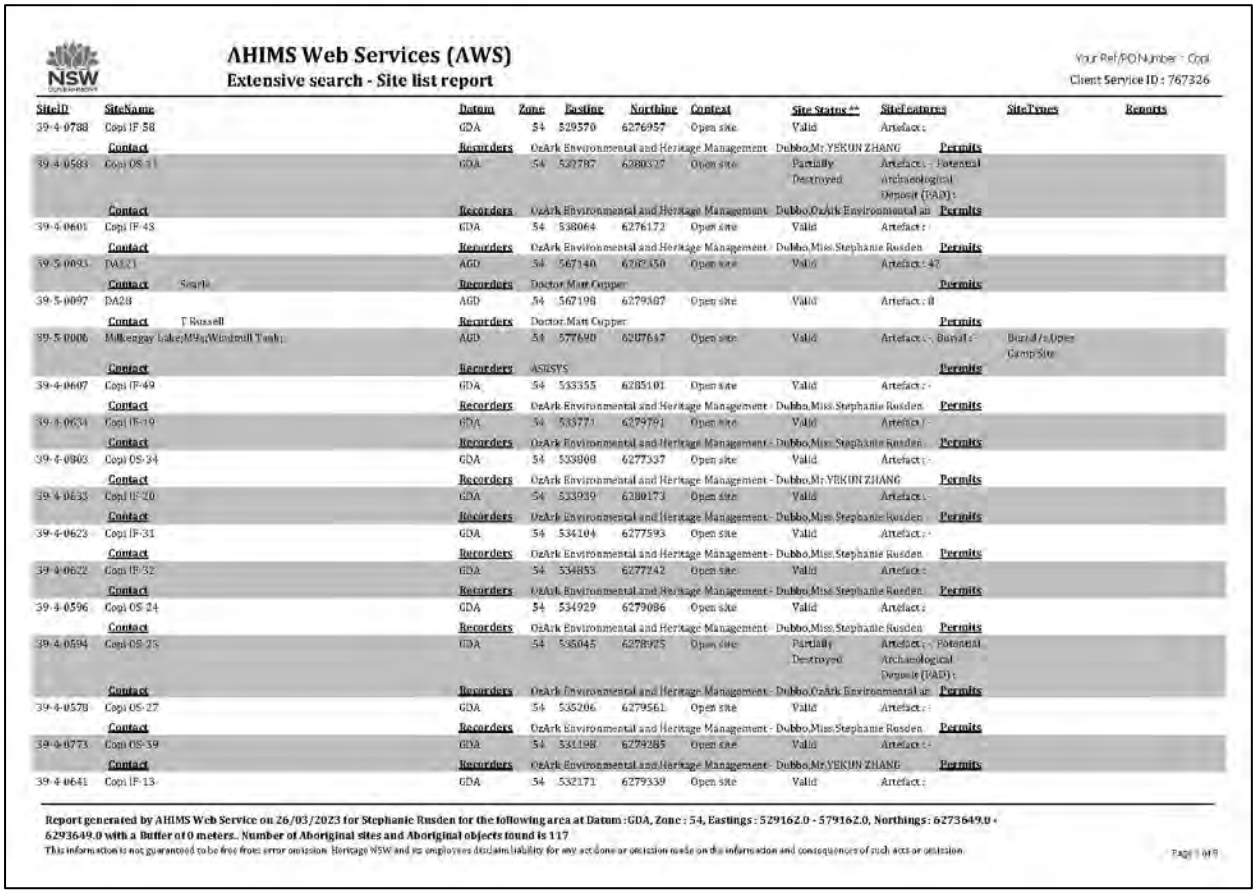

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi
Client Service ID : 767326

SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status **	Site Features	Site Types	Reports
39-4-0788	Copi IF 58	GDA	54	529570	6276957	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management			Dubbo,Mr YEKUN ZHANG		Permits		
39-4-0593	Copi OS 31	GDA	54	529787	6280327	Open site	Partially Destroyed	Artefact : - Potential Archaeological Deposit (PAD) :		
	Contact	Recorders	OzArk Environmental and Heritage Management			Dubbo,OzArk Environmental an		Permits		
39-4-0601	Copi IF 43	GDA	54	538064	6276172	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-5-0093	DA121	AGD	54	567140	6282450	Open site	Valid	Artefact : 42		
	Contact Search	Recorders	Doctor Matt Cupper					Permits		
39-5-0097	DA28	AGD	54	567198	6279307	Open site	Valid	Artefact : 8		
	Contact T Russell	Recorders	Doctor Matt Cupper					Permits		
39-5-0006	Milkengay Lake;Mya;Windmill Tank;	AGD	54	577690	6287617	Open site	Valid	Artefact : -	Burial / s;Open Camp Site	
	Contact	Recorders	ASESYS					Permits		
39-4-0607	Copi IF 49	GDA	54	533355	6285101	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0634	Copi IF 19	GDA	54	533771	6279791	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0803	Copi OS 34	GDA	54	533008	6277337	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr YEKUN ZHANG					Permits		
39-4-0633	Copi IF 20	GDA	54	533939	6280173	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0623	Copi IF 31	GDA	54	534104	6277593	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0622	Copi IF 32	GDA	54	534853	6277742	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0596	Copi OS 24	GDA	54	534929	6279086	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0594	Copi OS 25	GDA	54	535045	6278925	Open site	Partially Destroyed	Artefact : - Potential Archaeological Deposit (PAD) :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
39-4-0578	Copi OS 27	GDA	54	535206	6279561	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0773	Copi OS 39	GDA	54	531198	6279285	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr YEKUN ZHANG					Permits		
39-4-0641	Copi IF 13	GDA	54	532171	6279339	Open site	Valid	Artefact :		

Report generated by AHIMS Web Service on 26/03/2023 for Stephanie Rusden for the following area at Datum : GDA, Zone : 54, Eastings : 529162.0 - 579162.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 117
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AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi
Client Service ID : 767326

SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status **	Site Features	Site Types	Reports

**** Site Status**
Valid - The site has been recorded and accepted onto the system as valid
Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution
Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground
Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 26/03/2023 for Stephanie Rusden for the following area at Datum : GDA, Zone : 54, Eastings : 529162.0 - 579162.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 117
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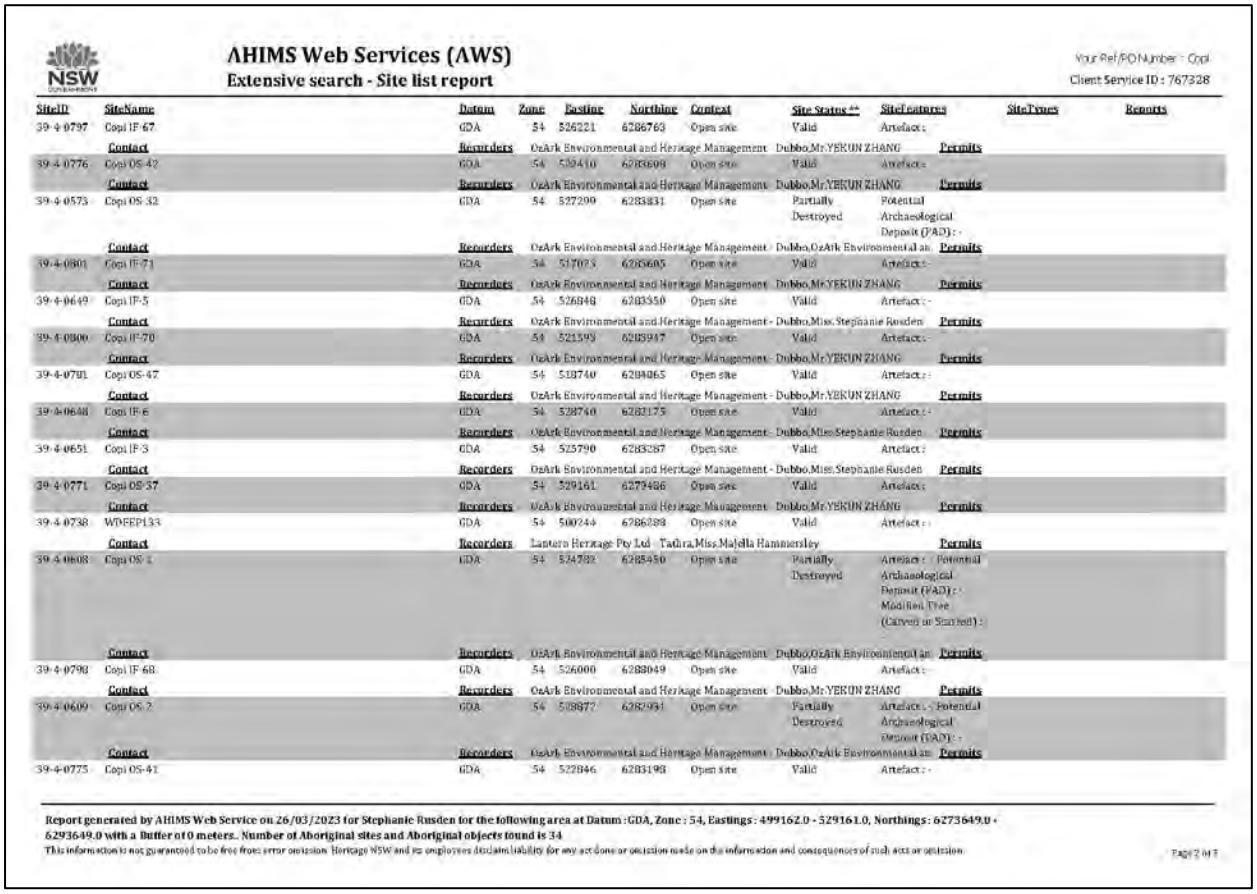

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi
Client Service ID : 767328

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
39-4-0797	Copi IF-67	GDA	54	526221	6286763	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0776	Copi OS-42	GDA	54	529410	6283609	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0573	Copi OS-32	GDA	54	527299	6283831	Open site	Partially Destroyed	Potential Archaeological Deposit (PAD): -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
39-4-0801	Copi IF-71	GDA	54	517073	6286605	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0649	Copi IF-5	GDA	54	526848	6283350	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0800	Copi IF-70	GDA	54	521599	6283947	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0791	Copi OS-47	GDA	54	518740	6284065	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0648	Copi IF-6	GDA	54	528740	6283175	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0651	Copi IF-3	GDA	54	525790	6283287	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0771	Copi OS-37	GDA	54	529161	6279486	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0738	WDPEP133	GDA	54	500244	6286289	Open site	Valid	Artefact: -		
	Contact	Recorders	Lantern Heritage Pty Ltd - Tathra,Miss Majella Hammersley					Permits		
39-4-0608	Copi OS-1	GDA	54	524782	6285450	Open site	Partially Destroyed	Artefact: - Potential Archaeological Deposit (PAD): - Modified Tree (Carved or Scarred): -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
39-4-0798	Copi IF-68	GDA	54	526000	6283049	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0609	Copi OS-2	GDA	54	508877	6282934	Open site	Partially Destroyed	Artefact: - Potential Archaeological Deposit (PAD): -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
39-4-0775	Copi OS-41	GDA	54	522846	6283198	Open site	Valid	Artefact: -		

Report generated by AHIMS Web Service on 26/03/2023 for Stephanie Rusden for the following area at Datum : GDA, Zone : 54, Eastings : 499162.0 - 529161.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 34

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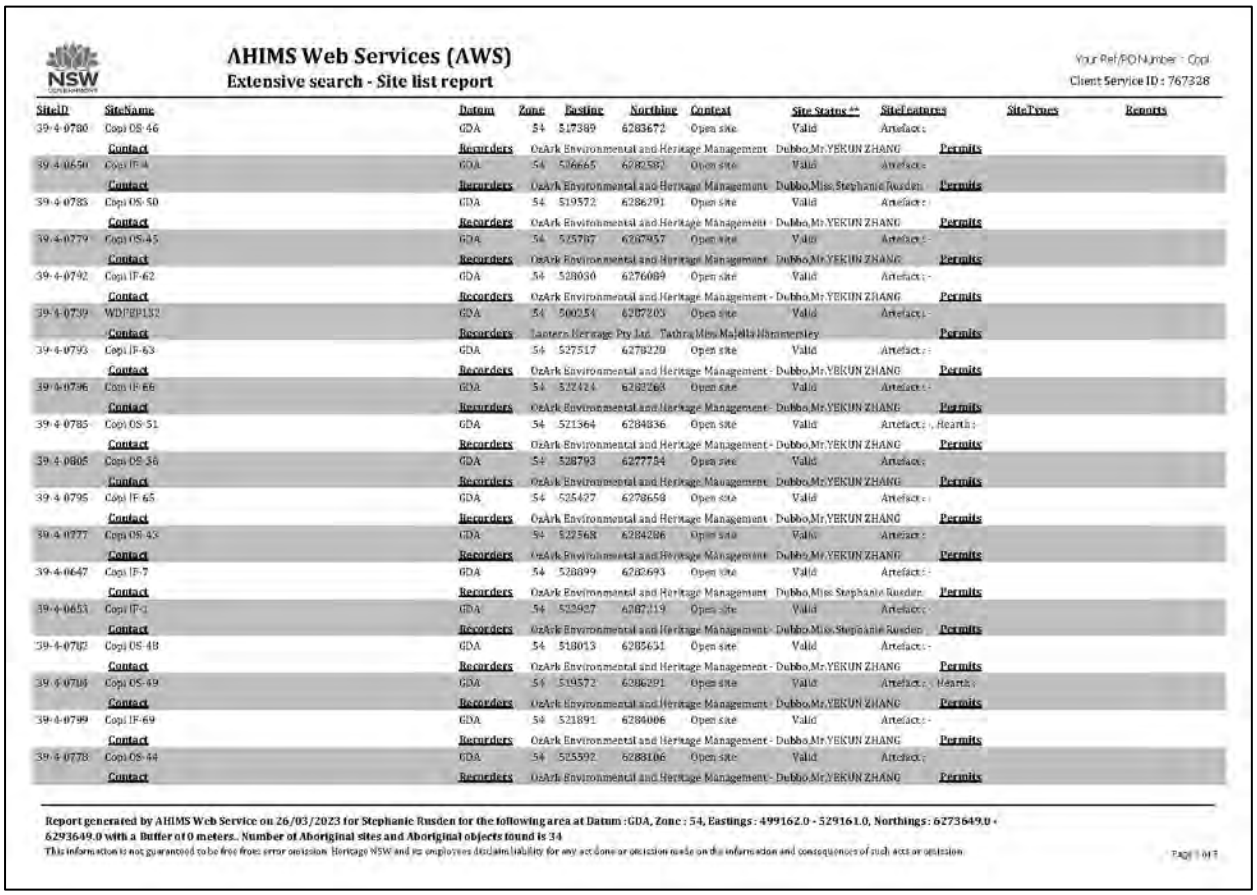

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi
Client Service ID : 767328

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
39-4-0780	Copi OS-46	GDA	54	517389	6283672	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0650	Copi IF-4	GDA	54	526665	6283582	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0785	Copi OS-50	GDA	54	519572	6286291	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0779	Copi OS-45	GDA	54	525787	6287957	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0792	Copi IF-62	GDA	54	528050	6276089	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0739	WDPEP132	GDA	54	500254	6287205	Open site	Valid	Artefact: -		
	Contact	Recorders	Lantern Heritage Pty Ltd - Tathra,Miss Majella Hammersley					Permits		
39-4-0793	Copi IF-63	GDA	54	527517	6278329	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0796	Copi IF-66	GDA	54	522424	6283263	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0785	Copi OS-51	GDA	54	521364	6284836	Open site	Valid	Artefact: - , Hearth: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0805	Copi OS-36	GDA	54	528793	6277754	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0795	Copi IF-65	GDA	54	525427	6278659	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0777	Copi OS-43	GDA	54	522568	6284286	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0647	Copi IF-7	GDA	54	528899	6282693	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0653	Copi IF-1	GDA	54	523927	6287119	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss Stephanie Rusden					Permits		
39-4-0702	Copi OS-48	GDA	54	518013	6285651	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0705	Copi OS-49	GDA	54	519572	6286291	Open site	Valid	Artefact: - , Hearth: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0799	Copi IF-69	GDA	54	521891	6284006	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		
39-4-0778	Copi OS-44	GDA	54	525592	6283106	Open site	Valid	Artefact: -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.YEKUN ZHANG					Permits		

Report generated by AHIMS Web Service on 26/03/2023 for Stephanie Rusden for the following area at Datum : GDA, Zone : 54, Eastings : 499162.0 - 529161.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 34

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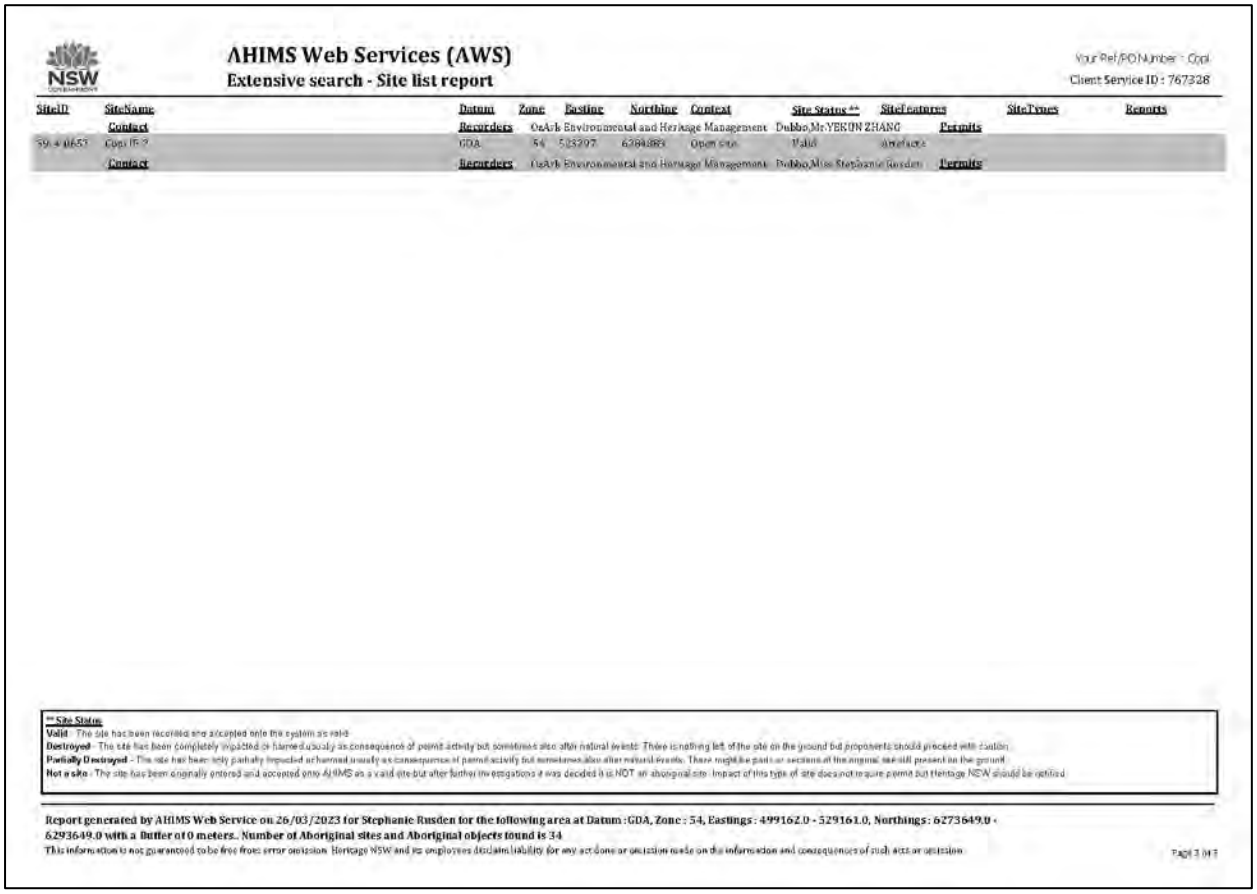

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi
Client Service ID : 767328

SiteID	SiteName	Datum	Zone	Eastings	Northings	Context	Site Status **	Site features	Site Types	Reports
	Contact	Recorders	OzArk Environmental and Heritage Management				Dubbo,Mr.YEKUN ZHANG		Permits	
59-4-0653	Copi IF-2	GDA	54	523297	6294883	Open site	Valid	artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management				Dubbo,Miss Stephanie Rusden		Permits	

** Site Status
Valid - The site has been recorded and accepted onto the system as valid
Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution
Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground
Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 26/03/2023 for Stephanie Rusden for the following area at Datum : GDA, Zone : 54, Eastings : 499162.0 - 529161.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 34
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22 April 2024 AHIMS search

AHIMS Web Services (AWS)

Note: This Excel report shows the sites found in AHIMS on the 22/04/2024. If this date is not the same as the original date of the Search Results letter obtained during the Basic Search, then the search results might be different. The PDF version of this report will always coincide with the Basic Search Results letter.

Site ID	Site name	Datum	Zone	Easting	Northing	Context	Site status	Site features	Site types	Recorders
39-4-0578	Copi OS-27	GDA	54	535206	6279561	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0583	Copi OS-11	GDA	54	532787	6280327	Open site	Partially Destroyed	Artefact : -, Potential Archaeological Deposit (PAD) : -		OzArk Environmental and Heritage Management -
39-4-0594	Copi OS-23	GDA	54	535045	6278925	Open site	Partially Destroyed	Artefact : -, Potential Archaeological Deposit (PAD) : -		OzArk Environmental and Heritage Management -
39-4-0596	Copi OS-24	GDA	54	534929	6279086	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-5-0006	Milkengay Lake;M9a;Windmill Tank;	AGD	54	577690	6287647	Open site	Valid	Artefact : -, Burial : -	Burial/s,Open Camp Site	ASRSYS
39-5-0093	DA121	AGD	54	567140	6282350	Open site	Valid	Artefact : 42		Doctor.Matt Cupper
39-5-0097	DA28	AGD	54	567198	6279387	Open site	Valid	Artefact : 8		Doctor.Matt Cupper
39-4-0601	Copi IF-43	GDA	54	538064	6276172	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0607	Copi IF-49	GDA	54	533355	6285101	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0622	Copi IF-32	GDA	54	534853	6277242	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0623	Copi IF-31	GDA	54	534104	6277593	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0633	Copi IF-20	GDA	54	533939	6280173	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0634	Copi IF-19	GDA	54	533771	6279791	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0788	Copi IF-58	GDA	54	529570	6276957	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0803	Copi OS-34	GDA	54	533808	6277337	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0850	Copi IF-84	GDA	54	532709	6275156	Open site	Valid	Artefact : -		Ms.Sophia Grubnic
39-4-0574	Copi OS-31	GDA	54	532794	6282105	Open site	Partially Destroyed	Artefact : -, Potential Archaeological Deposit (PAD) : -		OzArk Environmental and Heritage Management -
39-4-0587	Copi OS-15	GDA	54	534515	6279332	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0588	Copi OS-16	GDA	54	534790	6279744	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0591	Copi OS-19	GDA	54	533788	6277941	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0592	Copi OS-20	GDA	54	534595	6277843	Open site	Valid	Artefact : -, Hearth : -		OzArk Environmental and Heritage Management -
39-4-0595	Copi OS-22	GDA	54	534566	6278385	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-2-0007	Milkengay Lake M3;	AGD	54	577690	6293131	Open site	Valid	Shell : -, Artefact : -	Midden	ASRSYS
39-5-0090	DA118	AGD	54	566695	6280654	Open site	Valid	Artefact : 5		Doctor.Matt Cupper
39-5-0094	DA122	AGD	54	569498	6283069	Open site	Valid	Artefact : 6		Doctor.Matt Cupper
39-4-0606	Copi IF-48	GDA	54	532799	6281935	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0621	Copi IF-33	GDA	54	534980	6278021	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0629	Copi IF-25	GDA	54	534778	6279892	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0635	Copi IF-22	GDA	54	534206	6279718	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0641	Copi IF-13	GDA	54	532171	6279339	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0773	Copi OS-39	GDA	54	531198	6279285	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0789	Copi IF-59	GDA	54	530133	6277249	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0808	Copi IF-52	GDA	54	534131	6276682	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0810	Copi IF-54	GDA	54	534089	6277222	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0848	Copi IF-82	GDA	54	531883	6275462	Open site	Valid	Artefact : -		Ms.Sophia Grubnic

39-4-0852	Copi OS-53	GDA	54	539802	6279189	Open site	Valid	Artefact : -		Ms.Sophia Grubnic
39-4-0854	Copi OS-55	GDA	54	538160	6279014	Open site	Valid	Artefact : -		Ms.Sophia Grubnic
39-4-0844	Copi IF-74	GDA	54	539161	6278043	Open site	Valid	Artefact : -		Ms.Sophia Grubnic
39-4-0575	Copi OS-30	GDA	54	538359	6276402	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0579	Copi OS-7	GDA	54	530899	6280307	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0582	Copi OS-10	GDA	54	532560	6279916	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0597	Copi OS-25	GDA	54	535170	6279050	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-5-0007	Milkengay Lake;Southwest Beach M9b;	AGD	54	576776	6288104	Open site	Valid	Artefact : -	Open Camp Site	ASRSYS
39-4-0600	Copi IF-42	GDA	54	537495	6277500	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0615	Copi IF-39	GDA	54	535805	6278986	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0619	Copi IF-35	GDA	54	534935	6278600	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0631	Copi IF-23	GDA	54	534582	6279994	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0794	Copi IF-64	GDA	54	529740	6280178	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0802	Copi OS-33	GDA	54	534077	6277047	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0811	Copi IF-55	GDA	54	531732	6276458	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0847	Copi IF-80	GDA	54	533170	6274497	Open site	Valid	Artefact : -		Ms.Sophia Grubnic
39-4-0855	Copi OS-58	GDA	54	532677	6275012	Open site	Partially Destroyed	Artefact : -		Ms.Sophia Grubnic,Ms.Sophia Grubnic
39-4-0841	Copi IF-77	GDA	54	538248	6278638	Open site	Valid	Artefact : -		Ms.Sophia Grubnic
39-4-0842	Copi IF-76	GDA	54	539080	6278638	Open site	Valid	Artefact : -		Ms.Sophia Grubnic
39-5-0085	DA109	AGD	54	567198	6279387	Open site	Valid	Artefact : 7		Doctor.Matt Cupper
39-5-0095	DA123	AGD	54	569466	6283034	Open site	Valid	Artefact : 3		Doctor.Matt Cupper
39-5-0055	DA25	AGD	54	567863	6275347	Open site	Valid	Modified Tree (Carved or Scarred) : 1		M.Hetherington and K.Yerbury
39-5-0063	DA29	AGD	54	567026	6279396	Open site	Valid	Artefact : 2		Doctor.Matt Cupper
39-5-0065	DA31	AGD	54	570204	6283586	Open site	Valid	Artefact : 4		Doctor.Matt Cupper
39-5-0066	DA32	AGD	54	569802	6284211	Open site	Valid	Artefact : 5		Doctor.Matt Cupper
39-5-0096	DA26	AGD	54	568019	6279461	Open site	Valid	Artefact : 3		Doctor.Matt Cupper
39-4-0602	Copi IF-44	GDA	54	539571	6276007	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0605	Copi IF-47	GDA	54	532800	6281510	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0616	Copi IF-38	GDA	54	535768	6278859	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0620	Copi IF-34	GDA	54	535186	6278123	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0628	Copi IF-26	GDA	54	534920	6279529	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0637	Copi IF-17	GDA	54	533240	6279382	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0638	Copi IF-16	GDA	54	533294	6279713	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0642	Copi IF-12	GDA	54	532177	6280266	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0849	Copi IF-81	GDA	54	532708	6275741	Open site	Valid	Artefact : -		Ms.Sophia Grubnic
39-4-0846	Copi IF-72	GDA	54	539967	6280069	Open site	Valid	Artefact : -		Ms.Sophia Grubnic
39-4-0858	Copi OS-62	GDA	54	538617	6280466	Open site	Valid	Artefact : -, Hearth : -		Ms.Sophia Grubnic
39-5-0145	LTWP HTH 99	GDA	54	566456	6290965	Open site	Destroyed	Hearth : -, Artefact : -		Niche Environment and Heritage,Niche
39-4-0581	Copi OS-9	GDA	54	530918	6279863	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0584	Copi OS-12	GDA	54	532186	6280930	Open site	Partially Destroyed	Artefact : -, Hearth : -, Potential Archaeological Deposit		OzArk Environmental and Heritage Management -
39-4-0585	Copi OS-13	GDA	54	532996	6281057	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -
39-4-0589	Copi OS-17	GDA	54	533416	6278591	Open site	Valid	Artefact : -		OzArk Environmental and Heritage Management -

39-5-0089	DA117	AGD	54	566714	6280490	Open site	Valid	Artefact : 3	Doctor.Matt Cupper
39-5-0092	DA120	AGD	54	566823	6281671	Open site	Valid	Artefact : 1	Doctor.Matt Cupper
39-5-0067	DA33	AGD	54	569566	6284264	Open site	Valid	Shell : 4, Artefact : 4	Doctor.Matt Cupper
39-4-0613	Copi OS-6	GDA	54	531190	6280699	Open site	Partially Destroyed	Artefact : -, Hearth : -, Potential Archaeological Deposit	OzArk Environmental and Heritage Management -
39-4-0625	Copi IF-29	GDA	54	533811	6278257	Open site	Valid	Artefact : -	OzArk Environmental and Heritage Management -
39-4-0627	Copi IF-27	GDA	54	534089	6279060	Open site	Valid	Artefact : -	OzArk Environmental and Heritage Management -
39-4-0640	Copi IF-14	GDA	54	532290	6279495	Open site	Valid	Artefact : -	OzArk Environmental and Heritage Management -
39-4-0786	Copi IF-56	GDA	54	531582	6276316	Open site	Valid	Artefact : -	OzArk Environmental and Heritage Management -
39-4-0790	Copi IF-60	GDA	54	529935	6277270	Open site	Valid	Artefact : -	OzArk Environmental and Heritage Management -
39-4-0804	Copi OS-35	GDA	54	529989	6277061	Open site	Valid	Artefact : -	OzArk Environmental and Heritage Management -
39-4-0807	Copi IF-51	GDA	54	534170	6276314	Open site	Valid	Artefact : -	OzArk Environmental and Heritage Management -
39-4-0845	Copi IF-73	GDA	54	539385	6278999	Open site	Valid	Artefact : -	Ms.Sophia Grubnic
39-4-0851	Copi IF-83	GDA	54	541550	6282054	Open site	Valid	Artefact : -	Ms.Sophia Grubnic
39-4-0577	Copi OS-28	GDA	54	535170	6277392	Open site	Valid	Artefact : -	OzArk Environmental and Heritage Management -
39-4-0586	Copi OS-14	GDA	54	534105	6279230	Open site	Valid	Artefact : -	OzArk Environmental and Heritage Management -
39-5-0088	DA116	AGD	54	566550	6280163	Open site	Deleted	Artefact : 2	Doctor.Matt Cupper
39-5-0062	DA27	AGD	54	568094	6279455	Open site	Valid	Artefact : 5	Doctor.Matt Cupper
39-5-0068	DA34	AGD	54	570907	6289134	Open site	Valid	Artefact : 4	Doctor.Matt Cupper
39-5-0132	DA169	GDA	54	571032	6288880	Open site	Valid	Artefact : -	Doctor.Matt Cupper
39-5-0158	Silver City Highway Anabranch Bridge Artefact 1	GDA	54	569744	6284026	Open site	Valid	Artefact : -	Doctor.Matt Cupper,LandSkape - Natural &
39-4-0603	Copi IF-46	GDA	54	539974	6275741	Open site	Valid	Artefact : -	OzArk Environmental and Heritage Management -
39-4-0604	Copi IF-45	GDA	54	539674	6275851	Open site	Valid	Artefact : -	OzArk Environmental and Heritage Management -
39-4-0612	Copi OS-5	GDA	54	531418	6281097	Open site	Valid	Artefact : -	OzArk Environmental and Heritage Management -
39-4-0614	Copi IF-40	GDA	54	536358	6277498	Open site	Valid	Artefact : -	OzArk Environmental and Heritage Management -
39-4-0626	Copi IF-28	GDA	54	534223	6278718	Open site	Valid	Artefact : -	OzArk Environmental and Heritage Management -
39-4-0630	Copi IF-24	GDA	54	534525	6279662	Open site	Valid	Artefact : -	OzArk Environmental and Heritage Management -
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AHIMS Web Services (AWS)

Note: This Excel report shows the sites found in AHIMS on the 22/04/2024. If this date is not the same as the original date of the Search Results letter obtained during the Basic Search, then the search results might be different. The PDF version of this report will always coincide with the Basic Search Results letter.

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Report generated by AHIMS Web Service on 22/04/2024 for Stephanie Rusden for the following area at Datum :GDA, Zone : 54, Eastings : 499162.0 - 529161.0, Northings : 6273649.0 - 6293649.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 35

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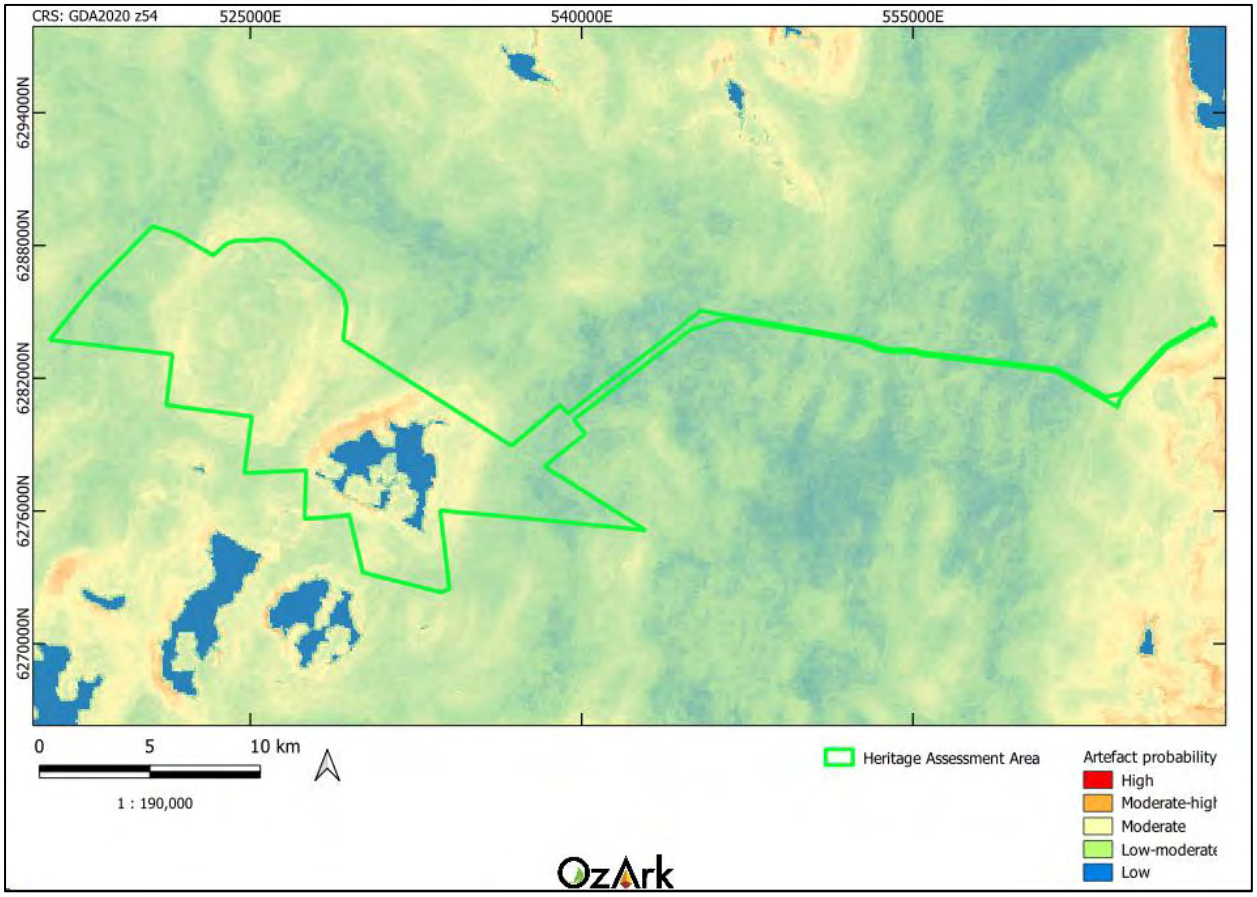
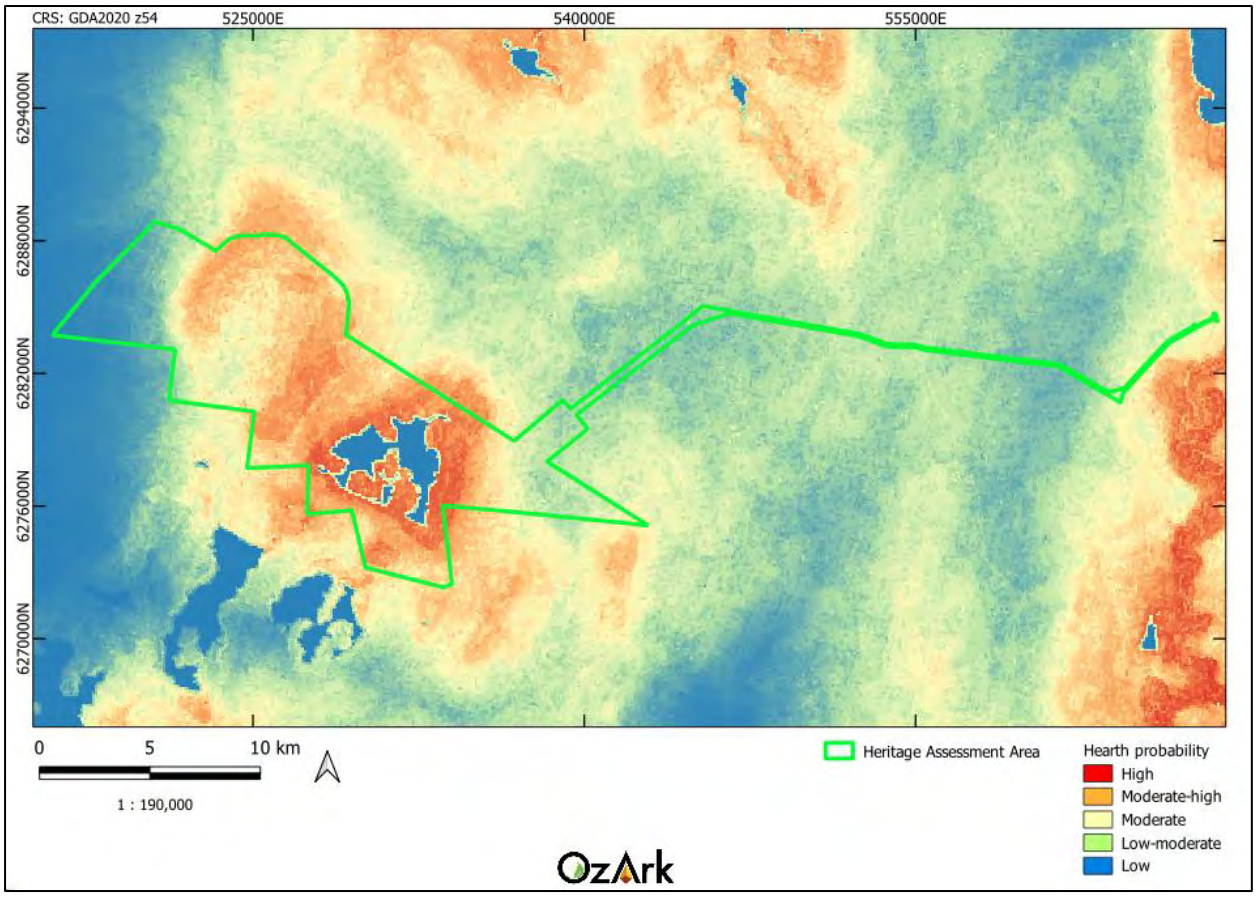
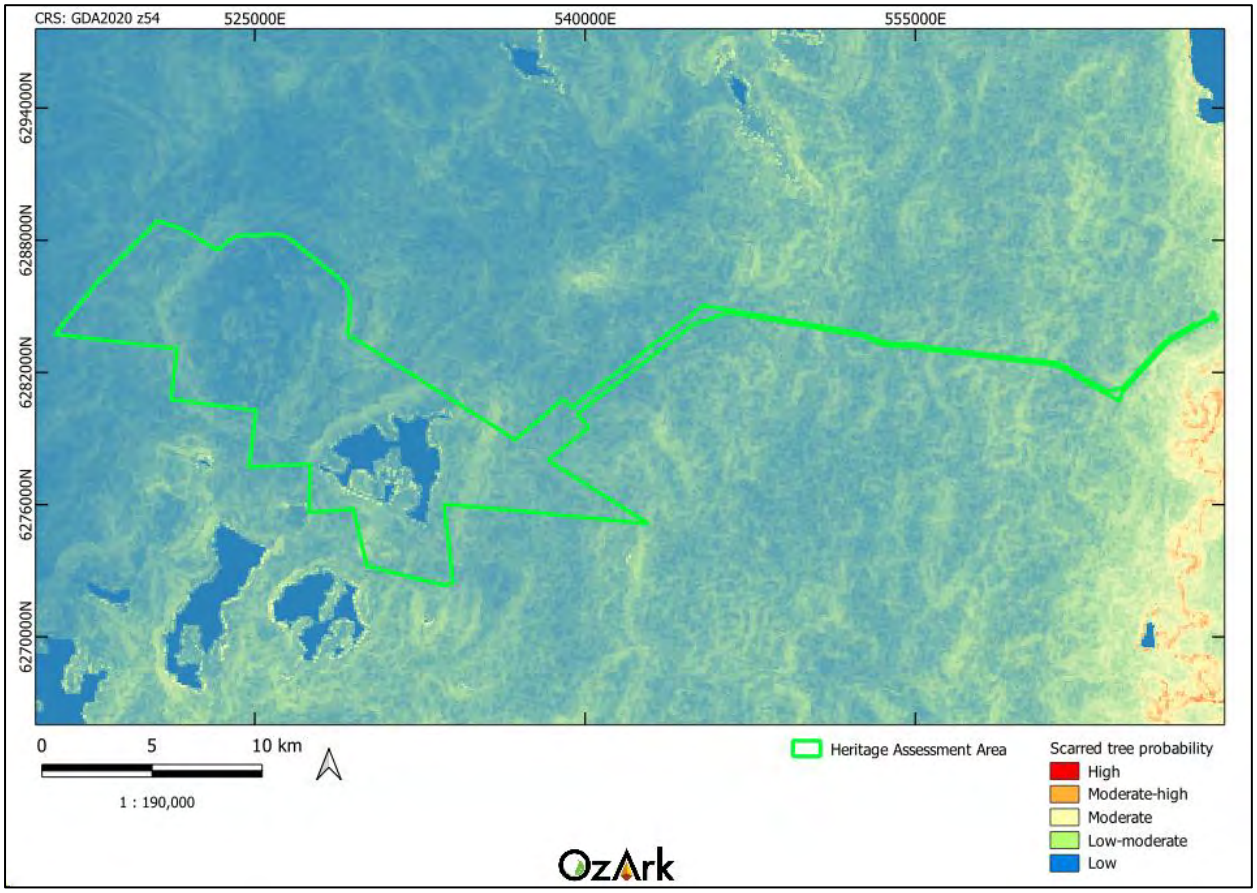
APPENDIX 3: ASDST MODELLING



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540000E
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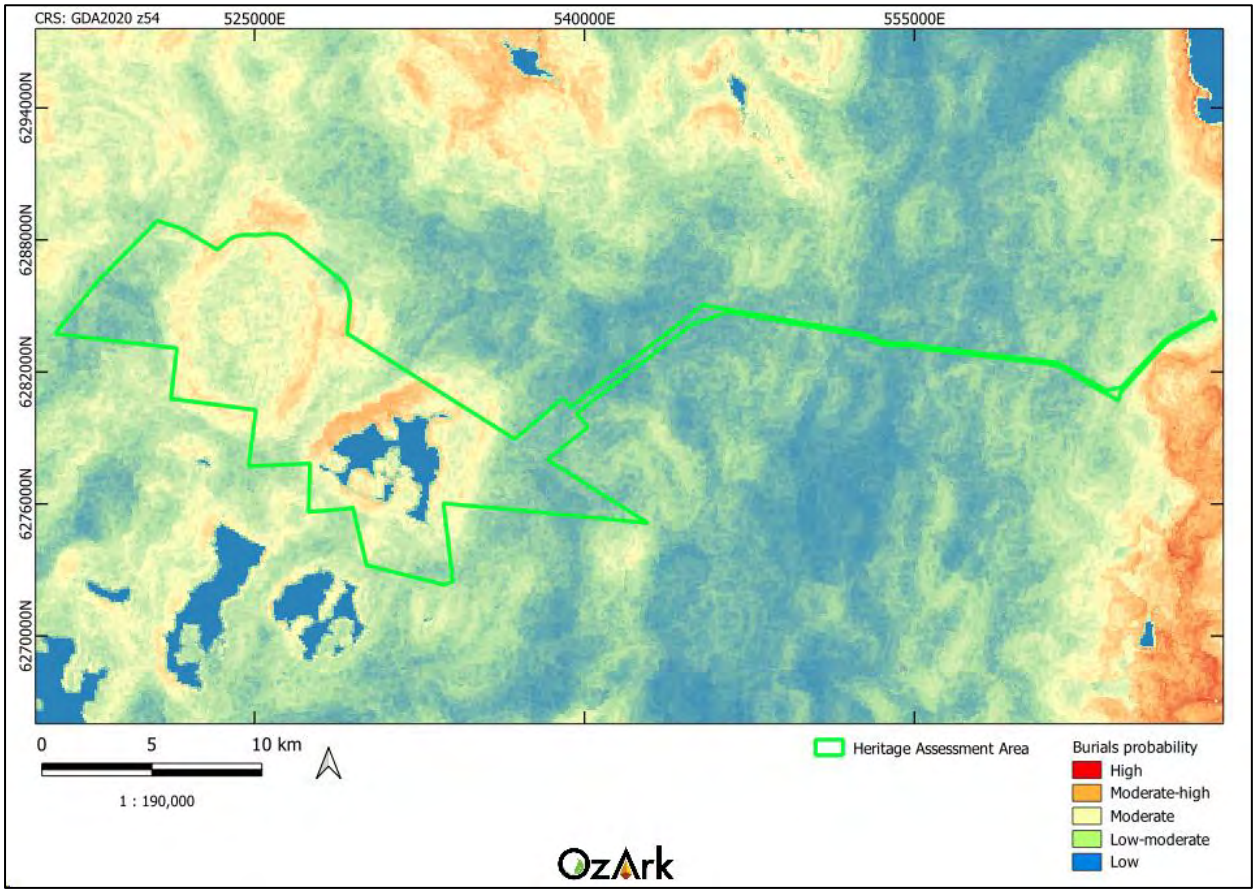
Heritage Assessment Area
Scarred tree probability
High
Moderate-high
Moderate
Low-moderate
Low
OzArk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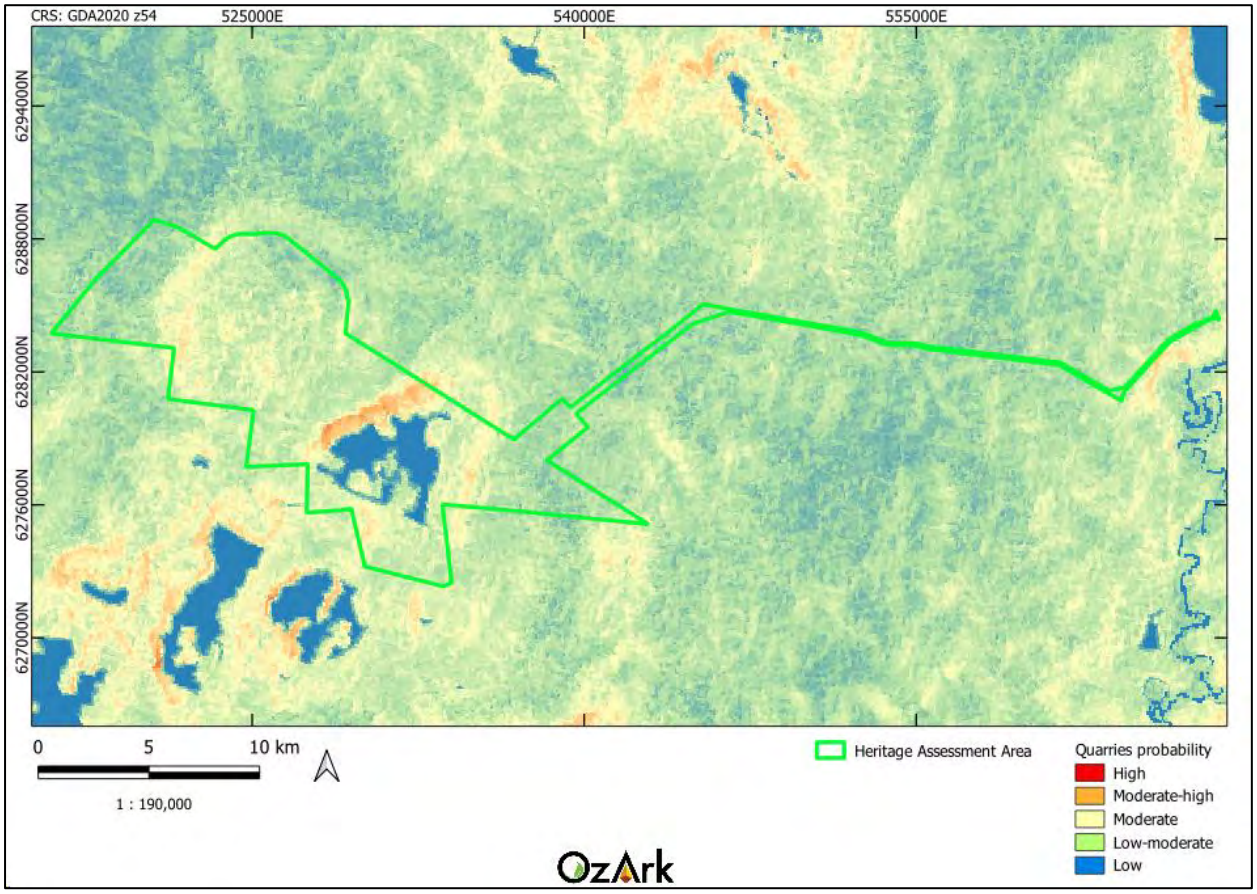
5
10 km
1 : 190,000
Heritage Assessment Area
Burials probability
High
Moderate-high
Moderate
Low-moderate
Low
OzArk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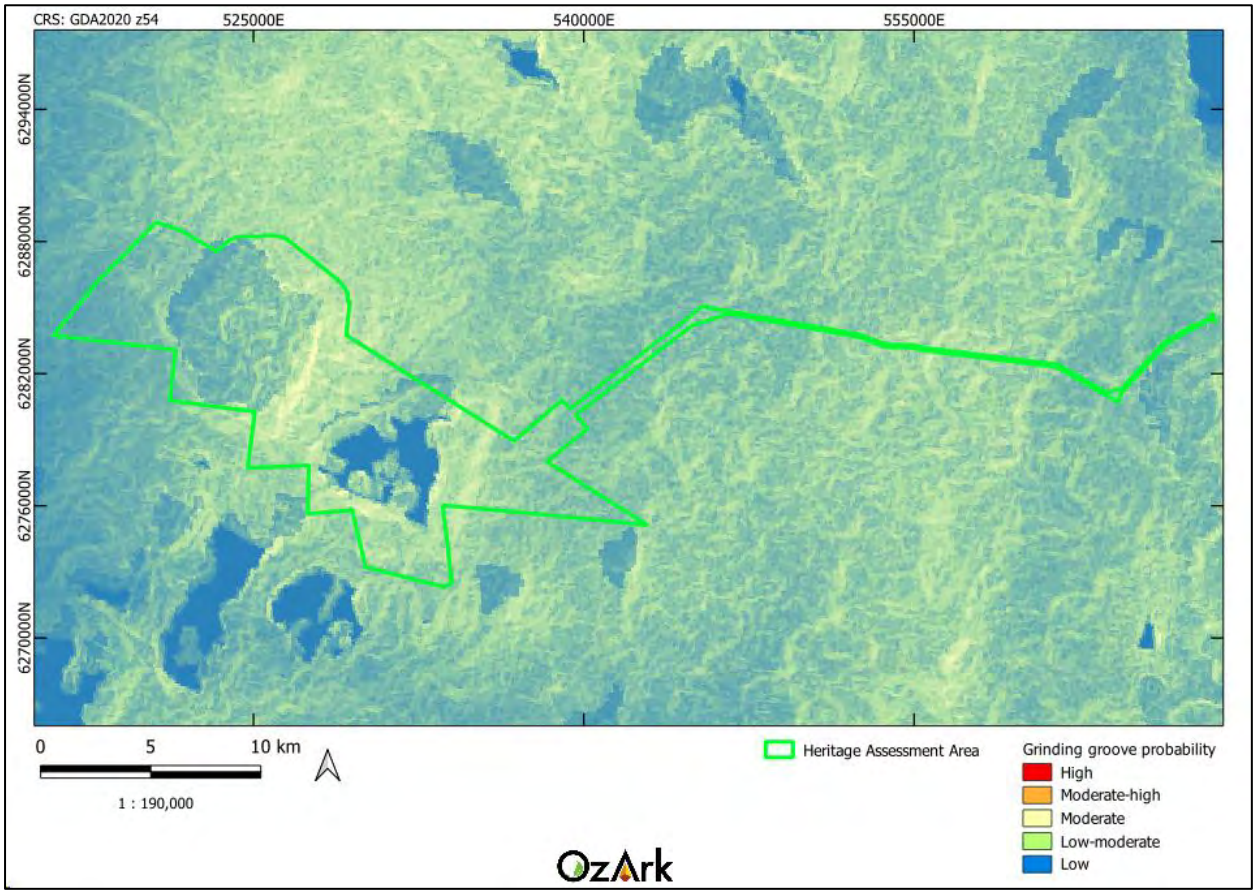
540000E
555000E
6294000N
6288000N
6282000N
6276000N
6270000N
0
5
10 km
1 : 190,000
Heritage Assessment Area
Quarries probability
High
Moderate-high
Moderate
Low-moderate
Low
OzArk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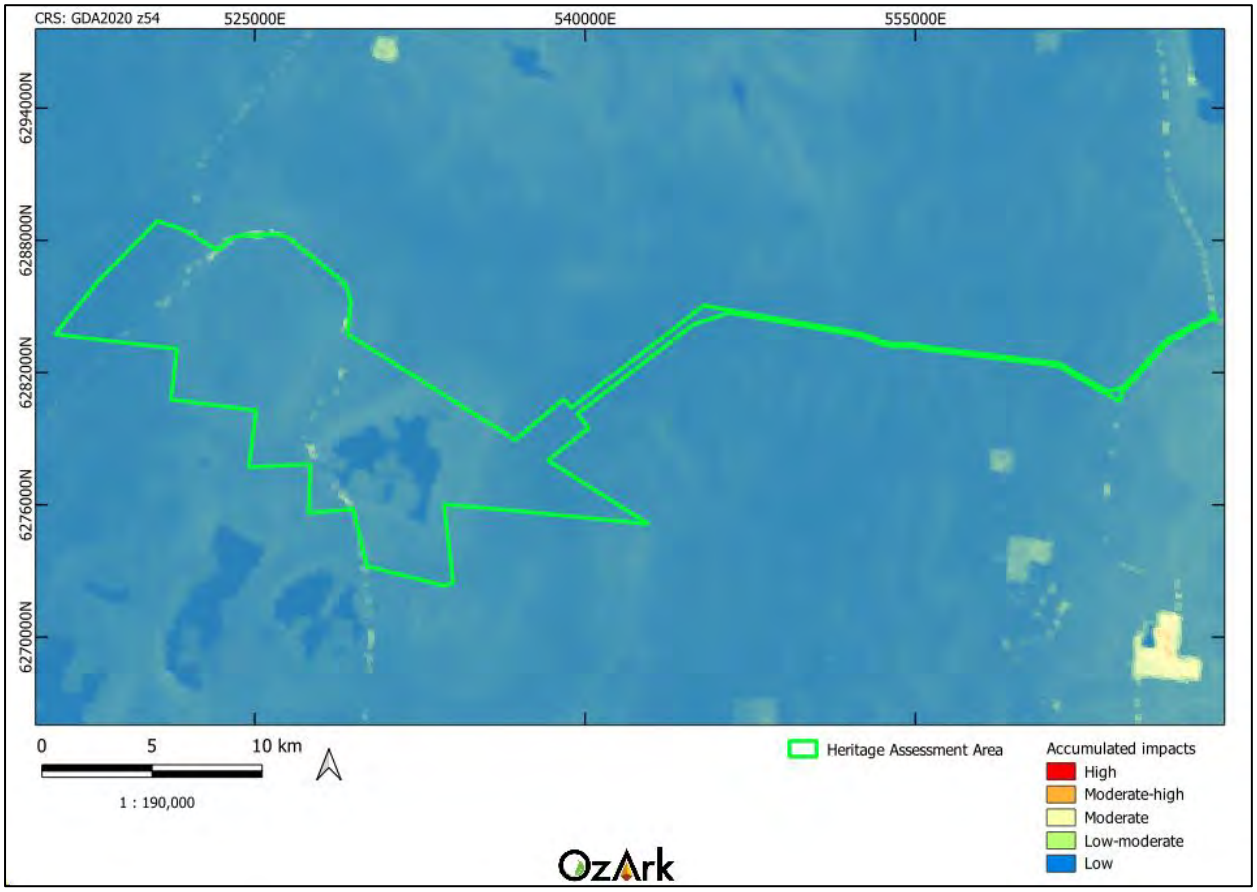
540000E
555000E
6294000N
6288000N
6282000N
6276000N
6270000N
0
5
10 km
1 : 190,000
Heritage Assessment Area
Grinding groove probability
High
Moderate-high
Moderate
Low-moderate
Low
OzArk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525000E
540000E
555000E
6294000N
6288000N
6282000N
6276000N
6270000N
0
5
10 km
1 : 190,000
Heritage Assessment Area
Accumulated impacts
High
Moderate-high
Moderate
Low-moderate
Low
OzArk

APPENDIX 4: PHASE 1 SURVEY METHODOLOGY

Sample view of the Project Site.

ABORIGINAL CULTURAL HERITAGE SURVEY METHODOLOGY

COPI MINERAL SANDS PROJECT

WENTWORTH LOCAL GOVERNMENT AREA

JANUARY 2020

Report prepared by

OzArk Environment & Heritage

for Relentless Resources Limited

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DOCUMENT CONTROLS

Proponent	Relentless Resources Limited
Client	RW Corkery & Co
Document Description	*Aboriginal Cultural Heritage Survey Methodology: Copi Mineral Sands Project, Wentworth LGA.*
File Location	OzArk Job No.
S:\OzArk EHM Data\Clients\ RW Corkery & Co	2026

Document Status V3.0 FINAL	Date 29 January 2020
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Draft V2.0 Report Draft for release to client (Series V2 = OzArk and client edits)	V2.0 BC sends to client for review 15/1/20 V2.1 BC incorporates WR comments 15/1/20 V2.2 JB edits 16/1/20 V2.3 SR update with BCD comments 29/1/20
FINAL V3.0 = Final report	V3.0 OzArk finalises 29/1/20
Prepared For	Prepared By
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Acknowledgement

OzArk acknowledge Traditional Owners of the area on which this assessment took place and pay respect to their beliefs, cultural heritage and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

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FIGURES

TABLES

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1 INTRODUCTION

OzArk Environmental & Heritage Management (OzArk) has been engaged by RW Corkery & Co on behalf of Relentless Resources Limited (the proponent) to prepare a survey methodology for the proposed Copi Mineral Sands Project (the Project) located approximately 75 kilometres (km) northwest of Wentworth in southwestern NSW and the Wentworth Local Government Area (LGA) (**Figure 1-1**).

This methodology has been prepared in accordance with Stage 3 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRs). The Project information provided here also satisfies Stage 2 of the ACHCRs.

As a mineral sands mine, the Project is classified as a State Significant Development under Clause 5(1)(a) of Schedule 1 of the State Environmental Planning Policy (SEPP) (State and Regional Development) 2011. As such, the Project requires an Environmental Impact Statement (EIS) to accompany the application made under Part 4 Division 4.7 of the *Environmental Planning & Assessment Act 1979* (EP&A Act). The Aboriginal cultural heritage assessment will be undertaken in accordance with the Secretary's Environmental Assessment Requirements (SEARs) issued (SSD 18-9572) and correspondence from the former OEH (now Biodiversity and Conservation Division of the Department [BCD]), in DOC18/661269 issued on 18 September 2018.

1.1 THE PROJECT SITE

The Project Site encompasses approximately 4,984 hectares (ha) of land, as well as a 39 km access road. The Project Site is confined to Lot 1 DP 756199, Lot 1907DP 763791, Lot 1940 DP763792, Lot 4068 DP766543 and unnamed road reserves (**Figure 1-2**). The Project Site is located 75 km northwest of Wentworth and 180 km south of Broken Hill in the Murray Basin region of southwestern NSW within the Wentworth Local Government Area.

1.2 THE PROJECT

The Project will include the operation of an open cut mineral sand mine (**Figure 1-3**) and will include the following components:

- Conventional load and haul extraction (dry mining methods) from two open cut pits (Pit 1 and Pit 2) covering approximately 143 ha, with a total annual extraction rate (ore and overburden) of between 6 million tonnes per annum (Mtpa) and 8 Mtpa, including up to 1.5 Mtpa of heavy mineral sand
- Processing of extracted ore using a Mobile Mining Unit located close to the active mining face that would wet screen the ore material, with the undersize material pumped to a Wet Concentrator Plant for conventional gravity separation and mineral concentration

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- Placement of overburden and tailings into a small out-of-pit emplacement, with the majority of waste material returned to the open cuts
- Transportation of heavy mineral concentrate via road to Broken Hill for dispatch to customers for further processing off site
- Construction and use of a range of ancillary infrastructure, a site access road, mine camp, reinjection borefield, dams, laydown areas, electricity supply and distribution, fuel storage, administration, workshop, stores and amenities buildings.

Figure 1-1. Map showing the location of the Project Site.

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Figure 1-2. Map showing cadastral details of the Project Site.

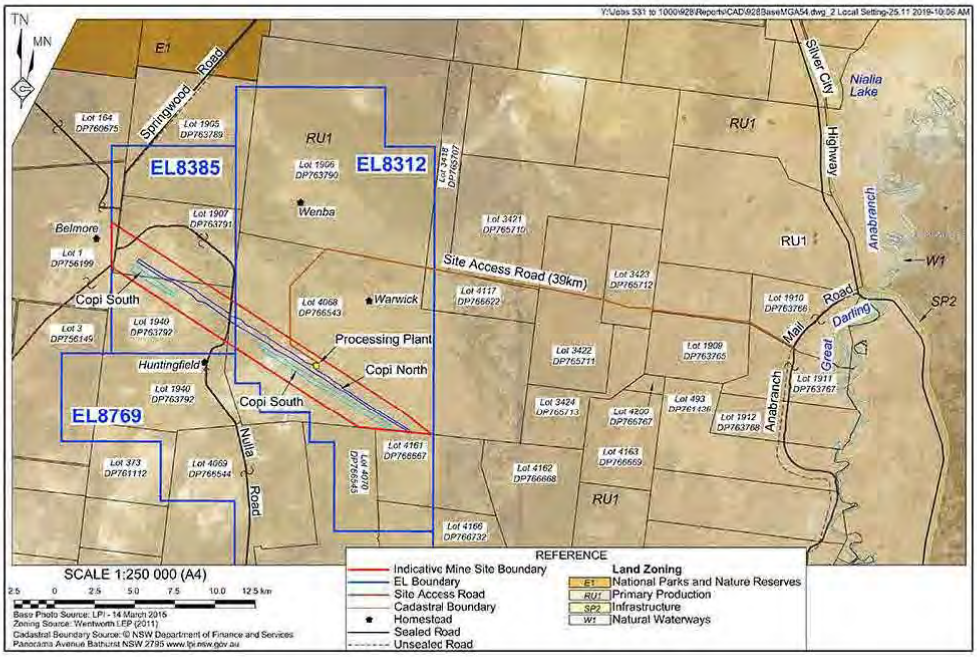

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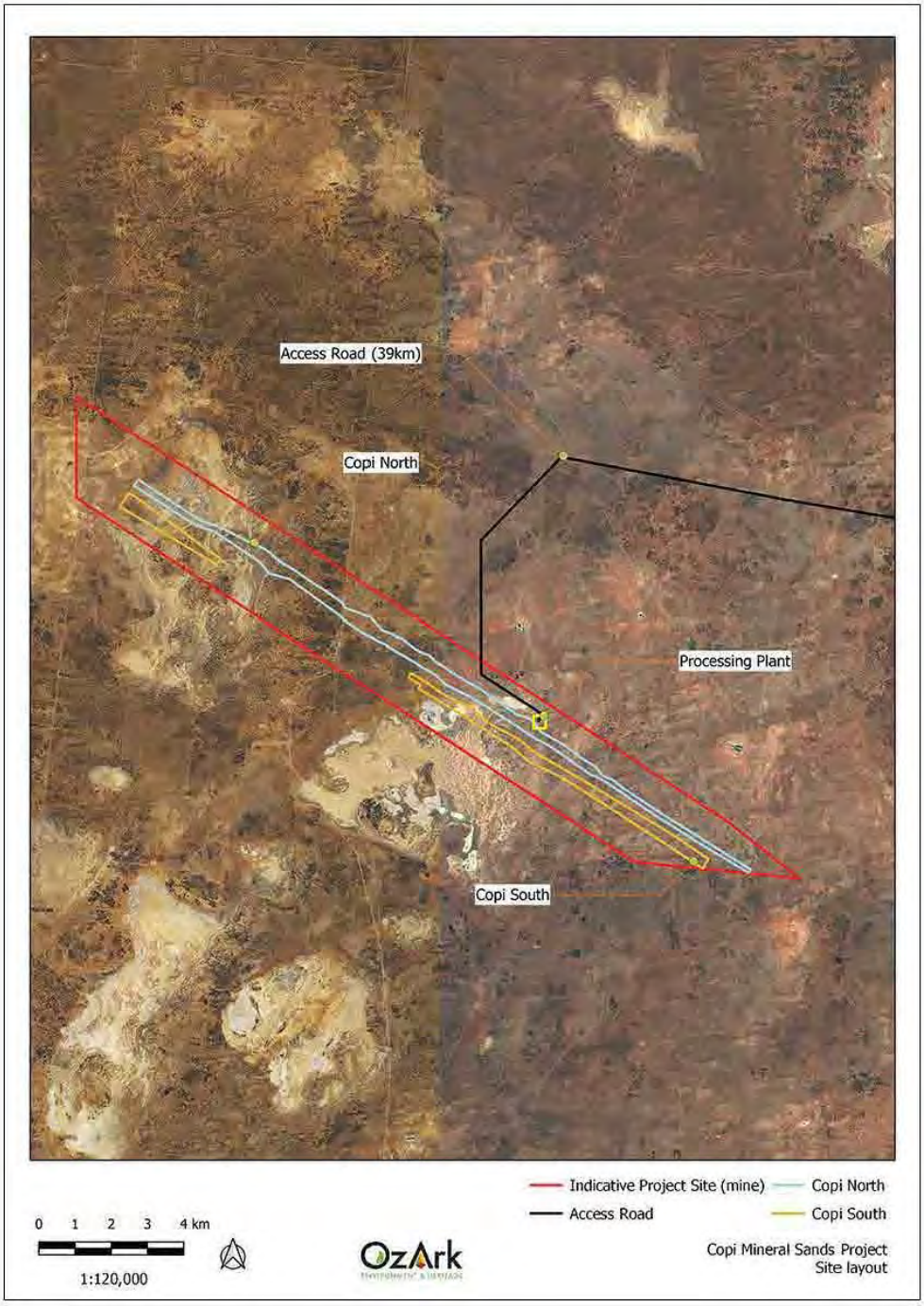
Figure 1-3. Map showing the proposed impact footprint of the Project.



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1.3 ASSESSMENT APPROACH

The field inspection of the Project Site will follow the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010). The field inspection Aboriginal cultural heritage assessment will follow the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (the Guide; OEH 2011).

This survey methodology is produced to satisfy Stage 3 of the ACHCRs and Requirements 1–4 in the Code of Practice.

1.4 CONSULTATION ON THIS METHODOLOGY

Consultation for this proposal has followed the guidelines established in the *Aboriginal cultural heritage consultation requirements for proponents* (ACHCRs, DECCW 2010) whereby an advertisement was placed in the local press and relevant agencies were contacted to ascertain if they were aware of groups or individuals who may have cultural knowledge of the region containing the proposal.

In August 2018 an advertisement was placed in the Sunraysia Daily requesting expressions of interest in being consulted about the proposal. In addition, the following agencies were contacted to identify potential stakeholders for the area: Office of Environment and Heritage (OEH now Biodiversity and Conservation Division of the Department of Planning, Industry and Environment); Dareton Local Aboriginal Land Council (LALC); Office of The Registrar, ALRA; National Native Title Tribunal; NTSCORP; Wentworth Shire Council; and Western Local Land Services.

As a result, the following groups or individuals registered to be consulted about the proposal. These groups or individuals constitute the Registered Aboriginal Parties (RAPs) for the proposal.

- Dareton LALC
- Barkindji-Maraura Elders Council
- Barkandji #8 Native title Determinants
- Maraura / Thangkaali (Pooncarie) First Nations Owners Association

Following Stage 1 the Project was put on hold for over 12 months as the impact footprint of the Project was being finalised. Updates were sent to the RAPs were six months, however, when the Project recommenced in December 2019, an additional advertisement was placed in the Sunraysia Daily and BCD were contacted for a list of stakeholders for new registrations. The following individuals and/or groups also registered interest:

- Arthur Kirby
- Clair Bates
- Amanda Whitton

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On 16 January 2020, all RAPs were sent information about the project and a draft of this survey methodology. RAPs were provided the stipulated 28 days in which to review and comment on these documents as per Stage 3 of the ACHCRs. The closing date for comment was 13 February 2020.

No comments were received from the RAPs on the survey methodology.

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2 ARCHAEOLOGICAL CONTEXT

2.1 ETHNO-HISTORIC SOURCES OF REGIONAL ABORIGINAL CULTURE

According to tribal maps (Tindale 1974) Aboriginal people of the Barkindji (Paakantji) language group inhabited the Lower Darling region at the time of first contact with Europeans. This language group comprised people who spoke the sub-dialects Barindji, Barkindji, Danggali, Maraura and Wiljakali. These tribes shared similar language and kinship systems, notably the division of members into matrilineal moieties (two-part social classification) known as Mukwara (wedge-tailed eagle) and Kilpara (raven) (Blows 1995 as cited in Cupper 2003). From early European accounts and archaeological evidence it appears that Barkindji were hunter-fisher-gatherers living a semi-sedentary lifestyle. Gerard Krefft (1865), an early explorer of the area, suggest that the Barkindji lived along the Lower Darling and Murray Rivers during the warmest months of the year, with people moving away from the rivers into the dune fields to collect food after winter rains (Cupper 2007).

Harry Nanya (c. 1835–1895), a Maraura of the Lower Darling and his family, were the last of the Barkindji to live by traditional hunting techniques, ranging from around Lake Victoria and along the Great Anabranch of the Darling (ANU ADB online; Cupper 2007: B14). Nanya's childhood through 1839-46, coincided with the incursions of European explorers, which were accompanied by expeditions that killed most of his people, notably in the 1841 Rufus River massacre by South Australian police led by Thomas O'Halloran. Around 1860 Nanya left his camp at Popiltah station, 60 km north of Pooncarie, with two women and a steel axe, he went into the waterless mallee country between the Darling Anabranch and the South Australian border, where he lived for over thirty years. Notes from amateur ethnographers suggest Nanya's self-imposed exile may have been due to having eloped with a woman of his own Makwarra moiety, an offence considered incestuous and meriting death (ANU ADB online).

Although Nanya's mob kept themselves well hidden, by the early 1890s the press reported more frequent sightings of the 'wild tribe' and tracks left around water holes showed that Nanya's family was increasing in numbers, causing anxiety and fear amongst the white settlers (ANU ADB online). In 1893 Aboriginal stockmen tracked down the family and persuaded them to return to the river. The twelve men, eight women and ten children, all in good physical condition, arrived at Popiltah Station and Nanya still had his steel axe, now worn wafer-thin. The Aboriginal Protection Board selected a site at Travellers Lake, near Wentworth, for them to settle, but Nanya's people preferred hunting-camps in the vicinity of Pooncarie.

The story for most of the Barkindji tribe, however, was that within about ten years of the advance of pioneering European settlement, they were living adjacent to pastoral homesteads, often working as shepherds or in other labouring activities (Lans et al 1988 and Withers 1989 in Cupper

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2007: B-14). By the turn of the nineteenth century many Barkindji resided on the Darling River near Pooncarie where an Aboriginal mission had been set up in 1911.

2.2 REGIONAL ARCHAEOLOGICAL CONTEXT

The Darling, the Darling River Anabranch and lake systems in southwestern NSW have been the subject of several heritage assessments, archaeological excavations and detailed academic studies. Some of the earliest evidence of human occupation of Australia comes from south-western NSW (Cupper 2007: B-14). The site of Lake Mungo contains archaeological evidence including human remains and stone tools that date to between 46,000 and 50,000 years before present (BP) (Bowler et al 2003). Evidence for human occupation has also been found at Menindee Lake from 45,000 BP (Cupper and Duncan 2006 as reported in Cupper 2007: B14) along the Darling and at Lake Victoria on the Murray River by around 21,000 BP. Archaeological evidence from Willandra Lakes suggests that Aboriginal occupation in the Murray-Darling basin dates from between 46,000 and 50,000 BP (Allen and Holdaway 2009: 99; Bowler et al 2003).

Previous archaeological studies undertaken within the vicinity of the Project Site provides information to obtain a sound understanding of the nature and distribution of archaeological sites within the area.

Martin 1985

An archaeological survey was completed by Martin (1985) at two sites in Hay, two at Wentworth, one at Balranald and forms the original archaeological survey of the Wentworth Pump Station located 200 metres (m) from the junction with the Darling River, 80 km southeast of the Project Site. Two middens, an open campsite and a scarred tree were recorded. One of the midden sites was identified as containing freshwater mussel shells, freshwater snail shell, baked clay, bird bone, and fragments of mammal bone. The hearth was also identified with fragments of shell as well as silcrete flakes.

Martin 1986

Martin (1985) conducted a survey for a proposed seismic line to the west of Lake Popiltah and included a sample of lakes, lunettes and dune field landforms in the west region and undulating sandplains, sub parabolic dunes with palaeochannels, source bordering dunes, swampy depressions and clay pan landforms located 70 km northeast of the Project Site. A high number of suites were recorded predominately in close proximity to formerly permanent water sources. Sites included low density silcrete and quartz artefact scatters of backed flakes, cores, pounders, tula adze, scarpers, grindstone fragments, mortars and top stones. Hearths were also located, as were middens.

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Craib 1992

Craib (1992) undertook a study of 625 ha of land across the Darling River margins on Kelso and Burtundy Station and the Murray River margins upstream of Wentworth.

Dune fields, sandplains and elevated alluvial terraces were associated with artefact scatters, and scarred trees. Sites were sparse in the sand hills, but source bordering dunes were associated with burials stone artefacts and scarred trees.

Riparian areas near margins and floodplains of flowing rivers and creeks were correlated with middens, scarred trees and artefact scatters were more abundant on the Darling River than the Murray River System. Lake deposits, swamps and billabongs were found to have a higher density of middens, scarred trees and burials than riparian landscapes.

Bonhomme, Craib and Associates 1999

Bonhomme, Craib and Associates 1999 completed the Murray Darling Water Management Action Plan (MDWMAP) largely via desktop review for an area of 900,000 ha extending 5 km either side of the Darling River from Wentworth to the Murrumbidgee confluence in the east. The study was a response to problems regarding the location and disturbance of Aboriginal sites.

The study found a general increase in the number and range of sites occurring from east to west. Mound sites, with some containing burials, began to appear around 4,000 BP and were strongly associated with the lower Darling River, the central and lower Murray and Wakool River systems.

Large shell middens were found in association with human burials along the Murray River dating between 13,000 and 10,000 BP. Isolated individual burials were most common of the Riverine plain. Many burials were located within the sand dunes along the Murray River, also with their occurrence in floodplain clays, prior stream sediment, mounds and lunettes. Multiple human burials were most common on lunettes and in source bordering dunes near stream channels. Burial grounds were most commonly recorded on source bordering dunes, prior stream levees and on the point bar sediment of rivers and lake outlet channels.

OzArk 2009

In 2009, OzArk completed an Aboriginal Cultural Heritage Assessment for proposed shoulder widening along the Silver City Highway, near Lake Commbah, located 97 km northeast of the Project Site. The archaeological survey assessed dunefields, undulating sandplains, playa and basins, lunettes, feeder channels and depressions. Six Aboriginal sites were recorded including artefact scatters, hearths and an isolated find. The assessment concluded that there may be potential for human burials to be located at depth in the dunes adjacent to the highway, though such occurrences would be rare. Intact subsurface deposits were assessed to be less likely due to the level of disturbance but areas of potential archaeological deposits (PADs) were also identified.

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Niche 2017

Throughout 2016 and 2017, Niche completed an archaeological survey for a 270 km pipeline extending from the Murray River at Wentworth to Broken Hill, following the Silver City Highway. As a result of the survey, 240 Aboriginal sites were identified, and six previously recorded sites were found to have a larger extent than originally recorded and an additional 12 previously recorded sites were located.

Of the recorded sites, 107 were stone artefact sites, 20 were hearths, five were artefact scatters with hearths and four contained artefacts, hearths, animal bone, shell and potential archaeological deposit (PAD). The remaining sites stone artefacts with PAD, stone artefacts with shell and scarred trees.

The Fowlers, Conservation, Darling, Barrier, Nine Mile, Oakvale and Kars land systems had the greatest number and density of artefacts recorded, reflective of the availability of raw material sources for manufacture and the availability of temporary water in these systems. Visibility of hearths was more common in the alluvial plains and sandplains than in the ranges and rolling downs and lowlands. Most sites were located within 600 m of water and where sites were located further away, they tended to be associate with stone sources.

2.3 LOCAL ARCHAEOLOGICAL CONTEXT

2.3.1 Previous archaeological assessment within the Project Site

In 2015, Landskape completed a Due Diligence assessment of eight proposed air-core drilling locations within Copi North, located within the Project Site. Survey of the assessed area occurred over one day and included full pedestrian survey of the impact areas. Site types predicted most likely to occur within the impact areas included artefact scatters, scarred trees, middens and burials. No Aboriginal archaeological sites were located within the impact areas despite high ground surface visibility. The absence of sites was attributed to a lack of landforms with increased archaeological potential such as lunettes or source-bordering dunes. In addition, no trees of suitable type and age to possess cultural modifications were present.

2.3.2 AHIMS search results

A search of the AHIMS database on 12 January 2020 returned 16 records for Aboriginal heritage sites within a 60 km x 60 km search area over the Project Site (GDA Zone 54 Eastings: 499143–559143; Northings: 6251420–6311420 with no buffer) (see **Table 2-1** for the site types and frequencies; results mapped in **Figure 2-1**).

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Table 2-1: AHIMS site types and frequencies.

Site Type	Number	% Frequency
Artefact scatters	10	62
Midden and artefact scatters	3	19
Hearth and artefact scatters	2	13
Hearths, artefact scatter and midden	1	6
Total	**16**	**100%**

Figure 2-1 shows that no AHIMS sites are located within the Project Site. A brief description of the sites closest to the Project Site are provided below.

Site #39-4-0088, located 10 km south of the Project Site, is an open campsite comprising an artefact scatter and hearths. The campsite is recorded on the sand lunette of New Bluff Lake with artefacts identified over an area measuring 500 m x 250 m. Fourteen hearths were recorded at the site as well as 15 isolated single heat-retainers (baked clay). Artefacts at the site included 76 silcrete artefacts including: 12 cores, five scrapers, three mortars, a pestle, a muller and 54 unmodified flakes. Nine chert artefacts were recorded included a core, a scraper and seven unmodified flakes. Additional artefacts include four sandstone mullers, a granodiorite manuport, a quartzite grinding implement fragment, a quartzite anvil and 12 ferricrete manuports (six fine-grained ironstone) noted as potentially being used for ochre.

Site #39-4-0074, located 27 km southwest of the Project Site, is also recorded as an open campsite comprising an artefact scatter and hearths over an area measuring 40 m x 40 m. The site is located on an eroded lunette of the salina (a salt encrusted lake bed) in the Bells Grove playa (a dry lake bed, often a salt lake) complex with archaeological material located on the lag surface of a broad deflation hollow. Three hearths were identified at the site, as well as several single heat-retainers that could not be tied to a confined feature. Artefacts identified included 18 silcrete flakes and a core, as well as six chert flakes. There was also numerous mussel shell and aquatic bird eggshell fragments recorded.

Site #39-1-0034, located 24 km northwest of the Project Site within the Tarawi Nature Reserve, is a low-density artefact scatter consisting of quartzite and silcrete flakes and cores along a sand dune.

Overall, artefact sites (including artefact scatters and isolated artefacts) are the most commonly recorded site type on AHIMS in the search area (62 per cent; **Table 2-1**). All other recorded sites include a combination of stone artefacts as well as hearths and / or middens. Sites are generally recorded on lunettes or source-bordering dunes or within a few hundred metres of water sources.

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Figure 2-1. AHIMS sites in relation to the Project Site.

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2.4 ARCHAEOLOGICAL CONTEXT: CONCLUSION

Due to the lack of systematic surveys in the area, it is difficult to use previous recordings to characterise the types of sites that may be present in the Project Site. While artefact sites represent the majority of recorded sites in the region, it is suspected that a greater variety of site types would be present if systematic survey were to take place.

There is little indication of the archaeological potential of the Project Site as there has been little survey effort either within the Project Site or adjoining areas. The only previous archaeological investigation to have taken place is a Due Diligence inspection that covered a limited surface area. This inspection recorded no sites in the Project Site, and while this result may indicate that the archaeological potential of the Project Site is limited, this would have to be confirmed by a more systematic survey.

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3 PREDICTIVE MODEL

3.1 ENVIRONMENTAL CONTEXT

The landforms of the Project Site are consistent with the Scotia Linear Dunes, Groundwater Basins and Sandplains landscape units (Mitchell 2002) in that it appears to consist of small, sub-circular to irregular relict lakes with extensive associated sandplains and isolated dunes (**Figure 3-1**). Overall, the landforms have little topographic variation, with a local relief up to 10 m.

Around two-and-a-half million years ago a large freshwater mega-lake, known as Lake Bungunnia, covered the Lower Darling region (Stephenson 1986, McLaren and Wallace 2010). Increasing climatic aridity around one million years ago caused the mega-lake to dry out (McLaren and Wallace 2010). It shrank into smaller lakes, which became saline (Stephenson 1986, McLaren et al 2009, McLaren and Wallace 2010). These salt lake sediments are known as the Yamba Formation (Firman 1966), with examples including the basins in the central portions of the Project Site within the Scotia Groundwater Basins landscape units.

Soils within these landscape units are mostly aeolian (wind-lain) and consist of deep, sandy red earths along the lunettes and dunes, sandy solonised brown soils on the sandplains and dark, cracking clays in the depressions.

Vegetation along the plains is generally comprised of dense mallee and/or belah, saltbush, chenopods and rosewood with more isolated instances of black box and white cypress pine woodland (Mitchell 2002: 42).

3.1.1 Existing levels of disturbance

Crucial for the preservation of archaeological deposits is the history of past land use in a particular area. Examination of aerial imagery of the Project Site shows that it has been subject to very low levels of disturbance, limited to the construction of graded roads which traverse portions of the Project Site. Other disturbances are likely confined to low-intensity grazing and erosion.

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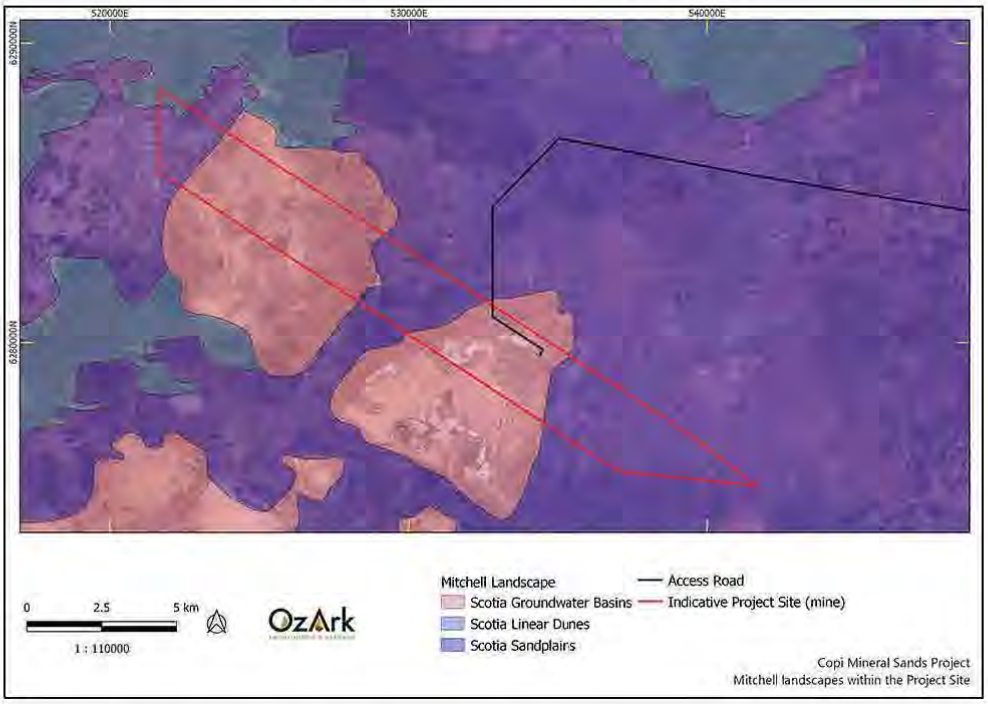
Figure 3-1. Environmental context of the Project Site.



3.2 PREDICTIVE MODEL FOR THE PROJECT SITE

Across Australia, numerous archaeological studies in widely varying environmental zones and contexts have demonstrated a high correlation between the permanence of a water source and the permanence and / or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including: plant and animal foods; stone and ochre resources and rock shelters; as well as by their general proximity to other sites/places of cultural/mythological significance. Consequently, sites tend to be found along permanent and ephemeral water sources, along access or trade routes or in areas that have good flora/fauna resources and appropriate shelter.

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally it is the more durable materials such as stone artefacts, stone hearths, shell, and some bones that remain preserved in the current landscape. Even these however may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport—both over short and long time scales—or (b) the historical impacts associated with the introduction of

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European farming practices. Scarred trees, due to their nature, may survive for up to several hundred years but rarely beyond.

OEH (2014) have produced a series of 'pre-1750' predictive models termed the Aboriginal Sites Decision Support Tool (ASDST) which combines data derived from AHIMS with a series of spatial variables that describe the landscape such as elevation, geology and proximity to water. The ASDST outputs GIS raster layers composed of one hectare cells that predict the likelihood of Aboriginal sites (e.g. mounds, artefacts, modified trees, grinding grooves, burials and hearths) occurring in the landscape prior to European settlement (**Appendix 2**). These models do not account for land use disturbance in the intervening period, or local conditions leading to differential preservation of features. However, the ASDST includes an 'accumulated impacts' model that indicates impacts of post-European settlement land-use and its impact upon Aboriginal site features in the landscape. In combination, these models are used to predict the likelihood of encountering different Aboriginal site types prior to European settlement, and how the distribution of Aboriginal sites are likely to have been affected since this time.

According to the pre-1750 models:

- Stone quarries have a generally low potential to occur within the Project Site, although the central portion holds some potential for identifying this site type
- Modified (scarred) trees are very unlikely to occur within the Project Site, most likely due to a lack of suitable tree species present
- The Project Site models as a moderate to high potential to contain burial sites, especially along the edges of ephemeral lake systems on the raised sandy lunettes
- There is a very high potential for hearths to be located over most of the Project Site
- The Project Site models as an area with moderate potential to contain stone artefact sites, similarly with hearths, these have increased potential to be located along the edges of the lake systems
- Grinding groove sites have a generally low potential of being located within the Project Site although there are some areas with moderate potential
- The ASDST accumulated impacts model indicates very low levels of disturbance throughout the Project Site, indicating that sites have an increased likelihood of being located in their original context.

Preliminary predictive modelling, based upon numerous archaeological studies in various environmental zones and contexts throughout Australia and the ASDST models shown above, indicates a high correlation between the permanence of a water source and the permanence and / or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including: plant and animal foods; stone and ochre resources and rock shelters; as well as by their general proximity to other sites/places of

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cultural significance. Consequently, sites tend to be found along permanent and ephemeral water sources, along access or trade routes, and in areas that have good flora/fauna resources and appropriate topography (i.e. flat or gently sloping landforms or those providing shelter).

Previous archaeological studies indicate that dune fields and sandplains of the Lower Darling have an overall low density of cultural heritage places. Occupation sites are almost invariably located at small ephemeral water sources such as swamps and claypans (Cupper 2007: B-20). The most frequently recorded Aboriginal sites in these landforms are stone artefact scatters with or without hearth / ground oven materials (Martin 1985; Cupper 2007). Other Aboriginal cultural heritage site types previously identified over the more extensive the Lower Darling region include shell middens, stone quarries, ceremonial and dreaming sites, trees scarred by Aboriginal people, burials, earth mounds and stone arrangements (Cupper 2007: B-20).

Knowledge of the environmental contexts of the Project Site and a desktop review of the known local and regional archaeological record, the following predictions are made concerning the probability of those site types being recorded within the Project Site:

- *Artefact scatters:* are one of the most likely site types to be encountered and are predicted to be located within the Project Site, particularly along sand lunettes of the lake systems within the Scotia Groundwater Basins landscape units and may be associated with larger, complex features including hearths, ovens and middens. Recorded artefacts are likely to be comprised of silcrete, chert or quartzite and may include a higher percentage of tools (**Section 2.2**)
- *Hearths and ovens:* are also one of the most likely site types to be recorded and are predicted to occur particularly along the sand lunettes of the lake systems which intersect the Project Site within the Scotia Groundwater Basins landscape units, largely in the west and central portions. Identification of this site type, similarly with stone artefacts, may however be dependent on levels of erosion
- *Mounds:* are predicted to occur to occur on slightly raised sandy palaeochannel features and around the edges of the ephemeral lake systems within the Scotia Groundwater Basins landscape units
- *Modified trees:* are less likely to occur throughout the Project Site due to the dominance of mallee and belah, however, they may be present if Black Box species are identified of a suitable age. Black Box species are confined to areas which experience inundation and therefore will be located in depressions bordering the ephemeral lakes
- *Burials:* may be present on palaeochannel systems edges and source bordering dunes and lunettes of lakes in well-drained areas
- *Middens:* are predicted to occur along the particularly along the sand lunettes of the lake systems within the Scotia Groundwater Basins landscape units
- *Isolated artefacts:* may occur anywhere but more likely to be located along source bordering dunes and lunettes of lakes, however may have been washed into areas of depression, within the lake beds themselves.

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3.3 RESEARCH QUESTIONS

Several research questions can meaningfully be applied to the investigation of the Project Site. These research questions include:

- What resources were available to the Aboriginal people using the Project Site (food, stone and water)?
- What tasks were Aboriginal people undertaking at the sites?
- Are there hearths in the area? And if so, do they contain remains (animal/plant) that may indicate what people were cooking/eating?
- Are there burials in the area?
- Is there evidence to suggest that Aboriginal people were using the area earlier than the mid to late Holocene?
- Can dates be obtained for the Aboriginal use of the area?
- What resources were transported to the area and where?
- Do the survey results correlate with the ASDST likelihood maps shown in **Appendix 2**?

The survey methodology set out in **Section 4** will be framed to help answer these questions; should sites of sufficient significance be encountered within the Project Site.

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4 SURVEY METHODOLOGY

4.1 ASSESSMENT APPROACH

The Aboriginal cultural heritage assessment of the Project Site will follow the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010b). Assessment of assessing Aboriginal cultural heritage and cultural significance will follow the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011) and the ACHCRs.

4.2 SURVEY AIMS

The purpose of the archaeological survey is to identify and make up-to-date records of known and identified objects (traces of past Aboriginal land use and Aboriginal archaeological sites) within a study area (DECCW 2010b).

The aim of any archaeological survey is not to locate each artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within a Project Site are known. Therefore, the aims of the survey will be to:

- Conduct pedestrian transects across targeted landforms in the Project Site so that their archaeological potential can be determined
- Evaluate whether the predictive model set out in **Section 3.2** is valid
- Determine if the research questions set out in **Section 3.3** can be answered
- Determine if any portions of the Project Site require test excavation to understand the archaeological potential at a particular location
- Undertake sufficient assessment in order to satisfy Sections 2.2, 2.4 (as it pertains to scientific values), 2.5, 2.6, and 2.7 in the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011)
- Collecting sufficient data so that the results can be presented in an ACHAR as set out in Section 3 in the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011)
- Undertaking survey and record keeping satisfying Requirements 1–13 of the Code of Practice.

4.3 SURVEY METHODOLOGY

Standard archaeological field survey and recording methods will be employed in this assessment (Burke & Smith 2004) and will follow the Code of Practice.

In the field, OzArk staff will identify, record and evaluate physical (i.e. archaeological) evidence. Site recording will capture all the information required to complete current AHIMS site recording forms (e.g. site location, site boundary, site plan, representative photographs, artefact recording

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and feature recording). Registered Aboriginal Parties (RAPs) will participate in the survey, identifying Aboriginal objects, determining the cultural significance of Aboriginal objects and identifying cultural places or non-physical site types within the Project Site. OzArk staff understand that cultural knowledge may not be provided in some instances due to cultural sensitivities (e.g. men's and/or women's places). Under these circumstances, to assess the potential impacts, OzArk staff will need to be told, only in general terms, why a particular place is important, and what the significance of the impact will be. OzArk staff will liaise with RAPs on a case-by-case basis to determine how to record the location in a culturally sensitive manner.

It is also stressed that the aim of any survey is not to record each artefact or feature within a given study area. As is set out in the Code of Practice, survey effort should be sufficient to allow for the archaeological characterisation of all landforms within the Project Site. This characterisation is to determine the potential for those landforms to contain objects of Aboriginal cultural heritage significance.

The Project Site has little in terms of distinguishing topography to allow it to be easily divided into meaningful survey units. At best, the information gained from a study of Mitchell landscapes (**Figure 3-1**) indicates three landform units: dunes in the northwest of the mine site, two depressions, also on the mine site; and sandplains for the remainder of the mine site and all of the access road. Archaeologically, the ASDST results shown in **Appendix 2** indicate that the landforms bordering the depressions have potential to contain artefact scatters, hearths and burials.

Integrating this information allowed the development of a survey methodology to sample all landforms in the Project Site, while concentrating on landforms with greater archaeological potential as follows:

- Full survey areas: These areas include all landforms with greater archaeological potential such as the dune landscapes in the northwest of the Project Site and landforms bordering the two depressions within the mine site. The survey methodology in these areas will be for teams to conduct set transects across these areas as is shown on **Figure 4-1**. These transects will be in pairs spaced 100 m apart. There will be 200 m between pairs of transects. At a minimum, this equates to 110 km of transects in the full survey areas. Should the information gained from these preliminary transects indicate that additional transects should be undertaken to 'fill in' the space between pairs there will be time to do this. Additionally, should a landform feature that could have greater archaeological sensitivity, such as an elevated mound, be noted in the area between pairs of transects, this landform feature will be investigated

- Sample landform surveys: As shown on **Figure 4-1** there are twelve 500 m by 500 m areas that will be sampled to investigate landforms with lower archaeological potential. These sample areas are confined to the beds of the major depression basins and to the sandplain landscapes. ASDST modelling indicates that these landforms have very low archaeological potential and this sampling regime is designed to test this predictive model. The location of the sample squares has been selected to cover areas supporting

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greater vegetation cover (hence potentially more stable soil profiles) or areas within the depression basins that aerial photography indicates may contain elevated landforms. The methodology would allow some flexibility in the placement of these sample squares based on observations in the field and discussions between the supervising archaeologist and attending RAPs

- Access Road: The access road consists of two portions: the 39 km route of the access road itself that is largely along existing tracks; and an approximate 38 ha area at the junction of the access road with Anabranch Mail Road to provide the proponent with some flexibility with regards to the location of the actual junction. All portions of the access road and the junction are outside of the mine site are in sandplain landscapes that have a low archaeological potential. As this component of the Project is entirely within landforms of low archaeological potential, the survey methodology will be to randomly assess 40 locations along the access road itself (i.e. a sample approximately every kilometre) and to undertake assessment of the four transects within the junction Project Site as is shown on **Figure 4-2**. All sample areas would be assessed on foot and 'vehicle survey' would be confined to areas between the sample survey areas.

4.4 SURVEY TIMING

It is planned to undertake the survey using two independent teams each consisting of two archaeologists and two RAPs. There is planned to be eight field days. This equates to 16 days in total (i.e. two teams each working for eight days which equals 64 person days of field effort). Based on this, the following timing scenario has been developed for the survey:

- Full survey areas: This involves 110 km of transects. It is estimated that allowing for recording of sites etc that this will take 10 days
- Sample landform surveys: This consists of 300 ha. As these areas will only be sampled (i.e. by walking two to four 500 m transects within each area and targeting any areas of higher archaeological potential), it is estimated that this component of the survey will take three days
- Access Road survey: The sampling of the 39 km length of road and the 38 ha junction area is estimated to take two days
- Contingency: At a minimum there will be a one day contingency to absorb any time lost should a large number of sites be recorded, or to undertake further transects in the full survey areas should the recordings indicate that this would be valuable. The location of any additional transects will be discussed with attending RAPs but the final decision will rest with the supervising archaeologist.

4.5 RAP REQUIREMENTS

This survey will be taking place in a remote location where there are no facilities. Further, the survey is planned to take place in late summer and early autumn. As such, the conditions will be difficult with potentially long, hot days without access to facilities such as toilets. All survey will be by foot, sometimes in a sandy environment which is not the easiest to walk in.

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Therefore, it is stressed that all attending RAPs are required to be 'fit for work'. Should any RAP present themselves for participation in the survey that are demonstrably not 'fit for work', their participation in the survey will be at the discretion of OzArk as OzArk must ensure that participants do not pose a health and safety risk to themselves or their fellow workers.

4.6 CONCLUSION

Should areas of high archaeological potential be encountered where it is not possible to record sites to the standard set out in the Code of Practice or the Guide, a second field mobilisation will be arranged, perhaps coinciding with any test excavation if it is required (**Section 4.7**). At this stage, there is only the results of the Due Diligence inspection that has occurred in the mine site to provide an indication of the archaeological potential of the Project Site (**Section 2.3.1**). As this inspection failed to record sites, there is an indication that perhaps the archaeological resource within the Project Site is limited; although not too much can be read into this result as the Due Diligence inspection was very confined in its scope.

As such, the methodology proposed here is designed to cover all portions of the Project Site, as well as all landforms types within the Project Site. This methodology will allow a robust understanding of the archaeological potential of the Project Site to be reached. However, should the archaeological potential of the Project Site be greater than has been predicted, OzArk will undertake discussions with RAPs, the proponent and the regulatory authorities to determine whether further investigation is required.

4.7 TEST EXCAVATION

It is possible that the survey may identify landforms where test excavation under the Code of Practice (Requirements 14–17) is required. Should such landforms be identified during the survey, the test excavation methodology will be prepared as a separate document that will be circulated to all RAPs for review and comment.

Figure 4-1: Proposed survey methodology for the mine site.

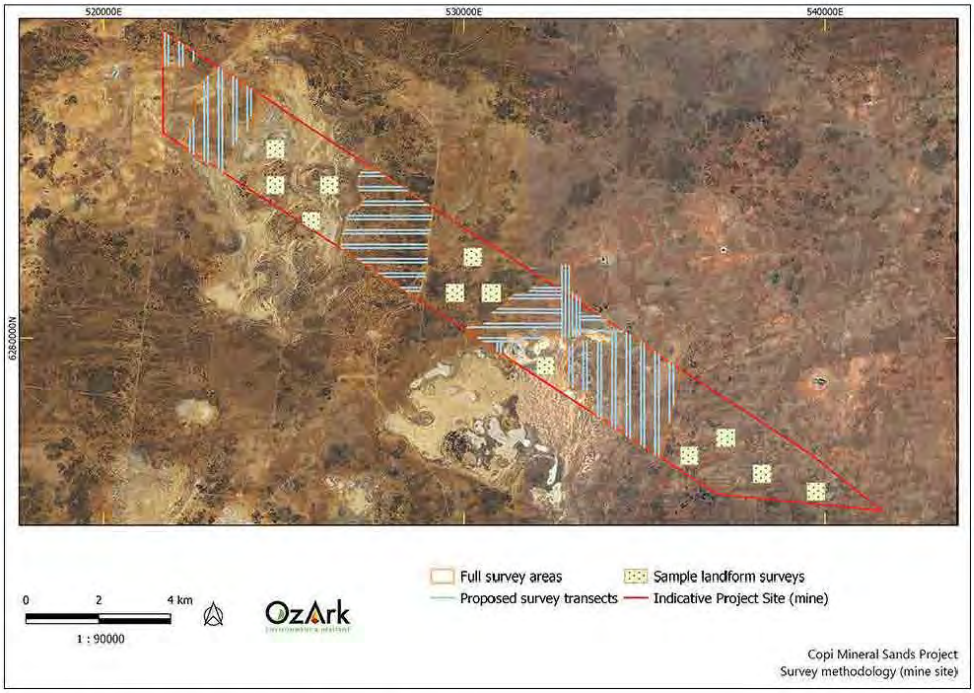
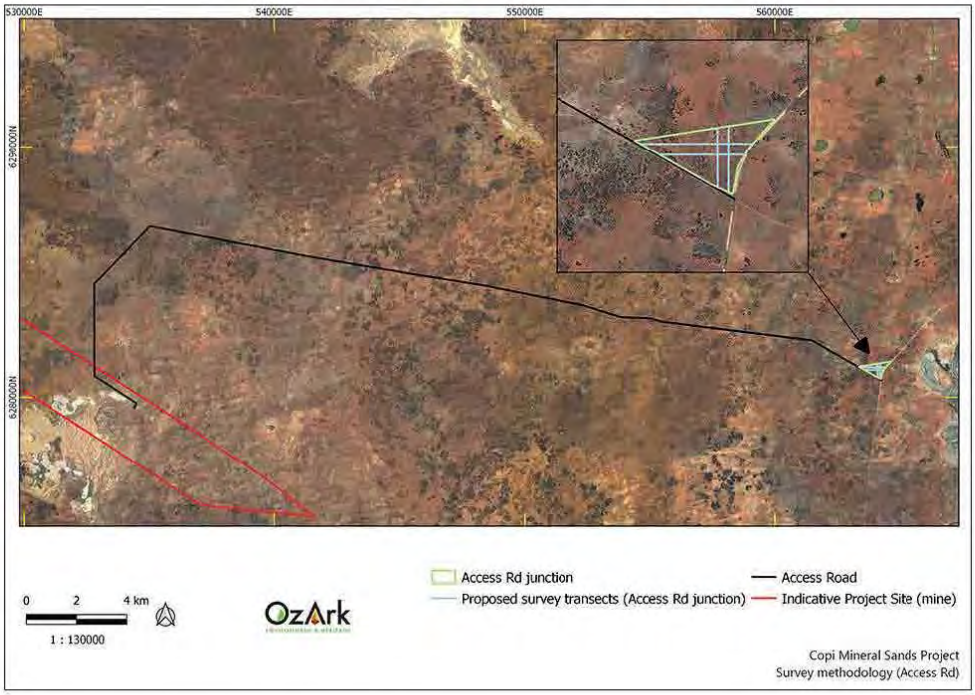


Figure 4-2: Proposed survey methodology for the access track.



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APPENDIX 1: AHIMS SEARCH RESULT

Office of Environment & Heritage NSW

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : Copi
Client Service ID : 476210

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports	Contact	Recorders	Permits
39-4-0075	DUNEDIN PARK 2	AGD	54	541960	6251410	Open site	Valid	Hearth : -, Artefact : -				Mr.Vanessa Edmonds	
39-4-0078	NULLA 7	AGD	54	[illegible]	[illegible]	Open site	Valid	Artefact : -				Ms.Vanessa Edmonds	
39-4-0079	NULLA 1	AGD	54	537040	6251400	Open site	Valid	Artefact : -				Ms.Vanessa Edmonds	
39-4-0080	NULLA 8	AGD	54	529620	6251960	Open site	Valid	Artefact : -				Ms.Vanessa Edmonds	
39-4-0020	Lake Victoria North 6;	AGD	54	522750	6251250	Open site	Valid	Shell : -, Artefact : -	Midden	1027		Mr.Allan Lance	
39-4-0021	Lake Victoria North 7	AGD	54	522800	6251400	Open site	Valid	Shell : -, Artefact : -	Midden	1027		Mr.Allan Lance	
39-4-0022	Lake Victoria North 8	AGD	54	522910	6252100	Open site	Valid	Shell : -, Artefact : -	Midden	1027		Mr.Allan Lance	
39-1-0015	Vaney Double Tank [illegible]	AGD	54	535463	[illegible]	Open site	Valid	Artefact : -	Open Camp Site	[illegible]		[illegible]	
39-1-0033	Tarawi 1;Tarawi Nature Reserve;	AGD	54	527480	6303790	Open site	Valid	Artefact : -	Open Camp Site			R Dayman,Les Williams	
39-1-0034	Tarawi 2;Tarawi Nature Reserve;	AGD	54	[illegible]	[illegible]	Open site	Valid	Artefact : -	Open Camp Site			R Dayman,Les Williams	
39-1-0035	Tarawi 3;Tarawi Nature Reserve;	AGD	54	514690	6300260	Open site	Valid	Artefact : -	Open Camp Site			R Dayman,Les Williams	
38-4-0074	[illegible] Salt Lake	AGD	54	515500	6264500	Open site	Valid	Artefact : -				Doctor.Matt Cupper	
39-4-0083	NULLA 3	AGD	54	530260	6251370	Open site	Valid	Artefact : -				Ms.Vanessa Edmonds	
39-4-0085	NULLA 4	AGD	54	[illegible]	6251450	Open site	Valid	Artefact : -				Ms.Vanessa Edmonds	
39-4-0089	New Bluff 01	AGD	54	527500	6272500	Open site	Valid	Artefact : 76			T Russell	Doctor.Matt Cupper	
[illegible]	Nulla Nulla Grinding Stones	GDA	54	[illegible]	[illegible]	Open site	Valid	Artefact : -				[illegible]	[illegible]

Report generated by AHIMS Web Service on 12/01/2020 for Stephanie Rusden for the following area at Datum :GDA, Zone : 54, Eastings : 499143 - 559143, Northings : 6251420 - 6311420 with a Buffer of 0 meters. Additional Info : Survey. Number of Aboriginal sites and Aboriginal objects found is 16

This information is not guaranteed to be free from error omission. Office of Environment and Heritage (NSW) and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

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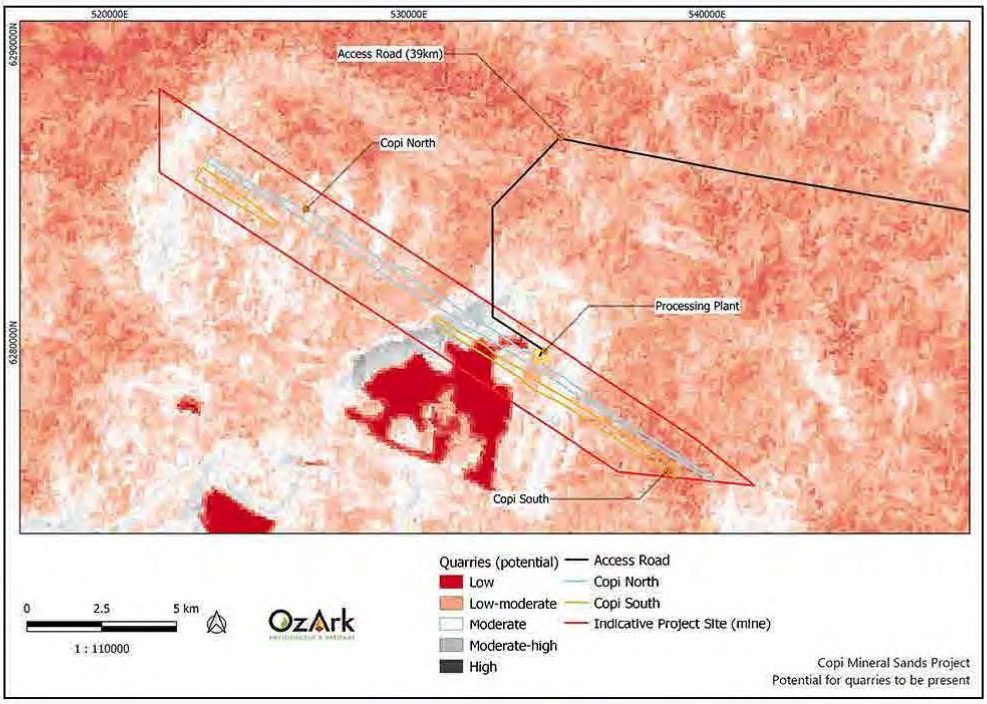
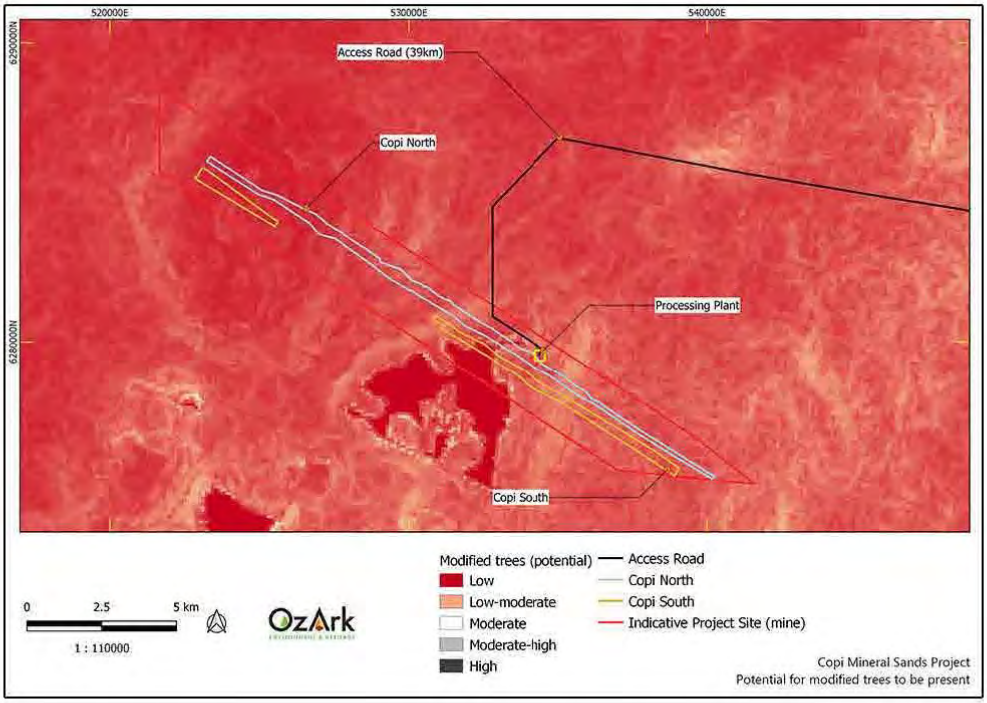
APPENDIX 2: ASDST RESULTS





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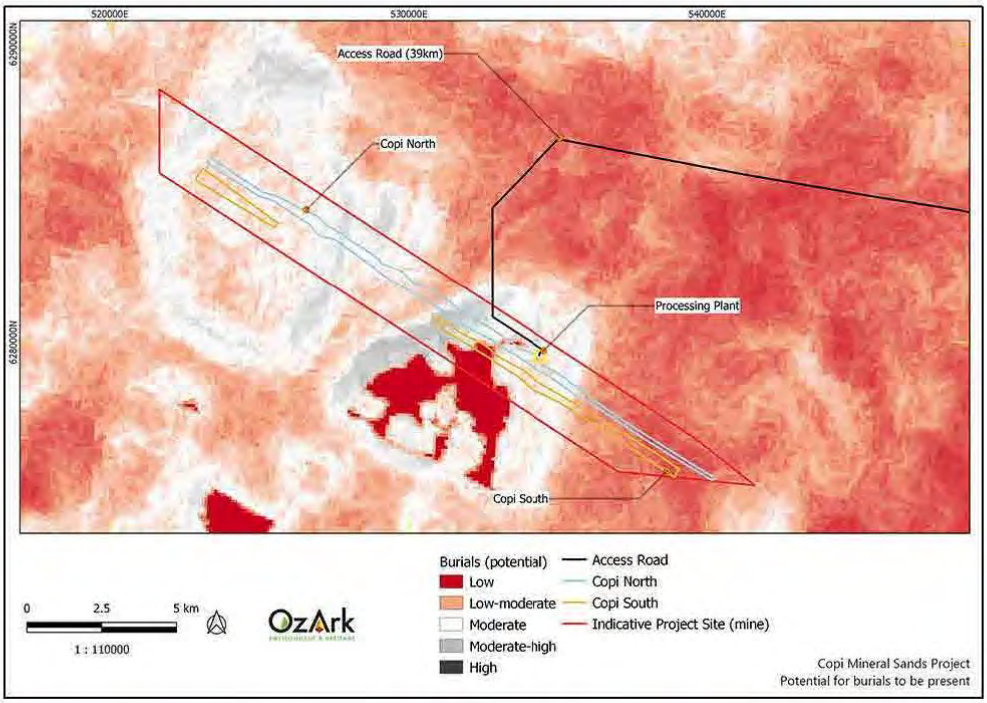

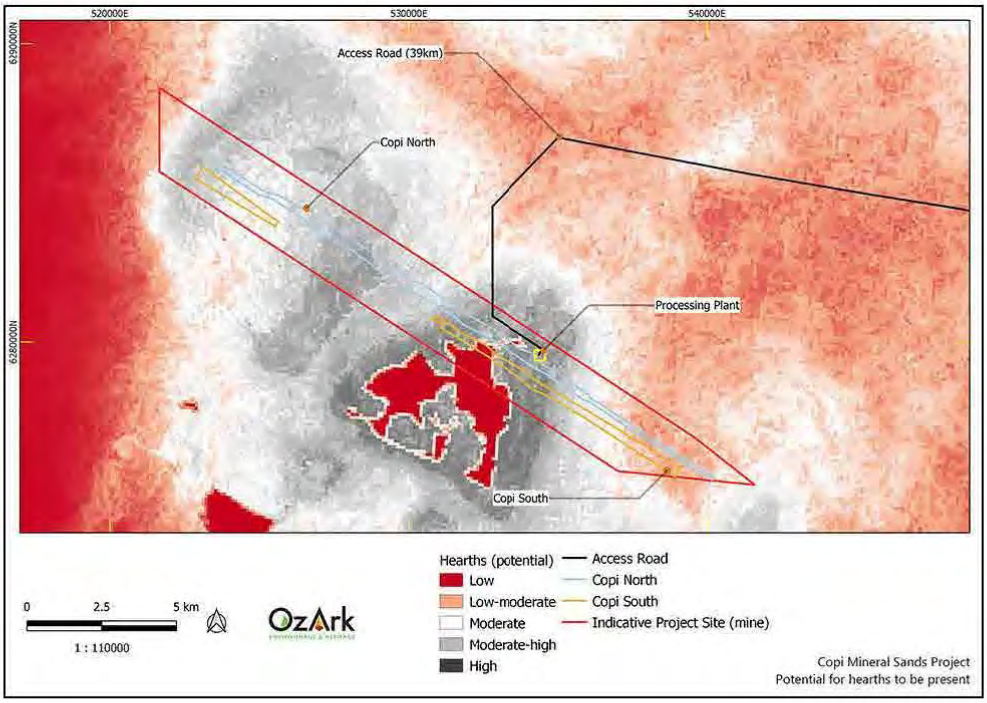

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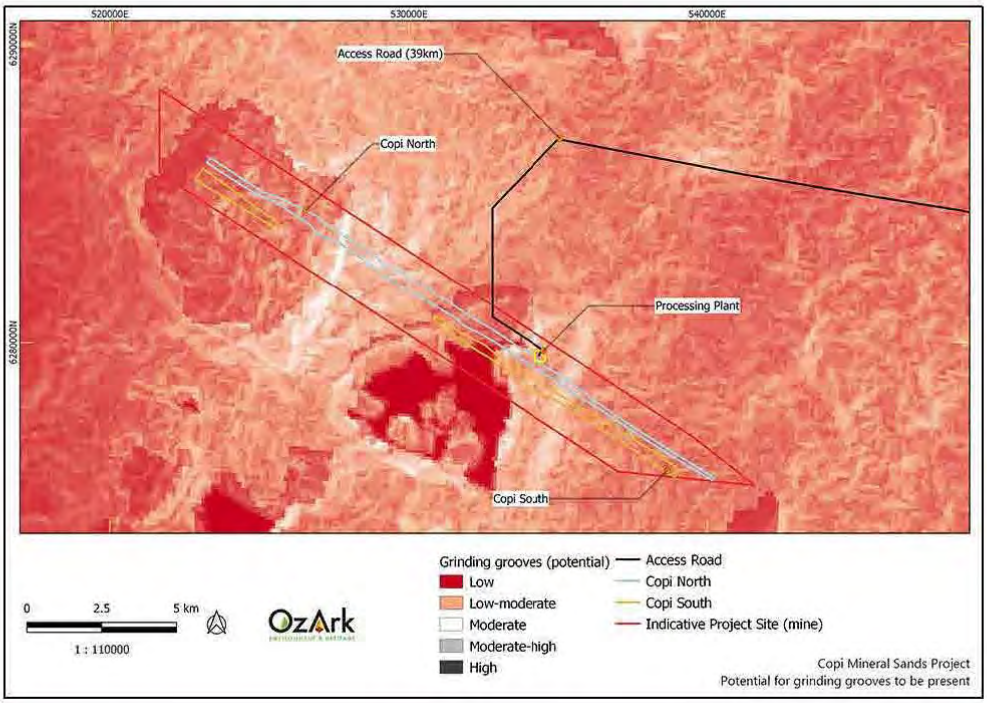

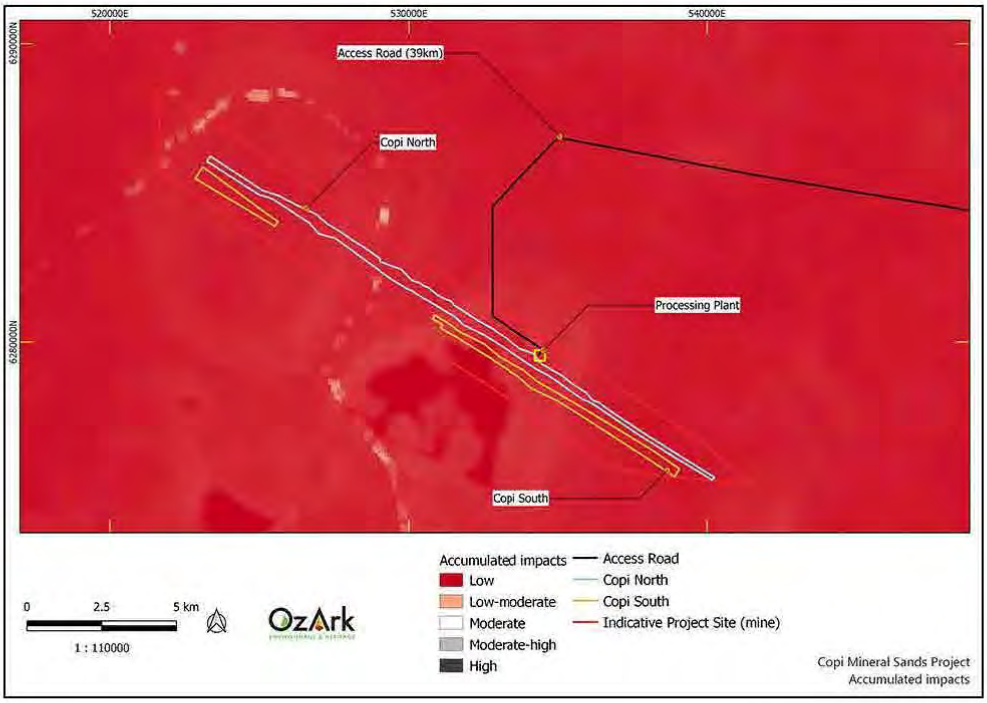

APPENDIX 5: PHASE 1 TEST EXCAVATION METHODOLOGY

View across the eastern relict lake.

ARCHAEOLOGICAL TEST EXCAVATION METHODOLOGY

COPI MINERAL SANDS PROJECT

WENTWORTH LOCAL GOVERNMENT AREA

MAY 2020

Report prepared by

OzArk Environment & Heritage

for Relentless Resources Limited

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Environment & Heritage

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DOCUMENT CONTROLS

Proponent	Relentless Resources Limited
Client	RW Corkery & Co
Document Description	*Archaeological Test Excavation Methodology: Copi Mineral Sands Project, Wentworth LGA*
File Location	OzArk Job No.
S:\OzArk EHM Data\Clients\ RW Corkery & Co	2026

Document Status: V3.0 FINAL	Date 8 May 2020
Draft V1.0 Author to editor OzArk 1st internal (Series V1 = OzArk internal edits)	V1.0 SR author 8/4/2020 V1.1 BC edit 8/4/20
Draft V2.0 Report Draft for release to client (Series V2 = OzArk and client edits)	V2.0 SR to RWC 8/4/20 V2.1 BC incorporates RWC comments 9/4/20
FINAL V3.0 = Final report	V3.0 OzArk finalises 8/5/20 and sends to RAPs 11/5/20
Prepared For	Prepared By
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Acknowledgement

OzArk acknowledge Traditional Owners of the area on which this assessment took place and pay respect to their beliefs, cultural heritage and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

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1 INTRODUCTION

1.1 PREAMBLE

OzArk Environmental & Heritage Management (OzArk) has been engaged by RW Corkery & Co on behalf of Relentless Resources Limited (the Proponent) to prepare a test excavation methodology for the proposed Copi Mineral Sands Project (the Project) located approximately 75 kilometres (km) northwest of Wentworth in southwestern NSW. The Project is in the Wentworth Local Government Area (LGA) (Figure 1-1).

This methodology has been prepared in accordance with Stage 3 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRs).

As a mineral sands mine, the Project is classified as a State Significant Development under Clause 5(1)(a) of Schedule 1 of the State Environmental Planning Policy (SEPP) (State and Regional Development) 2011. As such, the Project requires an Environmental Impact Statement (EIS) to accompany the application made under Part 4 Division 4.7 of the *Environmental Planning & Assessment Act 1979* (EP&A Act). The Aboriginal cultural heritage assessment will be undertaken in accordance with the *Secretary's Environmental Assessment Requirements* (SEARs) issued (SSD 18-9572) and correspondence from the former Office of Environment and Heritage (OEH) (now Biodiversity and Conservation Division of [BCD] of the Department Planning, Industry and Environment [DPIE]), in DOC18/661269 issued on 18 September 2018.

1.2 BACKGROUND TO THE TEST EXCAVATION PROGRAM

The Project Site encompasses approximately 4,984 hectares (ha) of land, as well as a 39 km access road (Figure 1-2). The Project Site is confined to Lot 1 DP 756199, Lot 1907DP 763791, Lot 1940 DP763792, Lot 4068 DP766543 and unnamed road reserves. The Project Site is located 75 km northwest of Wentworth and 180 km south of Broken Hill in the Murray Basin region of southwestern NSW. The Project will include the operation of an open cut mineral sand mine.

R.W. Corkery & Co has been engaged by Relentless Resources Limited (the Proponent) to prepare an *Environmental Impact Statement* (EIS) for the Project which involves the development of an *Aboriginal Cultural Heritage Assessment Report* (ACHAR).

As part of the ACHAR, OzArk have been engaged to undertake the archaeological assessment of the areas that will be potentially impacted by the Project. The surface archaeological assessment has already been completed over the Project Site during February and March 2019.

As a result of the surface archaeological assessment, ten locations were identified for subsurface test excavation in order to determine the integrity and/or extent of sites recorded during the field assessment.

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This document sets out the proposed methodology for the test excavation and follows the Code of Practice under Part 6 *National Parks and Wildlife Act 1974* (NPW Act).

Figure 1-1. Map showing the location of the Project Site.

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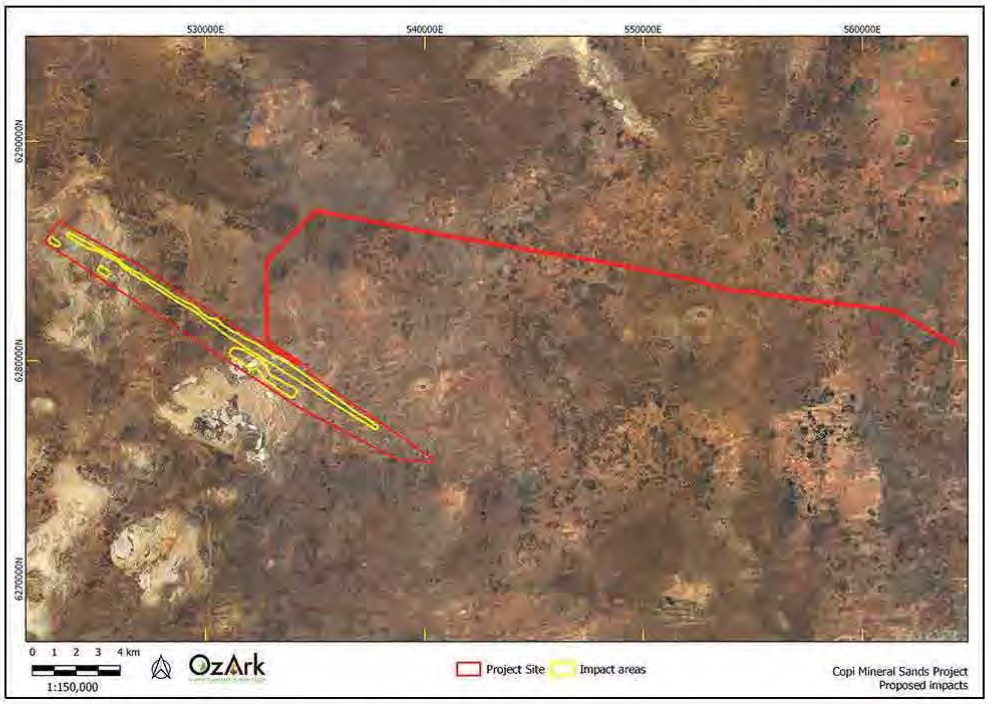
Figure 1-2. Map showing the proposed impact footprint of the Project.



1.3 CODE REQUIREMENTS FOR THE TEST EXCAVATION PROGRAM

The Code of Practice lists a number of requirements pertaining to test excavation. These requirements are enumerated below and further information pertaining to these requirements follow in subsequent sections of this document.

- **Requirement 14** (Test excavation which is not excluded from the definition of harm):

Sub-surface investigation will not be excluded from harm where they are carried out in the following areas:

- in or within 50 metres (m) of an area where burial sites are known or are likely to exist
- in or within 50 m of a declared Aboriginal place
- in or within 50 m of a rock shelter, shell midden or earth mound
- in areas known or suspected to be Aboriginal missions or previous Aboriginal reserves or institutes
- in areas known or suspected to be conflict or contact sites.
  - The test excavation locations are not located within the vicinity of the items listed under Requirement 14 of the Code.

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- **Requirement 15a** (Consultation): As the proposed archaeological test excavation program is part of the Project, consultation has been ongoing with the Registered Aboriginal Parties (RAPs) and has been completed to the stage described in subclause 80C (6) of the *National Parks and Wildlife Regulation 2009* (NPW Regulation).
- **Requirement 15b** (Test excavation sampling strategy): This document sets out the proposed sampling strategy for the test excavation program.
- **Requirement 15c** (Notification):
  - the location of the proposed test excavation and the subject area.
    - This document sets out the proposed location of the test excavation program.
  - the name and contact details of the legal entity with overall responsibility for the project.
    - Relentless Resources Limited, Level 12/37 Bligh St, Sydney NSW 2000.
  - the name and contact details of the person who will be carrying out the test excavations where this is different to the legal entity with overall responsibility for the project.
    - OzArk Environment & Heritage, 145 Wingewarra St, Dubbo NSW 2830
  - the proposed date of commencement, and estimated date of completion, of the test excavations.
    - Anticipated Commencement: May 2020
    - Anticipated Completion: May 2020

    Weather permitting, the projected period for the excavation is up to seven days.
  - the location of the temporary storage location for any Aboriginal objects uncovered during the test excavations.
    - Aboriginal objects recovered during the excavations will be temporarily stored in a locked cupboard at 145 Wingewarra, Dubbo, NSW, 2830 (OzArk office) for analysis. Following analysis, the artefacts will be stored at the OzArk office until such time as a Care Agreement is reached between an individual or organisation and the BCD. Other objects, such as faunal or charcoal samples, may be sent to third party specialists for analysis.
- **Requirement 16a** (Test Excavation): The test excavation program will adhere to Requirement 16a of the Code as set out in this document (see **Section 3.5.1**).
- **Requirement 16b** (Objects recovered during test excavations): Aboriginal objects recovered during the excavations will be analysed at 145 Wingewarra, Dubbo, NSW, 2830 (OzArk office). When not being analysed, the objects will be temporarily stored in a locked cupboard at the OzArk office. Following analysis, the artefacts will be stored at the OzArk office until such time as a Care Agreement is reached between an

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individual or organisation and the BCD. Other objects, such as faunal or charcoal samples, may be sent to third party specialists for analysis.

- **Requirement 17** (When to stop test excavations): the test excavation program will adhere to the requirements set out in the Code: *Any test excavation carried out under this requirement will cease when suspected human remains area encountered; or when enough information has been recovered to adequately characterise the objects present with regard to their nature and significance.*

    - OzArk shall ensure that this Requirement is adhered to during the test excavation program. This will include ceasing work as soon as human skeletal material is noted and immediately notifying the police. If the skeletal material is determined to be Aboriginal, BCD will be immediately notified.

1.4 ABORIGINAL COMMUNITY CONSULTATION

A draft of this test excavation methodology was issued to all RAPs on 4 April 2020 for a 28 day review period closing on 7 May 2020.

No comments were received from RAPs on the test excavation methodology.

The final methodology was sent to RAPs on Monday 11 May 2020.

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2 ARCHAEOLOGICAL CONTEXT

2.1 REGIONAL ARCHAEOLOGICAL CONTEXT

2.1.1 Introduction

The Darling, the Darling River Anabranch and lake systems in southwestern NSW have been the subject of several heritage assessments, archaeological excavations and detailed academic studies. Some of the earliest evidence of human occupation of Australia comes from south-western NSW (Cupper 2007: B-14). The site of Lake Mungo contains archaeological evidence including human remains and stone tools that date to between 46,000 and 50,000 years before present (BP) (Bowler et al 2003). Evidence for human occupation has also been recorded at Menindee Lake from 45,000 BP (Cupper and Duncan 2006 as reported in Cupper 2007: B14) along the Darling and at Lake Victoria on the Murray River by around 21,000 BP. Archaeological evidence from Willandra Lakes suggests that Aboriginal occupation in the Murray-Darling basin dates from between 46,000 and 50,000 BP (Allen and Holdaway 2009: 99; Bowler et al 2003).

2.1.2 Previous subsurface investigations within the region of the proposal

No previous subsurface archaeological investigation has occurred within the study area for the Project. Nor have subsurface investigations been undertaken in closely adjacent landforms.

Archaeological excavations that have occurred in proximity to the Project Site are limited to those completed as part of the Wentworth to Broken Hill Pipeline project (Niche 2019). The results of these investigations are summarised below to gain an understanding on the nature of subsurface deposits that may be encountered within the Project Site.

2.1.2.1 Salvage and compliance report: Wentworth to Broken Hill Pipeline, NSW

Between December 2017 and July 2018, Niche Environment and Heritage (Niche) completed salvage excavations for the Wentworth to Broken Hill (W2BH) pipeline (Niche 2019). The Wentworth to Broken Hill pipeline spans 270 km, largely adjacent to the Silver City Highway and traverses the river and creek floodplains, sandplains, dune fields, playa and basins, lowlands and Barrier Range land systems.

The salvage followed the completion of the archaeological survey and a test excavated program which identified over 350 Aboriginal cultural heritage sites and refined areas of archaeological sensitivity. Aboriginal sites consisting solely of stone artefacts at varying densities comprised 80% of the recorded site types. At other locations, stone artefacts were recorded in association with shell, faunal bones, hearths and/or potential archaeological deposits (PAD) (**Figure 2-1**).

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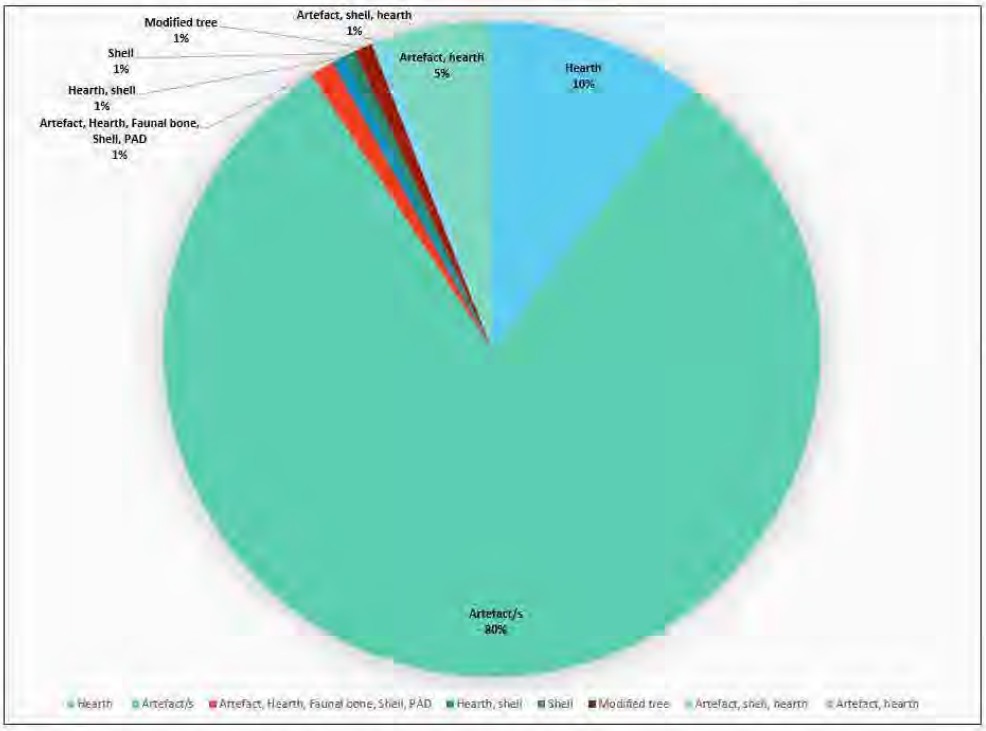
Figure 2-1: Recorded site types across the pipeline alignment.



The surface collection and salvage excavations were completed in accordance with the conditions of their respective Aboriginal Heritage Impact Permits (AHIPs) listed in **Table 2-1**. **Table 2-1** also summarises the number of sites impacted by the project and the overall area of excavated material.

Table 2-1: W2BH pipeline: Project components and AHIP areas.

Kilometres along pipeline (KP)	Project component	AHIP number	Number of sites impacted (partially or totally)	Number of sites determined not to be a site.	Area excavated
0-111.5 km	Stream 2A	C0003217	24	12	46 m²
3.5 to 4.5 km	Darling River Crossing	C0003772	2	-	10 m²
111.5 to 157 km	Stream 2B	C0003333	54	1	201 m²
157 to 221.75 km	Stream 2C	C0003451	85	-	5 m²
221.75 to 270 km	Stream 1	C0003153	102	-	10 m²

Results

The results of the overall assemblages of materials recovered during the salvage are summarised below:

- 8,211 stone artefacts were retrieved during the W2BH pipeline salvage. This included 4,614 stone artefacts collected across the surface and 3,597 recovered from

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excavations. An additional 800 non-diagnostic stone objects which were also collected. Salient characteristics of the artefact assemblage were:

  - The dominant material in the excavation assemblage was silcrete of varying grain size, comprising 48.51% of the overall assemblage, followed by quartz (both milky and crystal) with 28.74% and quartzite comprising 11.9%. Overall, both locally procured and non-local sources of materials were utilised
  - The most common artefact type was broken flakes (35.31%) followed by complete flakes (17.51%). Angular fragments made up 15.93% of the assemblage while formal tools accounted for less than 6%
  - Preference of finer grained materials for retouched tools, i.e. scrapers, backed blades was observed.

- Residue analysis on stone tools showed evidence of processing starchy and non-starchy plants, processing plants for medicinal purposes, and processing of animals
- Eleven Aboriginal sites were associated with the remains of several types of shellfish, however, only two sites (both located adjacent to the Darling Anabranch) contained enough samples for analysis. Both sites displayed some evidence of cultural discard i.e. heterogenous species composition, some burnt shell and location, however, there was not enough evidence to rule out that potential of the accumulations being from natural causes.
  - Shells recovered at depths between 20 to 60 cm from LTWP AFT HTH 103/MBHP AFT 5 on a rise dated between 2750 and 14064 cal BP[1] indicating a small volume of accumulated shell over a long period of time
  - Shell collected from MBHP AFT 7 on the floodplain dated to 266–47 cal BP and 910–790 cal BP. This was much more recent than the fish bone recovered at similar depths; therefore indicating mixed and inverted deposits.
- Fish otoliths were identified at one Aboriginal site which comprised stone artefacts and a potential midden (MBHP AFT 7) located on the floodplain of the Darling Anabranch. 19 otoliths were analysed, all from golden perch. Analysis found that the fish died at different times throughout the seasons and experienced fluctuating environmental conditions induced by seasonal environmental changes. Radiocarbon dates obtained range from 2750–2490 to 540–500 cal BP. Two distinct clusters of dates are evident, one from ca. 500–910 cal BP, and another from ca. 2000–2750 cal BP
- Faunal bones comprised only a small percentage of recovered material from excavations and the majority of recovered bone was small, fragmentary, and non-diagnostic. Where identifications could be made, they included, rabbit, rodent, yabby, sheep or goat, reptiles, golden perch, macropod, crayfish, gastropod and various mammals. The assemblages and presence of certain species provide indications of the

[1] The cal prefix indicates that the dates are the result of radiocarbon calibration using tree ring data. These values should correspond exactly to normal historical years BCE and CE. The term cal BP means the number of years before 1950 and can be directly compared to calendar years.

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degree of disturbance at some of the sites. No bone displayed any indication of cultural modifications and none was burnt

- 13 hearths which were identified during the survey were further investigated during the salvage and were determined to be remnants of natural, burnt termite mounds and /or attributed to land clearance practices
- Pleistocene occupation was confirmed at Lake Popiltah and possible terminal Pleistocene/early Holocene occupation at Pine Creek, in addition to Holocene occupation and Mid-late Holocene occupation was identified at Twin Lake[2].
    - Pine Creek
        - Optically Stimulated Luminescence (OSL) dating at LTWP AFT HTH 75 from test pit 159 provided dates of 14700 ± 500 BP for spit 10 and 15900 ± 1200 for spit 12. A third sample from test pit 161, spit 13, suggested early Holocene sediment deposit accruing on a Last Glacial Maximum (LGM[3]) feature with significant bioturbation episodes introducing earlier sand grains to the deposit. The dominant sand grain dating was 10800 ± 500 BP.
    - Lake Popiltah
        - Dating results indicate possible Aboriginal occupation dating back to 42,000 years ago
        - Artefact numbers peaked at Open Area 9 at 130–135 centimetres (cm), 160–170 cm and 190–205 cm. No artefacts were identified below 205 cm. The results indicate that multiple phases of occupation took place at MBHP AFT 48/46/45 during the Pleistocene Period
        - Only 25 artefacts were found in the top 100 cm during the test excavation at MBHP AFT 48/46/45. These included debitage fragments with no tools, indicating that there was a change in the way people occupied the location, possibly as a result of changing environmental conditions i.e. the transition of the Darling River from the anabranch around 7000–9000 BP meaning Lake Popiltah would fill less frequently.

2.1.3 Copi Mineral Sands Project Land Capability and Soils Assessment

Sustainable Soils Management Pty Ltd (Hulme 2020) have undertaken a soil assessment for the Project Site that has archaeological implications.

Hulme 2020 characterise the general environment of the Project Site as:

- The Project Site has a climate in which water is the major limitation to plant growth. Average monthly potential evapotranspiration ranges from double average rainfall in

[2] In terms of human occupation in Australia, the Pleistocene is associated with the ice ages that resulted in cooler temperatures and drier conditions. Around 12000 BP in the Holocene Period, conditions began to warm, and rainfall increased. Generally Aboriginal occupation becomes more widespread in the Holocene as conditions allowed a greater distribution of the resources required for sustenance.

[3] In Australia, the LGM is from 25000–16000 BP.

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June to 10 times rainfall in December and January. The temperature regime has mild winters, and hot in summer months

- The soil properties in the Project Site are controlled by the water regime in that carbonate occurs commonly in upland profiles and lake floors are likely to be saline
- Approximately half the Project Site is relict salt lakes. These are generally flat but contain raised gypsite flats and lunettes. There are also larger lunettes on the eastern border of the relict salt lakes. Soil in and around the relict salt lakes would be expected to be salty
- The remaining half of the Project Site was mapped as Sand Plains and Dune Fields. These occupy a large majority of the land around the Project Site. Soil texture is expected to be sand in the dunes and sandy, with calcium rich subsoil in swales and sand plains
- The relict salt lakes occupy the floor of closed depressions that are up to 19.5 m deep. Although the computer model was able to map drainage lines, it is unlikely that these are active
- The land shape is generally undulating. Slopes are neither steep enough nor long enough for water erosion to be common
- Land use around the Project Site is grazing of native vegetation.

Hulme 2020 maps six Soil Associations within the Project Site. These are mapped on **Figure 2-2** and are described below:

- Dunes and Sand Plains has profiles of red sandy topsoil over sand to sandy clay loam subsoil. The landform ranged from undulating plains to dunes and swales
- Lunettes on the eastern side of the relict lakes. It appears that these lunettes contain a large proportion of material that has been blown out of the relict lakes
- Lake Footslopes which are on the western side of relict lakes. It appears that the soil surface has been formed by deposition of sand that has come from the surrounding sandplains over subsoil that has been exposed by erosion as the relict lake floors have become lower
- Lake Floor East is the floor of the eastern relict lake. Soil salt chemistry appears to be dominated by chloride and sulphate
- Lake Floor West is the floor of the western relict lake. Soil salt chemistry appears to be dominated by sulphate
- Gypsite Flats are plains within the relict lakes that are above the lake floor by a height large enough that they have relatively low salinity topsoil.

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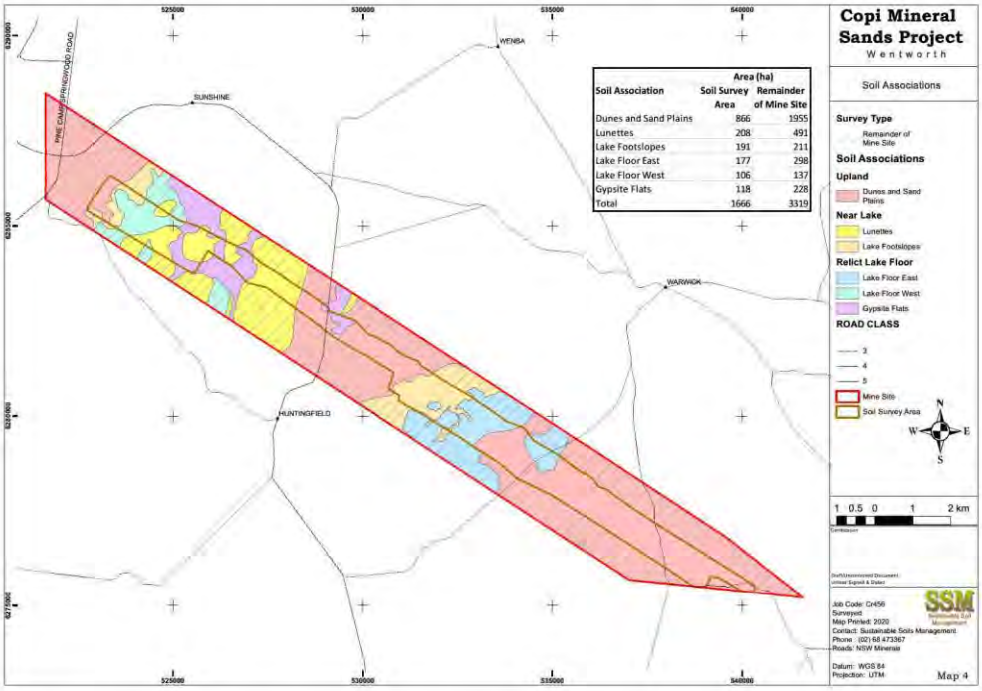
Figure 2-2: Map showing the Soil Associations as mapped in Hulme 2020 (Map 4).



As is noted in **Section 3.2**, the most important Soil Associations from an archaeological perspective are: Lunettes; Dunes and Sand Plains; and Lake Footslopes. All other Soil Associations are mostly within the relict lake systems where the preservation of archaeological deposits would be poor.

Soil profiles of the archeologically important Soil Associations are reproduced from Hulme 2020 in **Table 2-2**. Comments on these profiles from an archaeological perspective follow:

- Lunettes. While the system remains active, the differentiated soil profile and the build-up of carbonate indicates that the profile is not recently formed and has been relatively stable for some time (thousands of years). This would indicate that the 'lunettes' in the Project Site are not the 'lunettes' encountered in the Niche (2019) investigation (see for example the deep, undifferentiated lunette sand deposits at the Lake Popiltah site MBHP AFT 48 illustrated on the cover of Niche 2019). B-Horizon appears to be approximately 60 cm deep in this soil profile
- Dunes and Sand Plains. A reasonably undifferentiated soil profile but one with a coarse grain size. B-Horizon appears to be approximately 60 cm deep in this soil profile
- Lake Footslopes. Shows evidence of deflation as the B-Horizon appears to be approximately 20 cm deep in this soil profile.

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Table 2-2: Soil profiles from Hulme 2020.

		
1. Soil profile in the Lunette Soil Association.	2. Soil profile in the Dunes and Sand Plains Soil Association.	3. Soil profile in the Lake Footslopes Soil Association.

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3 PROPOSED METHODS

3.1 PURPOSE OF THE TEST EXCAVATION METHODOLOGY

The purpose of the test excavation program is to understand more completely the nature of the sub-surface material within the Project Site. Data obtained from the test excavation program will inform the mitigation and management options in the forthcoming ACHAR.

The aims are therefore to:

1. Establish the extent and nature the of sub-surface archaeological deposits at a site or landform with archaeological potential
2. Use the data gained from the test excavation program to better evaluate the archaeological significance and potential of the Project Site
3. Develop, in consultation with the RAPs and the Proponent, an informed strategy for the management of impacts to any Aboriginal cultural heritage likely to be impacted by the proposal.

As a result, locations initially considered for the test excavation program are limited to:

- Areas identified during the pedestrian survey as having archaeological potential
- Landforms which are relatively intact (i.e. not within disturbed contexts)

Excavations undertaken as per the Code do not require an AHIP under the NPW Act.

3.2 BACKGROUND TO THE TEST EXCAVATION PROGRAM

The test excavation program follows an extensive program of surface survey completed across the Project Site. The Aboriginal heritage surface survey was undertaken by two teams on 25 February to 4 March 2020 with each team consisting of two archaeologists and two RAPs. The assessment consisted of sampling all landforms in the Project Site, while concentrating more intensively on landforms with greater archaeological potential.

The results of the Aboriginal heritage assessment will be contained in the forthcoming ACHAR that will provide full details of all sites recorded. As an overview, the pedestrian survey recorded a number of artefacts, several hearths/ground ovens. The locations of recorded Aboriginal objects are shown in **Figure 3-1**. The greatest density of artefacts and hearths were identified within the Lake Footslopes Soil Association to the north of the eastern salt pan, followed by the Dunes and Plains Soil Association to the east of the eastern salt pan (**Figure 3-3**).

The survey identified ten areas where test excavation could provide a clearer picture of the subsurface archaeological potential across the Project Site. These initial areas, and the reasons why they were selected are outlined in **Table 3-1**. The location of these ten areas is shown on **Figure 3-2**.

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Figure 3-1: Locations of Aboriginal objects recorded during the survey.

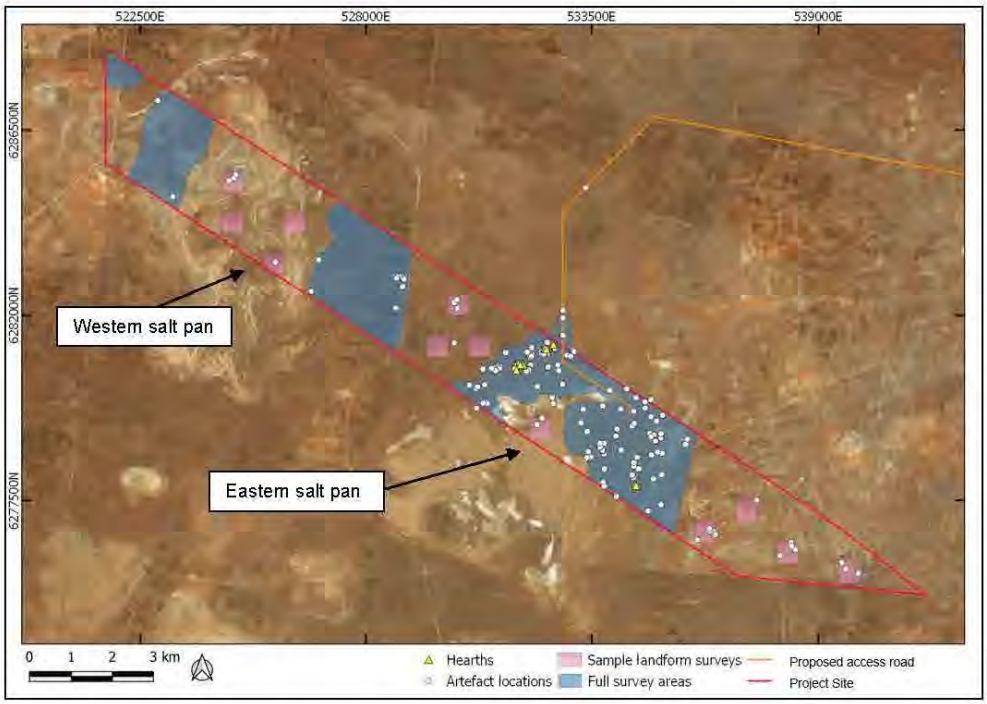

Table 3-1: Proposed areas for test excavation.

Area	Landform	Associated Soils	Reason for test excavation
Area 1	Isolated, elevated crest above the groundwater discharge basin/ relict lake? (the western salt pan).	Lunette	Lunettes are considered to be a landform with increased archaeological sensitivity. One of the few areas where artefacts were identified in the west of the Project Site.
Area 2	Broad, elevated plain with gentle undulations to the west of the western salt pan.	Lunette	A broad, undifferentiated landform where no surface artefacts were identified, however, as it has been mapped as a lunette (Hulme 2020), a landform considered to have archaeological potential, sub-surface deposits have an increased likelihood of being present and excavation will provide insight into the formation process and nature of the landform.
Area 3	Gentle slope rising to the west adjacent to gypsum flats.	Dunes and Sandplains.	A number of surface artefacts were visible during the survey along an area of water wash. Area in the west where the highest concentration of artefacts was identified. Testing would confirm whether the artefacts are present on a deflated surface.
Areas 4 and 5	Long, gentle slope to the north of the eastern salt pan.	Lake Footslopes.	Appeared to have high archaeological potential during the survey. The greatest density of artefacts was identified along this landform as were a number of hearths in areas subject to water and wind erosion. Testing will confirm whether the artefacts are present on

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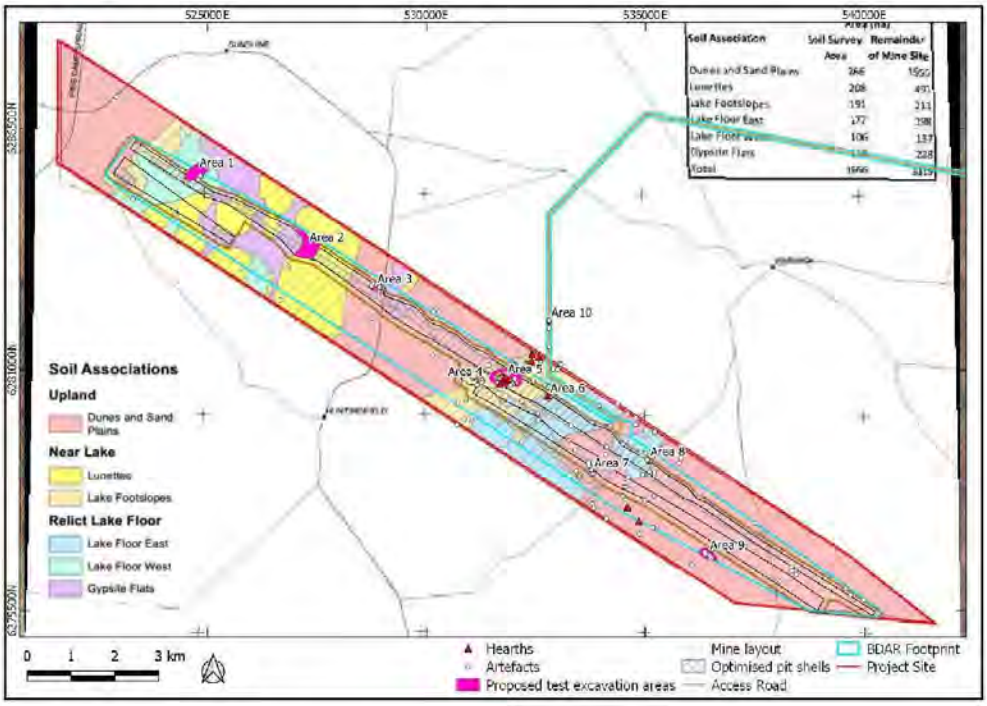
Area	Landform	Associated Soils	Reason for test excavation
			a deflated surface or if there are associated subsurface deposits.
Area 6	Sandy rise bordering a small depression to the north, in the vicinity of the eastern salt pan.	Lake Footslopes.	A discrete location of silcrete artefacts eroding from the edge of the landform. Appears to be a knapping floor.
Area 7	Slightly elevated landform along the western and northern sides of a depression.	Dunes and Sandplains.	Chosen in order to test the nature of deposits on the dunes and sand plains. Archaeological potential of this particular area is increased as it is adjacent to a depression which may have held water seasonally and surface artefacts have been identified.
Area 8	Slightly elevated landform adjacent to a depression.	Lake Floor East and Dunes and Sand Plains.	Chosen as artefacts were identified on the surface and it is at the transition of two Soil Associations.
Area 9	Gentle, undulating sand plain.	Dunes and Sandplains.	Chosen to gain further insight into the archaeological potential of landforms distant from the former groundwater basin/relict lake? (eastern salt pan)
Area 10	Flat, elevated plain above the long, gentle slope north of the eastern salt pan.	Not mapped – however, likely to be Dunes and Sandplains.	A concentration of artefacts was identified along the proposed access track. Chosen to gain further insight into the flat, undifferentiated plain which transitions into the long, gentle slope where the greatest concentration of artefacts was identified.

Figure 3-2: Location of the initially proposed test excavation areas.

Figure 3-3: Initial proposed test excavation areas overlaid with Hulme 2020 Map 4.



3.3 REVISED TEXT EXCAVATION AREAS

The Proponent is presently completing a Feasibility Study for the Project and disturbance areas are yet to be fully defined. As a result, following the identification of the ten proposed test excavation areas (**Section 3.2**), the Proponent provided further information in relation to the potential for disturbance at selected areas. This includes a lower potential for any disturbance to portions of the Project Site to the west of Nulla Road, as well as avoiding disturbance to some portions of the Project Site to the east of Nulla Road. **Table 3-2** and **Figure 3-4** outline the status of the ten initially proposed areas based on this amended impact footprint. The Proponent has committed to not disturbing those proposed excavation areas shown on **Figure 3-3** that are not the subject of investigation during the test excavation program.

Table 3-2: Revised status of proposed test excavation areas.

Area	Status following updated impact footprint	Summary of revised test excavation program at this location
Area 1	Located west of Nulla Road and therefore in an area of lower priority. Excluded from the main test excavation program. However, a limited number of pits are proposed to be excavated in this landform should time permit to determine the nature of the landform which is mapped as a lunette and to inform future design of the Project Site.	Limited investigation (1 m²)
Area 2	Located west of Nulla Road and in an area of lower priority. Excluded from the main test excavation program. However, a limited number of pits are proposed to be excavated, should time permit, in this landform that has been	Limited investigation (1 m²)

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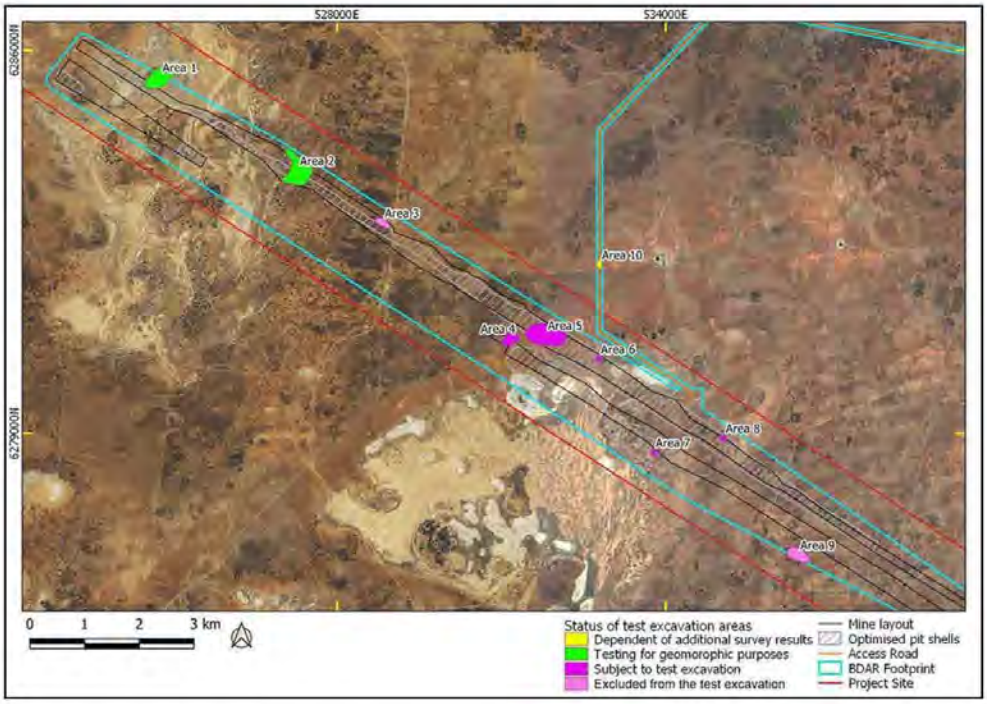
	mapped as a lunette in Hulme 2020 to determine the nature of the landform and to inform future design of the Project Site.	
Area 3	Located west of Nulla Road and therefore in an area of lower priority. Excluded from the test excavation program.	Excluded
Area 4	Located within the amended impact footprint therefore will be investigated during the test excavation program.	Included
Area 5	Located within the amended impact footprint therefore will be investigated during the test excavation program.	Included
Area 6	Located within the amended impact footprint therefore will be investigated during the test excavation program.	Included
Area 7	Located within the amended impact footprint therefore will be investigated during the test excavation program.	Included
Area 8	Located within the amended impact footprint therefore will be investigated during the test excavation program.	Included
Area 9	Will not be impacted by the proposed work, therefore the area is now excluded from the test excavation program.	Excluded
Area 10	Located along the proposed access route, therefore will be investigated during the test excavation program.	Included

Figure 3-4: Figure showing the revised status of the proposed test excavation areas.



3.4 RATIONALE BEHIND THE TEST EXCAVATION METHODOLOGY

3.4.1 Predictive model

As has been noted (**Section 3.2** and **Figure 3-3**), the distribution of surface artefacts indicates that the Lake Footslopes Soil Association contains the greatest density of artefacts, followed by the Dunes and Sand Plains Soil Association. Although the areas mapped as 'lunettes' in Hulme

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2020 were adequately assessed during the survey, this Soil Association recorded very few surface artefacts. It is noted, however, that Niche 2019 (**Section 2.1.2.1**) recorded that there were few surface artefacts visible in their lunette landforms, while subsurface artefacts extended to a depth of almost 2 m.

As all Soil Associations across the Project Site were afforded adequate survey effort, the observed artefact distribution can be seen as a true reflection of surface artefact distribution and is not a result of survey bias.

There is a distinct clustering of surface artefacts around the eastern salt pan when compared to the western salt pan. The Lake Footslopes and the Dunes and Sand Plains Soil Associations dominate the landforms beyond the bed of the salt pan in this area; and this may account for the strong association of surface artefacts to these Soil Associations rather than the soil type itself: i.e. some feature attracted occupation to this area (fresh water soaks as opposed to saline features in the western relict lake?) and it was this feature that determined occupation rather than the soil type. To reinforce this, as the survey moved to the east from the eastern salt pan within the Dunes and Sand Plains Soil Association, artefact density diminished.

As noted in **Section 2.1.3**, the soil profile presented in Hulme 2020 suggests that the Lake Footslopes Soil Association has been subjected to water wash and deflation; actions that have perhaps exposed artefacts that formerly would have been within the soil profile. This would suggest that while surface artefacts may be exposed in this area that the subsurface component has been diminished and is now shallow.

Based on this brief analysis, a predictive model for subsurface deposits can be postulated:

- Areas within the bed of the relict lakes will have a low probability of recording intact subsurface archaeological deposits
- Landforms within the Lake Footslopes Soil Association may only contain shallow and potentially disturbed subsurface deposits
- Landforms in the Dunes and Sand Plains Soil Association only have archaeological sensitivity near the eastern relict lake
- Lunette landforms do not display evidence of deep deposits. While subsurface cultural material cannot be ruled out, this landform feature does not appear to be the same as the archaeologically sensitive lunettes excavated elsewhere in the region. In contrast, the lunettes within the Project Site appear to be old and relatively shallow. This limits their archaeological potential.

3.4.2 Research questions

While any test excavation program is limited in the level of research objectives it can achieve due to the restricted nature of the excavations, the test excavations for the Project will attempt to shed light on:

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- How does the artefactual material and stratigraphy identified at the site compare to other archaeological excavations undertaken in the local area and the region?
- Is the observed surface manifestations and correlation to the mapped Soil Associations borne out by the sub-surface investigations?
- Are intact archaeological features, such as hearths and/or middens, present in the site area?
- Can chronological dates be obtained (i.e. from in situ charcoal samples) that will aid our understanding of when Aboriginal occupation in the region?

3.5 SAMPLING STRATEGY

The excavation program will be undertaken by archaeologists and representatives of RAPs and will include the following aspects:

1. Six areas (Area 4–8 and 10) will be investigated by the test excavation program. Areas 1 and 2 will be subject to testing only to understand the formation process and nature of the associated landform. For specific methodology relating to each area, see **Table 3-3**.
2. The location for the proposed test excavation program is shown on **Figure 3-4** and approximate locations of transects on **Figure 3-5** to **Figure 3-8**. The location of the proposed pits for Areas 1 and 2 will be determined in the field.
3. Excavation squares will generally be spaced with a 10 m interval so that a broad representation of the landform will be obtained. However, should the PAD under investigation be small in size, the excavation squares will be excavated at a 5 m interval.
4. Prior to any excavation, the site will be recorded via digital photography.
5. Initial excavation squares will be excavated in 5 cm spits to determine whether archaeological stratigraphy is present. If not, spit size will be increased to 10 cm. If archaeological stratigraphy is present, this will be used, so long as the stratigraphic layers are less than 10 cm deep. Otherwise, excavation will remain at 5 or 10 cm spits.
6. The excavated material from all pits will be sieved on site using dry sieving through nested sieves of 6–8 millimetre (mm) and 2.5–3.5 mm mesh (which is considered to satisfy the 5 mm aperture wire-mesh sieve requirement).
7. If the soils within the PAD are deep, the decision on when to stop excavation will rest with the supervising archaeologist although Requirement 16a, point 9 will be followed. This states: *Test excavation units must be excavated to at least the base of the identified Aboriginal object-bearing units, and must continue to confirm the soils below are culturally sterile.*
8. Each excavator (by hand) will be responsible for sieving the deposit from their excavation square, retrieving the artefacts and, in conjunction with the supervising archaeologist,

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correctly recording their provenance. There could be some room for assistance with the sieving but a self-contained approach is preferable. Deposits will be sieved on to tarpaulins and the spoil used to backfill the excavation pit once it has been photographed and recorded.

9. A standard excavation recording form will be used for each excavation square. Details will include; date, site recorder, spit number and depth, description of finds, description of soil, sketch plan of excavation (if relevant to show structure), end of spit levels, soil pH (when necessary or appropriate).

10. It is envisioned that the excavation crew will consist of an Excavation Director, four assistant archaeologists, a heritage officer, and at least four cultural heritage field workers. The excavator of each excavation square, in conjunction with the Excavation Director, will be responsible for ensuring all forms are correctly completed. It will be the archaeologists' responsibility to perform all photographic tasks, undertake any planning and section drawing if required and to ensure that a correct location of each excavation square is maintained.

11. Given that the work will be reasonably physical, all persons participating on the test excavation program should be aware of this and be 'fit for work'.

12. If intact archaeological deposits or archaeological features are encountered, then additional archaeological excavation squares may be excavated to ensure documentation of any features and/or retrieval of artefacts and other relevant archaeological material. A feature would include a high density of artefacts within a pit, or a square containing rare or unusual artefacts (such as artefacts constructed from a stone type rarely represented in the area or less-common tool forms such as ground edge axes, hammerstones, etc.), or other signs of human occupation i.e. ground ovens/hearths or charcoal concentrations. Any expansion must adhere to Requirement 16 (5). Any expansion would only occur with the consent of the Excavation Director who will determine if an expansion is required to gain the appropriate scientific information.

13. Rather than expanding around an individual square as set out in Point 12, it is more likely that any expansion will involve setting out an additional transect at 90 degrees to a transect that has demonstrated significant and intact archaeological deposits. The perpendicular transect will be used to assist in determining the spatial spread of the subsurface deposits.

14. If appropriate (i.e. intact archaeological stratigraphy is recorded) section drawings will be completed for the appropriate excavation square(s). If no archaeological stratigraphy is recorded, then digital photographs shall be taken of a representative section of each excavation square and a suitably representative drawing made of the excavation square section to show the soil profile.

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15. Analysis of all excavated lithics will be made in order to determine the site's characteristics and to enable the site to be compared with other sites in the region. Analysis will also assist in determining what type of activities the Aboriginal people carried out at the site and their relationship with local resources (fauna, flora, water and stone). All artefacts will be analysed and selectively photographed. If charcoal from a secure stratigraphic context is obtained, it may be sent to a laboratory for Carbon 14 dating (subject to Proponent's agreement).

16. All faunal remains, if recovered, will be analysed by a fauna specialist. Remnant shell and bone fragments may assist in determining what foods Aboriginal people may have eaten at the specific site and may elucidate possible foraging strategies. In conjunction with *in situ* stone tools, bone/shell fragments may also provide evidence of specific usage of stone tools for food processing.

17. Artefacts will remain in the care of OzArk until such time as the analysis is complete. Every effort will be made to analyse artefacts on-site to ensure that the artefacts do not have to leave the Project Site. However, in the case of large artefact numbers or artefacts requiring further research, it may be necessary to take artefacts off-site. If taken off-site, the artefacts would be the responsibility of OzArk.

18. The results of the test excavation program will inform the forthcoming ACHAR. Excavation results will be used to advise further courses of action in relation to the management and mitigation options for the Project Site.

19. Once all salvage activities for the Project Site are complete (should the Project be approved), artefacts will be amalgamated and managed as per the Aboriginal Cultural Heritage Management Plan (ACHMP). The ACHMP will be prepared following approval in consultation with RAPs and BCD.

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Figure 3-5: Figure showing indicative transect locations at Areas 4 and 5.

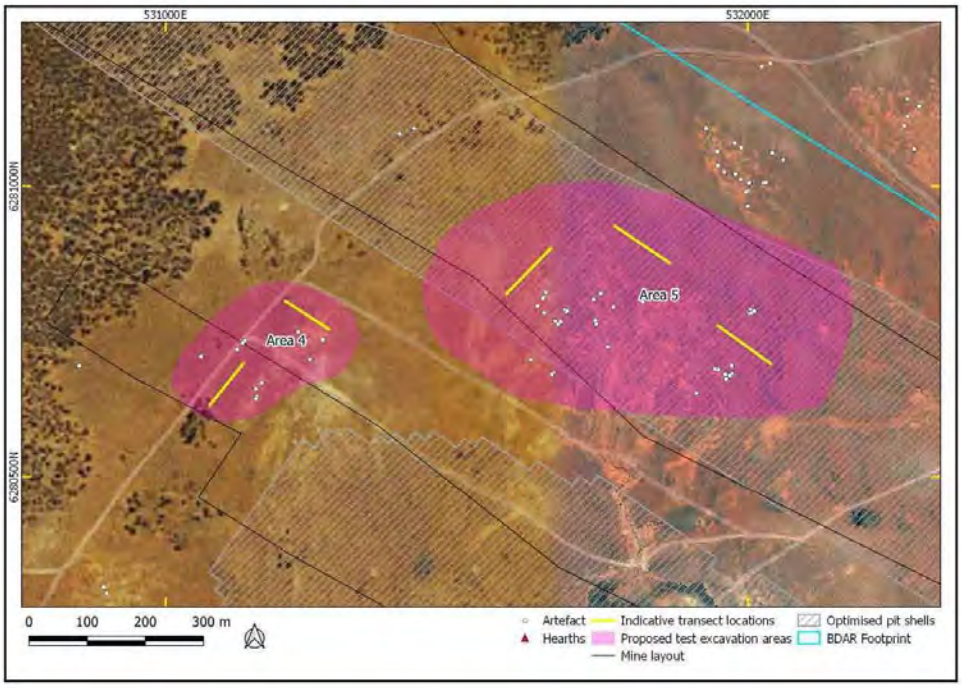

Figure 3-6: Figure showing the indicative transect location at Area 6.

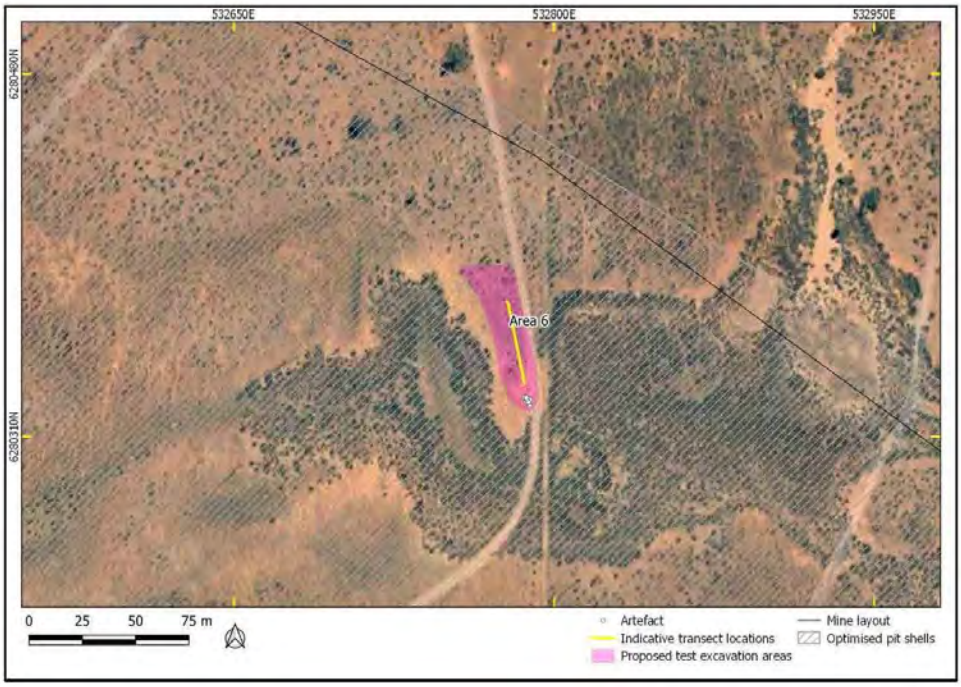

Figure 3-7: Figure showing indicative transect locations at Area 7.

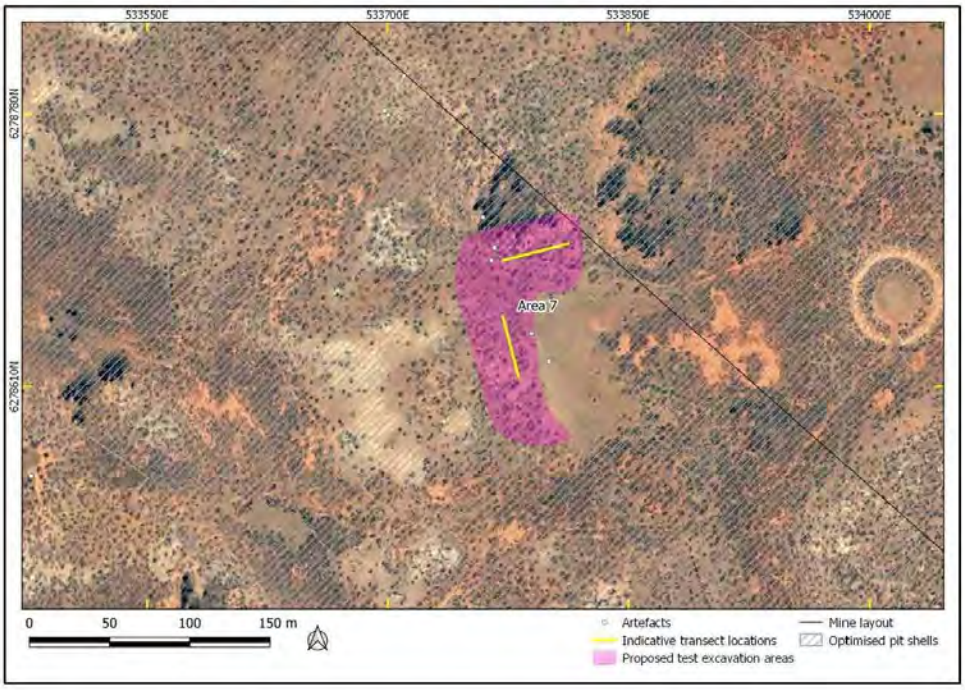

Figure 3-8: Figure showing indicative transect locations at Area 8.

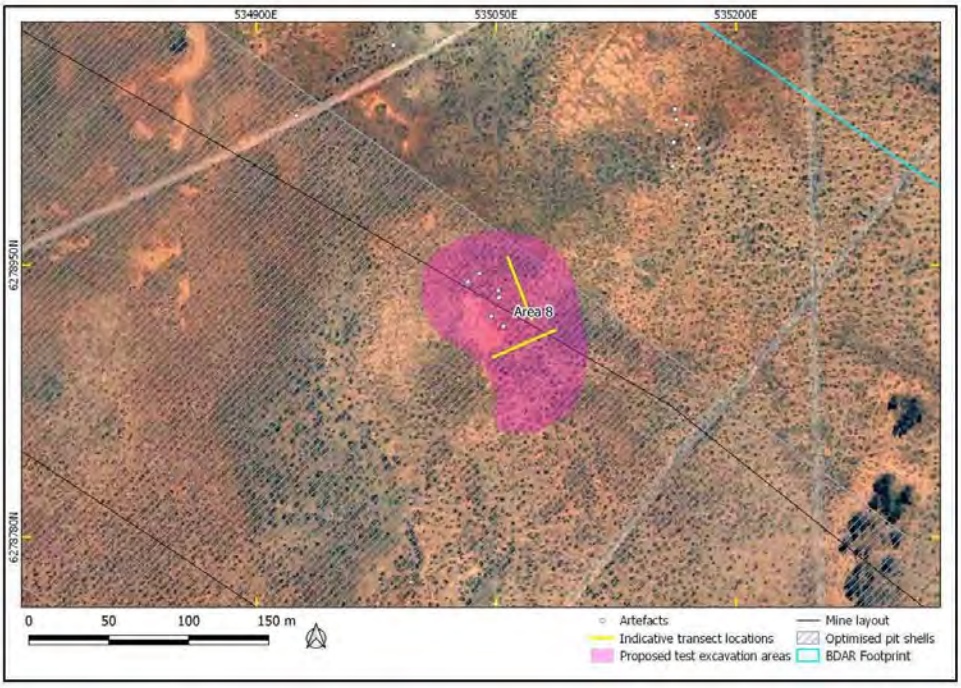

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Figure 3-9: Figure showing indicative transect locations at Area 10.

Table 3-3: Sampling methodology for text excavation program.

Area	Test excavation methodology	Landform area	0.5% of landform area	Proposed excavation area
Area 1	Up to four 0.5 x 0.5 m pits will be excavated. Depending on the depth of A-Horizon soils, these will be excavated in a 1 x 1 m area or along a transect with four individual pits.	158,101 m^2	790.5 m^2	1 m^2
Area 2	Up to four 0.5 x 0.5 m pits will be excavated. Depending on the depth of A-Horizon soils, these will be excavated in a 1 x 1 m area or along a transect with four individual pits.	204,142 m^2	1020.7 m^2	1 m^2
Area 4	2 x 90 m transects (20 0.5 x 0.5 m pits) will be excavated so the entire PAD area is investigated.	51,580 m^2	257.9 m^2	5 m^2
Area 5	3 x 90 m transects (30 0.5 x 0.5 m pits) will be excavated so the entire PAD area is investigated.	237,218 m^2	1186.1 m^2	7.5 m^2
Area 6	1 x 40 m transect (five 0.5 x 0.5 m pits) will be excavated on a north-south alignment to the north of the concentration of artefacts.	1,179 m^2	5.895 m^2	1.25 m^2
Area 7	2 x 40 m transects (10 pits total) will be excavated so the entire PAD area is investigated.	7,945 m^2	39.7 m^2	2.5 m^2
Area 8	2 x 40 m transects (10 pits total) will be excavated so the entire PAD area is investigated.	8,913 m^2	44.6 m^2	2.5 m^2

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Area	Test excavation methodology	Landform area	0.5% of landform area	Proposed excavation area
Area 10 (if needed)	1 x 40 m transects (five 0.5 x 0.5 m pits) will be excavated so the entire PAD area is investigated, should the existing access track alignment be utilised.	15,690 m^2	78.5 m^2	1.25 m^2

3.5.1 Sampling strategy compliance with the Code: Requirement 16

1 *Test excavation units must be placed on a systematic grid appropriate to the scale of the area—either PAD or site—being investigated e.g. 10 m intervals, 20 m intervals, or other justifiable and regular spacing.*

- The sampling strategy outlined above complies with this requirement. All pits will be confined to within the defined areas and placed along linear alignments in the area proposed for the ground disturbance work.

2 *Any test excavation point must be separated by at least 5 m.*

- The sampling strategy outlined above complies with this requirement as all pits will be separated by 10 m. However, depending on the depth to the B-Horizon identified in the pits, additional pit/s may be placed adjacent (making the pits 0.5 m x 1 m) to determine the depth of the horizon and identified stratigraphic information should the pits become too deep to excavate at 0.5 m x 0.5 m.

3 *Test excavations units must be excavated using hand tools only.*

- The sampling strategy outlined in **Section 3.5** complies with this requirement.

4 *Test excavations must be excavated in 0.5 m x 0.5 m units.*

- The sampling strategy outlined in **Section 3.5** complies with this requirement. However, depending on the depth to the B-Horizon identified in the pits, additional pit/s may be placed adjacent (making the pits 0.5 m x 1 m) to determine the depth of the horizon and identified stratigraphic information should the pits become too deep to excavate at 0.5 m x 0.5 m.

5 *Test excavations units may be combined and excavated as necessary to understand the site characteristics, however:*

i) the maximum continuous surface area of a combination of test excavation units at any single excavation point conducted in accordance with point 1 (above) must be no greater than 3 m^2;

- The sampling strategy outlined in **Section 3.5** complies with this requirement.

ii) the maximum surface area of all test excavation units must be no greater than 0.5% of the area—either PAD or site—being investigated.

- The number and size of test excavations undertaken as part of this program will be managed to ensure that this requirement is satisfied.

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6 *Where the 0.5 m x 0.5 m excavation unit is greater than 0.5% of the area then point 5 (ii) (above) does not apply.*

- Not applicable. As the potential archaeological deposits are spatially large, less than 0.5% of the known potential archaeological deposits dimensions will be investigated (see **Table 3-3**).

7 *The first excavation unit must be excavated and documented in 5 cm spits at each area —either PAD or site—being investigated. Based on the evidence of the first excavation unit, 10 cm spits or sediment profile/stratigraphic excavation (whichever is smaller) may then be implemented.*

- Complies. See in **Section 3.5** Point 5.

8 *All material excavated from the test excavation units must be sieved using a 5 mm aperture wire-mesh sieve.*

- Complies. See in **Section 3.5** Point 6.

9 *Test excavation units must be excavated to at least the base of the identified Aboriginal object-bearing units, and must continue to confirm the soils below are culturally sterile.*

- This requirement will be fulfilled in the field and all excavation squares will be excavated to the basal clays or where it is considered that culturally sterile units are present. The decision on when this point is reached will rest with the supervising archaeologist.

11 *Photographic and scale-drawn records of the stratigraphy/soil profile, features and informative Aboriginal objects must be made for each single excavation point.*

- Complies. See in **Section 3.5** Points 9, 10, 14, 15 and 16.

12 *Test excavations units must be backfilled as soon as practicable.*

- Complies. See in **Section 3.5** Point 8.

13 *Following test excavation, an Aboriginal Site Impact Recording form must be completed and submitted to the AHIMS Registrar as soon as practicable, for each AHIMS site that has been the subject of test excavation in accordance with the requirements of the Code.*

- It will be the responsibility of OzArk to ensure that this requirement is met.

3.6 CULTURAL VALUES

All RAPs have been issued with a draft of this document so that any known cultural values can be considered in the test excavation methodology. OzArk undertakes to use any cultural information only with the agreement of the person who provides it, and cultural information can be kept private and does need to appear in any documentation related to the Project.

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Should there be any cultural values that you feel should be considered in this methodology, the invitation is extended to contact OzArk as soon as is possible.

3.7 NOTE ON FITNESS FOR WORK

The test excavation program will involve travel out and back from Wentworth each day (a three-hour round trip) and reasonably physical work digging and sieving. While we will have communications (a satellite phone), the Project Site is distant to medical help. Further, the site does not have toilet facilities (although a 'bush toilet' will be established) and generally the work will be in exposed conditions when the weather will be getting cool.

The seven days of the program will be worked in one block without any day off.

OzArk asks that all participants take these conditions into account when nominating for work on the test excavation program. OzArk reserves the right to ask an individual not to come back to work the next day if they are endangering their own health or that of their co-workers.

All workers on the program will need to be aware of any regulations with regard to social distancing in relation to COVID-19. Should you have an underlying respiratory condition making you suspectable to harm from COVID-19, you should not be nominating for work on this program.

Each worker will need to sign a declaration regarding their state of health before they commence work on site.

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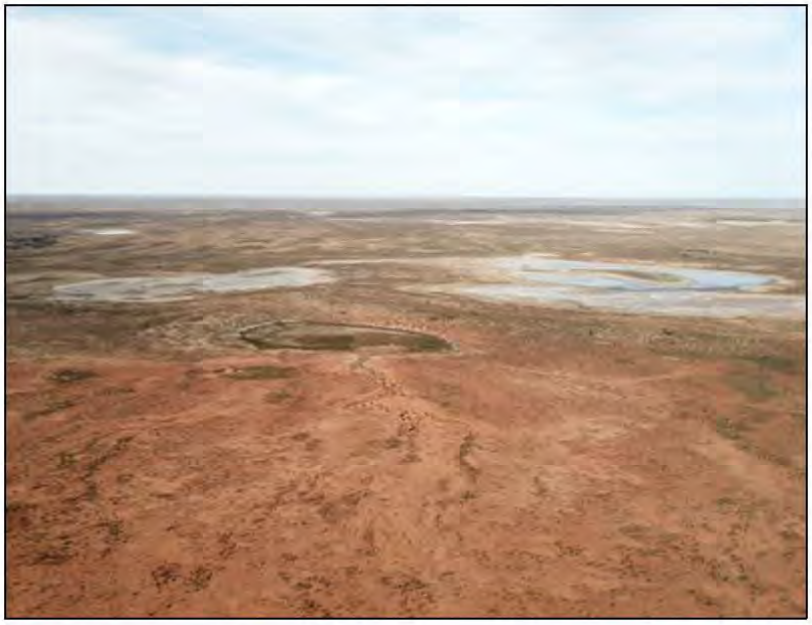
APPENDIX 6: PHASE 2 ASSESSMENT METHODOLOGY



View across the eastern salt pan at Copi.

ABORIGINAL CULTURAL HERITAGE ASSESSMENT METHODOLOGY

COPI MINERAL SANDS PROJECT
ADDITIONAL ASSESSMENT AREA

WENTWORTH LOCAL GOVERNMENT AREA, NSW

JANUARY 2021

Report prepared by

OzArk Environment & Heritage

for RZ Resources Limited

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Acknowledgement

OzArk acknowledge the traditional custodians of the area on which this assessment will take place and pay respect to their beliefs, cultural heritage, and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the Elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

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1 INTRODUCTION

OzArk Environment & Heritage (OzArk) has been engaged by RW Corkery & Co on behalf of RZ Resources Limited (the proponent) to prepare an assessment methodology for additional impacts associated with the proposed Copi Mineral Sands Project (the project).

The project is located 75 kilometres (km) northwest of Wentworth and 180 km south of Broken Hill in the Murray Basin region of southwestern NSW within the Wentworth Local Government Area (LGA; **Figure 1-1**).

This methodology is in accordance with Stage 3 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRs; DECCW 2010a). The project information provided here also complies with Stage 2 of the ACHCRs.

1.1 BACKGROUND

In February 2020 and May 2020, OzArk and the Registered Aboriginal Parties (RAPs) completed a survey and test excavation program, respectively, for the project as per the *Environmental Assessment Requirements*. The 2020 Project Site encompassed 5,043.3 hectares (ha) of land. Following the survey and test excavation program, OzArk prepared an Aboriginal Cultural Heritage Assessment Report (ACHAR) titled *Aboriginal Cultural Heritage Assessment: Copi Mineral Sands Project, Wentworth LGA* (OzArk 2020). The ACHAR was distributed to all RAPs in July 2020 for review as per Stage 4 of the ACHCRs.

During the preparation of the *Environmental Impact Statement* (EIS) for the project, the proponent identified a much larger resource area and therefore withdrew the application in order to assess the larger area.

The proponent has re-engaged OzArk to complete investigations of the Additional Assessment Area (**Figure 1-2**). The investigation set out in this methodology aims to identify Aboriginal cultural values, both tangible and intangible, that exist in the Additional Assessment Area. The results of this investigation will be presented in a revised ACHAR. The revised ACHAR will form part of the EIS being prepared by RW Corkery & Co to accompany an application for development consent under Division 4.7 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

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Figure 1-1: Location of the project.

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1.2 PROJECT OVERVIEW

The change in resource has resulted in an increased scale and intensity of operations to the project and changes to the mining method (from dry mining to dredging). This also required redefining the mining and project boundaries to reflect the change in scale and intensity.

Whilst the area of impact has increased, the potential impacts to the natural environment have not increased appreciably, nor the risk associated with those impacts.

In summary, the project would comprise the following components:

- A dredge mining operation, processing ~40 million tonnes per annum (Mtpa) of ore material. Previously dry mining was proposed
- A construction period of approximately 1.5 years, with a mine life of approximately 20+ years and a 5 year period for rehabilitation following the completion of the mining operations. The previously envisaged project-life had been approximately 13 years (total)
- Transfer of the extracted ore to a floating wet processing plant (WCP) for screening and gravity, and then further processing on a shore-based plant for magnetic and electrostatic separation to produce up to 350,000 tpa of heavy mineral products. Previously it was proposed the project would produce 135,000 tpa of heavy mineral products
- A 14 megawatt (MW) gas and solar power station that will provide power to the entire operation. This did not form part of the previously proposed project
- Transfer of overburden to in-pit and out-of-pit overburden emplacements, including co-disposal with tailings and slimes from the processing plant (WCP)
- Creation of a Solar Drying and Infiltration Dam (SDID) to allow for management of mine pond water, reduce salt load in the aquifer and potential salt harvesting as a product. This did not form part of the previously proposed project
- Transportation of heavy mineral products via the existing or alternative Site Access Road and Silver City Highway to a rail siding in Broken Hill. Previously proposed although the project now intends to use public roads (Nulla and Springwood Roads)
- Construction and use of a range of ancillary infrastructure as previously proposed, including:
    - mine laydown area and workshop
    - administration buildings, car park and mine team member accommodation
    - internal roads
    - processing treatment facility including reverse osmosis plant and road load out facility
    - rehabilitation related greenhouse, laboratory, bore field, reverse osmosis and other support services infrastructure.

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The above components would be supported by a range of infrastructure including a mine camp, site access road, internal roads, water management infrastructure, offices, workshops, laboratory, holding yard, weighbridge, amenities, raw water dam, power supply, and a range of services. It is proposed that approval for all ancillary components would be sought concurrently with that sought for the overall mine development.

1.3 ADDITIONAL ASSESSMENT AREA

The Additional Assessment Area describes the area in which all impacts associated with the project will now be located, not including the initial Project Site previously assessed in 2020 (**Figure 1-2**). The Additional Assessment Area covers approximately 9,200 hectares (ha) of land surrounding the initial Project Site.

The Additional Assessment Area extends across three pastoral properties: Warwick, Huntingfield and Belmore and is zoned RU1 – Primary Production under the Wentworth Local Environmental Plan (LEP) 2011. The principal area of the Additional Assessment Area consists of flat to gently undulating sand plains and dunes surrounding two salt pans, termed here the eastern and western salt pans.

1.4 ASSESSMENT APPROACH

The field assessment of the Additional Assessment Area will follow the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010b). The Aboriginal cultural heritage assessment will follow the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (the Guide; OEH 2011) and the ACHCRs.

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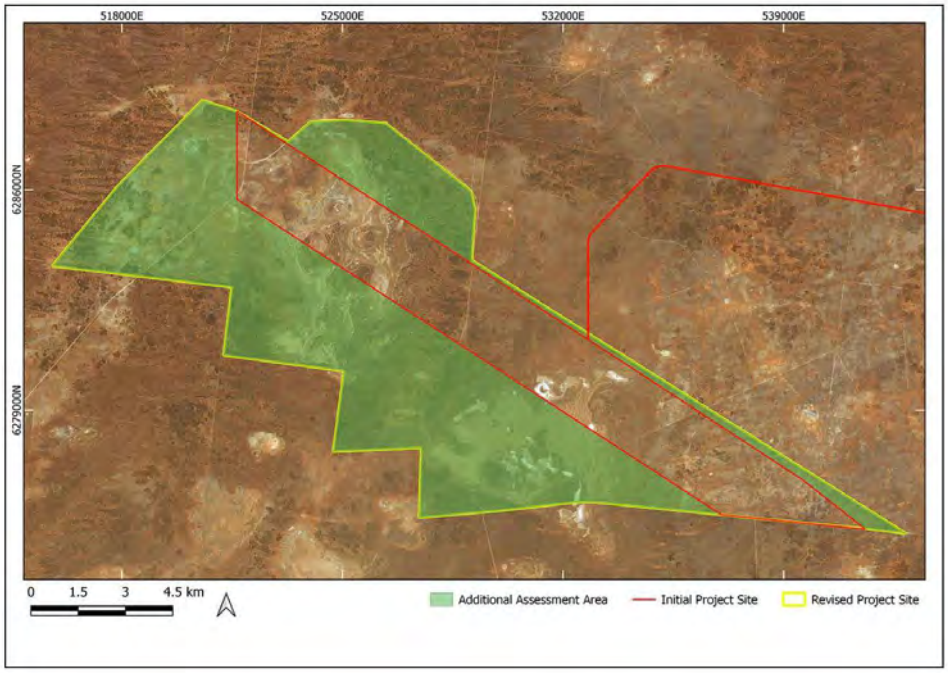
Figure 1-2. Aerial of the Additional Assessment Area.



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1.5 CONSULTATION ON THIS METHODOLOGY

Consultation for the project has followed the guidelines established in the ACHCRs (DECCW 2010a).

Consultation is continuing from the ACHCRs completed for the initial project which ended on 26 August 2020 following Stage 4 review of the ACHAR. Since this time, OzArk has provided RAPs with updates on the project every six months to ensure consultation has been 'ongoing'.

Despite ongoing consultation with the RAPs being maintained, a new stakeholder list for the Wentworth LGA was requested from Heritage NSW on 24 November 2021 to ensure there were no additional stakeholders who had not been previous sent an expression of interest. No additional Aboriginal stakeholders were on the list received from Heritage NSW on 1 December 2021. As such, the RAP list for the project remains unchanged.

The following individuals/groups registered to be consulted about the project:

- Dareton LALC
- Barkindji-Maraura Elders Council
- Barkandji #8 Native title Determinants
- Arthur Kirby
- Clair Bates
- Amanda Whitton.
- Maraura / Thangkaali (Pooncarie) First Nations Owners Association.

On 21 December 2021, all RAPs were sent information about the Project and a draft of this assessment methodology. RAPs were provided the stipulated 28 days in which to review and comment on these documents as per Stage 3 of the ACHCRs. The closing date for comment was 24 January 2022.

No comments were received from the RAPs on the assessment methodology.

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2 CULTURAL VALUES

2.1 INTRODUCTION TO CULTURAL VALUES

No matter who you are, we all have culture. Each person's culture is important; it's part of what makes us who we are.

Many Aboriginal people in Australia have a unique view of the world that's distinct from the mainstream. Land, family, law, ceremony and language are five key interconnected elements of Aboriginal culture. For example, families are connected to the land through the kinship system, and this connection to land comes with specific roles and responsibilities which are enshrined in the law and observed through ceremony. In this way, the five elements combine to create a way of seeing and being in the world that is distinctly Aboriginal.

Fundamentally, culture is living and is not static:

- Culture is acquired - we learn about culture from others in our community, including our parents
- Culture is shared - culture does not exist in a vacuum, it is shared amongst a group of people
- Culture defines core values - because we have been taught our culture and share it with our cultural group, we tend to form the same core values
- Cultures resist change but are not static - culture does and can change, but change is usually slow and gradual.

2.1.1 Connection to Country

Aboriginal and Torres Strait Islander peoples are connected to Country through lines of descent (paternal and maternal), as well as clan and language groups.

Although in the past (and sometimes into the present) there have been conflicts between different tribal groups, these were rarely over land. Aboriginal and Torres Strait Islander people have such a strong sense of belonging to country; they have no desire to own the land of others.

Territory is defined by spiritual as well as physical links. Landforms have deep meaning, recorded in art, stories, songs, and dance. Songlines or Dreaming Tracks as well as kinship structures link Aboriginal peoples to the territories of other groups. In the past, these links were also used for trade.

> *"When we say Country we might mean homeland, or tribal or clan area and in saying so we may mean something more than just a place; somewhere on the map. We are not necessarily referring to place in a geographical sense. But we are talking about the whole of the landscape, not just the places on it."*
>
> Professor Mick Dodson AM, August 2007

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2.1.2 Managing Country

Living on this land for around 50,000 years, Aboriginal and Torres Strait Islanders established effective ways to use and sustain resources. One important aspect is the right of certain people to control the use of resources in a particular area. Aboriginal and Torres Strait Islander people don't see themselves as 'owning' land, animals, plants, or nature, but rather belonging with these things as equal parts of creation.

The rights of different groups to live in and manage certain areas of land are clear and recorded through art, stories, songs, and dance.

Deep cultural and spiritual values like totemism have also played an important part in Aboriginal and Torres Strait Islander resource management. Totemism is a belief and value system that connects human beings to other animals, plants, and aspects of nature. Groups and individuals are assigned a particular animal that they are related to and must care for. This gives them a profound sense of connection to and responsibility for the natural world.

Aboriginal and Torres Strait Islanders people have a wide range of traditional methods for gathering food including fish traps, subsistence agriculture, hunting and harvesting a wide range of natural fruits and vegetables. Some groups of people would stay in one place, while others moved around the land according to the seasons, to ensure sustainable and rich food supplies, and to fulfil their spiritual and cultural obligations.

Even before 1788 there were complex relationships for long distance trade between Aboriginal and Torres Strait Islander communities especially for coastal shells and stone hatchets. When people from different groups met socially to share resources, for ceremonies or to settle disputes, they brought items to exchange. Items included stones for hatchets, kangaroo skins, timber for spears, ochre or clay for paint and marine shells for decoration. The exchange of objects was not motivated by a desire for wealth accumulation but a social system to build connection between people and groups.

2.1.3 Recognising lore

In much of eastern Australia, Aboriginal communities live their lives like most Australians without resorting to tribal lore. However, in certain crucial areas, particularly associated with family, leadership roles, and caring for Country, Aboriginal lore continues, even in the most urbanised communities.

2.2 IDENTIFYING CULTURAL VALUES

A major aim of this assessment is to identify any cultural values within the landscape in which the proposal is located so that those values can be recognised and incorporated into the ACHAR's management recommendations.

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Any cultural values relating to the Additional Assessment Area will be captured by the OzArk archaeologists (if such information is provided by RAPs during the survey) and included in the ACHAR.

Understanding cultural landscapes can only come from the views of a particular community, in this case, the Aboriginal community. Unless informed, OzArk will not know of the community's feelings towards the cultural landscape in which the project will be located. Should any RAPs have knowledge of cultural values regarding the proposal area that they wish to share or that may affect the survey methodology set out in **Section 5**, OzArk invites them to contact us so that these values can be recorded and/or responded to in the methodology.

2.2.1 Use of information collected

An ACHAR will be prepared for the project which articulates Aboriginal cultural values and associated conservation methods across the proposal area, as identified during the consultations. The ACHAR will be circulated to all RAPs for comment as is set out in the ACHCRs. The ACHAR will be available to Heritage NSW for their consideration of the proposal and the report will be publicly available.

2.2.2 Public / confidential information

Information will be treated in accordance with instructions received by Aboriginal informants. Information described as confidential (culturally sensitive) will not be detailed in the publicly available report. Confidential information should be made available to the proponent, its heritage consultants, and Heritage NSW so that significant cultural values can be conserved. On advice from the provider of the information, a redacted ACHAR would be made available to the wider public where any sensitive cultural information is removed.

2.2.3 Copyright

Information collected for this assessment remains the property of the Aboriginal informants and the author. Without written permission from individual informants and the author information may not be used for purposes other than those outlined above.

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3 ARCHAEOLOGICAL CONTEXT

3.1 ABORIGINAL PEOPLE OF THE PROJECT SITE

According to tribal maps (Tindale 1974) Aboriginal people of the Barkindji (Paakantji) language group inhabited the Lower Darling region at the time of first contact with Europeans. This language group comprised people who spoke the sub-dialects Barindji, Barkindji, Danggali, Maraura and Wiljakali. These tribes shared similar language and kinship systems, notably the division of members into matrilineal moieties (two-part social classification) known as Mukwara (wedge-tailed eagle) and Kilpara (raven) (Blows 1995 as cited in Cupper 2003). From early European accounts and archaeological evidence, it appears that Barkindji were hunter-fisher-gatherers living a semi-sedentary lifestyle. Gerard Krefft (1865), an early explorer of the area, suggest that the Barkindji lived along the Lower Darling and Murray Rivers during the warmest months of the year, with people moving away from the rivers into the dune fields to collect food after winter rains (Cupper 2007).

Harry Nanya (c. 1835–1895), a Maraura of the Lower Darling and his family, were the last of the Barkindji to live by traditional hunting techniques, ranging from around Lake Victoria and along the Great Anabranch of the Darling (ANU ADB online; Cupper 2007: B14). Nanya's childhood through 1839-46, coincided with the incursions of European explorers, which were accompanied by expeditions that killed most of his people, notably in the 1841 Rufus River massacre by South Australian police led by Thomas O'Halloran. Around 1860 Nanya left his camp at Popiltah station, 60 km north of Pooncarie, with two women and a steel axe, he went into the waterless mallee country between the Darling Anabranch and the South Australian border, where he lived for over thirty years. Notes from amateur ethnographers suggest Nanya's self-imposed exile may have been due to having eloped with a woman of his own Makwarra moiety, an offence considered incestuous and meriting death (ANU ADB online).

Although Nanya's mob kept themselves well hidden, by the early 1890s the press reported more frequent sightings of the 'wild tribe' and tracks left around water holes showed that Nanya's family was increasing in numbers, causing anxiety and fear amongst the white settlers (ANU ADB online). In 1893 Aboriginal stockmen tracked down the family and persuaded them to return to the river. The twelve men, eight women and ten children, all in good physical condition, arrived at Popiltah Station and Nanya still had his steel axe, now worn wafer-thin. The Aboriginal Protection Board selected a site at Travellers Lake, near Wentworth, for them to settle, but Nanya's people preferred hunting-camps in the vicinity of Pooncarie.

The story for most of the Barkindji tribe, however, was that within about ten years of the advance of pioneering European settlement, they were living adjacent to pastoral homesteads, often working as shepherds or in other labouring activities (Lans et al 1988 and Withers 1989 in Cupper

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2007: B-14). By the turn of the nineteenth century many Barkindji resided on the Darling River near Pooncarie where an Aboriginal mission had been set up in 1911.

3.2 REGIONAL ARCHAEOLOGICAL CONTEXT

The Darling River, the Darling River Anabranch, and lake systems in southwestern NSW have been the subject of several heritage assessments, archaeological excavations, and detailed academic studies. Some of the earliest evidence of human occupation of Australia comes from south-western NSW (Cupper 2007: B-14). The site of Lake Mungo contains archaeological evidence including human remains and stone tools that date to between 46,000 and 50,000 years before present (BP) (Bowler et al 2003). Evidence for human occupation has also been found at Menindee Lake from 45,000 BP (Cupper and Duncan 2006 as reported in Cupper 2007: B14) along the Darling River and at Lake Victoria on the Murray River by around 21,000 BP. Archaeological evidence from Willandra Lakes suggests that Aboriginal occupation in the Murray-Darling basin dates from between 46,000 and 50,000 BP (Allen and Holdaway 2009: 99; Bowler et al 2003).

Previous archaeological studies undertaken within the vicinity of the Additional Assessment Area provide information to obtain a sound understanding of the nature and distribution of archaeological sites within the area.

3.2.1 Clark 1983a

In 1983, Clark completed an archaeological assessment of a proposed drill hole (Nulla Nulla 1) with a 350 metre (m) radius, 40 km north of Lake Victoria. The study area was located on a tree-less low-lying landform. The only potential Aboriginal object identified included a piece of baked clay. The absence of archaeological sites was attributed to the scarcity of water resources and was concluded as being more likely occupied briefly during the wet season, or when specific resources were present.

3.2.2 Clark 1983b

Clark (1983) completed an archaeological assessment along three proposed seismic lines in south-western NSW. The Aboriginal sites were identified within the corridor of R83A-1 seismic line corridor which traversed a variety of landforms including longitudinal dunes in the east through to gently undulating sandplains and low-lying lake basins in the west. All three sites consisted of campfire or hearth remnants, two of which were identified near basins. No stone artefacts were found in association with the hearths or as discrete scatters.

Seismic line R33A-2 traversed the edge of the Darling River floodplain, then undulating sandplains comprised of degraded linear sand dunes and numerous low-lying lake basins. 15 sites were identified within the corridor. 14 of the 15 sites contained campfire remnants, seven of which were associated with stone artefacts. The largest of the sites identified was located

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adjacent to a billabong and extended 1,000 m x 400 m and comprised at least twenty hearths. Silcrete flakes were present across much of the site, with several dense knapping floors identified. Retouched artefacts present include scrapers and adzes. Cores, hammerstones, and fragments of grinding dishes were also present.

Seismic line R83A-3 traversed mostly mixed woodland covered linear dunes. No water sources were present in the general vicinity of the assessed corridor and was concluded as the main contributing factor to the absence of Aboriginal sites.

Clark concluded that the hearths identified were likely only used once or twice when Aboriginal people were camping in areas away from rivers and that the location and frequency of sites so far recorded in the Lower Darling region suggests that Aboriginal people lived for most of the time along rivers, lakes, and creeks. Brief visits were made into the relatively waterless hinterland area during hunting and gathering forays, however, this subsistence pattern probably became modified following heavy periods of rain when the landscape away from the rivers became flooded.

3.2.3 Martin 1985

Martin (1985) conducted a survey for a proposed seismic line to the west of Lake Popiltah and included a sample of lakes, lunettes and dune field landforms in the west region and undulating sandplains, sub parabolic dunes with palaeochannels, source bordering dunes, swampy depressions and clay pan landforms located 70 km northeast of the Additional Assessment Area. A high number of sites were recorded predominately near formerly permanent water sources. Sites included low density silcrete and quartz artefact scatters of backed flakes, cores, pounders, tula adze, scarpers, grindstone fragments, mortars, and top stones. Hearths were also located, as were middens.

3.2.4 Martin 1986

An archaeological survey was completed by Martin (1986) at two sites in Hay, two at Wentworth, one at Balranald and forms the original archaeological survey of the Wentworth Pump Station located 200 m from the junction with the Darling River, 80 km southeast of the Additional Assessment Area. Two middens, an open campsite and a scarred tree were recorded. One of the midden sites was identified as containing freshwater mussel shells, freshwater snail shell, baked clay, bird bone, and fragments of mammal bone. The hearth was also identified with fragments of shell as well as silcrete flakes.

3.2.5 Bonhomme 1990

Bonhomme (1990) examined the distribution of burials on the Riverine Plain and the Murray Mallee Sandplain to the west and found that burial distributions were related to geomorphology. Bonhomme categorised burials as: isolated individuals occurring randomly; locations with large

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numbers of burials apparently unrelated in space and time; and cemeteries with large numbers of burials associated in space and time. Cemeteries were not found on the eastern Riverine Plain, but increased in number in the west and southwest, toward the Mallee Sandplain. Sand bodies tended to contain burials, including lunettes, lunette fragments, source bordering dunes, modern riverbank levees, palaeochannel levees and channels, alluvial fan remnants, sandplain remnants, and reworked dune sets (Bonhomme 1990: 146–148).

3.2.6 Craib 1992

Craib (1992) undertook a study of 625 ha of land across the Darling River margins on Kelso and Burtundy Station and the Murray River margins upstream of Wentworth.

Dune fields, sandplains and elevated alluvial terraces were associated with artefact scatters, and scarred trees. Sites were sparse in the sand hills, but source bordering dunes were associated with burials, stone artefacts, and scarred trees.

Riparian areas near margins and floodplains of flowing rivers and creeks were correlated with middens, scarred trees and artefact scatters were more abundant on the Darling River than the Murray River System. Lake deposits, swamps and billabongs were found to have a higher density of middens, scarred trees, and burials than riparian landscapes.

3.2.7 Johnston and Witter 1996

Johnston and Witter (1996) developed a predictive model for Aboriginal archaeological site locations in western NSW. Expert system forecasts, archaeographic modelling (based on groups of land systems and their margins) and in-field reliability testing were employed to assess and characterise the distribution of Aboriginal archaeological material across the landscape. According to the predictive model for the semi-arid to arid landscapes in NSW:

- Occupation is expected near water, with the abundance of archaeological evidence proportional to the quality of the water source, including reliability, salinity, and vegetation
- Occupation is expected to focus on ecotonal boundaries. Preferences exist for certain environmental types, which are ranked according to factors like: the presence of ephemeral water, food resource abundance and food resource diversity
- Where a stone source exists, artefacts can be expected to have increased numbers within a radius of 20 km, with extreme abundance within a radius of 2 km
- Overarching or large-scale factors, including areas of known population focus, or zones of exceptional productivity and food abundance, could yield 'halo effects' whereby researchers view other factors favourably. Small-scale factors can be difficult to consider within regional models but are also important.

3.2.8 Bonhomme 1999

Bonhomme, Craib and Associates 1999 (Bonhomme 1999) completed the Murray Darling Water Management Action Plan (MDWMAP) largely via desktop review for an area of 900,000 ha extending 5 km either side of the Darling River from Wentworth to the Murrumbidgee confluence in the east. The study was a response to problems regarding the location and disturbance of Aboriginal sites.

The study found a general increase in the number and range of sites occurring from east to west. Mound sites, with some containing burials, began to appear around 4,000 BP and were strongly associated with the lower Darling River, the central and lower Murray and Wakool River systems.

Large shell middens were found in association with human burials along the Murray River dating between 13,000 and 10,000 BP. Isolated individual burials were most common of the Riverine plain. Many burials were located within the sand dunes along the Murray River, also with their occurrence in floodplain clays, prior stream sediment, mounds, and lunettes. Multiple human burials were most common on lunettes and in source bordering dunes near stream channels. Burial grounds were most commonly recorded on source bordering dunes, prior stream levees and on the point bar sediment of rivers and lake outlet channels.

3.2.9 Edmunds 1999

Edmunds (1999) completed an archaeological assessment for the bridge replacement across the Great Darling Anabranch along Main Road 68 (MR68), located 50 km south of the Additional Assessment Area. Three land systems were identified within the study area, all of which were assessed as having moderate archaeological sensitivity. These land systems include:

- Anabranch – elevated sandy lunettes, elevated plains and channel margins
- Hatfield – margins of swamps and depressions; and margins of lacustrine and riparian land systems
- Wentworth – elevated sandy rises; elevated back plains close to water sources; margins of elevated floodplain adjacent to lower floodplains; and channel margins.

Six Aboriginal sites were identified during the survey, including an artefact scatter with heat retainers from hearths, two middens and two middens with stone artefacts. Sites were identified either on the immediate bank of the Great Darling Anabranch, sand dunes along the riverbank, and elevated sandplains adjacent to the floodplain. The artefacts identified were predominately made from silcrete. Edmunds (1999) notes that silcrete occurs locally from pedogenic rocks which outcrop at Berribee on the Lindsay River in Victoria, and silcrete seams are widespread between Wentworth and Broken Hill but the seams are generally small and widespread. Artefacts consisted mostly of unmodified flakes, although a grindstone was also recorded.

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3.2.10 Holdaway et al 2002

Holdaway et al (2002) have attempted to resolve questions relating to the chronology of Aboriginal occupation in the arid margins of south-eastern Australia in areas well away from major rivers and lakes. In an area to the north of Broken Hill, Holdaway dated charcoal deposits found in 28 heat retainer hearths in Sturt National Park. The charcoal dates demonstrated hearths were used in the area for at least the past 1,700 years, but with a gap of 200–400 years between 820 ± 50 and 1170 ± 130 years BP. This finding was interpreted as demonstrating a hiatus in occupation of the area. However, while Holdaway suggests the possibility palaeo-environmental fluctuations resulted in this discontinuity of occupation, the authors nevertheless advised caution in postulating causes until further research had been conducted.

3.2.11 Witter 2004

In 2004 Witter investigated the variation of archaeology within the different regions of western NSW. Witter proposed eight archaeological regions in western NSW based on the differences in site types and materials present. According to Witter, the Additional Assessment Area is located within the Darling plain (**Figure 3-1**). The archaeological features of this region are summarised below:

- Darling plains:
    - Camps are common along rivers, stream channels, swamps and lakes, but rare on sandplains and in mallee dunes except around box swamps
    - Quarries are very rare but if present consist of silcrete
    - Burials are frequent along riverbanks and lake shores, as well as in source-bordering dunes and lunettes
    - Scarred trees are frequent along riverbanks
    - Hearths are common and mostly comprised of termite clay, but some clay lumps and calcrete nodules were also utilised
    - Middens are generally present along riverbeds, lakeshores, and some lunettes.

Witter noted that most of the archaeology in western NSW is found as surface sites, with specialised technologies frequently present, suggesting they are within the last 5,000 years. However, Witter highlighted that a few areas within western NSW, such as the Darling region, are conspicuous for their Pleistocene deposits.

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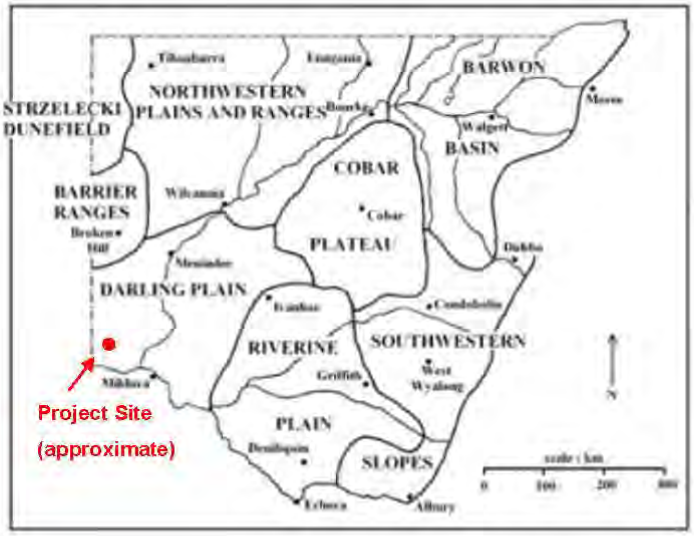
Figure 3-1: Archaeological regions of western NSW (source: Witter 2004: 134).



3.2.12 Shiner 2006

Shiner (2006) found a discontinuity in landscape occupation for the past 2,000 years when dating 16 hearths in conjunction with an analysis of the surface stone artefact assemblage from Pine Point and Langwell Stations, located just to the south of the foothills of the Barrier Range. Shiner (2006) found the different artefact assemblages he examined represented unique occupational histories, but these were punctuated by long periods with scant evidence of Aboriginal presence or activity.

3.2.13 Cupper 2007

In 2007, Landskape completed an archaeological assessment for the Snapper Mineral Sands Project, located between the Darling River and the Great Darling Anabranch, approximately 45 km east of the Additional Assessment Area. Land systems identified within the study area are:

- Trelega – slightly undulating sandplains and swales
- Overnewton – slightly undulating sandplains with isolated sandy hummocks and depressions
- Hatfield - slightly undulating sandplains with isolated depressions
- Arumpo – parallel dunes.

22 Aboriginal sites were identified during the survey. Sites included two hearths, two isolated finds, two artefact scatters with associated hearths, four quarries with associated artefacts and 12 artefact scatters. In relation to the land systems, two sites were recorded within the Hatfield

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land system; five within Trelega, and the remaining 15 within the Overnewton land system. All these land systems are located within the current Additional Assessment Area and generally correlate to the Sandplains and Dunes.

3.2.14 Fanning et al 2007

Fanning et al (2007) completed an archaeological research program in the Peery Lake area of Paroo Darling National Park in western NSW, located 45 km east of the Additional Assessment Area. Fanning et al undertook the third progress report of the project which commenced in 2005, and it focused on results of heat-retainer hearth excavation and dating carried out in 2006 and 2007. The project methods were to document stone artefact deposits and associated heat-retainer hearths produced and discarded by Aboriginal people. The aim was to understand how people lived and the variation in the characteristics of the objects left behind over many thousands of years of occupation. The project was conducted to comprehensively assess the significance of an archaeological record under threat of destruction through erosion. The research focussed on a 60 km^2 catchment area of Rutherfords Creek, located in the Peery Hills on the western side of Peery Lake. These areas were chosen based on:

- The large number of stone artefacts and hearths on the valley floor
- The accessibility of the catchment area
- The location being entirely contained within the national park.

The field methods used erosion features commonly referred to as 'scalds' as sampling methods for survey and excavation, as stone artefacts were often the lag remaining behind on the scald surface and were generally highly visible. Surface scalds were also used as good locators for the remains of heat-retainer hearths or earth ovens. Hearth remains were commonly clustered near to creeks and waterholes, and the aim was to extract, where possible, charcoal samples that could be analysed in a laboratory to determine how long ago the hearth was used. The three-year period of the project (2005–2007) identified the remains of 1,054 hearths in the Rutherfords Creek catchment. It was considered likely that more existed but only those visible on the surface were recorded. Consent was approved to partially excavate 156 hearths in 2006 and 100 in 2007 with an aim to extract charcoal samples for radiocarbon dating. Additionally, up to four hearth stones from each hearth were collected to conduct a trial of a new dating technique (optically stimulated luminescence, or OSL). Over 300 hearth stones were analysed. Approximately one third of the hearths excavated contained enough charcoal for radiocarbon dating. The rest either contained no charcoal or were too disturbed by processes of bioturbation, erosion and/or the effects of grazing animals. Of all the hearths that were excavated, they were dated to be less than 2,500 years old, and thus illustrate a pattern of repeated return of people to the valley. The age range of the hearths was related to the geomorphic environment, with those areas near the creek, that were considered most susceptible to erosion, having a shorter record than more stable areas

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at some distance from the creek. This was a similar pattern identified by the authors in other areas of western NSW.

3.2.15 OzArk 2009

In 2009, OzArk completed an Aboriginal cultural heritage assessment for proposed shoulder widening along the Silver City Highway, near Lake Commbah, located 97 km northeast of the Additional Assessment Area. The archaeological survey assessed dunefields, undulating sandplains, playa and basins, lunettes, feeder channels, and depressions. Six Aboriginal sites were recorded including artefact scatters, hearths, and an isolated find. The assessment concluded that there may be potential for human burials to be located at depth in the dunes adjacent to the highway, though such occurrences would be rare. Intact subsurface deposits were assessed to be less likely due to the level of disturbance, but areas of potential archaeological deposits (PAD) were also identified.

3.2.16 Niche 2017 and 2019

Throughout 2016 and 2017, Niche Environment and Heritage (Niche) completed an archaeological survey for a 270 km pipeline extending from the Murray River at Wentworth to Broken Hill (W2BH), largely adjacent to the Silver City Highway and traversing the river and creek floodplains, sandplains, dune fields, playa and basins, lowlands and Barrier Range land systems. As a result of the survey, 240 Aboriginal sites were identified, and six previously recorded sites were found to have a larger extent than originally recorded and an additional 12 previously recorded sites were located.

Of the recorded sites, 107 were stone artefact sites, 20 were hearths, five were artefact scatters with hearths and four contained artefacts, hearths, animal bone, shell, and PADs. The remaining sites stone artefacts with PAD, stone artefacts with shell, and scarred trees.

The Fowlers, Conservation, Darling, Barrier, Nine Mile, Oakvale and Kars land systems had the greatest number and density of artefacts recorded, reflective of the availability of raw material sources for manufacture and the availability of temporary water in these systems. Visibility of hearths was more common in the alluvial plains and sandplains than in the ranges and rolling downs and lowlands. Most sites were located within 600 m of water and where sites were located further away, they tended to be associated with stone sources.

Salvage excavation

Between December 2017 and July 2018, Niche completed salvage excavations for the W2BH pipeline (Niche 2019).

The salvage followed the completion of the archaeological survey and a test excavation program which identified over 350 Aboriginal cultural heritage sites and refined areas of archaeological

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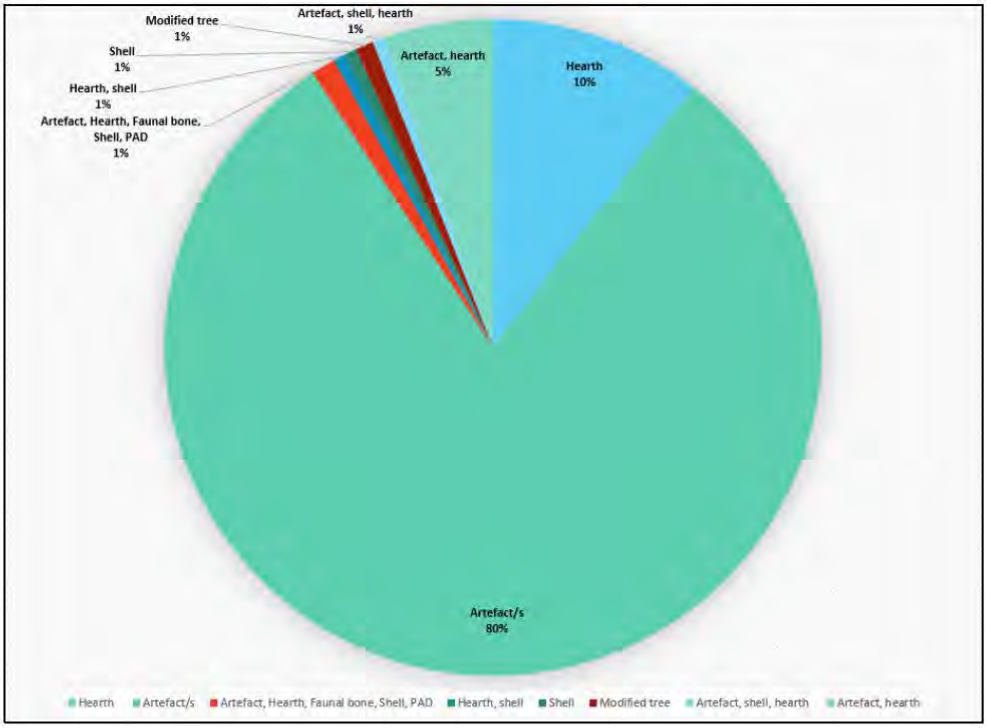
sensitivity. Aboriginal sites consisting solely of stone artefacts at varying densities comprised 80% of the recorded site types. At other locations, stone artefacts were recorded in association with shell, faunal bones, hearths and/or PAD (**Figure 3-2**).

Figure 3-2: Recorded site types across the pipeline alignment.



The surface collection and salvage excavations were completed in accordance with the conditions of their respective Aboriginal Heritage Impact Permits (AHIP) listed in **Table 3-1**. **Table 3-1** also summarises the number of sites impacted by the project and the overall area of excavated material.

Table 3-1: W2BH pipeline: project components and AHIP areas.

Kilometres along pipeline (KP)	Project component	AHIP number	Number of sites impacted (partially or totally)	Number of sites determined not to be a site.	Area excavated
0-111.5 km	Stream 2A	C0003217	24	12	46 m²
3.5 to 4.5 km	Darling River Crossing	C0003772	2	-	10 m²
111.5 to 157 km	Stream 2B	C0003333	54	1	201 m²
157 to 221.75 km	Stream 2C	C0003451	85	-	5 m²
221.75 to 270 km	Stream 1	C0003153	102	-	10 m²

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Niche 2019 Results

The results of the overall assemblages of materials recovered during the salvage are summarised below:

- 8,211 stone artefacts were retrieved during the W2BH pipeline salvage. This included 4,614 stone artefacts collected across the surface and 3,597 recovered from excavations. An additional 800 non-diagnostic stone objects which were also collected. Salient characteristics of the artefact assemblage were:
    - The dominant material in the excavation assemblage was silcrete of varying grain size, comprising 48.51% of the overall assemblage, followed by quartz (both milky and crystal) with 28.74% and quartzite comprising 11.9%. Overall, both locally procured and non-local sources of materials were utilised
    - The most common artefact type was broken flakes (35.31%) followed by complete flakes (17.51%). Angular fragments made up 15.93% of the assemblage while formal tools accounted for less than 6%
    - Preference of finer grained materials for retouched tools, i.e. scrapers, backed blades was observed.
- Residue analysis on stone tools showed evidence of processing starchy and non-starchy plants, processing plants for medicinal purposes, and processing of animals
- Eleven Aboriginal sites were associated with the remains of several types of shellfish, however, only two sites (both located adjacent to the Great Darling Anabranch) contained enough samples for analysis. Both sites displayed some evidence of cultural discard; i.e. heterogenous species composition and some burnt shell, however, there was not enough evidence to rule out that potential of the accumulations being from natural causes.
    - Shells recovered at depths between 20 to 60 centimetres (cm) from LTWP AFT HTH 103/MBHP AFT 5 on a rise dated between 2750 and 14064 cal BP[1] indicating a small volume of accumulated shell over a long period of time
    - Shell collected from MBHP AFT 7 on the floodplain dated to 266–47 cal BP and 910–790 cal BP. This was much more recent than the fish bone recovered at similar depths; therefore, indicating mixed and inverted deposits.
- Fish otoliths were identified at one Aboriginal site which comprised stone artefacts and a potential midden (MBHP AFT 7) located on the floodplain of the Great Darling Anabranch. 19 otoliths were analysed, all from golden perch. Analysis found that the fish died at different times throughout the seasons and experienced fluctuating environmental conditions induced by seasonal environmental changes. Radiocarbon dates obtained range from 2750–2490 to 540–500 cal BP. Two distinct clusters of dates are evident, one from ca. 500–910 cal BP, and another from ca. 2000–2750 cal BP

[1] The cal prefix indicates that the dates are the result of radiocarbon calibration using tree ring data. These values should correspond exactly to normal historical years BCE and CE. The term cal BP means the number of years before 1950 and can be directly compared to calendar years.

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- Faunal bones comprised only a small percentage of recovered material from excavations and most of the recovered bone was small, fragmentary, and non-diagnostic. Where identifications could be made, they included, rabbit, rodent, yabby, sheep or goat, reptiles, golden perch, macropod, crayfish, gastropod, and various mammals. The assemblages and presence of certain species provide indications of the degree of disturbance at some of the sites. No bone displayed any indication of cultural modifications, and none was burnt
- 13 hearths which were identified during the survey were further investigated during the salvage and were determined to be remnants of natural, burnt termite mounds and /or attributed to land clearance practices
- Pleistocene occupation was confirmed at Lake Popiltah and possible terminal Pleistocene/early Holocene occupation at Pine Creek, in addition to Holocene occupation and Mid-late Holocene occupation was identified at Twin Lake[2].
    - Pine Creek
        - Optically Stimulated Luminescence (OSL) dating at LTWP AFT HTH 75 from test pit 159 provided dates of 14700 ± 500 BP for spit 10 and 15900 ± 1200 for spit 12. A third sample from test pit 161, spit 13, suggested early Holocene sediment deposit accruing on a Last Glacial Maximum (LGM[3]) feature with significant bioturbation episodes introducing earlier sand grains to the deposit. The dominant sand grain dating was 10800 ± 500 BP.
    - Lake Popiltah
        - Dating results indicate possible Aboriginal occupation dating back to 42,000 years ago
        - Artefact numbers peaked at Open Area 9 at 130–135 cm, 160–170 cm and 190–205 cm. No artefacts were identified below 205 cm. The results indicate that multiple phases of occupation took place at MBHP AFT 48/46/45 during the Pleistocene Period
        - Only 25 artefacts were found in the top 100 cm during the test excavation at MBHP AFT 48/46/45. These included debitage fragments with no tools, indicating that there was a change in the way people occupied the location, possibly as a result of changing environmental conditions i.e. the transition of the Darling River from the anabranch around 7000–9000 BP meaning Lake Popiltah would fill less frequently.

[2] In terms of human occupation in Australia, the Pleistocene is associated with the ice ages that resulted in cooler temperatures and drier conditions. Around 12000 BP in the Holocene Period, conditions began to warm, and rainfall increased. Generally Aboriginal occupation becomes more widespread in the Holocene as conditions allowed a greater distribution of the resources required for sustenance.

[3] In Australia, the LGM is from 25000–16000 BP.

3.3 LOCAL ARCHAEOLOGICAL CONTEXT

3.3.1 Archaeological investigations within the initial Project Site

3.3.1.1 Landskape 2015

In 2015, Landskape completed a due diligence assessment of eight proposed air-core drilling locations within the initial Project Site. Survey of the assessed area occurred over one day and included full pedestrian survey of the impact areas. Site types predicted most likely to occur within the impact areas included artefact scatters, scarred trees, middens, and burials. No Aboriginal archaeological sites were located within the impact areas despite high ground surface visibility (GSV). The absence of sites was attributed to a lack of landforms with increased archaeological potential such as lunettes or source-bordering dunes. In addition, no trees of suitable type and age to possess cultural modifications were present.

3.3.1.2 OzArk 2020

In 2020, OzArk completed an archaeological survey across the initial Project Site with the assistance of the RAPs. A total of 81 sites were recorded (**Figure 3-3**), including:

- 49 isolated finds
- 21 artefact scatters
- Six artefact scatters with PAD
- One artefact scatter and hearth
- Two artefact scatters with hearths and PAD
- One artefact scatter and scarred tree with PAD
- One PAD.

Observations based on the survey results within the Project Site were as follows:

- The greatest density of artefacts and hearths were identified within the Lake Footslopes landform to the north of the eastern salt pan, followed by the Lunettes and Islands to the east of the eastern salt pan, and further afield across the Sandplains and Dunes in the east
- There is a distinct clustering of surface artefacts around the eastern salt pan when compared to the western salt pan
- Artefact sites are the most commonly recorded site type (n=80). Most artefacts sites are low density due to their distance from reliable water sources. Recorded artefacts were largely manufactured from silcrete, quartz, chert and quartzite as predicted, while a low number of chalcedony artefacts were also identified
- All recorded hearths (n=11) were identified in association with stone artefact sites. Most hearths (n=10) were located across the Lake Footslopes landform, as predicted, although

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one hearth was identified in the Sandplains and Dunes. All hearths were lagging on pedestals as predicted by Witter (2004)

- Most sites are situated within erosion scalds across the landscape and therefore artefacts would likely be located within secondary contexts
- One scarred tree was identified in association with an artefact scatter (Copi OS 1) on an island within the western salt pan. The recording of this site type did not conform to the predictive modelling as these site types are not commonly identified in areas distant to semi- or permanent water (Craib 1992; Witter 2004).

A test excavation program was completed at eight localities within the initial Project Site which highlighted a very sparse distribution of subsurface material. The results of the test excavation are detailed further in **Section 6.1**.

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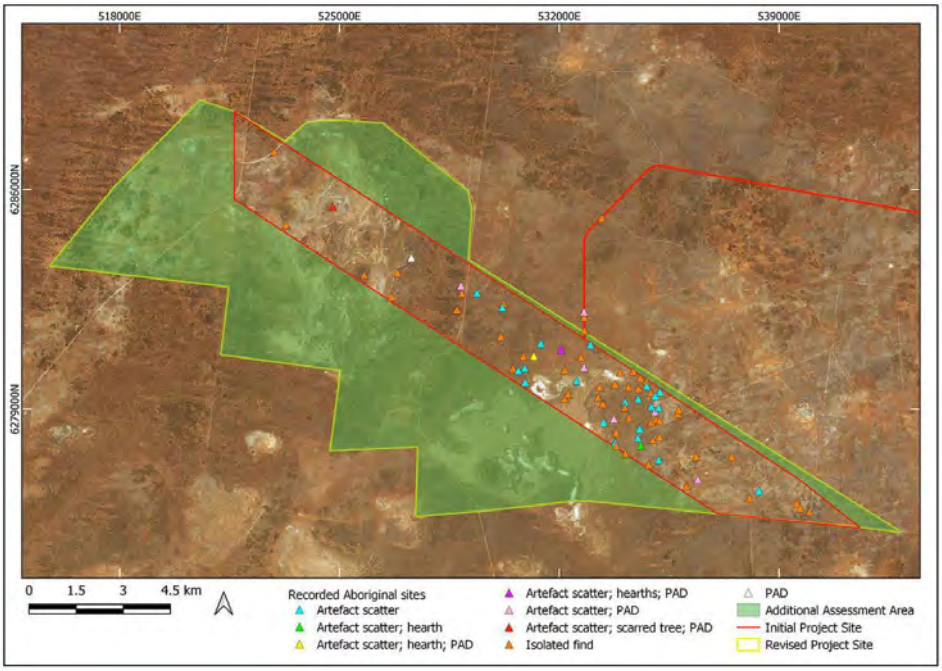
Figure 3-3: Recorded Aboriginal sites within the initial Project Site.



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3.4 ARCHAEOLOGICAL CONTEXT: CONCLUSION

Previous archaeological investigations completed across south-western NSW in the Murray and Lower Darling region highlight that distance to water is a significant predictor of site location. The greatest site concentrations occur near permanent and semi-permanent water sources suggesting that Aboriginal people lived for most of the time along rivers, lakes and creeks (Clarke 1983a). Evidence of occupation falls away exponentially with distance from permanent and semi-permanent water across the sandplains and dunefields. Although sites are present at locations at a greater distance from water across the sandplains and dunefields, these sites are generally limited in terms of both number, size, and complexity, constituting lower density sites and (Johnston and Witter 1996).

Such areas (including the Project Site) are likely to have been occupied briefly during wet seasons when rivers became flooded and specific resources were present for hunting and gathering forays, as suggested by explorer Gerard Kreft (1865). Furthermore, hearths identified were likely only used once or twice when Aboriginal people were camping in areas away from rivers (Clarke 1983a). Other investigations within semi-arid NSW have found that occupation away from permanent water was sporadic and demonstrated a hiatus in occupation of such landforms most likely occurring during palaeo-environmental fluctuations (Holdaway et al 2002 and Shiner 2006).

The most frequently recorded Aboriginal sites in these landforms are stone artefact scatters with or without hearth / ground oven materials (Martin 1985; Cupper 2007). Other Aboriginal cultural heritage site types previously identified over the more extensive Lower Darling region which comprise more abundant resources include shell middens, stone quarries, ceremonial and dreaming sites, scarred trees, burials, earth mounds and stone arrangements (Cupper 2007: B-20).

Surface sites across these landforms generally display specialised technologies (the 'Australian small tool tradition') suggesting these are from within the last 5,000 years (Witter 2004). However, western NSW, such as the Darling region, are conspicuous for their well-preserved Pleistocene deposits generally encountered at depth with lake lunettes and riverine source bordering dunes (Martin 1985: 15).

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4 PREDICTIVE MODEL

4.1 LANDFORM MODELLING

The Murray Darling Depression bioregion lies in the Murray Basin on Tertiary and Quaternary sediments deposited from a shallow sea, lakes, and rivers. The landscape is characterised by dunefields, sandplains, and undulating plains. There is very little structured drainage, but numerous lakes, swamps and depressions are present, some of which are driven by saline groundwater (NPWS 2003). The landscape of the South Olary Plain is characterised by dunefields, sandplains, dry lakes, and groundwater basins (NPWS 2003: 83).

In most arid lands, geomorphic processes and resultant landforms are dominated by wind action on unconsolidated surfaces (Thomas 1989). Therefore, depressions/basins and their lakes are likely to have their basins and shorelines modified by wind. This is demonstrated by the landforms present which consist of small, sub-circular to irregular relict lakes or groundwater basins, termed throughout this methodology as the 'eastern' and 'western' salt pans. The salt pans are generally flat, but they contain raised gypsite crests or islands and gypsum-rich lunettes located to the east of the salt pans (Hulme 2020). Footslopes, which consist of long gentle slopes, are present on the western sides of the lake floors. Landforms surrounding the remainder of the groundwater basins are extensive sandplains, dunes, and swales with little topographic variation. The average slope across the Additional Assessment Area is about 2%, with a local relief up to 10 m.

For the purposes of this assessment methodology, this landscape has been divided into four survey units based on topographic zones which inform an archaeological characterisation of its landforms (**Figure 4-1**). These can be briefly characterised as follows:

- Lake Footslopes: long, gentle slopes on the western sides of the salt pans
- Sandplains and Dunes: undulating plains to dunes and swales
- Lunettes and Islands: aeolian landforms which have generally built up on the eastern side of the salt pans. These landforms are variable and include irregular lunettes, raised gypsum crests or islands, and gypsite flats
- Salt Pans: the eastern and western salt pans as well as the gypsite flats which are part of groundwater discharge basins.

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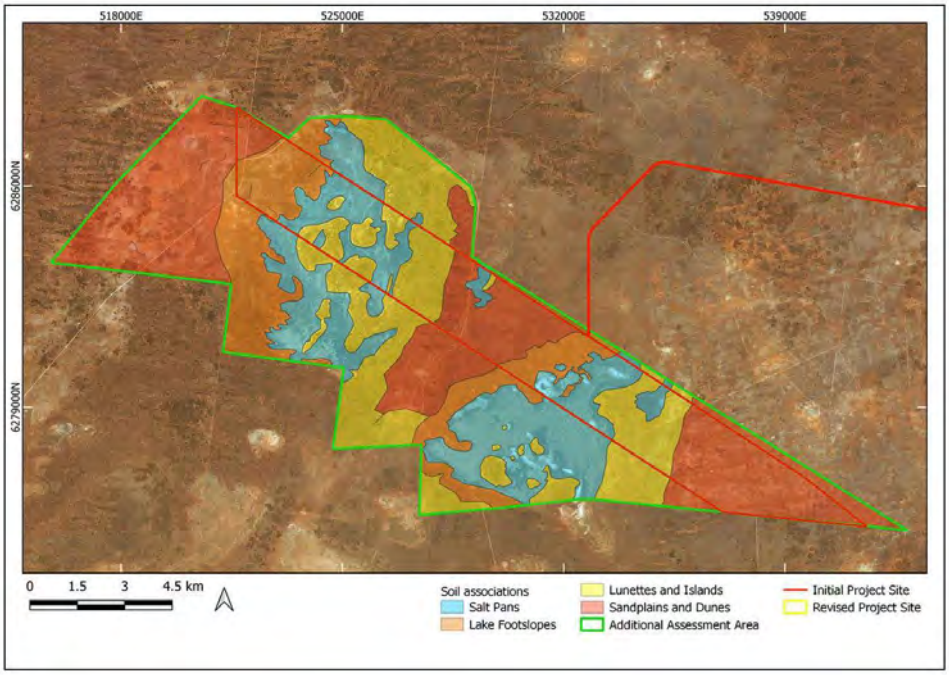
Figure 4-1: Landforms within the Project Site.



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4.1.1 Aboriginal Sites Decision Support Tool

OEH (2014) have produced a series of 'pre-1750' predictive models termed the Aboriginal Sites Decision Support Tool (ASDST) which combines data derived from the Aboriginal Heritage Information Management System (AHIMS) with a series of spatial variables that describe the landscape such as elevation, geology, and proximity to water. The ASDST outputs GIS raster layers composed of one hectare cells that predict the likelihood of Aboriginal sites (e.g. mounds, artefacts, modified trees, grinding grooves, burials and hearths) occurring in the landscape prior to European settlement. These models do not account for land use disturbance in the intervening period, or local conditions leading to differential preservation of features. However, the ASDST includes an 'accumulated impacts' model that indicates impacts of post-European settlement land-use and its impact upon Aboriginal site features in the landscape. In combination, these models are used to predict the likelihood of encountering different Aboriginal site types prior to European settlement, and how the distribution of Aboriginal sites are likely to have been affected since this time.

Preliminary predictive modelling, based upon numerous archaeological studies in various environmental zones and contexts throughout Australia and the ASDST models shown in **Appendix 1**, indicates a high correlation between the permanence of a water source and the permanence and / or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including: plant and animal foods; stone and ochre resources and rock shelters; as well as by their general proximity to other sites/places of cultural significance. Consequently, sites tend to be found along permanent and ephemeral water sources, along access or trade routes, and in areas that have good flora/fauna resources and appropriate topography (i.e. flat or gently sloping landforms or those providing shelter).

4.2 Predictive Model for the Additional Assessment Area

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally, it is the more durable materials such as stone artefacts, stone hearths, shell, and some bones that remain preserved in the current landscape. Even these however may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport—both over short- and long-time scales—or (b) the historical impacts associated with the introduction of colonial farming practices. Scarred trees, by their nature, may survive for up to several hundred years but rarely beyond.

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4.2.1 Site types in the region of the Project Site

The site types listed in **Table 4-1** are present in the region of the Project Site. The likelihood of these sites being present in the Additional Assessment Area is discussed in **Section 4.2.3**.

Table 4-1: Site types recorded in the region of the Project Site.

Site type	Site description
Isolated finds	May be indicative of random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or subsurface artefact scatter. They may occur anywhere within the landscape but are more likely to occur in topographies where open artefact scatters typically occur.
Open artefact scatters	Artefact scatters are defined as two or more artefacts, not located within a rock shelter, and located no more than 50 m away from any other constituent artefact. This site type may occur almost anywhere that Aboriginal people have travelled and may be associated with hunting and gathering activities, short- or long-term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations which relate to activity areas. Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of a background scatter rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'. Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands. Larger sites may be expected in association with permanent water sources. Topographies which afford effective through-access across, and relative to, the surrounding landscape, such as the open basal valley slopes and the valleys of creeks, will tend to contain more and larger sites, mostly camp sites evidenced by open artefact scatters.
Culturally modified trees	Aboriginal scarred trees contain evidence of the removal of bark (and sometimes wood) in the past by Aboriginal people, in the form of a scar. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels, and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed because of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginal people for both their own purposes and for roofing on early European houses. Consequently, the distinction between European and Aboriginal scarred trees may not be clear.
Rockshelters and art sites	Utilised in the past for both habitation and ceremonial purposes. The term 'rock shelter site' refers to rock shelters/rock overhangs that contain evidence such as stone artefacts and/or bones and/or plant remains (from meals eaten at the site) and/or hearths (fireplaces). Most rock shelter sites are secular in nature, however, those that also contain rock art or engravings are often believed to be non-secular in nature. The term 'rock art site' generally refers to Aboriginal ochre paintings or ochre or charcoal drawings located on a rock slab (generally in a sheltered place like the floor of a cave or rock shelter), boulder, cliff-face, cave or rock shelter wall or roof, or wall of a rock overhang. Most rock art sites are found in locations that are sheltered from the elements. This observation, however, is probably biased to some extent, as rock art would not preserve well in open positions. Rock art sites are generally believed to be non-secular in nature.
Hearths/ovens	Features used by Aboriginal people for the preparation of food and would generally be in the vicinity of available resources, such as water sources to procure fish and shellfish, and on elevated ground to avoid impact from environmental threats.
Burials	Generally found in soft sediments such as aeolian sand, alluvial silts, and rock shelter deposits. In valley floor and plains contexts, burials may occur in locally elevated topographies rather than poorly drained sedimentary contexts. Burials are also known to have occurred on rocky hilltops in some limited areas. Burials are generally only visible where there has been some disturbance of sub-surface sediments or where some erosional process has exposed them.
Bora/Ceremonial sites	Places which have ceremonial or spiritual connections. Ceremonial sites may comprise of natural landscapes or have archaeological material. Bora sites are ceremonial sites which consist of a cleared area and earthen rings.

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4.2.2 Landform modelling of archaeological potential

Previous archaeological survey across the initial project provides information to obtain a sound understanding of the nature and distribution of archaeological sites within the Additional Assessment Area. The results of the 2020 survey show that the greatest the distribution of surface artefacts and features is across the Lake Footslopes, followed by the Dunes and Sandplains (**Figure 4-2**). It is interesting to note that the survey showed a distinct clustering of surface artefacts around the eastern salt pan when compared to the western salt pan (**Figure 4-2**). The greatest density of artefacts and hearths were identified within the Lake Footslopes landform to the north of the eastern salt pan, followed by the Lunettes and Islands to the east of the eastern salt pan, and further afield across the Sandplains and Dunes in the east. While very few artefacts were identified surrounding the western salt pan. It is likely some feature attracted occupation to the eastern salt pan; i.e. possible freshwater soaks as opposed to the saline features at the western salt pan.

Crucial for the preservation of archaeological deposits is the history of past land use in an area. Primary use of the Additional Assessment Area is for sheep and goat grazing, and the Additional Assessment Area has also been impacted by widespread vegetation clearance. Both activities promote soil erosion and soil loss. As such, soils throughout most of the Additional Assessment Area are degraded. Such widespread impacts have undoubtedly affected the archaeological landscape in that many tens of centimetres of soils have been removed from many areas, thereby disturbing or deflating any archaeological deposits they may have contained. With such widespread soil movement, it is also important to remember that accumulations of artefacts that may be termed a 'site' today may have, in fact, been washed into that location during the historic period and bear no relationship to past Aboriginal occupation patterns in the area (Holdaway and Fanning 2008). Subsurface investigations within the initial Project Site completed by OzArk showed that most excavation areas comprised undifferentiated A1-Horizon and a leached A2-Horizon, the implication is that the landscape has been subject to the stripping of the A1-Horizon and the exposure of the A2-Horizon. The assumption is, therefore, that the landscape has undergone a high general disturbance from soil loss that has compromised the archaeological deposits across the initial Project Site.

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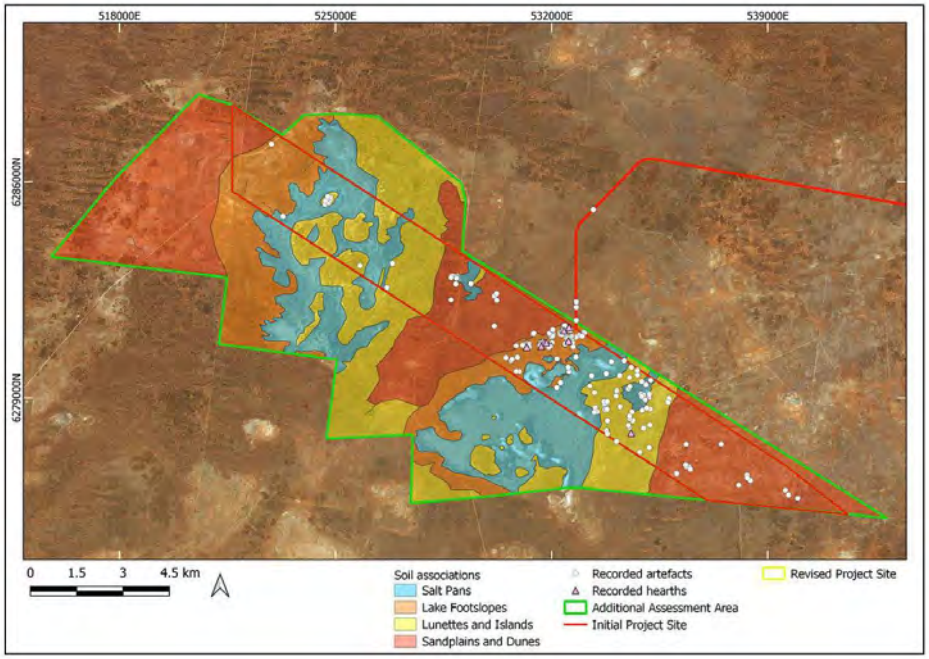
Figure 4-2: Previously recorded artefacts and hearths in relation to the landforms at the Project Site.



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4.2.3 Conclusion

Based on knowledge of the environmental contexts of the Additional Assessment Area and a desktop review of the known local and regional archaeological record, the following predictions are made concerning the probability of landforms and what types of sites may be present within the Additional Assessment Area (**Table 4-2**).

Table 4-2: Likelihood of certain site types being present in the Additional Assessment Area.

Site type	Likelihood of being present in the Additional Assessment Area
Isolated finds	As isolated finds may occur anywhere but more likely to be located along the Sandplains and Dunes; Lake Footslopes and Lunettes, however, may have been washed into low lying areas within the salt pans themselves.
Open artefact scatters	One of the most likely site types to be encountered and are predicted to be located within the Additional Assessment Area, particularly along Lunettes and Islands and Lake Footslopes (Ozark 2020). Sites within the Sandplains and Dunes are likely to be sparse and of low-density (Craib 1992) while higher density scatters are likely to be located on the Lunettes and Islands and Lake Footslopes due to their proximity to the salt pans. Sites on these landforms may be associated with larger, complex features including hearths, ovens, and middens. Recorded artefacts are likely to be comprised of silcrete, quartz, chert or quartzite and may include a higher percentage of tools. Artefact scatters are likely to be identified within 'scalds' across the landscape (Fanning et al 2007) as stone artefacts are often the lag remaining behind on the scald surface and they contain high GSV. It would be expected that most sites located would date to the late Holocene (i.e. less than 4,000-5,000 BP), the age attributed to the A-Horizon artefact bearing deposits. Although Pleistocene sites contained within B-Horizon sediments may also occur, there have been only one or two instances of Pleistocene deposits being identified in the region in a source-bordering dune and a lunette (Niche 2019).
Culturally modified trees	Less likely to occur throughout the Additional assessment Area due to the dominance of mallee and belah, however, they may be present if Black Box species are identified of a suitable age. Black Box species are confined to areas that experience inundation and therefore will likely be located in depressions bordering the ephemeral lakes. One scarred tree has been recorded in the initial Project Site on a Black Box.
Hearths/ovens	Hearths are also one of the most likely site types to be recorded and are predicted to occur particularly along landforms adjacent to lake systems. Evidence for both hearths and heat retainer ground ovens has already been recorded with the region with 29 hearths recorded within 25 km of the Project Site and are likely to be identified alongside stone artefacts (OzArk 2020). Hearths in the Darling Plains are most likely to be comprised of termite clay but may also consist of clay lumps and calcrete nodules (Witter 2004). Identification of this site type, similarly with stone artefacts, may however be dependent on levels of erosion. Previous investigations have shown that hearths in semi-arid NSW have been heavily disturbed by processes of bioturbation, erosion and/or the effects of grazing animals (Fanning et al 2007). Identification of hearths can be difficult and sometimes only be confirmed through subsurface excavations. As found by Niche (2019), several hearths investigated were determined to be remnants of natural, burnt termite mounds and /or attributed to land clearance practices.
Burials	Burials within south-western NSW have predominately been identified in source bordering dunes along the rivers and stream channels, in floodplain clays, prior stream sediment, mounds, and lunettes (Martin 1985; Bonhomme 1999; Witter 2004). Landforms within the Additional Assessment Area with increased potential to contain burials are the Lunettes and Islands, which comprise softer soil, bordering the salt pans in well-drained areas. However, the Additional Assessment Area lacks true source bordering dunes and lunettes where this site type has been associated with elsewhere.
Bora/Ceremonial sites	This site type does not necessarily follow landform predictability and are, overall, a rare site type with a low likelihood of being present and remaining extant. These sites are generally identified through consultation with the RAPs. RAPs for the project did not note any ceremonial areas across the initial Project Site (OzArk 2021).

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4.3 RESEARCH QUESTIONS

Several research questions can meaningfully be applied to the investigation of the Additional Assessment Area. These research questions include:

- Does the density of artefacts across the Lake Footslopes along the eastern salt pan continue throughout the Additional Assessment Area?
- Are there resources available to the Aboriginal people using the land within the Additional Assessment Area (food, stone, and water) not present within the initial Project Site?
- Do the findings within the Additional Assessment Area (if any) accord with the regional archaeological context examined in **Section 3.2**?
- Do the survey results support the predictive model set out in **Section 4.2.3**?

The survey methodology set out in **Section 5** will be framed to help answer these questions; should sites of sufficient significance be encountered. However, based on the results of previous assessments and past disturbances, it not expected that the land within the Additional Assessment Area will contain sites of sufficient significance to help answer those research questions that require a robust data set.

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5 SURVEY METHODOLOGY

5.1 ASSESSMENT APPROACH

The Aboriginal cultural heritage assessment of the study area will follow the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010). The field inspection will follow the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (The Guide, OEH 2011).

Survey for Aboriginal cultural heritage values will concentrate on the Additional Assessment Area where project impacts will be located.

5.2 SURVEY AIMS

The aim of any archaeological survey is not to locate each artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within the Additional Assessment Area are known. Therefore, the aims of the survey will be to:

- Inspect all landform types in the Additional Assessment Area so that their archaeological potential can be determined
- Evaluate whether the predictive model set out in **Section 4.1.1** is valid
- Determine if the research questions set out in **Section 4.2.1** can be answered
- Determine if any landforms of the Additional Assessment Area require test excavation to understand the archaeological potential at a particular location
- Undertake sufficient assessment to satisfy Sections 2.2, 2.4, 2.5, 2.6, and 2.7 in the Guide
- Collect sufficient data so that the results can be presented in the revised ACHAR as set out in Section 3 in the Guide
- Undertake survey and record keeping satisfying Requirements 1–13 of the Code of Practice.

5.3 SURVEY METHODOLOGY

Standard archaeological field survey and recording methods will be employed in this assessment (Burke & Smith 2004) and will follow the Code of Practice.

In the field, OzArk staff will identify, record, and evaluate physical (i.e., archaeological) evidence. Site recording will capture all the information required to complete current AHIMS site recording forms (e.g., site location, site boundary, site plan, representative photographs, artefact recording, and feature recording). RAPs will participate in the survey, identifying Aboriginal objects, determining the cultural significance of Aboriginal objects, and identifying cultural places or non-physical site types within the Additional Assessment Area. OzArk staff understand that cultural

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knowledge may not be provided in some instances due to cultural sensitivities (e.g., men's and/or women's places). Under these circumstances, to assess the potential impacts, OzArk staff will need to be told, only in general terms, why a particular place is important, and what the significance of the impact will be. OzArk staff will liaise with RAPs on a case-by-case basis to determine how to record the location in a culturally sensitive manner.

It is also stressed that the aim of any survey is not to record each artefact or feature within a given study area. As is set out in the Code of Practice, survey effort should be sufficient to allow for the archaeological characterisation of all landforms. This characterisation is to determine the potential for those landforms to contain objects of Aboriginal cultural heritage significance.

The Additional Assessment Area has little in terms of distinguishing topography to allow it to be easily divided into meaningful survey units. At best, the information gained from a study of soil associations (**Figure 4-2**) indicates landform units: Lake Footslopes, Lunettes and Islands, Sandplains and Dunes and Salt Pans. Archaeologically, the ASDST results shown in **Appendix 1** indicate that the landforms bordering the salt pans have the greatest potential to contain artefact scatters, hearths, and burials.

Integrating this information allowed the development of a survey methodology to sample all landforms in the revised Project Site, while concentrating on landforms with greater archaeological potential as follows:

- Full survey areas: These areas include all landforms with greater archaeological potential such as most of the areas of the Lake Footslopes and Lunettes and Islands adjacent to the salt pans. An additional area of full survey has been included in the southwest of the Additional Assessment Area in the Sandplains and Dunes as there is potential for linear sand dunes to be present based on aerial imagery. The survey methodology in these areas will be for teams to conduct set transects across these areas as is shown on **Figure 5-1**. These transects will be in pairs spaced 100 m apart. There will be 200 m between pairs of transects. At a minimum, this equates to 145 km of transects in the full survey areas. Should the information gained from these preliminary transects indicate that additional transects should be undertaken to 'fill in' the space between pairs there will be time to do this. Additionally, should a landform feature that could have greater archaeological sensitivity, such as an elevated mound, be noted in the area between pairs of transects, this landform feature will be investigated
- Sample landform surveys: As shown on **Figure 5-1** there are twenty 500 m by 500 m areas that will be sampled to investigate landforms with lower archaeological potential. This equates to 40 km of transects. These sample areas are located across the Sandplains and Dunes, and portions of the Lake Footslopes and Lunettes and Islands that are not adjacent to the salt pans. The results of OzArk (2020) indicate that these areas have low archaeological potential, and this sampling regime is designed to further test this predictive model. The location of the sample squares has been selected to cover areas supporting greater vegetation cover (hence potentially more stable soil profiles) or areas within the depression basins that aerial photography indicates may contain elevated landforms. The methodology would allow some flexibility in the placement of these sample

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squares based on observations in the field and discussions between the supervising archaeologist and attending RAPs.

5.4 RAP REQUIREMENTS

All personnel conducting activities on the Project Site will be required to comply with RZ Resources Limited's policies, including 'fit for work'. This survey will be taking place in a remote location where there are no facilities. Further, the survey is planned to take place in late summer. As such, the conditions will be difficult with potentially long, hot days without access to facilities such as toilets. All survey will be by foot, sometimes in a sandy environment which is not the easiest to walk in.

Therefore, it is stressed that all attending RAPs are required to be 'fit for work'. Should any RAP present themselves for participation in the survey that are demonstrably not 'fit for work', their participation in the survey will be at the discretion of OzArk as OzArk must ensure that participants do not pose a health and safety risk to themselves or their fellow workers.

5.5 TEST EXCAVATION

It is possible that the survey may identify landforms within the Additional Assessment Area where test excavation under the Code of Practice (Requirements 14–17) is required. Should such landforms be identified during the survey, a later test excavation methodology will be prepared as a separate document that will be circulated to all RAPs for review and comment.

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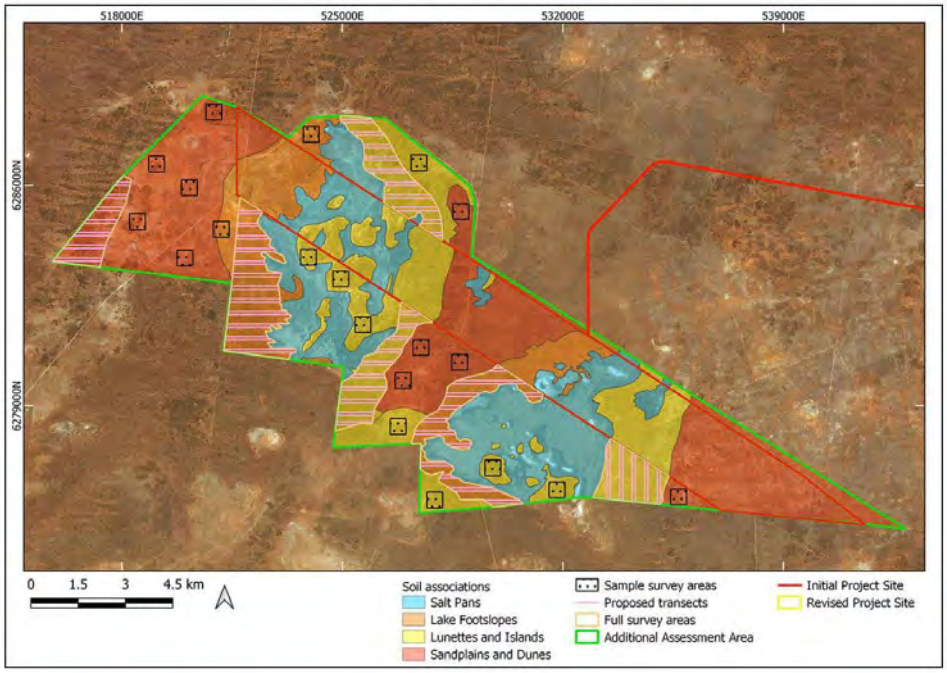
Figure 5-1: Aerial showing the proposed survey areas.



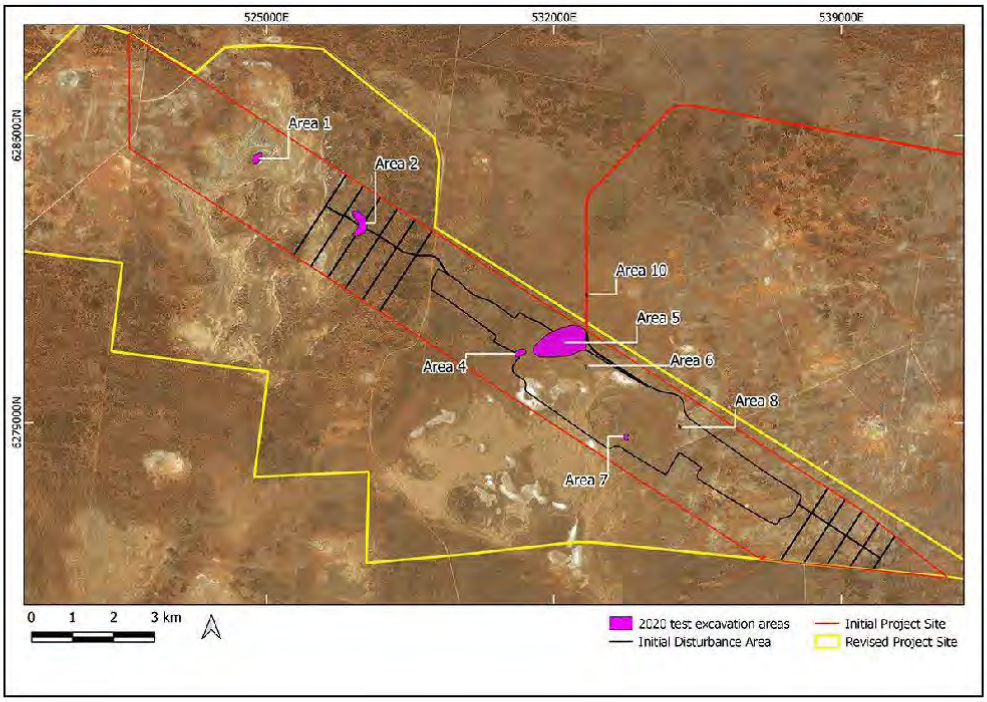
6 TEST EXCAVATION METHODOLOGY

6.1 BACKGROUND TO THE TEST EXCAVATION PROGRAM

During the 2020 survey, OzArk identified ten areas where test excavation was proposed to provide a clearer picture of the subsurface archaeological potential across the initial Project Site. Following the identification of the ten proposed test excavation areas, the proponent refined the Disturbance Area, as such Areas 3 and 9 were excluded from the test excavation program.

The test excavation was completed over seven days in May 2020 by OzArk and the RAPs. The locations of the eight areas subject to test excavation are shown in completed **Figure 6-1**.

Figure 6-1: Areas subject to test excavation in 2020.



The results of the test excavation program were very sparse. 110 test pits (0.5 m by 0.5 m) were excavated across the eight separate localities: a total of 27.5 m^2. From these eight localities, 12 artefacts were recovered: an average of 0.4 artefacts per square metre. The number of artefacts recovered at each area is summarised in **Table 6-1**. Based on the results of the 2020 test excavation program, it was concluded that further archaeological excavation at these areas is unwarranted due to very low density of subsurface artefacts.

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Table 6-1: 2020 test excavation results.

Area	Number of artefacts
Area 1	0
Area 2	2
Area 4	3
Area 5	4
Area 6	0
Area 7	1
Area 8	1
Area 10	1

Following the revision of the impact footprint for the Project Site, both Area 3 and 9 will now be impacted. **Sections 6.2** to **6.5** outline the Code requirements and proposed sampling strategy to be undertaken at Area 3. Test excavation is not proposed to occur at Area 9 as it contains the same landform and soil association as Area 8 which recorded only one subsurface artefact. As such, the subsurface potential of the landform is now considered to be well understood and test excavation at this location is no longer considered warranted.

6.2 CODE REQUIREMENTS FOR THE TEST EXCAVATION PROGRAM

The Code of Practice lists a number of requirements pertaining to test excavation. These requirements are enumerated below and further information pertaining to these requirements follow in subsequent sections of this document.

- **Requirement 14** (Test excavation which is not excluded from the definition of harm):

Sub-surface investigation will not be excluded from harm where they are carried out in the following areas:

a) in or within 50 metres (m) of an area where burial sites are known or are likely to exist

b) in or within 50 m of a declared Aboriginal place

c) in or within 50 m of a rock shelter, shell midden or earth mound

d) in areas known or suspected to be Aboriginal missions or previous Aboriginal reserves or institutes

e) in areas known or suspected to be conflict or contact sites.

- The test excavation locations are not located within the vicinity of the items listed under Requirement 14 of the Code.

- **Requirement 15a** (Consultation): As the proposed archaeological test excavation program is part of the project, consultation has been ongoing with the RAPs and has been completed to the stage described in subclause 80C (6) of the *National Parks and Wildlife Regulation 2009* (NPW Regulation).

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- **Requirement 15b** (Test excavation sampling strategy): This document sets out the proposed sampling strategy for the test excavation program.
- **Requirement 15c** (Notification):
  - the location of the proposed test excavation and the subject area.
    - This document sets out the proposed location of the test excavation program (see **Section 6.4**).
  - the name and contact details of the legal entity with overall responsibility for the project.
    - RZ Resources Limited, Level 7, 10 Eagle St, Brisbane QLD 4000 (GPO Box 2367, Brisbane QLD 4001).
  - the name and contact details of the person who will be carrying out the test excavations where this is different to the legal entity with overall responsibility for the project.
    - OzArk Environment & Heritage, 145 Wingewarra St, Dubbo NSW 2830
  - the proposed date of commencement, and estimated date of completion, of the test excavations.
    - Anticipated Commencement: February 2022
    - Anticipated Completion: February 2022

    Weather permitting, the projected period for the excavation is one day.
  - the location of the temporary storage location for any Aboriginal objects uncovered during the test excavations.
    - Aboriginal objects recovered during the excavations will be temporarily stored in a locked cupboard at 145 Wingewarra, Dubbo, NSW, 2830 (OzArk office) for analysis. Following analysis, the artefacts will be stored at the OzArk office until such time as a Care Agreement is reached between an individual or organisation and Heritage NSW. Other objects, such as faunal or charcoal samples, may be sent to third party specialists for analysis.
- **Requirement 16a** (Test Excavation): The test excavation program will adhere to Requirement 16a of the Code as set out in this document (see **Section 6.5.1**).
- **Requirement 16b** (Objects recovered during test excavations): Aboriginal objects recovered during the excavations will be analysed at 145 Wingewarra, Dubbo, NSW, 2830 (OzArk office). When not being analysed, the objects will be temporarily stored in a locked cupboard at the OzArk office. Following analysis, the artefacts will be stored at the OzArk office until such time as a Care Agreement is reached between an individual or organisation and Heritage NSW. Other objects, such as faunal or charcoal samples, may be sent to third party specialists for analysis.

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- **Requirement 17** (When to stop test excavations): the test excavation program will adhere to the requirements set out in the Code: *Any test excavation carried out under this requirement will cease when suspected human remains area encountered; or when enough information has been recovered to adequately characterise the objects present with regard to their nature and significance.*
    - OzArk shall ensure that this Requirement is adhered to during the test excavation program. This will include ceasing work as soon as human skeletal material is noted and immediately notifying the police. If the skeletal material is determined to be Aboriginal, Heritage NSW will be immediately notified.

6.3 PURPOSE OF THE TEST EXCAVATION METHODOLOGY

The purpose of the test excavation program is to understand more completely the nature of the sub-surface material at Area 3. Data obtained from the test excavation program will inform the mitigation and management options in the forthcoming revised ACHAR.

The aims are therefore to:

1. Establish the extent and nature the of sub-surface archaeological deposits at Area 3
2. Use the data gained from the test excavation program to better evaluate the archaeological significance and potential of the PAD
3. Develop, in consultation with the RAPs and the proponent, an informed strategy for the management of impacts to any Aboriginal cultural heritage likely to be impacted by the project.

Excavations undertaken as per the Code do not require an AHIP under the NPW Act.

6.4 PROPOSED TEST EXCAVATION AREA

Area 3 is within the Dunes and Sandplains soil association landform at Copi OS-2, an artefact scatter consisting of a minimum of 22 artefacts located on the eroding sloped bank of a drainage line. Copi OS-2 was assessed as having potential for subsurface archaeological deposits across the flat elevated land to the west of the area where surface artefacts have eroded downslope.

Two parallel transects each consisting of six test pits will be excavated at Area 3 (**Table 6-2** and **Figure 6-2**). The test pits will be spaced 10 m apart.

Table 6-2: Sampling methodology for text excavation at Area 3.

Area	Test excavation methodology	Landform area	0.5% of landform area	Proposed excavation area
Area 3	2 x 50 m transects (12 0.5 x 0.5 m pits) will be excavated across the PAD.	13,000 m²	65 m²	3 m²

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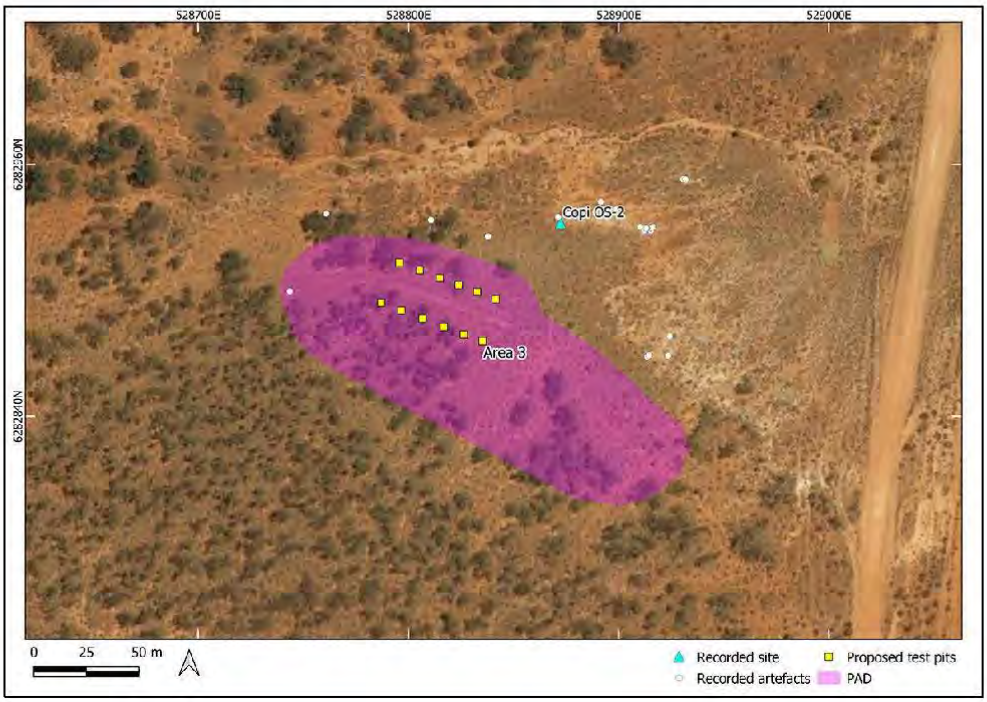
Figure 6-2: Indicative test pit locations at Area 3.



6.5 SAMPLING STRATEGY

The excavation program will be undertaken by archaeologists and representatives of RAPs and will include the following aspects:

1. One area (Area 3) will be investigated by the test excavation program (**Table 6-2**).
2. The location for the proposed test excavation program and approximate transect locations are shown on **Figure 6-2**.
3 Excavation squares will generally be spaced with a 10 m interval so that a broad representation of the landform will be obtained.
4. Prior to any excavation, the site will be recorded via digital photography.
5. Initial excavation squares will be excavated in 5 cm spits to determine whether archaeological stratigraphy is present. If not, spit size will be increased to 10 cm. If archaeological stratigraphy is present, this will be used, so long as the stratigraphic layers are less than 10 cm deep. Otherwise, excavation will remain at 5 or 10 cm spits.
6. The excavated material from all squares will be sieved on site using dry sieving through a 5 millimetre (mm) sieve. A 3 mm sieve will be available should the deposits and artefacts being recorded suggest that it would be warranted to use a smaller sieve size.

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7. If the soils within the PAD are deep, the decision on when to stop excavation will rest with the supervising archaeologist although Requirement 16a, point 9 will be followed. This states: *Test excavation units must be excavated to at least the base of the identified Aboriginal object-bearing units, and must continue to confirm the soils below are culturally sterile.*
8. Each excavator (by hand) will be responsible for sieving the deposit from their excavation square, retrieving the artefacts and, in conjunction with the supervising archaeologist, correctly recording their provenance. There could be some room for assistance with the sieving but a self-contained approach is preferable. Deposits will be sieved on to tarpaulins and the spoil used to backfill the excavation pit once it has been photographed and recorded.
9. A standard excavation recording form will be used for each excavation square. Details will include: date, site recorder, spit number and depth, description of finds, description of soil, sketch plan of excavation (if relevant to show structure), end of spit levels, soil pH (when necessary or appropriate).
10. It is envisioned that the excavation crew will consist of an Excavation Director, three assistant archaeologists and at least four cultural heritage field workers. The excavator of each excavation square, in conjunction with the Excavation Director, will be responsible for ensuring all forms are correctly completed. It will be the archaeologists' responsibility to perform all photographic tasks, undertake any planning and section drawing if required and to ensure that a correct location of each excavation square is maintained.
11. Given that the work will be reasonably physical, all persons conducting activities on the Project Site will be required to comply with RZ Resources Limited's policies, including 'fit for work'.
12. If intact archaeological deposits or archaeological features are encountered, then additional archaeological excavation squares may be excavated to ensure documentation of any features and/or retrieval of artefacts and other relevant archaeological material. A feature would include a high density of artefacts within a pit, or a square containing rare or unusual artefacts (such as artefacts constructed from a stone type rarely represented in the area or less-common tool forms such as ground edge axes, hammerstones, etc.), or other signs of human occupation i.e. ground ovens/hearths or charcoal concentrations. Any expansion must adhere to Requirement 16 (5). Any expansion would only occur with the consent of the Excavation Director who will determine if an expansion is required to gain the appropriate scientific information.
13. Rather than expanding around an individual square as set out in Point 12, it is more likely that any expansion will involve setting out an additional transect at 90 degrees to a transect

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that has demonstrated significant and intact archaeological deposits. The perpendicular transect will be used to assist in determining the spatial spread of the subsurface deposits.

14. Section drawings and photographs will be completed for all excavation squares to show the soil profile.

15. Analysis of all excavated lithics will be made to determine the site's characteristics and to enable the site to be compared with other sites in the region. Analysis will also assist in determining what type of activities the Aboriginal people carried out at the site and their relationship with local resources (fauna, flora, water, and stone). All artefacts will be analysed and selectively photographed. If charcoal from a secure stratigraphic context is obtained, it may be sent to a laboratory for Carbon 14 dating (subject to proponent's agreement).

16. All faunal remains, if recovered, will be analysed by a fauna specialist. Remnant shell and bone fragments may assist in determining what foods Aboriginal people may have eaten at the specific site and may elucidate possible foraging strategies. In conjunction with *in situ* stone tools, bone/shell fragments may also provide evidence of specific usage of stone tools for food processing.

17. Artefacts will remain in the care of OzArk until such time as the analysis is complete. Every effort will be made to analyse artefacts on-site to ensure that the artefacts do not have to leave the Project Site. However, in the case of large artefact numbers or artefacts requiring further research, it may be necessary to take artefacts off-site. If taken off-site, the artefacts would be the responsibility of OzArk.

18. The results of the test excavation program will inform the forthcoming revised ACHAR. Excavation results will be used to advise further courses of action in relation to the management and mitigation options for the Project Site.

19. Once all salvage activities for the project are complete (should the project be approved), artefacts will be amalgamated and managed as per the Aboriginal Cultural Heritage Management Plan (ACHMP). The ACHMP will be prepared following approval in consultation with RAPs and Heritage NSW.

6.5.1 Sampling strategy compliance with the Code: Requirement 16

1 *Test excavation units must be placed on a systematic grid appropriate to the scale of the area—either PAD or site—being investigated e.g. 10 m intervals, 20 m intervals, or other justifiable and regular spacing.*

- The sampling strategy outlined above complies with this requirement. All pits will be confined to within Area 3 and placed along two parallel transects in the area proposed for the ground disturbance work. The transects will be 20 m apart.

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2 *Any test excavation point must be separated by at least 5 m.*

- The sampling strategy outlined above complies with this requirement as all pits will be separated by 10 m. However, depending on the depth to the B-Horizon identified in the pits, additional pit/s may be placed adjacent (making the pits 0.5 m x 1 m) to determine the depth of the horizon and identified stratigraphic information should the pits become too deep to excavate at 0.5 m x 0.5 m.

3 *Test excavations units must be excavated using hand tools only.*

- The sampling strategy outlined in **Section 6.5** complies with this requirement.

4 *Test excavations must be excavated in 0.5 m x 0.5 m units.*

- The sampling strategy outlined in **Section 6.5** complies with this requirement. However, depending on the depth to the B-Horizon identified in the pits, additional pit/s may be placed adjacent (making the pits 0.5 m x 1 m) to determine the depth of the horizon and identified stratigraphic information should the pits become too deep to excavate at 0.5 m x 0.5 m.

5 *Test excavations units may be combined and excavated as necessary to understand the site characteristics, however:*

i) the maximum continuous surface area of a combination of test excavation units at any single excavation point conducted in accordance with point 1 (above) must be no greater than 3 m^2;

- The sampling strategy outlined in **Section 6.5** complies with this requirement.

ii) the maximum surface area of all test excavation units must be no greater than 0.5% of the area—either PAD or site—being investigated.

- The number and size of test excavations undertaken as part of this program will be managed to ensure that this requirement is satisfied.

6 *Where the 0.5 m x 0.5 m excavation unit is greater than 0.5% of the area then point 5 (ii) (above) does not apply.*

- Not applicable. As the potential archaeological deposits is spatially large, less than 0.5% of the known potential archaeological deposit's dimensions will be investigated (see **Table 6-2**).

7 *The first excavation unit must be excavated and documented in 5 cm spits at each area —either PAD or site—being investigated. Based on the evidence of the first excavation unit, 10 cm spits or sediment profile/stratigraphic excavation (whichever is smaller) may then be implemented.*

- Complies. See in Section 6.5 Point 5.

8 *All material excavated from the test excavation units must be sieved using a 5 mm aperture wire-mesh sieve.*

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- Complies. See in Section 6.5 Point 6.

9 *Test excavation units must be excavated to at least the base of the identified Aboriginal object-bearing units and must continue to confirm the soils below are culturally sterile.*

- This requirement will be fulfilled in the field and all excavation squares will be excavated to the basal clays or where it is considered that culturally sterile units are present. The decision on when this point is reached will rest with the Excavation Director.

11 *Photographic and scale-drawn records of the stratigraphy/soil profile, features and informative Aboriginal objects must be made for each single excavation point.*

- Complies. See in **Section 6.5** Points 9, 10, 14, 15 and 16.

12 *Test excavations units must be backfilled as soon as practicable.*

- Complies. See in Section 6.5 Point 8.

13 *Following test excavation, an Aboriginal Site Impact Recording form must be completed and submitted to the AHIMS Registrar as soon as practicable, for each AHIMS site that has been the subject of test excavation in accordance with the requirements of the Code.*

- It will be the responsibility of OzArk to ensure that this requirement is met.

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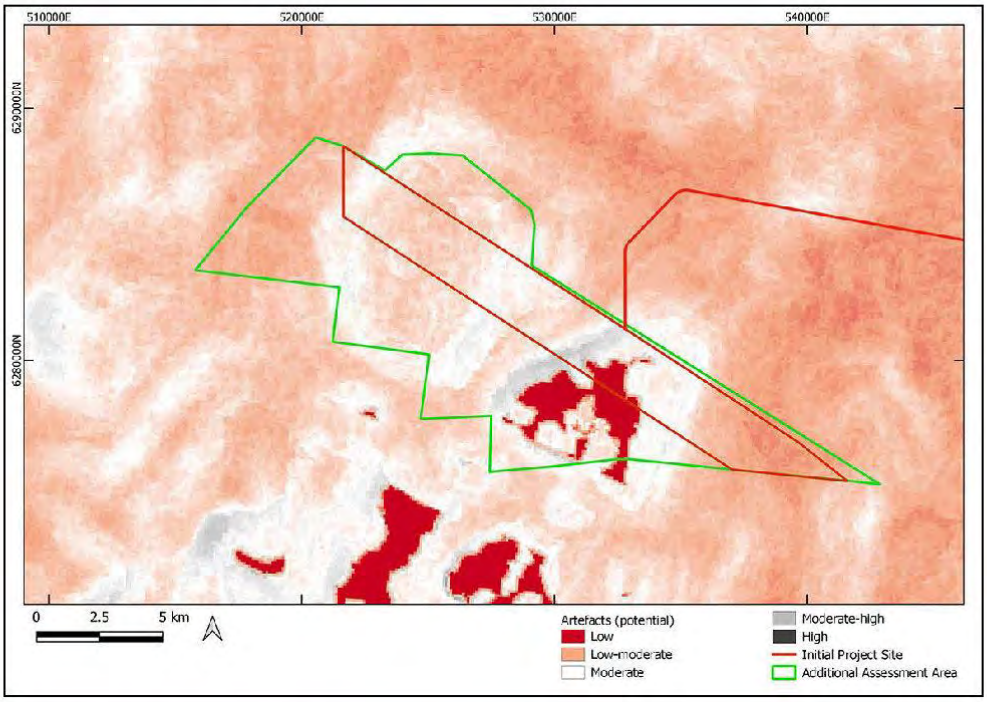
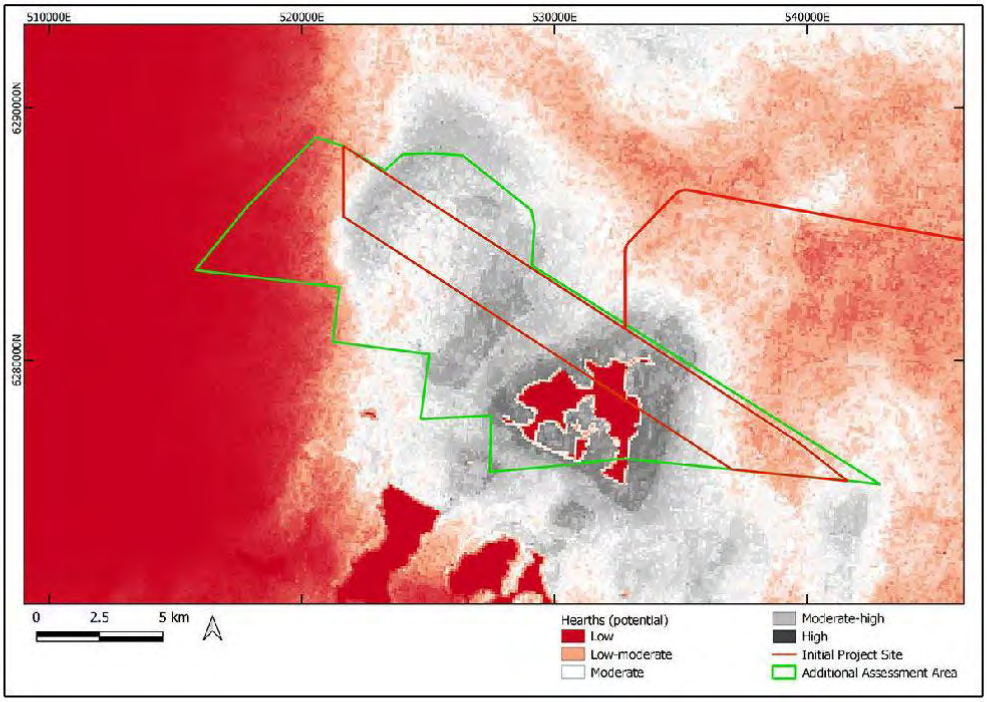
APPENDIX 1: ASDST RESULTS





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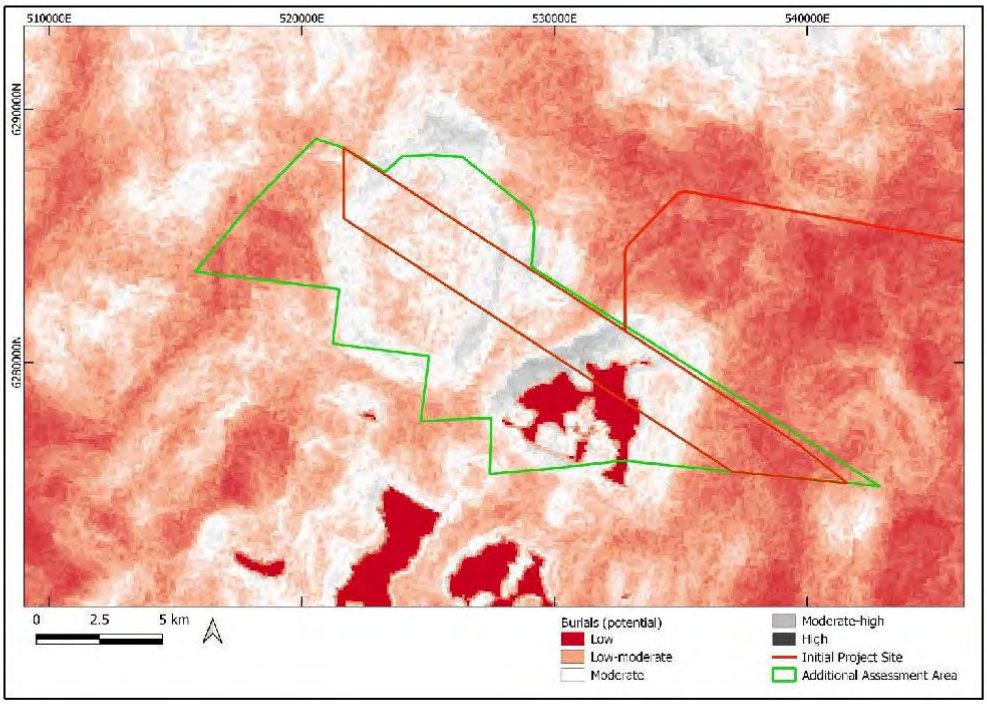
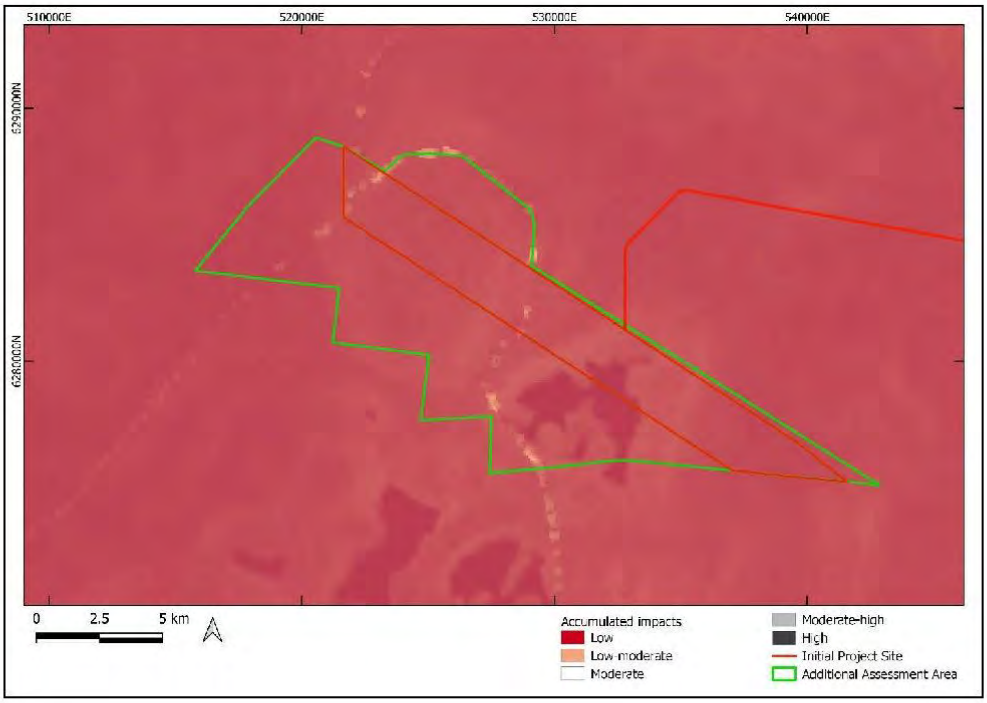
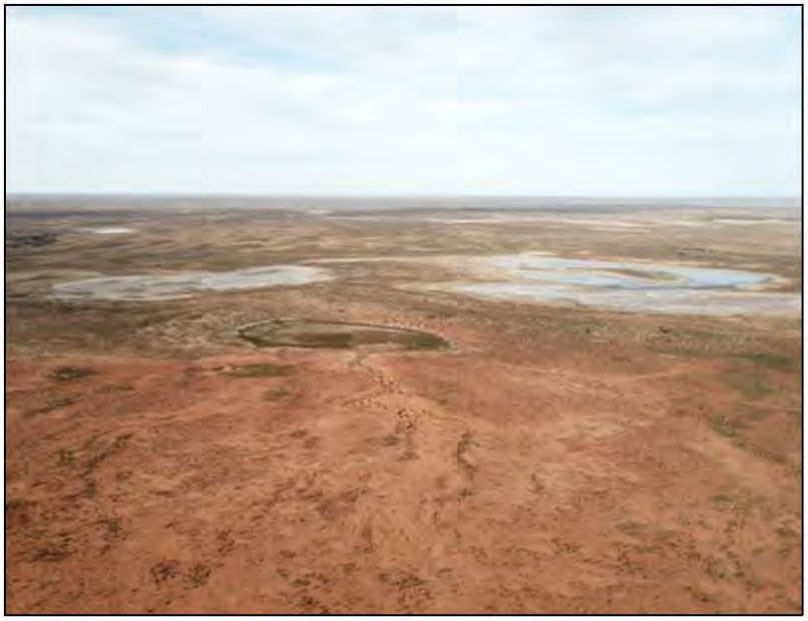




APPENDIX 7: PHASE 3 ASSESSMENT METHODOLOGY



View across the eastern salt pan at Copi.

ABORIGINAL CULTURAL HERITAGE ASSESSMENT METHODOLOGY

COPI MINERAL SANDS PROJECT - PHASE 3 ASSESSMENT AREA

WENTWORTH LOCAL GOVERNMENT AREA, NSW

NOVEMBER 2023

Report prepared by

OzArk Environment & Heritage

for RZ Resources Limited

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Acknowledgement

OzArk acknowledge the traditional custodians of the area on which this assessment will take place and pay respect to their beliefs, cultural heritage, and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the Elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

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1 INTRODUCTION

1.1 PREAMBLE

OzArk Environment & Heritage (OzArk) has been engaged by RW Corkery & Co on behalf of RZ Resources Limited (the Proponent) to prepare an assessment methodology for additional impacts associated with the proposed Copi Mineral Sands Project (the Project).

The proposed Mine Site for the Project is located 75 kilometres (km) northwest of Wentworth and 180 km south of Broken Hill in the Murray Basin region of southwestern NSW in the Wentworth Local Government Area (LGA; **Figure 1-1**).

This methodology is in accordance with Stage 3 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRs; DECCW 2010a). The Project information provided here also complies with Stage 2 of the ACHCRs.

1.2 BACKGROUND

In February 2020 and May 2020, OzArk and the Registered Aboriginal Parties (RAPs) completed a survey and test excavation, respectively, for the Project as per the *Environmental Assessment Requirements*. The 2020 Project encompassed 5,043.3 hectares (ha) of land (herein referred to as the Phase 1 Assessment Area). Following the survey and test excavation program OzArk prepared an Aboriginal Cultural Heritage Assessment Report (ACHAR) titled *Aboriginal Cultural Heritage Assessment: Copi Mineral Sands Project, Wentworth LGA* (OzArk 2020). The ACHAR was distributed to all RAPs in July 2020 for review as per Stage 4 of the ACHCRs.

During the preparation of the *Environmental Impact Statement* (EIS) for the Project, the Proponent identified a much larger resource area and withdrew the application to assess the larger area.

In late 2021, the Proponent re-engaged OzArk to complete investigations of the increased resource area which included an additional 9,130 ha of land (herein referred to as the Phase 2 Assessment Area). Additional survey and test excavation was undertaken by OzArk and the RAPs in February and March 2022. Following the survey and test excavation OzArk prepared a revised ACHAR titled *Revised Aboriginal Cultural Heritage Assessment: Copi Mineral Sands Project, Wentworth LGA* (OzArk 2022). The revised ACHAR was distributed to all RAPs in November 2022 for review as per Stage 4 of the ACHCRs.

The EIS for the Project was submitted to the Department of Planning and Environment (DPE) in May 2023. Since the submission of the EIS, there have been several developments to the Project as follows:

- Additional high-grade resource has been discovered on Warwick. This additional resource, together with other factors such as tenure of Springfield Road and landowner

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considerations, has resulted in a re-optimisation of the mine plan, with mining to now commence on Warwick

- The mine camp and other infrastructure has also been relocated to Warwick
- The site will now be accessed from the east via a new site access road from Anabranch Mail Road. This road is largely consistent with that proposed for the Project in 2020
- The Mine Site has been expanded to include a section of "Nulla Station" to the south of Warwick.

These developments have resulted in an additional 4,279 ha of land being added to the Project (herein referred to as the Phase 3 Assessment Area). Combined, the Phase 1 to 3 Assessment Areas include approximately 18,645 ha of land (herein referred to as the Heritage Assessment Area).

The Proponent has now re-engaged OzArk to complete investigations of the Phase 3 Assessment Area (**Figure 1-2**). The investigation set out in this methodology aims to identify Aboriginal cultural values, both tangible and intangible, that exist in the Phase 3 Assessment Area.

The results of this investigation and the results of previous assessments across the broader Heritage Assessment Area will be presented in a second revised ACHAR. The second revised ACHAR will form part of the EIS being prepared by RW Corkery & Co to accompany an application for development consent under Division 4.7 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

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Figure 1-1: Location of the Mine Site for the Project.

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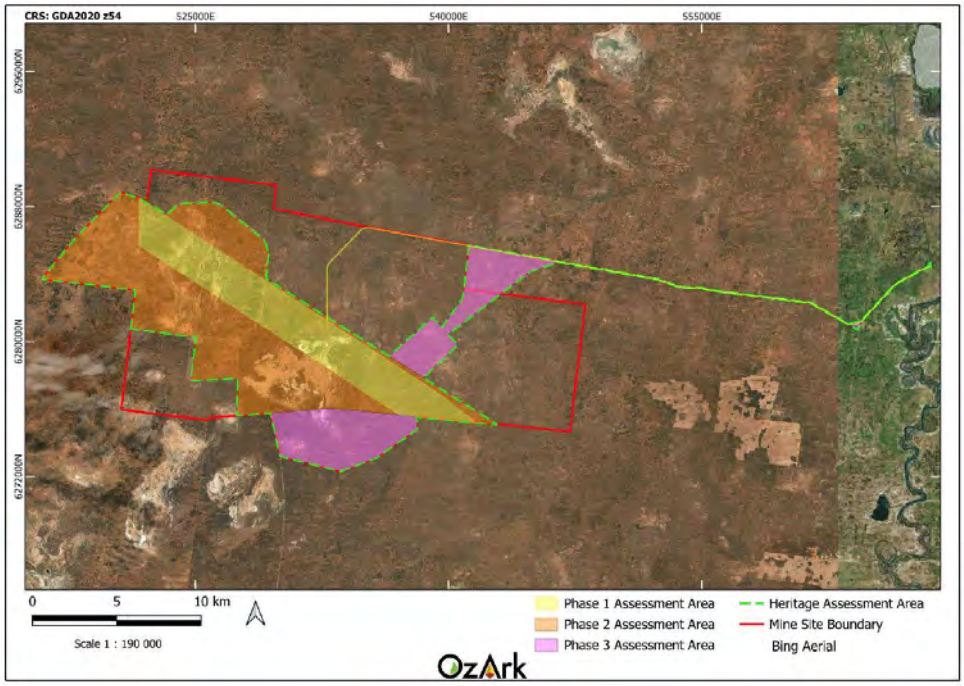
Figure 1-2: Aerial of the Phase 3 Assessment Area.



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1.3 PROJECT OVERVIEW

The Project will comprise the following components:

- Construction and use of a range of ancillary infrastructure, including the following:
  - A mine camp, including accommodation and amenities for 200 people, car parking and related infrastructure
  - Office and administration, workshop, laydown, and stores areas
  - A solar farm and separate power station, each with a nominal capacity of 35 megawatt (MW)
  - A water storage dam and tailings storage facility located within internally draining sections of the landscape
  - Stockpile areas
  - A site access road from Anabranch Mail Road, including an upgrade to an approximately 5.5 km section of Anabranch Mail Road and intersections with the Silver City Highway and the site access road
  - Internal roads.
- Open cut mining using a combination of traditional dry (excavate, load and haul) and wet (dredging) mining techniques to extract overburden, interburden and ore
- On-site processing of extracted ore using a floating wet concentrator and land-based heavy mineral concentrate washing plant to produce heavy mineral concentrate
- Transportation of heavy mineral concentrate in sealed containers from the Mine Site to the Broken Hill Rail Facility via the site access road, the upgraded Anabranch Mail Road, and the existing heavy vehicle transportation route via the Silver City Highway to Broken Hill
- Initial placement of overburden on the mine path and interburden and tailings within the tailings storage facility. Once sufficient area within the dredge pond has been established, interburden and tailings would be placed within completed sections of the dredge pond, with overburden used to cap the placed material and for construction of the final landform
- Progressive rehabilitation of completed sections of the Mine Site, including re-establishment of a final landform that would largely mimic the existing landform and revegetation with native species to re-establish ecosystem function within the Mine Site.

1.4 PHASE 3 ASSESSMENT AREA

The Phase 3 Assessment Area includes approximately 4,279 ha of land located on the Warwick and Nulla pastoral properties (**Figure 1-2**).

The Phase 3 Assessment Area consists of flat to gently undulating sand plains and dunes. In the south, the Phase 3 Assessment Area contains salt pans including the continuation of what has been previously referred to as the 'eastern salt pan'.

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1.5 ASSESSMENT APPROACH

The field assessment of the Phase 3 Assessment Area will follow the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010b). The Aboriginal cultural heritage assessment will follow the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (the Guide; OEH 2011) and the ACHCRs.

1.6 CONSULTATION ON THIS METHODOLOGY

Consultation for the Project has followed the guidelines established in the ACHCRs (DECCW 2010a).

Consultation is continuing from the ACHCRs completed for the first two phases of the Project which ended on 16 December 2022 following Stage 4 review of the revised ACHAR. However, due to the increased size of the Project, a new stakeholder list for the Wentworth LGA was requested from Heritage NSW on 22 September 2023 to ensure there were no additional stakeholders who had not been previous sent an expression of interest. Five additional Aboriginal stakeholders were on the list received from Heritage NSW on 28 September 2023. OzArk wrote to these stakeholders on 3 October 2023.

The following individuals/groups registered to be consulted about the Project:

- Dareton LALC
- Barkindji-Maraura Elders Council
- Barkandji #8 Native title Determinants
- Barkandji Maraura Environmental Team (c/Arthur Kirby)
- Clair Bates
- Amanda Whitton.
- Maraura / Thangkaali (Pooncarie) First Nations Owners Association
- Koori Digs Services.

On 19 October 2023, all RAPs were sent information about the Project and a draft of the assessment methodology for the Phase 3 Assessment Area. RAPs were provided the stipulated 28 days in which to review and comment on these documents as per Stage 3 of the ACHCRs. The closing date for comment was 16 November 2023.

No comments were received on the draft assessment methodology.

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2 CULTURAL VALUES

2.1 INTRODUCTION TO CULTURAL VALUES

No matter who you are, we all have culture. Each person's culture is important; it's part of what makes us who we are.

australianstogether.org.au

Many Aboriginal people in Australia have a unique view of the world that's distinct from the mainstream. Land, family, law, ceremony, and language are five key interconnected elements of Aboriginal culture. For example, families are connected to the land through the kinship system, and this connection to land comes with specific roles and responsibilities which are enshrined in the law and observed through ceremony. In this way, the five elements combine to create a way of seeing and being in the world that is distinctly Aboriginal.

Fundamentally, culture is living and is not static:

- Culture is acquired – we learn about culture from others in our community, including our parents
- Culture is shared – culture does not exist in a vacuum, it is shared amongst a group of people
- Culture defines core values – because we have been taught our culture and share it with our cultural group, we tend to form the same core values
- Cultures resist change but are not static – culture does and can change, but change is usually slow and gradual.

2.1.1 Connection to Country

Aboriginal and Torres Strait Islander peoples are connected to Country through lines of descent (paternal and maternal), as well as clan and language groups.

Although in the past (and sometimes into the present) there have been conflicts between different tribal groups, these were rarely over land. Aboriginal and Torres Strait Islander people have such a strong sense of belonging to country; they have no desire to own the land of others.

Territory is defined by spiritual as well as physical links. Landforms have deep meaning, recorded in art, stories, songs, and dance. Songlines or Dreaming Tracks as well as kinship structures link Aboriginal peoples to the territories of other groups. In the past, these links were also used for trade.

"When we say Country we might mean homeland, or tribal or clan area and in saying so we may mean something more than just a place; somewhere on the map. We are not necessarily referring to place in a geographical sense. But we are talking about the whole of the landscape, not just the places on it."

Professor Mick Dodson AM, August 2007

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2.1.2 Managing Country

Living on this land for around 50,000 years, Aboriginal and Torres Strait Islanders established effective ways to use and sustain resources. One important aspect is the right of certain people to control the use of resources in a particular area. Aboriginal and Torres Strait Islander people don't see themselves as 'owning' land, animals, plants, or nature, but rather belonging with these things as equal parts of creation.

The rights of different groups to live in and manage certain areas of land are clear and recorded through art, stories, songs, and dance.

Deep cultural and spiritual values like totemism have also played an important part in Aboriginal and Torres Strait Islander resource management. Totemism is a belief and value system that connects human beings to other animals, plants, and aspects of nature. Groups and individuals are assigned a particular animal that they are related to and must care for. This gives them a profound sense of connection to and responsibility for the natural world.

Aboriginal and Torres Strait Islanders people have a wide range of traditional methods for gathering food including fish traps, subsistence agriculture, hunting and harvesting a wide range of natural fruits and vegetables. Some groups of people would stay in one place, while others moved around the land according to the seasons, to ensure sustainable and rich food supplies, and to fulfil their spiritual and cultural obligations.

Even before 1788 there were complex relationships for long distance trade between Aboriginal and Torres Strait Islander communities especially for coastal shells and stone hatchets. When people from different groups met socially to share resources, for ceremonies or to settle disputes, they brought items to exchange. Items included stones for hatchets, kangaroo skins, timber for spears, ochre or clay for paint and marine shells for decoration. The exchange of objects was not motivated by a desire for wealth accumulation but a social system to build connection between people and groups.

2.1.3 Recognising lore

In much of eastern Australia, Aboriginal communities live their lives like most Australians without resorting to tribal lore. However, in certain crucial areas, particularly associated with family, leadership roles, and caring for Country, Aboriginal lore continues, even in the most urbanised communities.

2.2 IDENTIFYING CULTURAL VALUES

A major aim of this assessment is to identify any cultural values within the landscape in which the proposal is located so that those values can be recognised and incorporated into the ACHAR's management recommendations.

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Any cultural values relating to the Heritage Assessment Area will be captured by the OzArk archaeologists (if such information is provided by RAPs during the survey) and included in the ACHAR.

Understanding cultural landscapes can only come from the views of a particular community, in this case, the Aboriginal community. Unless informed, OzArk will not know of the community's feelings towards the cultural landscape in which the Project will be located. Should any RAPs have knowledge of cultural values regarding the proposal area that they wish to share or that may affect the survey methodology set out in **Section 5**, OzArk invites them to contact us so that these values can be recorded and/or responded to in the methodology.

2.2.1 Use of information collected

An ACHAR will be prepared for the Project which articulates Aboriginal cultural values and associated conservation methods across the proposal area, as identified during the consultations. The ACHAR will be circulated to all RAPs for comment as is set out in the ACHCRs. The ACHAR will be available to Heritage NSW for their consideration of the proposal and the report will be publicly available.

2.2.2 Public / confidential information

Information will be treated in accordance with instructions received by Aboriginal informants. Information described as confidential (culturally sensitive) will not be detailed in the publicly available report. Confidential information should be made available to the Proponent, its heritage consultants, and Heritage NSW so that significant cultural values can be conserved. On advice from the provider of the information, a redacted ACHAR would be made available to the wider public where any sensitive cultural information is removed.

2.2.3 Copyright

Information collected for this assessment remains the property of the Aboriginal informants and the author. Without written permission from individual informants and the author information may not be used for purposes other than those outlined above.

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3 ARCHAEOLOGICAL CONTEXT

3.1 ABORIGINAL PEOPLE OF THE HERITAGE ASSESSMENT AREA

According to tribal maps (Tindale 1974) Aboriginal people of the Barkindji (Paakantji) language group inhabited the Lower Darling region at the time of first contact with Europeans. This language group comprised people who spoke the sub-dialects Barindji, Barkindji, Danggali, Maraura and Wiljakali. These tribes shared similar language and kinship systems, notably the division of members into matrilineal moieties (two-part social classification) known as Mukwara (wedge-tailed eagle) and Kilpara (raven) (Blows 1995 as cited in Cupper 2003). From early European accounts and archaeological evidence, it appears that Barkindji were hunter-fisher-gatherers living a semi-sedentary lifestyle. Gerard Krefft (1865), an early explorer of the area, suggest that the Barkindji lived along the Lower Darling and Murray Rivers during the warmest months of the year, with people moving away from the rivers into the dune fields to collect food after winter rains (Cupper 2007).

Harry Nanya (c. 1835–1895), a Maraura of the Lower Darling and his family, were the last of the Barkindji to live by traditional hunting techniques, ranging from around Lake Victoria and along the Great Anabranch of the Darling (ANU ADB online; Cupper 2007: B14). Nanya's childhood through 1839-46, coincided with the incursions of European explorers, which were accompanied by expeditions that killed most of his people, notably in the 1841 Rufus River massacre by South Australian police led by Thomas O'Halloran. Around 1860 Nanya left his camp at Popiltah station, 60 km north of Pooncarie, with two women and a steel axe, he went into the waterless mallee country between the Darling Anabranch and the South Australian border, where he lived for over thirty years. Notes from amateur ethnographers suggest Nanya's self-imposed exile may have been due to having eloped with a woman of his own Makwarra moiety, an offence considered incestuous and meriting death (ANU ADB online).

Although Nanya's mob kept themselves well hidden, by the early 1890s the press reported more frequent sightings of the 'wild tribe' and tracks left around water holes showed that Nanya's family was increasing in numbers, causing anxiety and fear amongst the white settlers (ANU ADB online). In 1893 Aboriginal stockmen tracked down the family and persuaded them to return to the river. The twelve men, eight women and ten children, all in good physical condition, arrived at Popiltah Station and Nanya still had his steel axe, now worn wafer-thin. The Aboriginal Protection Board selected a site at Travellers Lake, near Wentworth, for them to settle, but Nanya's people preferred hunting-camps in the vicinity of Pooncarie.

The story for most of the Barkindji tribe, however, was that within about ten years of the advance of pioneering European settlement, they were living adjacent to pastoral homesteads, often working as shepherds or in other labouring activities (Lans et al. 1988 and Withers 1989 in Cupper

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2007:B-14). By the turn of the nineteenth century many Barkindji resided on the Darling River near Pooncarie where an Aboriginal mission had been set up in 1911.

3.2 REGIONAL ARCHAEOLOGICAL CONTEXT SUMMARY

The Darling River, the Darling River Anabranch, and lake systems in southwestern NSW have been the subject of several heritage assessments, archaeological excavations, and detailed academic studies. Some of the earliest evidence of human occupation of Australia comes from south-western NSW (Cupper 2007:B-14). The site of Lake Mungo contains archaeological evidence including human remains and stone tools that date to between 46,000 and 50,000 years before present (BP) (Bowler et al. 2003). Evidence for human occupation has also been found at Menindee Lake from 45,000 BP (Cupper and Duncan 2006 as reported in Cupper 2007:B14) along the Darling River and at Lake Victoria on the Murray River by around 21,000 BP. Archaeological evidence from Willandra Lakes suggests that Aboriginal occupation in the Murray-Darling basin dates from between 46,000 and 50,000 BP (Allen and Holdaway 2009:99; Bowler et al. 2003).

Previous archaeological investigations completed across south-western NSW in the Murray and Lower Darling region highlight that distance to water is a significant predictor of site location. The greatest site concentrations occur near permanent and semi-permanent water sources suggesting that Aboriginal people lived for most of the time along rivers, lakes, and creeks (Clarke 1983). Evidence of occupation falls away exponentially with distance from permanent and semi-permanent water across the sandplains and dunefields. Although sites are present at locations at a greater distance from water across the sandplains and dunefields, these sites are generally limited in terms of both number, size, and complexity, constituting lower density sites and (Johnston and Witter 1996).

Such areas (including the Heritage Assessment Area) are likely to have been occupied briefly during wet seasons when rivers became flooded and specific resources were present for hunting and gathering forays, as suggested by explorer Gerard Kreft (1865). Furthermore, hearths identified were likely only used once or twice when Aboriginal people were camping in areas away from rivers (Clarke 1983). Other investigations within semi-arid NSW have found that occupation away from permanent water was sporadic and demonstrated a hiatus in occupation of such landforms most likely occurring during palaeo-environmental fluctuations (Holdaway et al. 2002 and Shiner 2006).

The most frequently recorded Aboriginal sites in these landforms are stone artefact scatters with or without hearth / ground oven materials (Martin 1985; Cupper 2007). Other Aboriginal cultural heritage site types previously identified over the more extensive Lower Darling region which comprise more abundant resources include shell middens, stone quarries, ceremonial and

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dreaming sites, scarred trees, burials, earth mounds and stone arrangements (Cupper 2007:B-20).

Surface sites across these landforms generally display specialised technologies (the 'Australian small tool tradition') suggesting these are from within the last 5,000 years (Witter 2004). However, western NSW, such as the Darling region, are conspicuous for their well-preserved Pleistocene deposits generally encountered at depth with lake lunettes and riverine source bordering dunes (Martin 1985:15).

3.3 LOCAL ARCHAEOLOGICAL CONTEXT

3.3.1 Archaeological investigations within the Heritage Assessment Area

3.3.1.1 Landskape 2015

In 2015, Landskape completed a due diligence assessment of eight proposed air-core drilling locations within the Phase 1 Assessment Area. Survey of the assessed area occurred over one day and included full pedestrian survey of the impact areas. Site types predicted most likely to occur within the impact areas included artefact scatters, scarred trees, middens, and burials. No Aboriginal archaeological sites were located within the impact areas despite high ground surface visibility (GSV). The absence of sites was attributed to a lack of landforms with increased archaeological potential such as lunettes or source-bordering dunes. In addition, no trees of suitable type and age to possess cultural modifications were present.

3.3.1.2 OzArk 2020 and 2023

In 2020, OzArk completed an archaeological survey across the Phase 1 Assessment Area with the assistance of the RAPs. A total of 81 sites were recorded (**Figure 3-1**), including:

- 49 isolated finds
- 21 artefact scatters
- Six artefact scatters with potential archaeological deposit (PAD)
- One artefact scatter and hearth
- Two artefact scatters with hearths and PAD
- One artefact scatter and scarred tree with PAD
- One PAD.

Observations based on the survey results within the Phase 1 Assessment Area were as follows:

- The greatest density of artefacts and hearths were identified within the Lake Footslopes landform to the north of the eastern salt pan, followed by the Lunettes and Islands to the

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east of the eastern salt pan, and further afield across the Sandplains and Dunes in the east

- There is a distinct clustering of surface artefacts around the eastern salt pan when compared to the western salt pan
- Artefact sites are the most commonly recorded site type (n=80). Most artefacts sites are low density due to their distance from reliable water sources. Recorded artefacts were largely manufactured from silcrete, quartz, chert and quartzite as predicted, while a low number of chalcedony artefacts were also identified
- All recorded hearths (n=11) were identified in association with stone artefact sites. Most hearths (n=10) were located across the Lake Footslopes landform, as predicted, although one hearth was identified in the Sandplains and Dunes. All hearths were lagging on pedestals as predicted by Witter (2004)
- Most sites are situated within erosion scalds across the landscape and therefore artefacts would likely be located within secondary contexts
- One scarred tree was identified in association with an artefact scatter (Copi OS 1) on an island within the western salt pan. The recording of this site type did not conform to the predictive modelling as these site types are not commonly identified in areas distant to semi- or permanent water (Craib 1992; Witter 2004).

During the 2020 survey, OzArk identified ten areas (Area 1 to 10) where test excavation was proposed to provide a clearer picture of the subsurface archaeological potential. Following the identification of the ten proposed test excavation areas, the Proponent refined the Limit of Disturbance Area, as such Areas 3 and 9 were excluded from the test excavation program.

The Phase 1 test excavation program was subsequently completed at eight localities (Area 1, 2, 4–8, and 10) which highlighted a very sparse distribution of subsurface material. 110 test units (TUs) (0.5 m by 0.5 m) were excavated across the eight separate localities: a total of 27.5 m^2. From these eight localities, 12 artefacts were recovered: an average of 0.4 artefacts per square metre. Based on the results of the 2020 test excavation program, it was concluded that further archaeological excavation at these areas is unwarranted due to very low density of subsurface artefacts.

In 2022, OzArk completed an archaeological survey across the Phase 2 Assessment Area with the assistance of the RAPs. A total of 41 sites were recorded, including:

- 22 isolated finds
- 17 artefact scatters
- Two artefact scatters with hearths.

Test excavation was also completed at Area 3 in 2022 following revision of the Limit of Disturbance. A total of 12 TUs (0.5 x 0.5 m) were excavated at Area 3: a total of 3 m^2. From the 12 TUs only two artefacts were recovered: an average of 0.6 artefacts per square metre.

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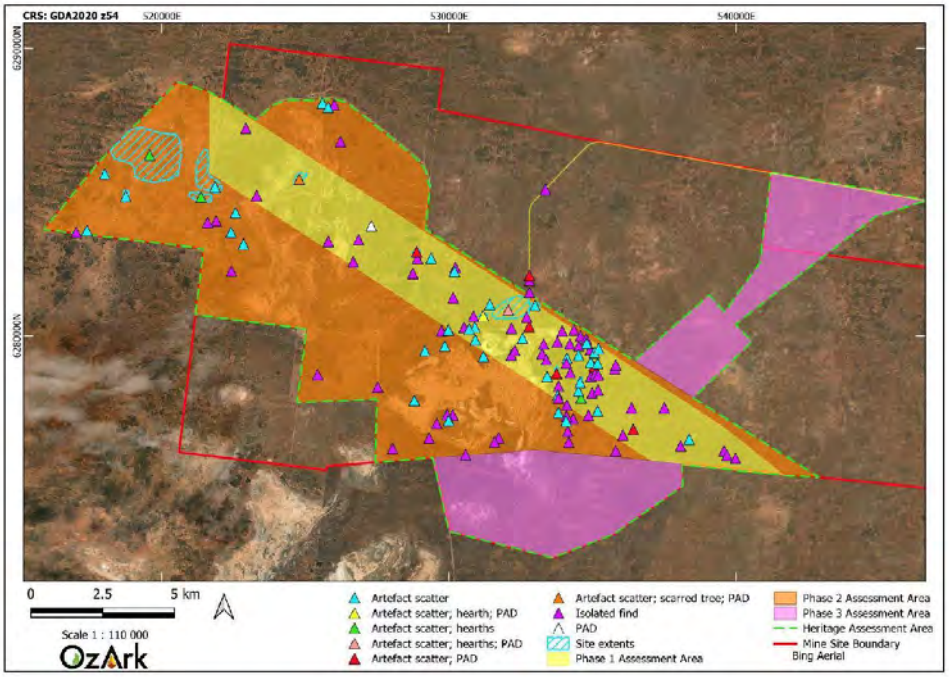
Overall, a total of 122 have been recorded as part of the Phase 1 and 2 assessments (**Figure 3-1**). Recorded site types include:

- 71 isolated finds
- 39 artefact scatters (including one PAD with a confirmed low-density subsurface scatter)
- Six artefact scatters with PAD
- Three artefact scatters with hearth/s
- Two artefact scatters with hearths and PAD
- One artefact scatter and scarred tree with PAD.

Figure 3-1: Recorded Aboriginal sites within the Phase 1 and 2 Assessment Areas.



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4 PREDICTIVE MODEL

4.1 LANDFORM MODELLING

The Murray Darling Depression bioregion lies in the Murray Basin on Tertiary and Quaternary sediments deposited from a shallow sea, lakes, and rivers. The landscape is characterised by dunefields, sandplains, and undulating plains. There is very little structured drainage, but numerous lakes, swamps and depressions are present, some of which are driven by saline groundwater (NPWS 2003). The landscape of the South Olary Plain is characterised by dunefields, sandplains, dry lakes, and groundwater basins (NPWS 2003:83).

In most arid lands, geomorphic processes and resultant landforms are dominated by wind action on unconsolidated surfaces (Thomas 1989). Therefore, depressions/basins and their lakes are likely to have their basins and shorelines modified by wind. This is demonstrated by the landforms present which consist of small, sub-circular to irregular relict lakes or groundwater basins, termed throughout this methodology as the 'eastern' and 'western' salt pans. The salt pans are generally flat, but they contain raised gypsite crests or islands and gypsum-rich lunettes located to the east of the salt pans (Hulme 2020). Footslopes, which consist of long gentle slopes, are present on the western sides of the lake floors. Landforms surrounding the remainder of the groundwater basins are extensive sandplains, dunes, and swales with little topographic variation.

For the purposes of this assessment methodology, this landscape has been divided into four survey units based on topographic zones which inform an archaeological characterisation of its landforms (**Figure 4-1**). These can be briefly characterised as follows:

- Lake Footslopes: long, gentle slopes predominately on the western sides of the salt pans
- Sandplains and Dunes: undulating plains to dunes and swales
- Lunettes and Islands: aeolian landforms which have generally built up on the eastern side of the salt pans. These landforms are variable and include irregular lunettes, raised gypsum crests or islands, and gypsite flats
- Salt Pans: the eastern and western salt pans as well as the gypsite flats which are part of groundwater discharge basins.

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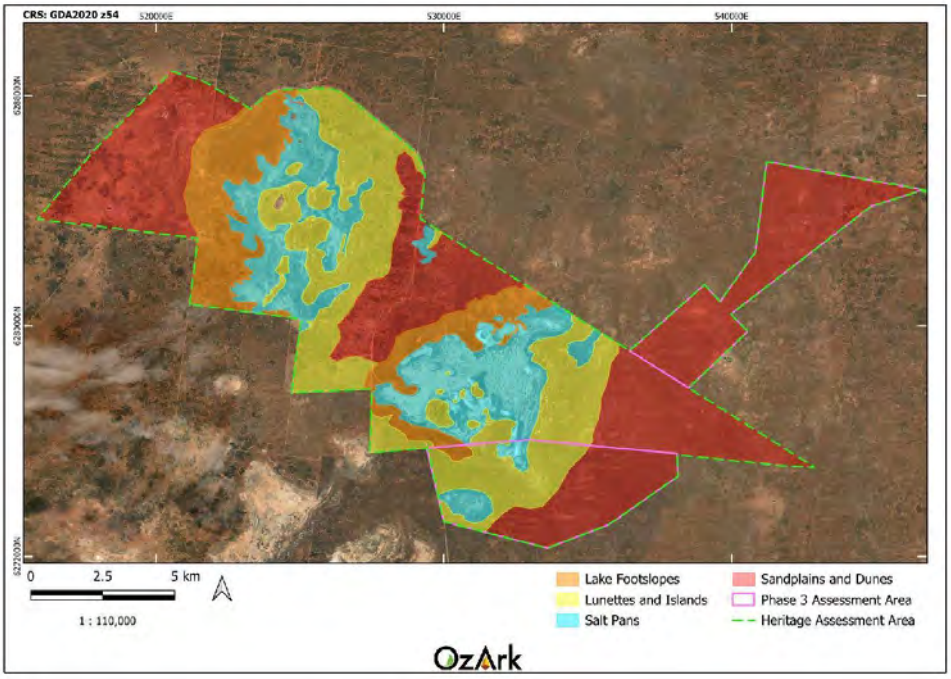
Figure 4-1: Landforms within the Phase 3 and Heritage Assessment Areas.



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4.2 PREDICTIVE MODEL FOR THE PHASE 3 ASSESSMENT AREA

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally, it is the more durable materials such as stone artefacts, stone hearths, shell, and some bones that remain preserved in the current landscape. Even these however may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport—both over short- and long-time scales—or (b) the historical impacts associated with the introduction of colonial farming practices. Scarred trees, by their nature, may survive for up to several hundred years but rarely beyond.

4.2.1 Site types in the region of the Phase 3 Assessment Area

The site types listed in **Table 4-1** are present in the region of the Phase 3 Assessment Area. The likelihood of these sites being present in the Phase 3 Assessment Area is discussed in **Section 4.2.3**.

Table 4-1: Site types recorded in the region of the Phase 3 Assessment Area.

Site type	Site description
Isolated finds	May be indicative of random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or subsurface artefact scatter. They may occur anywhere within the landscape but are more likely to occur in topographies where open artefact scatters typically occur.
Open artefact scatters	Artefact scatters are defined as two or more artefacts, not located within a rock shelter, and located no more than 50 metres (m) away from any other constituent artefact. This site type may occur almost anywhere that Aboriginal people have travelled and may be associated with hunting and gathering activities, short- or long-term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations which relate to activity areas. Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of a background scatter rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'. Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands. Larger sites may be expected in association with permanent water sources. Topographies which afford effective through-access across, and relative to, the surrounding landscape, such as the open basal valley slopes and the valleys of creeks, will tend to contain more and larger sites, mostly camp sites evidenced by open artefact scatters.
Culturally modified trees	Aboriginal scarred trees contain evidence of the removal of bark (and sometimes wood) in the past by Aboriginal people, in the form of a scar. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels, and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed because of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginal people for both their own purposes and for roofing on early European houses. Consequently, the distinction between European and Aboriginal scarred trees may not be clear.

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Site type	Site description
Hearths/ovens	Features used by Aboriginal people for the preparation of food and would generally be in the vicinity of available resources, such as water sources to procure fish and shellfish, and on elevated ground to avoid impact from environmental threats.
Burials	Generally found in soft sediments such as aeolian sand, alluvial silts, and rock shelter deposits. In valley floor and plains contexts, burials may occur in locally elevated topographies rather than poorly drained sedimentary contexts. Burials are also known to have occurred on rocky hilltops in some limited areas. Burials are generally only visible where there has been some disturbance of sub-surface sediments or where some erosional process has exposed them.
Bora/Ceremonial sites	Places which have ceremonial or spiritual connections. Ceremonial sites may comprise of natural landscapes or have archaeological material. Bora sites are ceremonial sites which consist of a cleared area and earthen rings.

4.2.2 Landform modelling of archaeological potential

Previous archaeological investigations completed for the Project provides information to obtain a sound understanding of the nature and distribution of archaeological sites within the Phase 3 Assessment Area. The results of the 2020 survey of the Phase 1 Assessment Area show that the greatest the distribution of surface artefacts and features is across the Lake Footslopes, followed by the Dunes and Sandplains (**Figure 4-2**). It is interesting to note that the survey showed a distinct clustering of surface artefacts around the eastern salt pan when compared to the western salt pan (**Figure 4-2**). The greatest density of artefacts and hearths in the Phase 1 Assessment Area were identified within the Lake Footslopes landform to the north of the eastern salt pan, followed by the Lunettes and Islands to the east of the eastern salt pan, and further afield across the Sandplains and Dunes in the east. Very few artefacts were identified surrounding the western salt pan, therefore it was concluded likely some feature attracted occupation to the eastern salt pan; i.e. possible freshwater soaks as opposed to the saline features at the western salt pan. However, during the survey of the Phase 2 Assessment Area, a larger number of artefacts and hearths were identified across the Lake Footslopes landform to the southwest of the western salt pan as opposed to the Lake Footslopes landform to the southwest of the eastern salt pan (**Figure 4-2**). A large number of artefacts and several hearths were also identified across the Sandplains and Dunes in the western portion. The increased frequency of sites in the west is likely attributed to a larger number of drainage lines in the far west as opposed to the far east.

Crucial for the preservation of archaeological deposits is the history of past land use in an area. Primary use of the Phase 3 Assessment Area and the broader Heritage Assessment Area is for sheep and goat grazing, and the Heritage Assessment Area has also been impacted by widespread vegetation clearance. Both activities promote soil erosion and soil loss. As such, soils throughout most of the Heritage Assessment Area are degraded. Such widespread impacts have undoubtedly affected the archaeological landscape in that many tens of centimetres of soils have been removed from many areas, thereby disturbing or deflating any archaeological deposits they may have contained. With such widespread soil movement, it is also important to remember that accumulations of artefacts that may be termed a 'site' today may have, in fact, been washed into that location during the historic period and bear no relationship to past Aboriginal occupation

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patterns in the area (Holdaway and Fanning 2008). Subsurface investigations completed as part of the Phase 1 and 2 assessments have shown that most excavation areas comprise undifferentiated A1-Horizon and a leached A2-Horizon, the implication is that the landscape has been subject to the stripping of the A1-Horizon and the exposure of the A2-Horizon. The assumption is, therefore, that the landscape has undergone a high general disturbance from soil loss that has compromised the archaeological deposits across the Heritage Assessment Area.

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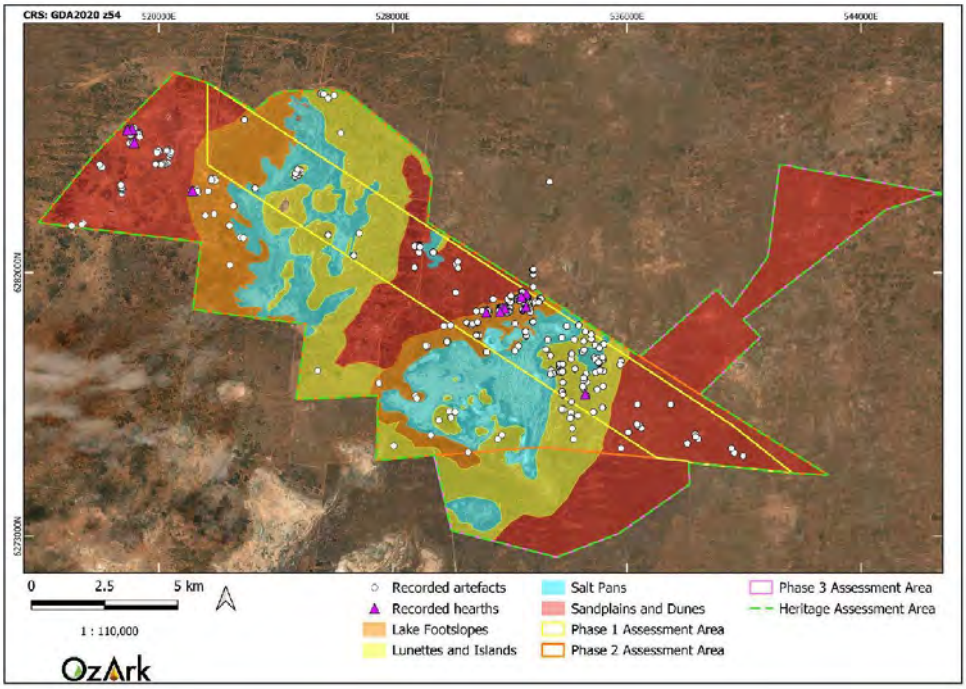
Figure 4-2: Previously recorded artefacts and hearths across the Phase 1 and 2 Assessment Areas.



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4.2.3 Conclusion

Based on knowledge of the environmental contexts of the Heritage Assessment Area and a desktop review of the known local and regional archaeological record, the following predictions are made concerning the probability of landforms and what types of sites may be present within the Phase 3 Assessment Area (**Table 4-2**).

Table 4-2: Likelihood of certain site types being present in the Phase 3 Assessment Area.

Site type	Likelihood of being present in the Phase 3 Assessment Area
Isolated finds	Isolated finds may occur anywhere but are more likely to be located along the Sandplains and Dunes; Lake Footslopes and Lunettes and Islands, however, may have been washed into low lying areas within the salt pans themselves.
Open artefact scatters	Artefact scatters are the most likely site type to be encountered. Based on the landforms of the Phase 3 Assessment Area, artefact scatters with the greatest density are predicted to be more common across the Lunettes and Islands (OzArk 2020 and 2022). Scatters across the Sandplains and Dunes are likely to be sparse and of low-density (Craib 1992) Recorded artefacts are likely to be comprised of silcrete, quartz, chert or quartzite and may include a higher percentage of tools. Artefact scatters are likely to be identified within 'scalds' across the landscape (Fanning et al. 2007) as stone artefacts are often the lag remaining behind on the scald surface and they contain high GSV. It would be expected that most sites located would date to the late Holocene (i.e. less than 4,000-5,000 BP), the age attributed to the A-Horizon artefact bearing deposits. Although Pleistocene sites contained within B-Horizon sediments may also occur, there have been only one or two instances of Pleistocene deposits being identified in the region in a source-bordering dune and a lunette (Niche 2019).
Culturally modified trees	Less likely to occur throughout the Phase 3 Assessment Area due to the dominance of mallee and belah, however, they may be present if Black Box species are identified of a suitable age. Black Box species are confined to areas that experience inundation and therefore will likely be located in depressions bordering the ephemeral lakes. One scarred tree has been recorded in the Phase 1 Assessment Area on a Black Box tree.
Hearths/ovens	Hearths are also one of the most likely site types to be recorded and are predicted to occur particularly along landforms adjacent to lake systems. Evidence for both hearths and heat retainer ground ovens has already been recorded with the region with 29 hearths recorded within 25 km of the Heritage Assessment Area and are likely to be identified alongside stone artefacts (OzArk 2020). Hearths in the Darling Plains are most likely to be comprised of termite clay but may also consist of clay lumps and calcrete nodules (Witter 2004). Identification of this site type, similarly with stone artefacts, may however be dependent on levels of erosion. Previous investigations have shown that hearths in semi-arid NSW have been heavily disturbed by processes of bioturbation, erosion and/or the effects of grazing animals (Fanning et al. 2007). Identification of hearths can be difficult and sometimes only be confirmed through subsurface excavations. As found by Niche (2019), several hearths investigated were determined to be remnants of natural, burnt termite mounds and /or attributed to land clearance practices.
Burials	Burials within south-western NSW have predominately been identified in source bordering dunes along the rivers and stream channels, in floodplain clays, prior stream sediment, mounds, and lunettes (Martin 1985; Bonhomme 1999; Witter 2004). Landforms within the Phase 3 Assessment Area with increased potential to contain burials are the Lunettes and Islands, which comprise softer soil, bordering the salt pans in well-drained areas. However, the Phase 3 Assessment Area lacks true source bordering dunes and lunettes where this site type has been associated with elsewhere.
Bora/Ceremonial sites	This site type does not necessarily follow landform predictability and are, overall, a rare site type with a low likelihood of being present and remaining extant. These sites are generally identified through consultation with the RAPs. RAPs for the Project have not noted any ceremonial areas across the Phase 1 and 2 Assessment Areas (OzArk 2022).

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4.3 RESEARCH QUESTIONS

Several research questions can meaningfully be applied to the investigation of the Phase 3 Assessment Area. These research questions include:

- Are there resources available to the Aboriginal people using the land within the Phase 3 Assessment Area (food, stone, and water) not present within the Phase 1 and 2 Assessment Areas?
- Do the findings within the Phase 3 Assessment Area (if any) accord with the regional archaeological context examined in **Section 3.2**?
- Do the survey results support the predictive model set out in **Section 4.2.3**?

The survey methodology set out in **Section 5** will be framed to help answer these questions; should sites of sufficient significance be encountered. However, based on the results of previous assessments and past disturbances, it not expected that the land within the Phase 3 Assessment Area will contain sites of sufficient significance to help answer those research questions that require a robust data set.

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5 SURVEY METHODOLOGY

5.1 ASSESSMENT APPROACH

The Aboriginal cultural heritage assessment of the study area will follow the Code of Practice (DECCW 2010b). The field inspection will follow the Guide (OEH 2011).

Survey for Aboriginal cultural heritage values will concentrate on the Phase 3 Assessment Area where Project impacts will be located.

5.2 SURVEY AIMS

The aim of any archaeological survey is not to locate each artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within the Phase 3 Assessment Area are known. Therefore, the aims of the survey will be to:

- Inspect all landform types in the Phase 3 Assessment Area so that their archaeological potential can be determined
- Evaluate whether the predictive model set out in **Section 4.2** is valid
- Determine if the research questions set out in **Section 4.3** can be answered
- Determine if any landforms of the Phase 3 Assessment Area require test excavation to understand the archaeological potential at a particular location
- Undertake sufficient assessment to satisfy Sections 2.2, 2.4, 2.5, 2.6, and 2.7 in the Guide
- Collect sufficient data so that the results can be presented in the revised ACHAR as set out in Section 3 in the Guide
- Undertake survey and record keeping satisfying Requirements 1–13 of the Code of Practice.

5.3 SURVEY METHODOLOGY

Standard archaeological field survey and recording methods will be employed in this assessment (Burke & Smith 2004) and will follow the Code of Practice.

In the field, OzArk staff will identify, record, and evaluate physical (i.e., archaeological) evidence. Site recording will capture all the information required to complete current AHIMS site recording forms (e.g., site location, site boundary, site plan, representative photographs, artefact recording, and feature recording). RAPs will participate in the survey, identifying Aboriginal objects, determining the cultural significance of Aboriginal objects, and identifying cultural places or non-physical site types within the Phase 3 Assessment Area. OzArk staff understand that cultural knowledge may not be provided in some instances due to cultural sensitivities (e.g., men's and/or women's places). Under these circumstances, to assess the potential impacts, OzArk staff will

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need to be told, only in general terms, why a particular place is important, and what the significance of the impact will be. OzArk staff will liaise with RAPs on a case-by-case basis to determine how to record the location in a culturally sensitive manner.

It is also stressed that the aim of any survey is not to record each artefact or feature within a given study area. As is set out in the Code of Practice, survey effort should be sufficient to allow for the archaeological characterisation of all landforms. This characterisation is to determine the potential for those landforms to contain objects of Aboriginal cultural heritage significance.

The Phase 3 Assessment Area has little in terms of distinguishing topography to allow it to be easily divided into meaningful survey units. At best, the information gained from a study of soil associations (**Figure 4-2**) indicates landform units: Lake Footslopes, Lunettes and Islands, Sandplains and Dunes and Salt Pans. Archaeologically, the previous assessments indicate that the landforms bordering salt pans have the greatest potential to contain artefact scatters, hearths, and burials.

Integrating this information allowed the development of a survey methodology to sample all landforms in the Phase 3 Assessment Area, while concentrating on landforms with greater archaeological potential as follows:

- Full survey areas: These areas include all landforms with greater archaeological potential such as most of the areas of the Lake Footslopes and Lunettes and Islands to the east and south of the eastern salt pan. An additional area of full survey has been included in the northeast of the Phase 3 Assessment Area in the Sandplains and Dunes sue to the presence of ephemeral drainage lines. The survey methodology in these areas will be for teams to conduct set transects across these areas as is shown on **Figure 5-1**. These transects will be in pairs spaced 100 m apart. There will be 200 m between pairs of transects. At a minimum, this equates to 77 km of transects in the full survey areas. Should the information gained from these preliminary transects indicate that additional transects should be undertaken to 'fill in' the space between pairs there will be time to do this. Additionally, should a landform feature that could have greater archaeological sensitivity, such as an elevated mound, be noted in the area between pairs of transects, this landform feature will be investigated
- Sample landform surveys: As shown on **Figure 5-1** there are 22 500 m by 500 m areas that will be sampled to investigate landforms with lower archaeological potential. This equates to 44 km of transects. These sample areas are located across the Sandplains and Dunes. The results of OzArk (2020 and 2022) indicate that these areas have low archaeological potential, and this sampling regime is designed to further test this predictive model. The location of the sample squares has been selected to cover areas supporting greater vegetation cover (hence potentially more stable soil profiles) or areas within the depression basins that aerial photography indicates may contain elevated landforms. The methodology would allow some flexibility in the placement of these sample squares based on observations in the field and discussions between the supervising archaeologist and attending RAPs.

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5.4 RAP REQUIREMENTS

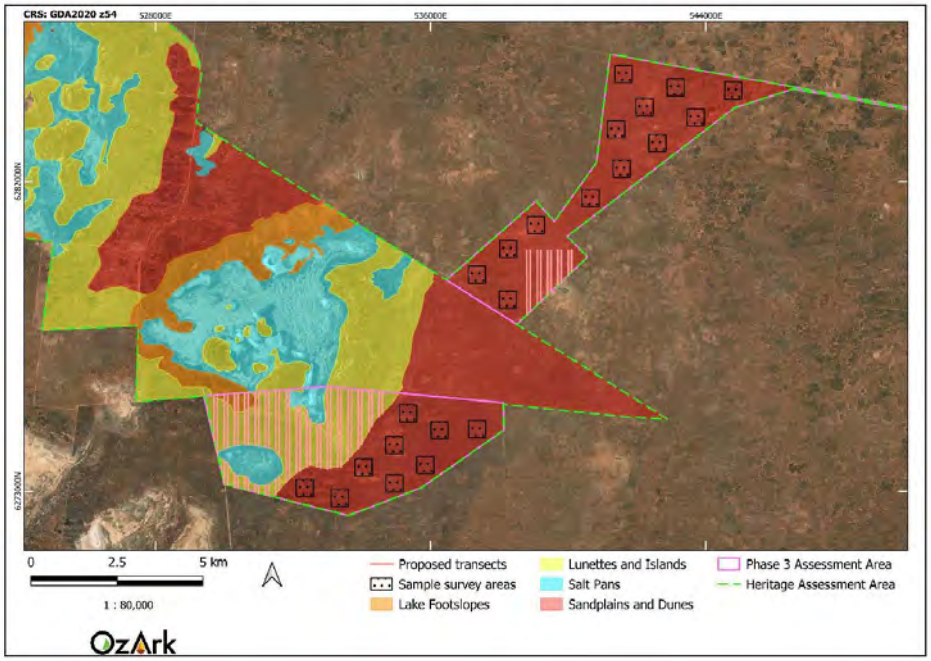
All personnel conducting activities for the Project will be required to comply with RZ Resources Limited's policies, including 'fit for work'. This survey will be taking place in a remote location where there are no facilities. Further, the survey is planned to take place in late summer. As such, the conditions will be difficult with potentially long, hot days without access to facilities such as toilets. All survey will be by foot, sometimes in a sandy environment which is not the easiest to walk in.

Therefore, it is stressed that all attending RAPs are required to be 'fit for work'. Should any RAP present themselves for participation in the survey that are demonstrably not 'fit for work', their participation in the survey will be at the discretion of OzArk as OzArk must ensure that participants do not pose a health and safety risk to themselves or their fellow workers.

5.5 TEST EXCAVATION

It is possible that the survey may identify landforms within the Phase 3 Assessment Area where test excavation under the Code of Practice (Requirements 14–17) is required. Should such landforms be identified during the survey, a later test excavation methodology will be prepared as a separate document that will be circulated to all RAPs for review and comment.

Figure 5-1: Aerial showing the proposed survey areas in the Phase 3 Assessment Area.



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APPENDIX 8: PHASE 3 TEST EXCAVATION METHODOLOGY

View northwest across an aeolian landform showing Copi-OS58 in the background (area of exposure).

ARCHAEOLOGICAL TEST EXCAVATION METHODOLOGY

COPI MINERAL SANDS PROJECT -
PHASE 3 ASSESSMENT

WENTWORTH SHIRE COUNCIL LOCAL GOVERNMENT AREA

JANUARY 2024

Report prepared by

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Acknowledgement

OzArk acknowledge the traditional custodians of the area on which this assessment will take place and pay respect to their beliefs, cultural heritage, and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the Elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

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1 INTRODUCTION

1.1 PREAMBLE

RZ Resources Limited (the Proponent) is proposing to construct the Copi Mineral Sands Project (the Project), in the Wentworth Shire Council Local Government Area (LGA).

OzArk Environment & Heritage (OzArk) has been commissioned to prepare an archaeological test excavation methodology and conduct archaeological test excavations in accordance with the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010a) within the Phase 3 Assessment Area for the Project.

Archaeological test excavation is required to determine if subsurface archaeological material is present and to provide management recommendations in relation to the findings.

One acronym is used in this methodology that describe aspects of the archaeological investigation:

TU Test unit. In the test excavation program, a TU is the standard 50 centimetre (cm) by 50 cm excavation square excavated to non-cultural soil levels.

This methodology has been prepared in accordance with Stage 3 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRs; DECCW 2010b).

1.2 BACKGROUND TO THE TEST EXCAVATION PROGRAM

In November 2023, OzArk and site officers from the Registered Aboriginal Parties (RAPs) completed the survey of the Phase 3 Assessment Area.

As a result of the survey, an additional 21 Aboriginal sites were recorded (**Figure 1-1** and **Figure 1-2**). Site types include 13 isolated finds, seven artefact scatters, and an artefact scatter associated with hearths. Additionally, an aeolian dune landform located south of the eastern salt pan was recorded as a potential archaeological deposit (PAD) (**Figure 1-2**). This PAD encompasses two areas with known surface artefacts (Copi OS-58 and OS-59). Copi OS-59 is associated with 16 artefacts while Copi OS-58 is associated with up to 200 artefacts (**Figure 1-3**).

The artefacts at Copi OS-58 are concentrated within an area measuring 0.5 hectares (ha) which is the densest concentration of artefacts identified across the Phase 1 to 3 Assessment Areas. The areas across the PAD, excluding the delineated site extents of Copi OS-58 and 59, retain a greater amount of A horizon soils (although it is acknowledged that the landform has been stripped of a large amount of soil), which are considered likely to contain subsurface artefacts given the presence of artefacts in the two deflated areas. This landform differs from the landforms that have been previously subject to test excavation (see **Section 3.1**), therefore subsurface investigations are required investigate the nature of the landform and confirm whether the surface artefacts at Copi OS 58 and 59 are associated with intact subsurface deposits.

Figure 1-1: Aboriginal sites recorded in the northern portion of the Phase 3 Assessment Area.

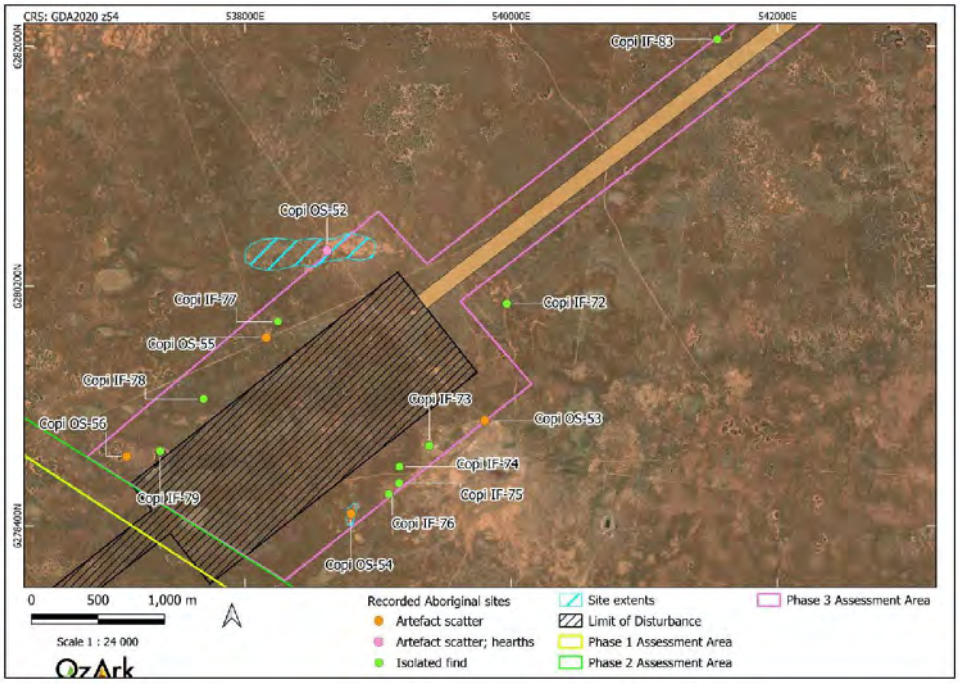

Figure 1-2: Aboriginal sites recorded in the southern portion of the Phase 3 Assessment Area.

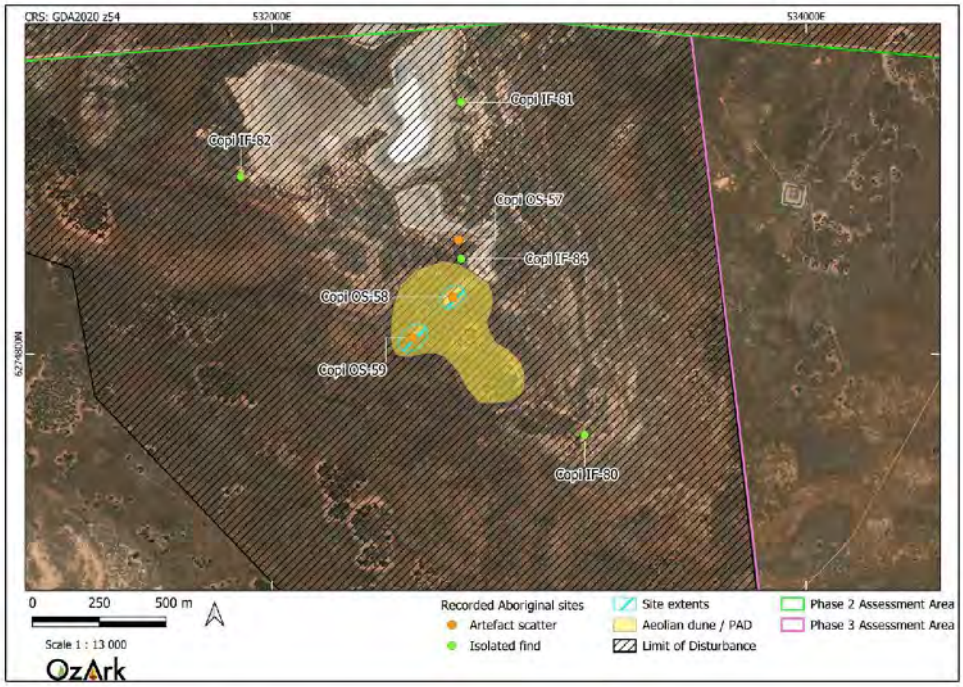

Figure 1-3: View of Copi OS-58 and OS-59.

	
1. View southeast across Copi OS-58.	2. View across the western extent of Copi OS-59.

1.3 CODE REQUIREMENTS FOR THE TEST EXCAVATION PROGRAM

Excavations undertaken as per the Code of Practice do not require an Aboriginal Heritage Impact Permit (AHIP) under the *National Parks and Wildlife Act 1974* (NPW Act).

The Code of Practice lists several requirements pertaining to test excavation. These requirements are enumerated below and further information pertaining to these requirements follow in subsequent sections of this document.

- **Requirement 14** (Test excavation which is not excluded from the definition of harm):

  Sub-surface investigation will not be excluded from harm where they are carried out in the following areas:

  a) in or within 50 metres (m) of an area where burial sites are known or are likely to exist

  b) in or within 50 m of a declared Aboriginal place

  c) in or within 50 m of a rock shelter, shell midden or earth mound

  d) in areas known or suspected to be Aboriginal missions or previous Aboriginal reserves or institutes

  e) in areas known or suspected to be conflict or contact sites.

  - The PAD is not located within the vicinity of the items listed under Requirement 14 of the Code of Practice, and therefore the proposed subsurface investigation is excluded from the definition of 'harm'.

- **Requirement 15a** (Consultation): consultation has been initiated with the RAPs in accordance with the ACHCRs and has been completed to the stage described in subclause 60C (6) of the *National Parks and Wildlife Regulation 2019* (NPW Regulation).
- **Requirement 15b** (Test excavation sampling strategy): This document sets out the proposed sampling strategy for the test excavation program.

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- **Requirement 15c** (Notification):
  - the location of the proposed test excavation and the subject area.
    - This document sets out the proposed location of the test excavation program (see **Section 3.3**).
  - the name and contact details of the legal entity with overall responsibility for the project.
    - RZ Resources Limited, Level 7, 10 Eagle St, Brisbane QLD 4000 (GPO Box 2367, Brisbane QLD 4001).
  - the name and contact details of the person who will be carrying out the test excavations where this is different to the legal entity with overall responsibility for the project.
    - OzArk Environment & Heritage, 145 Wingewarra St, Dubbo NSW 2830
  - the proposed date of commencement, and estimated date of completion, of the test excavations.
    - Anticipated commencement: 30 January 2023
    - Anticipated completion: 2 February 2023

    Weather permitting, the projected period for the excavation is four days.
  - the location of the temporary storage location for any Aboriginal objects uncovered during the test excavations.
    - Aboriginal objects recovered during the excavations will be temporarily stored in a locked cupboard at 145 Wingewarra Street, Dubbo, NSW, 2830 (OzArk office) for analysis. Other objects, such as faunal or charcoal samples, may be sent to third party specialists for analysis.
- **Requirement 16a** (Test Excavation):
  - The test excavation program will adhere to Requirement 16a of the Code of Practice as set out in this document (see **Section 3.5**).
- **Requirement 16b** (Objects recovered during test excavations):
  - If further analysis Aboriginal objects recovered during the excavations will be analysed at 145 Wingewarra Street, Dubbo, NSW, 2830 (OzArk office). When not being analysed, the objects will be temporarily stored in a locked cupboard at 145 Wingewarra Street, Dubbo, NSW, 2830 (OzArk office). The long-term management of any recovered artefacts will be determined in consultation with the RAPs.
- **Requirement 17** (When to stop test excavations): the test excavation program will adhere to the requirements set out in the Code of Practice: *Any test excavation carried out under this requirement will cease when suspected human remains area encountered; or when*

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enough information has been recovered to adequately characterise the objects present with regard to their nature and significance.

- OzArk shall ensure that this Requirement is adhered to during the test excavation program. This will include ceasing work as soon as human skeletal material is noted and immediately notifying the police. If the skeletal material is determined to be Aboriginal, Heritage NSW will be immediately notified.

1.4 CONSULTATION ON THIS METHODOLOGY

Consultation for the Project has followed the guidelines established in the ACHCRs (DECCW 2010b).

Consultation is continuing from the ACHCRs completed for the first two phases of the Project which ended on 16 December 2022 following Stage 4 review of the revised Aboriginal Cultural Heritage Assessment Report (ACHAR). However, due to the increased size of the Project, a new stakeholder list for the Wentworth LGA was requested from Heritage NSW on 22 September 2023 to ensure there were no additional stakeholders who had not previously been sent an expression of interest. Five additional Aboriginal stakeholders were on the list received from Heritage NSW on 28 September 2023. OzArk wrote to these stakeholders on 3 October 2023.

The following individuals/groups registered to be consulted about the Project:

- Dareton Local Aboriginal Land Council
- Barkindji-Maraura Elders Council
- Barkandji #8 Native Title Determinants
- Arthur Kirby
- Clair Bates
- Amanda Whitton.
- Maraura / Thangkaali (Pooncarie) First Nations Owners Association
- Koori Digs Services.

On 19 October 2023 a copy of the assessment methodology for the Phase 3 Assessment Area was sent to RAPs for 28-day review. The feedback date ended on 16 November 2023..

A response was received from Koori Digs Service on 23 October 2023 stating that they agree with the methodology.

The test excavation methodology was distributed to all RAPs on 20 December 2023. The closing date for comment was 23 January 2024.

No comments were received from the RAPs on the test excavation methodology.

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2 CULTURAL VALUES

2.1 INTRODUCTION TO CULTURAL VALUES

No matter who you are, we all have culture. Each person's culture is important; it's part of what makes us who we are.

australianstogether.org.au

Many Aboriginal people in Australia have a unique view of the world that's distinct from the mainstream. Land, family, law, ceremony, and language are five key interconnected elements of Aboriginal culture. For example, families are connected to the land through the kinship system, and this connection to land comes with specific roles and responsibilities which are enshrined in the law and observed through ceremony. In this way, the five elements combine to create a way of seeing and being in the world that is distinctly Aboriginal.

Fundamentally, culture is living and is not static:

- Culture is acquired - we learn about culture from others in our community, including our parents
- Culture is shared - culture does not exist in a vacuum, it is shared amongst a group of people
- Culture defines core values - because we have been taught our culture and share it with our cultural group, we tend to form the same core values
- Cultures resist change but are not static - culture does and can change, but change is usually slow and gradual.

2.1.1 Connection to Country

Aboriginal and Torres Strait Islander peoples are connected to Country through lines of descent (paternal and maternal), as well as clan and language groups.

Although in the past (and sometimes into the present) there have been conflicts between different tribal groups, these were rarely over land. Aboriginal and Torres Strait Islander people have such a strong sense of belonging to country; they have no desire to own the land of others.

Territory is defined by spiritual as well as physical links. Landforms have deep meaning, recorded in art, stories, songs, and dance. Songlines or Dreaming Tracks as well as kinship structures link Aboriginal peoples to the territories of other groups. In the past, these links were also used for trade.

"When we say Country we might mean homeland, or tribal or clan area and in saying so we may mean something more than just a place; somewhere on the map. We are not necessarily referring to place in a geographical sense. But we are talking about the whole of the landscape, not just the places on it."

Professor Mick Dodson AM, August 2007

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2.1.2 Managing Country

Living on this land for around 50,000 years, Aboriginal and Torres Strait Islanders established effective ways to use and sustain resources. One important aspect is the right of certain people to control the use of resources in a particular area. Aboriginal and Torres Strait Islander people don't see themselves as 'owning' land, animals, plants, or nature, but rather belonging with these things as equal parts of creation.

The rights of different groups to live in and manage certain areas of land are clear and recorded through art, stories, songs, and dance.

Deep cultural and spiritual values like totemism have also played an important part in Aboriginal and Torres Strait Islander resource management. Totemism is a belief and value system that connects human beings to other animals, plants, and aspects of nature. Groups and individuals are assigned a particular animal that they are related to and must care for. This gives them a profound sense of connection to and responsibility for the natural world.

Aboriginal and Torres Strait Islanders people have a wide range of traditional methods for gathering food including fish traps, subsistence agriculture, hunting and harvesting a wide range of natural fruits and vegetables. Some groups of people would stay in one place, while others moved around the land according to the seasons, to ensure sustainable and rich food supplies, and to fulfil their spiritual and cultural obligations.

Even before 1788 there were complex relationships for long distance trade between Aboriginal and Torres Strait Islander communities especially for coastal shells and stone hatchets. When people from different groups met socially to share resources, for ceremonies or to settle disputes, they brought items to exchange. Items included stones for hatchets, kangaroo skins, timber for spears, ochre or clay for paint and marine shells for decoration. The exchange of objects was not motivated by a desire for wealth accumulation but a social system to build connection between people and groups.

2.1.3 Recognising lore

In much of eastern Australia, Aboriginal communities live their lives like most Australians. However, in certain crucial areas, particularly associated with family, leadership roles, and caring for Country, Aboriginal lore continues, even in the most urbanised communities.

2.2 IDENTIFYING CULTURAL VALUES

A major aim of this assessment is to identify any cultural values within the landscape in which the Project is located so that those values can be recognised and incorporated into the ACHAR's management recommendations.

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Any cultural values relating to the study area will be captured by the OzArk archaeologists (if such information is provided by RAPs during the test excavation) and included in the ACHAR.

Understanding cultural landscapes can only come from the views of a particular community, in this case, the Aboriginal community. Unless informed, OzArk will not know of the community's feelings towards the cultural landscape in which the Project will be located. Should any RAPs have knowledge of cultural values regarding the study area that they wish to share or that may affect the test excavation methodology set out in **Section 3**, OzArk invites them to contact us so that these values can be recorded and/or responded to in the methodology.

2.2.1 Use of information collected

An ACHAR will be prepared for the Project which articulates Aboriginal cultural values and associated conservation methods across the study area, as identified during the consultations. The ACHAR will be circulated to all RAPs for comment as is set out in the ACHCRs. The ACHAR will be available to Heritage NSW for their consideration of the Project and the report will be publicly available.

2.2.2 Public / confidential information

Information will be treated in accordance with instructions received by Aboriginal informants. Information described as confidential (culturally sensitive) will not be detailed in the publicly available report. Confidential information should be made available to the proponent, its heritage consultants, and Heritage NSW so that significant cultural values can be conserved. On advice from the provider of the information, a redacted ACHAR would be made available to the wider public where any sensitive cultural information is removed.

2.2.3 Copyright

Information collected for this assessment remains the property of the Aboriginal informants and the author. Without written permission from individual informants and the author information may not be used for purposes other than those outlined above.

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3 TEST EXCAVATION METHODOLOGY

The test excavation program follows a program of pedestrian survey across the Phase 3 Assessment Area (**Section 1.2**).

No previous subsurface archaeological investigation has occurred within the Phase 3 Assessment Area; however, subsurface investigations have been undertaken previously in the Phase 1 Assessment Area.

3.1 PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS FOR THE PROJECT

During the 2020 survey of the Phase 1 Assessment Area, OzArk identified ten areas where test excavation was proposed to provide a clearer picture of the subsurface archaeological potential. These initial areas, and the reasons why they were selected are outlined in **Table 3-1**. The location of these ten areas is shown on **Figure 3-1**.

Following the identification of the ten proposed test excavation areas, the Proponent refined the Limit of Disturbance and Areas 3 and 9 were excluded from the test excavation program.

The initial test excavation program was completed over seven days in May 2020 by OzArk and the RAPs.

Table 3-1: Proposed areas for test excavation.

Area	Landform	Associated Soils	Reason for test excavation
Area 1	Isolated, elevated crest above the groundwater discharge basin/ relict lake? (the western salt pan).	Lunette	Lunettes are considered to be a landform with increased archaeological sensitivity. One of the few areas where artefacts were identified in the west of the Phase 1 Assessment Area.
Area 2	Broad, elevated plain with gentle undulations to the west of the western salt pan.	Lunette	A broad, undifferentiated landform where no surface artefacts were identified, however, as it has been mapped as a lunette (Hulme 2020), a landform considered to have archaeological potential, sub-surface deposits have an increased likelihood of being present and excavation will provide insight into the formation process and nature of the landform.
Area 3	Gentle slope rising to the west adjacent to gypsum flats.	Dunes and Sandplains	A number of surface artefacts were visible during the survey along an area of water wash. Area in the west where the highest concentration of artefacts was identified. Testing would confirm whether the artefacts are present on a deflated surface.
Areas 4 and 5	Long, gentle slope to the north of the eastern salt pan.	Lake Footslopes	Appeared to have high archaeological potential during the survey. The greatest density of artefacts was identified along this landform as were a number of hearths in areas subject to water and wind erosion. Testing will confirm whether the artefacts are present on a deflated surface or if there are associated subsurface deposits.
Area 6	Sandy rise bordering a small depression to the north, in the vicinity of the eastern salt pan.	Lake Footslopes	A discrete location of silcrete artefacts eroding from the edge of the landform. Appears to be a knapping floor.
Area 7	Slightly elevated landform along the western and northern sides of a depression.	Dunes and Sandplains	Chosen in order to test the nature of deposits on the dunes and sand plains. Archaeological potential of this particular area is increased as it is adjacent to a depression which may have

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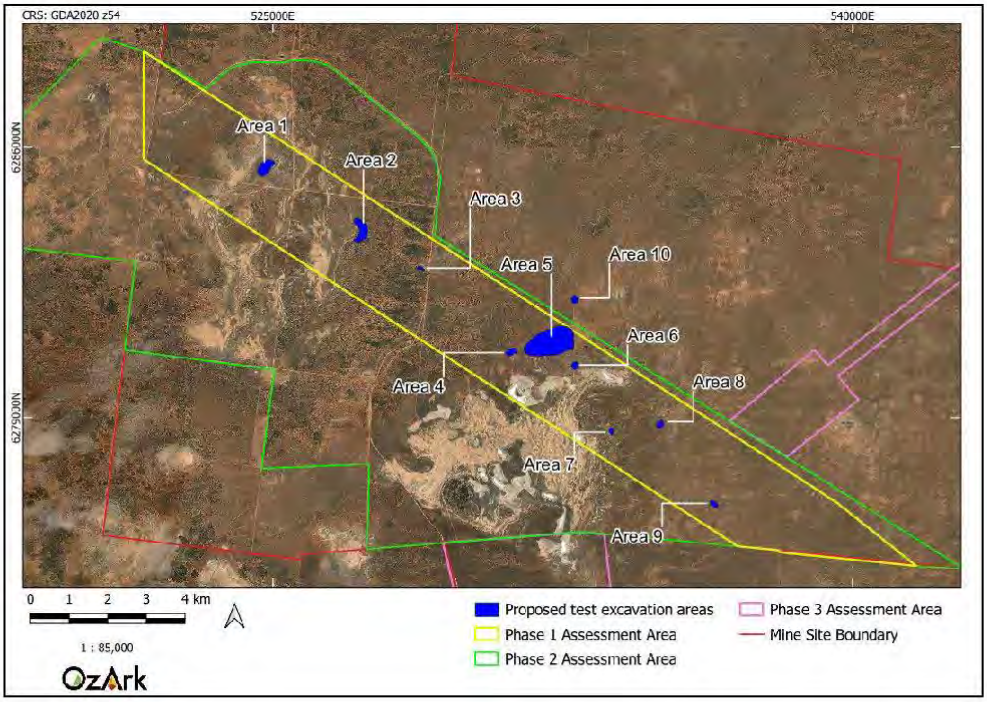
Area	Landform	Associated Soils	Reason for test excavation
			held water seasonally and surface artefacts have been identified.
Area 8	Slightly elevated landform adjacent to a depression.	Lake Floor East and Dunes and Sand Plains	Chosen as artefacts were identified on the surface and it is at the transition of two Soil Associations.
Area 9	Gentle, undulating sand plain.	Dunes and Sandplains	Chosen to gain further insight into the archaeological potential of landforms distant from the former groundwater basin/relict lake? (eastern salt pan)
Area 10	Flat, elevated plain above the long, gentle slope north of the eastern salt pan.	Not mapped – however, likely to be Dunes and Sandplains	A concentration of artefacts was identified along the proposed access track. Chosen to gain further insight into the flat, undifferentiated plain which transitions into the long, gentle slope where the greatest concentration of artefacts was identified.

Figure 3-1: Location of the initially proposed test excavation areas.



The results of the 2020 test excavation program were very sparse. 110 test units (TUs) (0.5 m x 0.5 m) were excavated across eight separate localities: a total of 27.5 square metres (m^2). From these eight localities, 12 artefacts were recovered: an average of 0.4 artefacts per m^2. The number of artefacts recovered at each area is summarised in **Table 3-2**. Based on the results of the 2020 test excavation program, it was concluded that further archaeological excavation at these areas is unwarranted due to very low density of subsurface artefacts.

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Table 3-2: 2020 test excavation results.

Area	Number of artefacts
Area 1	0
Area 2	2
Area 4	3
Area 5	4
Area 6	0
Area 7	1
Area 8	1
Area 10	1

Following a redesign of the Limit of Disturbance in 2021/2022, it was determined that Area 3 would be impacted by the Project and therefore test excavation was undertaken at this location. Test excavation at Area 3 was completed on 1 March 2022. A total of 12 TUs were excavated at Area 3: a total of 3 m^2. From the 12 TUs only two artefacts, both quartzite flakes, were recovered: an average of 0.6 artefacts per square metre.

3.2 PURPOSE OF THE TEST EXCAVATION METHODOLOGY

The purpose of the test excavation program is to understand more completely the nature of the subsurface material across the area of PAD identified. Data obtained from the test excavation program will inform the mitigation and management options in the forthcoming ACHAR.

The aims are therefore to:

1. Establish the extent and nature of the PAD
2. Use the data gained from the test excavation program to better evaluate the archaeological significance and potential of the location
3. Develop, in consultation with the RAPs and the Proponent, an informed strategy for the management of impacts to any Aboriginal cultural heritage likely to be impacted by the Project.

3.3 RESEARCH QUESTIONS

While any test excavation program is limited in the level of research objectives it can achieve due to the restricted nature of the excavations, the test excavations within the Phase 3 Assessment Area will attempt to shed light on:

- How does the artefactual material and stratigraphy identified at the site compare to other archaeological excavations undertaken in the Phase 1 Assessment Area and the broader region?
- Is there evidence providing insight into the tasks were Aboriginal people undertaking across this landform?

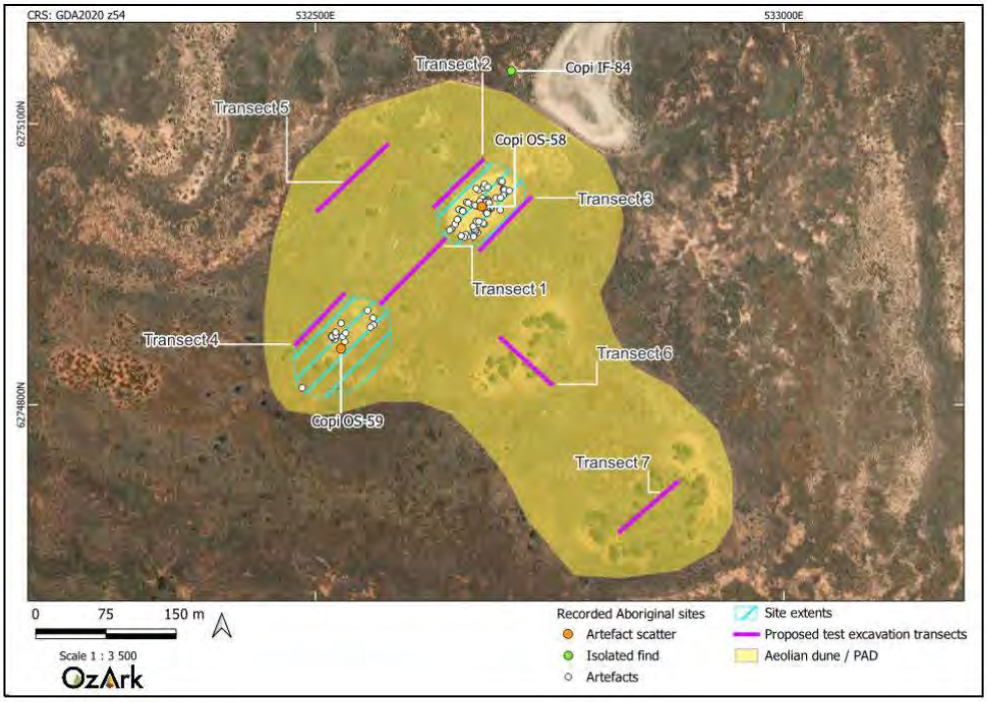
3.4 PROPOSED EXCAVATION TRANSECTS

The proposed sampling strategy for the test excavation program is detailed in **Table 3-3** and the approximate location of these transects are shown on **Figure 3-2**.

Table 3-3: Proposed sample strategy.

Transect	Sampling strategy
Transect 1	Located between Copi OS-58 and OS-59 90 metre (m) transect = 10 TUs spaced 10 m apart.
Transect 2	Along the northwestern rim of Copi OS-58 exposure 70 m transect = 8 TUs spaced 10 m apart.
Transect 3	Along the southwestern rim of Copi OS-58 exposure. 70 m transect = 8 TUs spaced 10 m apart.
Transect 4	Along the northwestern rim of Copi OS-59 exposure 70 m transect = 8 TUs spaced 10 m apart.
Transect 5	Across the northwestern section of the dune. 90 m transect = 10 TUs spaced 10 m apart.
Transect 6	Across the southeastern section of the dune which retains greater A horizon soils. 70 m transect = 8 TUs spaced 10 m apart.
Transect 7	Across the southeastern section of the dune which retains greater A horizon soils. 70 m transect = 8 TUs spaced 10 m apart.

Figure 3-2: Indicative transect locations.



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3.5 SAMPLING STRATEGY

The excavation program will be undertaken by archaeologists and representatives of RAPs and will include the following aspects:

1. One landform will be investigated by the test excavation program.
2. The location of the proposed transects is shown on **Figure 3-2**. It is noted that there can be some flexibility in the field about the precise location of a transect and the precise location of TUs. Any decisions about where to place transects will be done in consultation with the RAPs who are in present at the time.
3. Seven transects will be excavated with TUs spaced 10 m apart. Transects 1 and 5 will contain 10 TUs while the remaining transects will consist of 8 TUs. Some minor movement off may be needed to avoid vegetation or areas of disturbance. No TU will be closer than 5 m to another.
4. Prior to any excavation, the area will be recorded via digital photography.
5. Initial TUs will be excavated in 5 cm spits to determine whether archaeological stratigraphy is present. If not, spit size will be increased to 10 cm. If archaeological stratigraphy is present, this will be used, so long as the stratigraphic layers are less than 10 cm deep. Otherwise, excavation will remain at 5 cm or 10 cm spits.
6. The excavated material from all squares will be sieved on site using dry sieving through a five millimetre (mm) sieve. A 3 mm sieve will be available should the deposits and artefacts being recorded suggest that it would be warranted to use a smaller sieve size.
7. If the soils at a location are deep, the decision on when to stop excavation will rest with the supervising archaeologist although Requirement 16a, point 9 will be followed. This states: *Test excavation units must be excavated to at least the base of the identified Aboriginal object-bearing units, and must continue to confirm the soils below are culturally sterile.*
8. Each excavator (by hand) will be responsible for sieving the deposit from their TU, retrieving the artefacts and, in conjunction with the supervising archaeologist, correctly recording their provenance. There could be some room for assistance with the sieving, but a self-contained approach is preferable. Deposits will be sieved on to tarpaulins and the spoil used to backfill the TU once it has been photographed and recorded.
9. A standard excavation recording form will be used for each TU. Details will include: date, site recorder, spit number and excavation depth, description of the soil profile with Munsell colours being used as appropriate, measured section of the excavation, and soil pH recordings (when necessary or appropriate).

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10. It is envisioned that the excavation crew will consist of five OzArk Archaeologists (including the Excavation Director) and four cultural heritage field workers. The excavator of each TU, in conjunction with the Excavation Director, will be responsible for ensuring all forms are correctly completed. It will be the archaeologists' responsibility to perform all photographic tasks, undertake any planning and section drawing if required, and to ensure that a correct location of each TU is maintained.
11. Given that the work will be reasonably physical, all persons conducting activities must be fit for work.
12. If intact archaeological deposits or archaeological features are encountered, then additional archaeological TUs may be excavated to ensure documentation of any features and/or retrieval of artefacts and other relevant archaeological material. A feature would include a high density of artefacts within a TU, or a square containing rare or unusual artefacts (such as artefacts constructed from a stone type rarely represented in the area or less-common tool forms such as ground edge hatchet heads, hammerstones, etc.), or other signs of human occupation i.e. ground ovens/hearths or charcoal concentrations. Any expansion must adhere to Requirement 16 (5). Any expansion would only occur with the consent of the Excavation Director who will determine if an expansion is required to gain the appropriate scientific information.
13. Rather than expanding around an individual square as set out in Point 12, it is more likely that any expansion will involve excavating an additional TU 5 m from the TU of interest along the same transect. Any additional TUs will be used to assist in determining the spatial spread of the subsurface deposits.
14. Section drawings and photographs will be completed for all TUs to show the soil profile.
15. Analysis of all excavated lithics will be made to determine the site's characteristics and to enable the site to be compared with other sites in the region. Analysis will also assist in determining what type of activities the Aboriginal people carried out at the site and their relationship with local resources (fauna, flora, water, and stone). All artefacts will be analysed and selectively photographed. If charcoal from a secure stratigraphic context is obtained, it may be sent to a laboratory for Carbon 14 dating (subject to the Proponent's agreement).
16. All faunal remains, if recovered, will be analysed by a fauna specialist. Remnant shell and bone fragments may assist in determining what foods Aboriginal people may have eaten at the specific site and may elucidate possible foraging strategies. In conjunction with *in situ* stone tools, bone/shell fragments may also provide evidence of specific usage of stone tools for food processing.

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17. Artefacts will remain at 145 Wingewarra Street, Dubbo, NSW, 2830 (OzArk office) until the analysis is complete. Once complete, the artefacts will remain at the OzArk office where whey will be kept at a locked location until point 19 below is enacted.
18. The results of the test excavation program will inform the forthcoming revised ACHAR. Excavation results will be used to advise further courses of action in relation to the management and mitigation options for the Project.
19. Once all salvage activities for the Project are complete (should the Project be approved), artefacts, if present, will have their ultimate fate decided in a negotiated agreement between the RAPs, the Proponent, and Heritage NSW.

3.6 SAMPLING STRATEGY COMPLIANCE WITH THE CODE OF PRACTICE: REQUIREMENT 16

1 *Test excavation units must be placed on a systematic grid appropriate to the scale of the area—either PAD or site—being investigated e.g. 10 m intervals, 20 m intervals, or other justifiable and regular spacing.*

- The sampling strategy outlined above complies with this requirement. All TUs will be at least 10 m apart at each of the seven identified locations across the study area. This will provide an adequate sample to be able to understand the subsurface potential of the areas assessed as having moderate archaeological significance.

2 *Any test excavation point must be separated by at least 5 m.*

- The sampling strategy outlined above complies with this requirement as all TUs will be separated by 10 m.

3 *Test excavations units must be excavated using hand tools only.*

- All test excavation will be done by hand.

4 *Test excavations must be excavated in 0.5 m x 0.5 m units.*

- All TUs will measure 0.5 x 0.5 m.

5 *Test excavations units may be combined and excavated as necessary to understand the site characteristics, however:*

i) the maximum continuous surface area of a combination of test excavation units at any single excavation point conducted in accordance with point 1 (above) must be no greater than 3 m^2

- The sampling strategy outlined above complies with this requirement.

ii) the maximum surface area of all test excavation units must be no greater than 0.5% of the area—either PAD or site—being investigated.

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- The number and size of test excavations undertaken as part of this program will be managed to ensure that this requirement is satisfied.

6 *Where the 0.5 m x 0.5 m excavation unit is greater than 0.5% of the area then point 5 (ii) (above) does not apply.*

- Not applicable.

7 *The first excavation unit must be excavated and documented in 5 cm spits at each area —either PAD or site—being investigated. Based on the evidence of the first excavation unit, 10 cm spits or sediment profile/stratigraphic excavation (whichever is smaller) may then be implemented.*

- The test excavation program will commence with 5 cm spits until it is clear that 10 cm spits can be excavated.

8 *All material excavated from the test excavation units must be sieved using a 5 mm aperture wire-mesh sieve.*

- All deposits will be sieved through a 5 mm mesh sieve. A 3 mm mesh sieve will be available if required.

9 *Test excavation units must be excavated to at least the base of the identified Aboriginal object-bearing units and must continue to confirm the soils below are culturally sterile.*

- This requirement will be fulfilled in the field and all TUs will be excavated to the basal clays or where it is considered that culturally sterile units are present. The decision on when this point is reached will rest with the Excavation Director.

11 *Photographic and scale-drawn records of the stratigraphy/soil profile, features and informative Aboriginal objects must be made for each single excavation point.*

- The Excavation Director will ensure that this requirement is met during the test excavation program.

12 *Test excavations units must be backfilled as soon as practicable.*

- All TUs will be backfilled with the sieved deposits from that TU.

13 *Following test excavation, an Aboriginal Site Impact Recording form must be completed and submitted to the AHIMS Registrar as soon as practicable, for each AHIMS site that has been the subject of test excavation in accordance with the requirements of the Code.*

- It will be the responsibility of OzArk to ensure that this requirement is met.

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REFERENCES

DECCW 2010a — Department of Environment, Climate Change and Water, Sydney (now Heritage NSW). *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*.

DECCW 2010b — Department of Environment, Climate Change and Water, Sydney (now Heritage NSW). *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*.

APPENDIX 9: PHASE 1 TEST EXCAVATION ARTEFACT ASSEMBLAGE

Area	Transect	Square	Spit (10 cm spits)	Artefact type	Material	Integrity	Size (LxBxW mm)	Reduction	Rotation	Platform type	Platform size	Termination type	Notes
2	1	1	7	Flake	Quartzite	Complete	12x21x5 mm	Tertiary	Rotation	Simple	Small	-	
2	1	3	3	Flake	Quartzite	Complete	10x8x4 mm	Tertiary	Parallel	Simple	Very small	-	
4	2	2	1	Core	Chert	-	-	Secondary	-	-	-	-	Max size 22 mm; multi-directional; 6 flakes scars; 30% cortex; reduced
4	4	4	1	Flake	Quartz	Proximal fragment	12x10x7 mm	Tertiary	Not discernible	Simple	Moderate	-	
4	4	4	2	Flake	Quartzite	Complete	10x5x2 mm	Secondary	Parallel	Simple	Very small	-	
5	5	1	2	Flake	Chert	Complete	10x8x5 mm	Tertiary	Not discernible	Point	Very Small	Feather	Possible retouch on distal
5	5	2	1	Backed flake	Chert	Complete	16x17x5 mm	Tertiary	Parallel	Crushed	Small	Feather	
5	5	4	1	Flake	Quartz	Complete	16x10x3 mm	Tertiary	Rotated	Point	Very Small	Feather	Platform split
5	5	8	1	Flake	Quartz	Complete	18x26x6 mm	Tertiary	Parallel	Simple	Moderate	Feather	Crystal quartz
7	2	1	1	Flake	Quartzite	Complete	21x12x4 mm	Tertiary	Not discernible	Simple	Small	-	
8	1	2	1	Flake	Quartzite	Distal Fragment	10x4x3 mm	Tertiary	Not discernible	-	-	-	
10	1	5	1	Flake	Quartz	Distal Fragment	11x10x5 mm	Tertiary	Parallel	-	-	-	

APPENDIX 10: PHASE 3 TEST EXCAVATION ARTEFACT ASSEMBLAGE

Area	Transect	Square	Spit (5cm spits)	Artefact type	Material	Integrity	Size (LxBxW mm)	Reduction	Rotation	Platform type	Platform size	Termination type
Copi-OS59	8	1	1	Flake	Silcrete	Complete	20x12x4 mm	Tertiary	Parallel	Point	Very small	Feather
Copi-OS59	8	1	1	Flake	Quartzite	Complete	15x22x7 mm	Tertiary	Rotated	Simple	Small	Feather
Copi-OS59	8	2	3	Flake	Silcrete	Complete	13x16x3 mm	Tertiary	N/A	Simple	Small	Feather