Appendix 7 Archaelogical & Heritage Management Solutions, Cultural Heritage Management Plan, September 2017

Nolans Rare Earth Project, Nolans Bore, Northern Territory: Cultural Heritage Management Plan

Prepared for GHD on behalf of Arafura Resources Limited

September 2017

AHMS

ARCHAEOLOGICAL & HERITAGE MANAGEMENT SOLUTIONS

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1 INTRODUCTION

1.1 Project Background

Arafura Resources Limited (hereafter the 'Proponent') proposes to develop a rare earths mine, and associated processing facilities, at Nolans Bore in the Northern Territory (NT) (hereafter the 'Project'). The Project has been determined to be a controlled action, requiring approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). It is being assessed under a bilateral agreement between the Australian and NT Governments, made under section 45 of the EPBC Act.

The Northern Territory *Environmental Assessment Administrative Procedures* (EAAP) require that matters affecting the environment are considered when proposed actions are assessed, including impacts on places and items with historic or cultural heritage values. GHD is preparing an Environmental Impact Statement (EIS) for the Project, in accordance with Terms of Reference issued by the NT Environment Protection Authority under Clause 8 of the EAAP.

Following an archaeological investigation of the Project area (AHMS 2015), Archaeological and Heritage Management Solutions Pty Ltd (AHMS) has been commissioned by GHD to develop a Cultural Heritage Management Plan (CHMP) for the EIS. The relevant Terms of Reference are:

5.10.3 Mitigation

The EIS should describe measures to prevent and/or mitigate risks of impacts to existing sites or items of historic and cultural heritage in a Cultural Heritage Management Plan (CHMP). The CHMP should include:

- *procedures to avoid significant sites and areas*
- *protection of key sites during construction, operation and decommissioning work*
- *measures to enable the Proponent, or contractor to the Proponent, to meet its duty of care to protect the cultural and heritage values of any places or items of significance*
- *procedures for the discovery of surface or sub-surface items during the course of the Project.*

5.10.4 Monitoring

The CHMP should include details of a monitoring and reporting program to determine the effectiveness of mitigation measures. The monitoring and reporting program should identify when further action is required and outline contingency measures should the proposed mitigation measures result in degradation to the values of sites or items with heritage or cultural significance.

1.2 Purpose of this Plan

This CHMP describes the protection measures and procedures to be implemented for the management and mitigation of impacts on known, and as yet unknown, historic and Aboriginal cultural heritage items (sites, places or objects) during the construction, operation and decommissioning phases of the Project.

Additional requirements that may supplement the management of cultural heritage items and places, as detailed in this Plan, are provided in the:

- Communication Plan
- Indigenous Land Use Agreement

1.2.1 Objectives

The objectives of this CHMP are to:

- summarise potential impacts on identified heritage items arising from the Project;
- describe how measures will be implemented to prevent heritage impacts;
- provide specific guidelines for the mitigation of impacts to known heritage items that will be directly and indirectly impacted by the Project;
- provide procedures for the management of unexpected finds (surface or sub-surface items), including human skeletal remains;
- provides triggers for community consultation and communication; and
- outline an effective monitoring and reporting framework to assess the effectiveness of the management and mitigation measures.

1.3 Project Area

Nolans Bore is located approximately 135km north west of Alice Springs, and 10km west of the Stuart Highway near Aileron, NT (**Figure 1**). The Project comprises areas of proposed works within exploration licences EL28473, EL28498, EL29509 and EL29905, on land within the Aileron Perpetual Pastoral Lease (PPL 1097), NT Portion 703.

1.4 Project Proposal

The proposed Project configuration includes three key areas: the Mine Site (ML26659), Processing Site, and Borefield area (**Figure 1**). Infrastructure required to support the Project includes:

- Site access roads, comprising:

o Access road from the Stuart Highway;

o Access road and service corridor between the Processing Site and the Mine Site;

o Access road and service corridor to the accommodation village; and

o Access track and service corridor to the borefield.

- Site buildings, comprising:

o Administration building;

o Concentrator control rooms and operations centre;

o Concentrator maintenance workshop and warehouse;

- Concentrator reagents store;
- Dangerous goods storage;
- Rare Earth (RE) Intermediate Plant control room and operations centre;
- RE Intermediate Plant maintenance workshop and warehouse;
- RE Intermediate Plant reagents and product warehouse;
- Laboratory;
- Security building;
- Medical and emergency services centre; and
- Heavy and light vehicle wash station and weighbridge.
    - Borefield and raw water supply pipeline to the Processing Site and Mine Site;
    - Potable water supply and sewerage treatment;
    - Accommodation village (based on a 400 person requirement);
    - Concentrate slurry, filtrate return and water pipelines and pumps between Concentrator and RE Intermediate Plant;
    - Power supply from gas and steam turbine-generators;
    - Power distribution including overhead lines, HV switchgear and transformers from the RE Intermediate Plant to the Concentrator, accommodation village and borefield; and
    - Tailings Storage Facilities (TSFs) and Residue Storage Facilities (RSFs).

1.5 Legislative Context

There are several Commonwealth and Territory Acts relevant to the protection and management of Indigenous and historic heritage in the Northern Territory. These are summarised below in **Table 1**.

Table 1. Summary of legislative context for the Project.

Legislation	Description	Register	Details
Aboriginal & Torres Strait Islander Heritage Protection Act 1986 (Cth)	Preserves and protects areas and objects of particular significance to Aboriginal Australians from injury or desecration.	Case by case basis dealt with by the Minister, Department of the Environment and Energy.	No Aboriginal areas or objects are currently subject to a Declaration.
Environment Protection and Biodiversity Conservation Act 1999 (Cth)	Protects natural, historic and Indigenous heritage places that are of outstanding universal value, outstanding significance to the nation; or that are owned or	World Heritage List National Heritage List Commonwealth Heritage List	No sites or places are currently listed on the World Heritage List, National Heritage List, or Commonwealth Heritage List. The Project has been determined as a 'controlled action' under this Act, and is being assessed by the

	controlled by the Australian Government.		Northern Territory Environment Protection Authority.
Native Title Act 1993 (Cth)	Establishes the National Native Title Tribunal, which administers rights and interests over lands and waters by Aboriginal people.	No formal register of sites, however Native Title Representative Bodies can record places and negotiate land use and management conditions according to an Indigenous Land Use Agreement (ILUA) on behalf of Traditional Owners.	There is one native title determination covering part of the Project area (DCD2013/001 - Napperby Perpetual Pastoral Lease), and two registered claimant applications (DC2014/002 - Aileron Pastoral Lease; DC2007/002 - Aileron).
Aboriginal Land Rights (Northern Territory) Act 1976 (Cth)	Establishes the role of Aboriginal Land Councils in the NT, and contains provisions to protect sacred sites.	Register of Cultural Sites	The Project is within the Central Land Council administrative boundary. A number of sacred sites have been recorded in the Project area.
Heritage Act 2011 (NT)	Provides blanket protection for Aboriginal and Macassan archaeological places and objects across the NT, and other places, classes of places, or objects which the Heritage Council considers to be of heritage significance.	Northern Territory Heritage Register Archaeological Site Register	A summary of Aboriginal archaeological places and objects, and potential historic heritage places is attached in **Appendix 1**. There are no nominated or declared heritage places in the vicinity of the Project area.
Aboriginal Sacred Sites Act 1989 (NT)	Provides blanket protection for sacred sites in the NT, and establishes the Aboriginal Areas Protection Authority (AAPA) which is responsible for issuing Authority Certificates that set out conditions for carrying out proposed works or using land in the vicinity of sacred sites.	Register of Sacred Sites	Sacred site clearances have been undertaken with the AAPA, and Authority Certificates were issued in 2008 for works associated with mining and access to the mine site (C2008/205), and in 2013 for mineral exploration activities (C2013/205). Copies of the certificates are attached in **Appendix 2**.

1.5.1 Approvals and Certificates

Assessment of the Project as a controlled action under the EPBC Act does not remove the requirement to obtain certain statutory approvals including:

- the requirement to obtain a work approval from the Director of the Heritage Branch (Department of Tourism and Culture) to carry out work on heritage places or objects under the *Heritage Act 2011*; and

- the requirement to obtain an Authority Certificate from the Aboriginal Areas Protection Authority to carry out proposed works or use land in the vicinity of sacred sites under the *Northern Territory Aboriginal Sacred Sites Act 1989*.

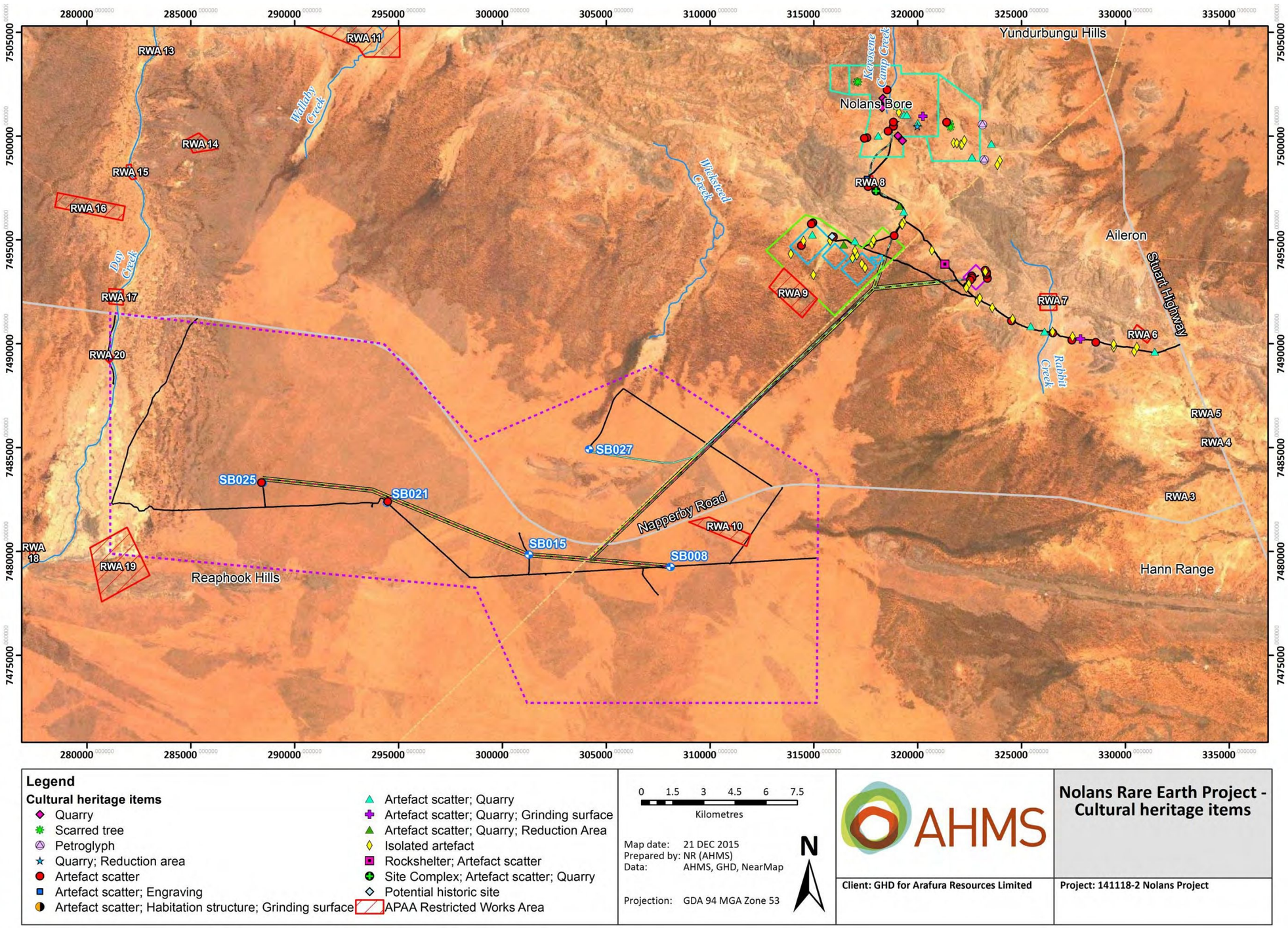

Figure 1. Proposed Nolans Rare Earth Project configuration.

2 IDENTIFICATION AND ASSESSMENT

2.1 Historic and Cultural Heritage Items

- Archaeological surveys undertaken to inform the EIS for the Project include:
- Archaeological & Heritage Management Solutions Pty Ltd 2015, *Nolans Rare Earth Project, Nolans Bore, Northern Territory: Indigenous and Historic Cultural Heritage Assessment*, GHD on behalf of Arafura Resources Limited.
- Earthsea Pty Ltd 2010, *Archaeological Survey of the proposed Haul Road Corridor, Nolan's Bore Rare Earths Project*, GHD for the Nolans Bore Environmental Impact Statement (EIS).
- Earthsea Pty Ltd 2012, *Archaeological survey of parts of EL28473, Nolan's Bore 2011-2012*, GHD and Arafura Resources Ltd.
- Gunn, R 2006, *Nolans Bore Prospect Aileron, Central Australia: Archaeological Survey*, Arafura Resources Ltd.
- The assessments identified a number of historic and cultural heritage items within, and in the vicinity of the Project area (within 100 m of proposed infrastructure), including 64 Aboriginal archaeological sites, 76 isolated artefacts and one potential historic site. Aboriginal site features include artefacts, quarries, scarred trees, grinding surfaces, reduction areas, and a rockshelter, potential habitation structure, and engraving. The potential historic site, Old Albies Bore and Yard, is associated with the pastoral history of Aileron station, and consists of a water tank, stock yards, and a Southern Cross windmill (**Table 2**).
- Further details of historic and cultural heritage items in the vicinity of the Project area are presented in **Appendix 1, Table A1-1**.

Table 2. Historic and cultural heritage items in the vicinity of the Project area.

Proposed Infrastructure	Heritage Items	Isolated Artefacts
Access road and service corridor between the processing site and the mine site	RWA8 - sacred site 5552-30 (including NP-1; NP-2; NP-3); NP-10; NP-11; NP-30; NP-32	NP-ISO-10; NP-ISO-11-1; NP-ISO-11-2; NP-ISO-12-1; NP-ISO-12-2
Access road from the Stuart Highway	NP-21; NP-22; NP-23; NP-24; NP-25; NP-26; NP-27; NP-28; NP-29	NP-ISO-16-1; NP-ISO-16-2; NP-ISO-17; NP-ISO-18-1; NP-ISO-19; NP-ISO-22-1; NP-ISO-22-2; NP-ISO-22-3; NP-ISO-23; NP-ISO-25; NP-ISO-26; NP-ISO-27; NP-ISO-28-1; NP-ISO-28-2; NP-ISO-29-1; NP-ISO-29-2
Access track and service corridor to the borefield	NP-19; NP-20	-
Accommodation village	NP-16; NP-17; NP-18	NP-ISO-14
Mine site, including Tailings Storage Facility	NB-1; NB-2; NB-3; NB-4; NB-5; NB-6; NB-7; NB-8; NB-9; SP-1; SP-2; Scar 1; Scar 2; Scar 3; Site 1; Site 10; Site 11; Site 12; Site 13; Site 14; Site 15; Site 16; Site 17; Site 18; Site 19; Site 2; Site 3; Site 5; Site 6; Site 7; Site 8;	ISO1; ISO2; ISO3; ISO4; ISO5; ISO8, 24 unnamed isolated artefacts in the vicinity of Kerosene Camp Creek

Proposed Infrastructure	Heritage Items	Isolated Artefacts
Processing site, including Rare Earth (RE) Intermediate Plant, power station, residue storage facilities (RSFs) and evaporation ponds	NP-4; NP-5; NP-6; NP-7; NP-8; NP-9; NP-28, Old Albies Bore and Yard	NP-ISO-1-1, NP-ISO-1-2, NP-ISO-1-3, NP-ISO-2, NP-ISO-3, NP-ISO-4, NP-ISO-5-1, NP-ISO-5-2, NP-ISO-5-3, NP-ISO-6, NP-ISO-7-1, NP-ISO-7-2, NP-ISO-8, NP-ISO-9; NP-ISO-20; NP-ISO-21-1; NP-ISO-21-2; NP-ISO-30-1; NP-ISO-30-2
Outside curtilage of key areas and proposed infrastructure	NP-12, NP-13, NP-14, NP-15; NP-31; RWA9; RWA10	NP-ISO-13-1; NP-ISO-13-2; NP-ISO-15; NP-ISO-18-2; NP-ISO-22-1; NP-ISO-22-2; NP-ISO-22-3; NP-ISO-24

2.2 Potential Impacts

The Project will have varying potential impacts on identified historic and cultural heritage items. These include:

2.2.1 Direct Impacts

Direct impacts on identified sites will occur in key areas within the footprint of proposed infrastructure; including the open cut pit, topsoil storage areas, dump sites, and tailings storage facility at the mine site, site buildings and residue storage facilities at the processing site, and the workers' accommodation and residue storage facility at the accommodation village.

It is considered that impacts would include excavation, earthworks, grading, establishment of structures and overburden, and likely result in partial or complete destruction of any historical and/or cultural sites present.

Overall, 67 Aboriginal archaeological sites (including 34 isolated artefacts) would be subject to direct impact. Of note are artefact scatters and a quarry with potential subsurface archaeological deposit, which have research potential (NB-2, Site 19, NB-4); intact and representative or locally rare examples of artefact scatters and quarries (NP-19, Site 10, Site 11, Site 15, Site 18, Site 1, Site 14, Site 5, Site 6, Site 7, Site 8, Site 12, Site 13, Site 16, Site 17, Site 3, NP-6); and scarred trees (Scar 3, SP-1, and SP-2) which are regionally rare.

2.2.2 Indirect Impacts

Indirect impacts associated with vegetation clearance, spoil removal, vehicle movement, access road construction (within 100 m of existing tracks), and pipeline and power line construction (within 15 m of proposed service corridors) are also likely to occur.

It is considered that indirect impacts would include nearby vibration, dust, minor construction (such as fencing), storage of materials and/or traversing areas in light vehicles. Such activities would likely result in some disturbance or partial destruction of any historical and/or cultural sites present.

Overall, 62 Aboriginal archaeological sites (including 35 isolated artefacts) and one potential historical site would be subject to indirect impact. Of note are a rockshelter with potential subsurface archaeological deposit and an associated low density artefact scatter (NP-29) which is locally rare, and scarred trees (Scar 1, Scar 2) which are regionally rare.

A summary of historic and cultural heritage items identified within, and in the vicinity of, the Project area and anticipated impacts is provided in **Appendix 1, Table A1-2.**

2.3 Sacred Sites

- In addition to the above sites, one Restricted Works Area, RWA8, associated with sacred site 5552-30, has been recorded within the Project area; in the vicinity of the access road and service corridor between the Processing Site and the Mine Site and would be subject to direct impact. The features of sacred site 5552-30 described in the Authority Certificate issued by the Aboriginal Areas Protection Authority include stone arrangements, soakages and rockholes.

- Two Restricted Works Areas, RWA9 and RWA10, associated with sacred sites 5552-41 and 5552-44 respectively, are adjacent to the Project area and would be subject to potential indirect impact. RWA9 is located on the southwest boundary of the Processing Site. The features of sacred site 5552-41 include a hill and swamp. RWA10 is located to the west of an access track between the Napperby Road and Borefield Area. The features of sacred site 5552-44 include a rocky ridge and sand dune.

Authority Certificates were issued by the APAA in 2008 and 2013, identifying conditions covering all works associated with mining and access to the mine site (C2008/205), and mineral exploration activities inclusive of water drilling, reconnaissance visits in 4WD vehicles, access with drilling rig and support vehicles and minor vegetation clearing at discrete locations (C2013/205). The conditions in C2013/205 specify that no work shall take place or no damage shall occur within RWA8, RWA9, and RWA10. Copies of the certificates are attached in **Appendix 2**.

A new Authority Certificate from the APAA will be required prior to commencement of the construction phase of the Project. Any conditions in the certificate relating to Restricted Works Areas will be incorporated into this CHMP.

3 MANAGEMENT AND MITIGATION

The management and mitigation measures identified for cultural heritage items within the Project area are based on:

- Anticipated impacts to heritage items;
- Assessed scientific (archaeological) significance, and (where known) overall heritage significance;
- Legislative requirements and the planning approval framework;
- Recommendations in previous archaeological survey reports; and
- Heritage best practice in accordance with the principles of *The Australia ICOMOS Charter for Places of Cultural Significance, 2013* (The Burra Charter).

3.1 Mitigation Measures

Where possible, options to avoid adversely impacting identified heritage items should be considered. However, the construction phase of the Project cannot completely avoid harm to heritage items. Where items cannot be avoided, further works are recommended in order to mitigate impacts.

A number of mitigation measures have been identified based on the type of site, site features, extent of impact (direct or indirect) and the significance of the site (**Table 3**). Prior to carrying out further works, an Application to Carry Out Work on Heritage Place or Object should be submitted to the Director of the Heritage Branch for approval. The procedure for submission of an Application to Carry Out Work on Heritage Place or Object is provided in **Appendix 4**. Applications involving significant impacts will be assessed by the Heritage Council.

Any conditions associated with an approval (if granted) must be implemented.

Overarching methodologies for the mitigation measures outlined below, and management of archaeological material collected during mitigation works, are provided in **Appendix 3**.

Should changes to the proposed works result in a direct impact to heritage items where currently an indirect impact is identified, or have an impact on heritage items where currently no impact is identified, additional mitigation measures would be required.

Table 3. Mitigation measures for cultural heritage items.

Site Type	Heritage Significance	Impact	Mitigation Measure	Heritage Items	Key Area
Sacred site/Restricted Works Area: • Stone arrangements; Soakages; Rockholes	High overall cultural significance	Direct	• No works or damage is currently permitted within RWA8. • Consult with the AAPA and Traditional Owners about the proposed works to discuss likely impacts to heritage values of RWA8 and appropriate controls and mitigation measures. • Heritage Branch Application to Carry Out Work on Heritage Place or Object (and implementation of conditions).	RWA8 (including NP-1, NP-2, NP-3)	Access road and service corridor between the processing site and the mine site
Sacred site/Restricted Works Area: • Hill; Swamp • Rocky ridge; Sand dune	High overall cultural significance	Indirect	• Establish exclusion zones prior to commencement of the construction phase of the Project. • Install flagging or barriers along boundary of adjacent key areas/access tracks. • Mark with signage indicating no unauthorised entry. • Consult with Traditional Owners during process of developing and installing appropriate fencing and signage.	RWA9	Processing site
				RWA10	Access road and service corridor to the borefield
Aboriginal archaeological site: • Scarred tree	Moderate or high scientific (archaeological) significance	Direct	• Heritage Branch Application to Carry Out Work on Heritage Place or Object (and implementation of conditions). • Archival recording. • Consult with Traditional Owners regarding potential management measures such as relocation of the scarred section of the trunk.	NB-3	Mine site
				Scar 3	Mine site
				SP-1	Mine site
				SP-2	Mine site
Aboriginal archaeological site: • Scarred tree	Moderate or high scientific (archaeological) significance	Indirect	• Demarcate with temporary fencing prior to commencement of the construction phase of the Project to avoid accidental impacts. • Mark with signage indicating no unauthorised entry. • Consult with Traditional Owners during process of developing and installing appropriate fencing and signage.	Scar 1	Mine site
				Scar 2	Mine site

Site Type	Heritage Significance	Impact	Mitigation Measure	Heritage Items	Key Area
Aboriginal archaeological site: • Artefact scatter; Potential Archaeological Deposit • Quarry; Potential Archaeological Deposit	Moderate or high scientific (archaeological) significance	Direct	• Heritage Branch Application to Carry Out Work on Heritage Place or Object (and implementation of conditions). • Artefact collection, artefact relocation, artefact recording or avoidance mitigation strategies to be implemented, - as determined by the works approval. • Consultation between Proponent, Traditional Owners and archaeologist regarding the implementation of the works approval.	NB-2	Mine site
				Site 19	Mine site
				NB-4	Mine site
Aboriginal archaeological site: • Artefact scatter • Artefact Scatter; Quarry • Quarry • Quarry; Reduction Area • Artefact Scatter; Quarry; Grinding Surface	Moderate or high scientific (archaeological) significance	Direct	• Heritage Branch Application to Carry Out Work on Heritage Place or Object (and implementation of conditions). • Artefact collection, artefact relocation, artefact recording or avoidance mitigation strategies to be implemented, - as determined by the works approval. • Consultation between Proponent, Traditional Owners and archaeologist regarding the implementation of the works approval.	NP-19	Access road and service corridor to the borefield
				Site 10	Mine site
				Site 11	Mine site
				Site 15	Mine site
				Site 18	Mine site
				Site 1	Mine site
				Site 14	Mine site
				Site 5	Mine site
				Site 6	Mine site
				Site 7	Mine site
				Site 8	Mine site
				Site 12	Mine site
				Site 13	Mine site
				Site 16	Mine site
				Site 17	Mine site
				Site 3	Mine site
				NP-6	Processing site
Aboriginal archaeological site: • Artefact scatter • Artefact scatter; Engraving	Moderate or high scientific (archaeological) significance	Indirect	• Demarcate with temporary fencing for the duration of the construction phase of the Project or maintain a minimum buffer distance of 50 m to avoid accidental impacts.	NP-11	Access road and service corridor between the processing site and the mine site
				NP-10	Access road and service corridor between the

Site Type	Heritage Significance	Impact	Mitigation Measure	Heritage Items	Key Area
• Artefact scatter; Habitation structure; Grinding surface • Artefact scatter; Quarry; Reduction area • Quarry; Artefact scatter • Rockshelter; Artefact Scatter • Artefact scatter; Quarry; Grinding surface • Artefact scatter; Quarry; Reduction area; Grinding surface			• Mark with signage indicating no unauthorised entry. • Consult with Traditional Owners during process of developing and installing appropriate fencing and signage.		processing site and the mine site
				NP-32	Access road and service corridor between the processing site and the mine site
				NP-28	Access road from the Stuart Highway
				NP-21	Access road from the Stuart Highway
				NP-26	Access road from the Stuart Highway
				NP-27	Access road from the Stuart Highway
				NP-29	Access road from the Stuart Highway
				NP-23	Access road from the Stuart Highway
				Site 2	Mine site
				NP-9	Processing site
				NP-12	Accommodation village
Aboriginal archaeological site: • Artefact scatter • Quarry	Low scientific (archaeological) significance	Direct or Indirect	• Heritage Branch Application to Carry Out Work on Heritage Place or Object (and implementation of conditions). • Artefact collection, artefact relocation, artefact recording or avoidance mitigation strategies to be implemented, - as determined by the works approval.	NP-30	Access road and service corridor between the processing site and the mine site
				NP-17	Access road and service corridor to the accommodation village
				NP-18	Access road and service corridor to the accommodation village
				NP-20	Access road and service corridor to the borefield

Site Type	Heritage Significance	Impact	Mitigation Measure	Heritage Items	Key Area
				NP-22	Access road from the Stuart Highway
				NP-24	Access road from the Stuart Highway
				NP-25	Access road from the Stuart Highway
				NB-1	Mine site
				NB-5	Mine site
				NB-6	Mine site
				NB-7	Mine site
				NB-8	Mine site
				NB-9	Mine site
				NP-4	Processing site
				NP-5	Processing site
				NP-7	Processing site
				NP-8	Processing site
				NP-16	Accommodation village
Aboriginal archaeological sites • Isolated artefact	Low scientific (archaeological) significance	Direct or Indirect	• Heritage Branch Application to Carry Out Work on Heritage Place or Object for permission to destroy prior to commencement of the construction phase of the Project. • Any conditions associated with approval to be implemented.	NP-ISO-10	Access road and service corridor between the processing site and the mine site
				NP-ISO-11-1	Access road and service corridor between the processing site and the mine site
				NP-ISO-11-2	Access road and service corridor between the processing site and the mine site
				NP-ISO-12-1	Access road and service corridor between the processing site and the mine site
				NP-ISO-12-2	Access road and service corridor between the processing site and the mine site

Site Type	Heritage Significance	Impact	Mitigation Measure	Heritage Items	Key Area
				NP-ISO-14	Access road and service corridor to the accommodation village
				NP-ISO-16-1	Access road from the Stuart Highway
				NP-ISO-16-2	Access road from the Stuart Highway
				NP-ISO-17	Access road from the Stuart Highway
				NP-ISO-18-1	Access road from the Stuart Highway
				NP-ISO-19	Access road from the Stuart Highway
				NP-ISO-23	Access road from the Stuart Highway
				NP-ISO-25	Access road from the Stuart Highway
				NP-ISO-26	Access road from the Stuart Highway
				NP-ISO-27	Access road from the Stuart Highway
				NP-ISO-28-1	Access road from the Stuart Highway
				NP-ISO-28-2	Access road from the Stuart Highway
				NP-ISO-29-1	Access road from the Stuart Highway
				NP-ISO-29-2	Access road from the Stuart Highway
				ISO1	Mine site
				ISO2	Mine site
				ISO3	Mine site
				ISO4	Mine site
				ISO5	Mine site
				ISO8	Mine site
				24 unnamed isolated artefacts in	Mine site

Site Type	Heritage Significance	Impact	Mitigation Measure	Heritage Items	Key Area
				the vicinity of Kerosene Camp Creek	
				NP-ISO-1-1	Processing site
				NP-ISO-1-2	Processing site
				NP-ISO-1-3	Processing site
				NP-ISO-2	Processing site
				NP-ISO-20	Processing site
				NP-ISO-21-1	Processing site
				NP-ISO-21-2	Processing site
				NP-ISO-3	Processing site
				NP-ISO-30-1	Processing site
				NP-ISO-30-2	Processing site
				NP-ISO-4	Processing site
				NP-ISO-5-1	Processing site
				NP-ISO-5-2	Processing site
				NP-ISO-5-3	Processing site
				NP-ISO-6	Processing site
				NP-ISO-7-1	Processing site
				NP-ISO-7-2	Processing site
				NP-ISO-8	Processing site
				NP-ISO-9	Processing site
				NP-ISO-15	Accommodation village
Aboriginal archaeological sites • Artefact scatter • Artefact scatter; Potential Archaeological Deposit	Moderate or High scientific (archaeological) significance	No impact	• No further action required.	NP-31	Access road from the Stuart Highway
				NP-13	Accommodation village
				NP-14	Accommodation village

Site Type	Heritage Significance	Impact	Mitigation Measure	Heritage Items	Key Area
• Artefact scatter; Quarry				NP-15	Accommodation village
Aboriginal archaeological sites • Isolated artefact	Low scientific (archaeological) significance	No impact	• No further action required.	NP-ISO-13-1	Accommodation village
				NP-ISO-13-2	Accommodation village
				NP-ISO-18-2	Access road from the Stuart Highway
				NP-ISO-22-1	Access road from the Stuart Highway
				NP-ISO-22-2	Access road from the Stuart Highway
				NP-ISO-22-3	Access road from the Stuart Highway
				NP-ISO-24	Access road from the Stuart Highway
Potential historic place • Old Albies Bore and Yard	Potential	Indirect	• Archival photographic recording. • Demarcate with temporary fencing for the duration of the construction phase of the Project or maintain a minimum buffer distance of 50 m to avoid accidental impacts. • Mark with signage indicating no unauthorised entry.	Old Albies Bore and Yard	Processing site

3.2 Unexpected Finds

During the course of the Project, it is possible that unexpected historic or cultural heritage items or human skeletal remains may be discovered. Unexpected finds and human remains procedures will apply across the Project area. Explanations of these procedures will be included in the site induction which is compulsory for all Field Team Members.

Refer to **Appendix 5 – Unexpected Finds Procedure – Historic and cultural heritage items**.

Refer to **Appendix 6 – Unexpected Finds Procedure – Suspected human remains**.

3.3 Consultation and Communication

The archaeological survey undertaken in 2006 for the mine and processing site engaged a senior traditional owner as a field assistant. No traditional owner consultation was included in the later surveys as it was not able to be co-ordinated with CLC.

Sacred site clearance surveys were undertaken by AAPA and included on-site consultation with traditional owners. These surveys were undertaken for the mining and processing site in 2008 and the bore field in 2013. Additional consultation will be required in associated with the sacred site clearance survey required for new Authority Certificate. These surveys identify sacred sites and determined the appropriate control measures to protect the sites, in the context of the proposed activity, in consultation with the traditional owners.

Regular meetings with the traditional owners have taken place over the last ten years during the exploration and development phases of the Mine. Since 2011 there have been five formal, CLC facilitated meetings with traditional owners, including four on-country meetings. Additionally, the CLC have detailed that more intensive consultations, with the smaller traditional owner groups, has since occurred to supplement the consultation process.

Ongoing engagement with traditional owners is a key component of the management of cultural heritage sites. The engagement includes consultation and/or onsite meetings to discuss potential impacts and mitigation measures regarding all sites identified as being of high or moderate heritage value (except NP-19). The agreed management of these sites will be detailed in this CHMP. Details of all meetings completed with traditional owners, the CLC and all stakeholders are recorded in the stakeholder database.

The endorsement of the CHMP by traditional owners will be a requirement of the Indigenous Land Use Agreement.

4 ENVIRONMENTAL IMPACTS AND RISK ASSESSMENT

4.1 Risk Assessment

The key activities and potential environmental impacts of the Project identified for historic and cultural heritage are summarised in **Table 4**. Risk assessment is based on (1) the likelihood of an impact occurring as a result of a proposed activity; and (2) the consequences of the impact if the event occurred.

The risk matrix, and definition of likelihood and consequence are provided in **Appendix 7**.

Table 4. Key activities, risks and impacts.

Activity	Potential Environmental Impact	Residual Risk		
		Consequence	Likelihood	Risk
Site establishment (including vegetation clearing) results in physical disturbance of sites/objects of heritage significance, heritage items or places and/or sacred sites during construction of the Project.	Damage, destruction or removal of heritage items or sacred sites, including RWA8, which is a site of high scientific (archaeological) significance and a sacred site. Non-compliance of legislative requirements.	Moderate	Unlikely	Medium
Disturbance of previously unidentified of sites/objects of heritage significance, artefacts, skeletal remains during construction of the Project.	Inadvertent damage, destruction or removal of heritage items or sites. Non-compliance of legislative requirements.	Minor	Unlikely	Low
	Impact to sacred sites and/ or artefacts from build-up of dust (deposition).	Minor	Unlikely	Low
	Altered character of Aboriginal sacred sites or heritage places sites caused by vibration impacts (e.g. subsidence or modification to observed deposits and outcrops).	Insignificant	Unlikely	Low
Progressive water table drawdown from unsustainable groundwater extraction rates from the borefield.	Decline in water availability and/or damage to waterbodies of cultural significance, such as soaks.	Minor	Unlikely	Low

4.2 Control Measures

The planned controls to manage risk, listed below in **Table 5**, will be implemented to minimise potential impact to historic and cultural heritage.

Table 5. Planned controls to manage risk.

Project Phase	Activity	Control Measures
Pre-construction	Site establishment (including vegetation clearing) results in physical disturbance of sites/objects of heritage significance, heritage items or places and/or sacred sites.	Identification of historic and cultural heritage sites and mitigation requirements as part of any Project related WHS induction to staff, contractors and other relevant personnel. Development and implementation of this CHMP, including: • Minimum buffer distance of 50 m or fencing surrounding identified archaeological sites and/or sacred sites to ensure no accidental impacts occur. o The fencing of sacred sites should delineate the identified boundary of the Restricted Works Area. o The fencing of scarred trees should delineate the Tree Protection Zone. o The fencing of other heritage items should incorporate a buffer distance of 10 m. • Research plan for an appropriate recording and salvage program if requested. • Consultation and engagement with Traditional Owners and custodians. AAPA Clearance certificate and CLC clearance certificates. An approval to carry out work on a heritage place or object will be sourced prior to any removal or destruction (Heritage Branch Application to Carry Out Work on Heritage Place or Object). Work will be in accordance with works approval and agreed process with Traditional Owners. Compliance with Ground Disturbance Permit System, in the **Nolans Project Biodiversity Management Plan.**
Construction Operation	Disturbance of previously unidentified of sites / objects of heritage significance, artefacts, skeletal remains.	Identification of historic and cultural heritage sites and mitigation requirements as part of any Project related WHS induction to staff, contractors and other relevant personnel. Development and implementation of this CHMP, including: • Pre-clearing/disturbance visual investigations (complete - archaeological surveys undertaken to inform the EIS, see **Section 2.1**). • Consultation and engagement with Traditional Owners and custodians. AAPA Clearance certificate.

		Development and implementation of an **Air and Dust Management Plan**.
Operation	Progressive water table drawdown from unsustainable groundwater extraction rates from the Southern basins borefield.	Identification of historic and cultural heritage sites and mitigation requirements as part of any Project related WHS induction to staff, contractors and other relevant personnel. Development and implementation of a **Water Management Plan**. Future recalibration of groundwater model, informed by historical operational data after several years of Project operations.

4.3 Accidental Impacts

In the event of accidental entry to a sacred site or interference with a Restricted Works Area, the actions in the **Nolans Project Emergency Response Management Plan** would be implemented.

In the event of an accidental impact to an historic and cultural heritage item, the following steps would be implemented:

- All works would stop immediately, and the Environmental Manager informed.
- The Environmental Manager would attend the location to assess the impact and determine a course of action, which would include:
  - Notifying the Heritage Branch of the impact as soon as practicable.
  - Identifying any corrective measures or remediation works to mitigate the impact. This should be undertaken in consultation with the Traditional Owners and any other relevant parties.
  - Developing a short report on the impact, the circumstances under which it occurred, corrective measures taken, and lessons learned.
- The Environmental Manager will present a tool-box talk to Field Team Members summarising the incident, the circumstances under which it occurred, and detailing any additional controls to reduce the risk of the event reoccurring.
- The Environmental Manager will include any actions taken in the Monthly Environmental Performance Report.
- The Environmental Manager will revise and update the CHMP (where relevant) to ensure future accidental impacts are avoided.

5 COMPLIANCE

5.1 Training

All Field Team Members (site personnel including employees, subcontractors and visitors) will receive cultural heritage awareness training during site inductions and toolbox talks. Training will reinforce the importance of heritage issues and the measures that will be implemented. Specifically, cultural heritage training will cover:

- The roles and responsibilities of personnel in regard to heritage protection and management.
- The location and types of identified heritage items, including sacred sites.
- The means of identifying heritage items.
- Work approval conditions relating to cultural heritage.
- Ground Disturbance Permit System relating to cultural heritage.
- Procedures to be followed in the event an unexpected find is discovered.
- Procedures to be followed in the event human skeletal remains are discovered.
- Procedures to be followed in the event of unauthorised entry and/or damage to a sacred site/Restricted Works Area.
- Procedures to be followed in the event of accidental impacts to an identified heritage item.

Key staff will undertake specific training relevant to their position and/or responsibilities. This training may be provided as tool-box talks or at a more advanced level by the Environment Manager or delegated representatives.

Records will be kept of all personnel undertaking the site induction and training, including the content of the training, date and name of trainer(s).

The roles of Project personnel and their responsibilities in relation to implementing this CHMP are outlined in **Section 6 Roles and Responsibilities.**

5.2 Monitoring

Inspections of identified heritage items by the Environmental Manager will occur for the duration of the Project, to ensure the effectiveness of protection and mitigation measures. Regular processes will include the following:

- Monthly inspections of signage, and flagging or barriers protecting Restricted Works Area exclusion zones by the Environmental Manager.
- Quarterly inspections of temporary fencing protecting Aboriginal archaeological places and objects by the Environmental Manager.

- Additional monitoring of identified heritage items by the Environmental Manager if an issue is identified or a complaint is made, as required.

A register of issues identified through inspections will be maintained to ensure that any issues are recorded for future action. The Heritage Inspection Register is attached in **Appendix 8**.

5.3 Reporting

Reporting will be undertaken by the Environmental Manager, and will include as a minimum a Monthly Environmental Performance Report, Half-Year Report and Annual Performance Review. Each report will detail relevant training, inspections, and consultation undertaken for the reporting period relating to heritage management of the Project.

In addition, both internal and external audits will be undertaken in accordance with **Section 6, Nolans Project Environmental Management Plan**.

6 ROLES AND RESPONSIBILITIES

The roles of Project personnel and key responsibilities in relation to implementing this CHMP are outlined below (**Table 6**).

Table 6. Project personnel roles and responsibilities.

Role	Key Responsibilities
Site Manager / Mine Manager	Allocate adequate resources to implement this plan and meet obligations to identify and protect items with historic and cultural heritage value. Secure the location of any unexpected finds or potential human skeletal remains. Undertake and/or authorise reporting to the Heritage Branch regarding the discovery of unexpected finds. Undertake and/or authorise reporting to the Aboriginal Areas Protection Authority and Central Land Council regarding unauthorised entry or interference with sacred sites/RWAs. Undertake and/or authorise reporting to the Northern Territory Police regarding the discovery of human skeletal remains.
Environmental Manager	Ensure the cultural heritage management and mitigation measures identified in this plan are implemented. Ensure inclusion of cultural heritage awareness training in site inductions and tool-box talks through input into induction documentation and sign off sheets. Coordinate relevant specialist subcontractors to conduct further works as specified in this plan. Act as a point of contact for Project personnel regarding this plan, and provide guidance and additional training as required. Update this plan as required. Maintain records of past plans and archaeological survey reports. Arrange for yearly review of the CHMP. Ensure any actions taken are included in the monthly, half yearly and annual performance review.
Environment Team Members	Manage community consultation with Indigenous stakeholders and Traditional Owners. Distribute copies of this plan to stakeholders for review prior to its adoption, and as required over the life of the Project. Arrange site based meeting regarding potential impacts to items with historic or cultural heritage value. Develop a Communications Plan to keep stakeholders informed about the implementation of this CHMP. Maintain records of stakeholder consultation. Log complaints in accordance with the **Environmental Management Plan** (Section 6.7 and Appendix B). Act as a point of contact for the community regarding this CHMP, and respond to enquiries and complaints as required.

Role	Key Responsibilities
Health and Safety Officer	Monitor radio communications and capture all information relating to unauthorised entry or interference with sacred sites/RWAs, and the discovery of human skeletal remains. Undertake and/or manage investigations into unauthorised entry or interference with sacred sites/RWAs. Provide summary of incidents, actions and responses to the Emergency Response Coordinator. Provide tool-box talks that summarise emergency responses regarding cultural heritage and details of any incidents which have occurred and management measures implemented.
Field Team Members (site personnel including employees, subcontractors and visitors)	Undertake cultural heritage awareness training as part of site induction and toolbox talks, and sign agreement that they understand and accept their responsibilities in regard to cultural heritage. Report any accidental impact to historic or cultural heritage items to the Environment Officer. Report the discovery of any unexpected historic or cultural heritage items to the Environment Officer. Report the discovery of potential human skeletal remains to the Emergency Operations Officer. Report any entry to a sacred site or interference with a Restricted Works Area to the Emergency Operations Officer.

7 REVIEW OF THIS PLAN

This CHMP will be maintained over the life of the Project. It will be updated as required, and reviewed within one year. Any changes will be recorded in the document control section for each revision.

A copy of the updated plan and summary of changes will be maintained by the Environmental Manager, and provided to the Department of Primary Industry and Resources.

Appendix 1 – Historic and cultural heritage sites

Table A1-1. Descriptions of identified cultural heritage items.

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
Access road and service corridor between the processing site and the mine site	NP-1 (within RWA8)			20m (N/S) x 20m (E/W)	Artefact scatter; Engraving	A gneiss dome crops out to the west of the ephemeral creek, with a large semi-vertical face in the creek gully. There are two surfaces with possible petroglyphs (discrete areas with pounded cupules/pits). The largest of these is on the surface facing towards the creek. Only 2 quartz flakes were found surrounding the gneiss dome owing to extensive disruption to soils from grazing activity.	AHMS (2015, Appendix 3)
Access road and service corridor between the processing site and the mine site	NP-2 (within RWA8)			60m (N/S) x 40m (E/W)	Artefact scatter; Habitation structure; Grinding surface	A high density artefact scatter is located around a gneiss pavement adjacent to an ephemeral creek. An unusual site feature was an uplifted broken slab of gneiss which may be a possible habitation structure. A potential grinding surface was identified near the uplifted slab. Artefacts are located mostly around the base of the gneiss platform, and on a flat area in the eastern portion of the site. Artefacts include quartz cores, retouched flakes, flakes, and flaked pieces; silcrete flakes; a quartzite muller; marble-like quartz grindstones and flakes of marble-like quartz; and a bifacial flaked gneiss artefact. The site is likely to contain subsurface artefacts in the surrounding alluvial soils. Artefact densities were high at 40/m^2, with an average of 0.25/m^2 across the site.	AHMS (2015, Appendix 3)
Access road and service corridor between the processing site and the mine site	NP-3 (within RWA8)			200m (E/W) x 100m (N/S)	Artefact scatter	This area consists of wide spread clusters and lower densities of stone artefacts around a central gneiss dome and creek gully. A low density background artefact scatters connects this site to NP- 2. Stone artefacts include quartz cores, retouched flakes, flakes, flake pieces; silcrete flakes; quartzite muller; and a silcrete muller. Artefact densities in some areas are as high as 30-40/m^2, with lower concentrations connecting these high density areas.	AHMS (2015, Appendix 3)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
Access road and service corridor between the processing site and the mine site	NP-10			50m (N/S) x 50m (E/W)	Artefact scatter; Quarry; Reduction area	A major vertical quartz vein crops out at this site and has been quarried. The bedrock has been worked, and there is a high density distribution of artefacts across the site. Artefacts consist mainly of quartz flakes, cores, and flaked pieces. Other artefacts include a red quartzite grindstone (200mm x 100mm x 20mm). Cores range up to 200mm in size, with an average size of 100mm. The site is restricted to the base of the slope and does not extend out onto the surrounding plain. Average artefact density is approximately 10/m^2, with a maximum in places of 100/m^2.	AHMS (2015, Appendix 3)
Access road and service corridor between the processing site and the mine site	NP-11			15m (N/S) x 15m (E/W)	Artefact scatter; Quarry	The site is located on a wedge shaped gravel slope between low rocky strike ridge outcrops. Artefacts found in this area consisting of quartz cores, flakes, flake pieces, a quartzite pounding stone and a quartzite grindstone. The available quartz has not been intensively worked, with an average artefact density of 0.25/m^2 with a maximum of 10/m^2.	AHMS (2015, Appendix 3)
Access road and service corridor between the processing site and the mine site	NP-30			16m (N/S) x 14m (E/W)	Artefact scatter	A low density scatter of quartz cores and flakes, a silcrete flake, a chert flake and two gneiss pounding stones were found in disturbed soils around the base of a gneiss dome. Average artefact density for the site is 0.04/m^2, with a maximum density of 1/m^2.	AHMS (2015, Appendix 3)
Access road and service corridor between the processing site and the mine site	NP-32			1000m (N/S) x 200m (E/W)	Artefact scatter; Quarry; Reduction area; Grinding surface	a very high occurrence of archaeological features and artefacts along the narrow area leading up to the saddle between the two main ridges in this area. Although densities were variable, the stone artefact densities were consistently high that it was not possible to define any particular site boundaries. Therefore this area has been identified as a single site consisting of clusters of high densities of stone artefacts and areas of quarried raw material areas of quartz	AHMS (2015, Appendix 3)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
						connected by a high density background scatter of stone artefacts. Several grinding surfaces were noted on the low outcropping gneiss domes. Stone artefacts consist mostly of quartz flakes, cores, flake pieces, and retouched flakes. Other stone artefacts noted in this area included chert flakes, chert utilised flakes, chert tula adze slug, chert retouched flakes, chalcedony flakes, chalcedony cores, steeply retouched chert flakes, and a very fine grained banded metamorphic material retouched flake. Meta-sandstone and marble grinding stone fragments and quartzite pounders were noted throughout the site area. Three dolerite pounding stones were also found, with one showing use wear from grinding. One of the dolerite pounders had bifacial flaking on one end. The dolerite was a very fine grained variety. Quartz artefacts were made on consistently high quality opaque and clear varieties of the material. Quartz cores were very regular in their reduction as multiplatform cores occurring mostly across the site as approximately 50mm to 100mm diameter cores. Stone artefacts were found in higher densities in the one metre margins around the gneiss pavements that cropped out along the site area at various points. At the top of the saddle a considerable lag deposit of quartz and quartz crops out on the side of the ridges which has been used as a significant raw material source. Average stone artefact densities ranged from 0.001/m^2 to 0.25/m^2 in the areas sampled, with an average density along the site of 0.12/m^2. Maximum artefact densities noted ranged from 15/m^2 to 0.1/m^2, with an average maximum artefact density of 4.3/m^2. Given the size of the site up to the saddle between the hills, this area has the	

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
						potential to contain thousands of stone artefacts.	
Access road and service corridor between the processing site and the mine site	NP-ISO-10			N/A	Isolated artefact	Quartz flake.	AHMS (2015, p. 39)
Access road and service corridor between the processing site and the mine site	NP-ISO-11-1			N/A	Isolated artefact	Quartz flake.	AHMS (2015, p. 39)
Access road and service corridor between the processing site and the mine site	NP-ISO-11-2			N/A	Isolated artefact	Quartz transverse broken flake.	AHMS (2015, p. 39)
Access road and service corridor between the processing site and the mine site	NP-ISO-12-1			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 39)
Access road and service corridor between the processing site and the mine site	NP-ISO-12-2			N/A	Isolated artefact	Quartz transverse broken flake.	AHMS (2015, p. 39)
Access road and service corridor between the processing site and the mine site	RWA8 - sacred site 5552-30				Stone arrangements; Soakages; Rockholes		APAA Authority Certificate (C2013/205)
Access road and service corridor to the accommodation village	NP-17			26m (N/S) x 12m (E/W)	Artefact scatter	Low density artefact scatter on an exposure of gravel and sand. Artefacts consist of quartz cores, retouched flakes, flakes, flake pieces. Very small quartz flakes were observed (<5mm). Average artefact density estimated to be 0.03/m^2 with a maximum density of 2/m^2.	AHMS (2015, Appendix 3)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
Access road and service corridor to the accommodation village	NP-18			10m (N/S) x 5m (E/W)	Artefact scatter	Low density artefact scatter on an exposure of gravel and sand. Artefacts consist of quartz cores, flakes, flake pieces; a broken chert retouched flake, and a gneiss bifacial flaked artefact with edge damage. Very small quartz flakes were observed (<10mm). Average artefact density estimated to be approximately 0.03/m^2 with a maximum density of 2/m^2.	AHMS (2015, Appendix 3)
Access road and service corridor to the accommodation village	NP-ISO-14			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 39)
Access road and service corridor to the borefield	NP-19			25m (N/S) x 10m (E/W)	Artefact scatter	A discrete low density artefact scatter on an extensive sand plain. Artefacts consist of quartz cores, retouched flakes, flakes, flake pieces; silcrete flake; and pounding stones made on gneiss and basalt which show ground surface use wear and hertzian cone fractures from use as an anvil. Artefact densities average 0.25/m^2, with a maximum density of 4/m^2. The quartz shows a moderate amount of reduction with very little cortex noted. There is a relatively high frequency of pounding stones found at this site. The site has been impacted by a vehicle access track from the adjacent bore (Bore SB025).	AHMS (2015, Appendix 3)
Access road and service corridor to the borefield	NP-20			5m (N/S) x 5m (E/W)	Artefact scatter	A small artefact scatter on the sand plain. The site consists of two quartzite pounding stone fragments, a quartz core, and several small quartz flakes (<5mm). The site has an average artefact density of 0.2/m^2 with a maximum of 1/m^2. The artefacts are located on a small area of coarse grained sand and small gravels, which is an unusual geomorphological exposure on the sand plain. The site also coincides with an area of slight elevation on the 600m contour.	AHMS (2015, Appendix 3)
Access road and service corridor to the borefield	RWA10 - Sacred				Rocky ridge; Sand dune		APAA Authority Certificate (C2013/205)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
	site 5552-44						
Access road from the Stuart Highway	NP-21			30m (N/S) x 10m (E/W)	Artefact scatter; Quarry	A band of stone artefacts can be found at the base of the gneiss hillside and outcrop. The distribution of artefacts is quite restricted to this area. Artefacts consist of quartz cores, retouched flakes, flakes, and flake pieces; a chert retouched flake; and a tabular piece of marble (c. 50mm in diameter and 10mm thick) which has been hammer-dressed around the margins and has a ground surface. A discrete 4m^2 area of high density quartz artefacts provided very good examples of knapped quartz. Artefact densities averaged 0.1/m^2 with a maximum density of 25/m^2.	AHMS (2015, Appendix 3)
Access road from the Stuart Highway	NP-22			18m (N/S) x 5m (E/W)	Artefact scatter	A discrete, small low density scatter of stone artefacts amongst a low outcrop of gneiss boulders (<25cm height). The site is restricted to the outcrop area. Artefacts consist of quartz cores, flakes, retouched flakes, and flaked pieces; three chert retouched flakes; a chalcedony utilised retouched flake; grindstones made of gneiss and ortho-quartzite; and a gneiss pounding stone. Artefact densities are sparse and not clustered with a likely maximum of 20 artefacts at this site. The average artefact density is estimated to be 0.2/m^2 with a maximum density of 2/m^2. A corroded piece of soldered tin was located at the site, and is likely to date around or before World War II. It is stamped on the base - 109-.	AHMS (2015, Appendix 3)
Access road from the Stuart Highway	NP-23			44m (N/S) X 35m (E/W)	Artefact scatter; Quarry; Grinding surface	A low basalt outcrop (rare in the area) is the main feature of this site with three grinding surfaces on two sets of low boulders. Two grinding surfaces were located on the central outcrop with the third to the north near several Eucalypts. The surfaces are abraded and ground, with significant pounding use wear. Several large basalt flakes and negative flake	AHMS (2015, Appendix 3)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
						scars on bedrock were found amongst the outcrop illustrating that it was utilised as a stone source. Three quartz flakes were identified around the outcrop. Visibility of artefacts was significantly affected by trampling and soil disturbance around the site in an area frequented by cattle.	
Access road from the Stuart Highway	NP-24			100m (N/S) x 40m (E/W)	Artefact scatter	An artefact scatter found on a 100m exposure along a slight rise on the plain near a large creek gully. Artefacts consist of basalt flakes and pounding stones; quartz cores, retouched flakes, flakes and flake pieces. Large quartz cores dominate the assemblage, owing to the sheet wash erosion of the site. Artefact densities averaged 0.01/m^2 with a maximum density of 2/m^2. Historic artefacts noted on the site included a post-WWII Southwark beer bottle, Norwegian sardine tin, soldered tin can fragments, and later materials such as cans and bottles dating to the 1970s.	AHMS (2015, Appendix 3)
Access road from the Stuart Highway	NP-25			95m (SW/NE) x 10m (NS/SW)	Artefact scatter	A low density scatter found across a c.100m area within three small erosional exposures. The first exposure contained three chert flakes, a chert retouched flake, two quartz cores and two flakes. The second exposure contained a gneiss grindstone and a chalcedony flake. The third exposure contained a gneiss grindstone and two quartz flakes. An ortho-quartzite muller stone was located across the pastoral track some 25 metres north of the site. The scatter was probably exposed by erosional processes (sheet wash) and overgrazing. Average artefact density is 0.01/m^2.	AHMS (2015, Appendix 3)
Access road from the Stuart Highway	NP-26			200m (N/S) x 150m (E/W)	Artefact scatter; Quarry	The site consists of an extensive artefact scatter along the western side of Rabbit Creek on a slight rise that is formed by a gneiss outcrop out on the plain. A large scatter of knapped quartz artefacts is associated with outcrops of quartz and a lag	AHMS (2015, Appendix 3)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
						deposit. The site is notable for a very high diversity of artefact types including quartz cores, retouched flakes , flakes, flake pieces; chert retouched flakes, flakes; chalcedony retouched flakes, flakes; gneiss and ortho-quartzite grindstones ; an ortho-quartzite pounding stone, and basalt pounding stones. High densities of quartz artefacts located in discrete areas throughout the site area. Artefact densities are highly variable with an average of 0.1/m^2 to a maximum of 15/m^2. The scatter continues in and around the gneiss outcrop.	
Access road from the Stuart Highway	NP-27			60m (N/S) x 45m (E/W)	Artefact scatter; Quarry	Quartz lag deposit and outcrop of gneiss used as a source for quarrying raw stone material. Tabular marble-like quartz is interbedded with the gneiss, and a number of pieces have been shaped into rounded flat artefacts approximately 100mm in diameter x 20mm thick. A gneiss bifacial flaked artefact which produces a sharp edge around the entire margin was also found at this site (150mm x 100mm x 20mm). Artefacts consisted of quartz cores, retouched flakes, flakes, and flake pieces, basalt pounding stone; a gneiss grindstone; and a quartzite grindstone. Artefact densities averaged 0.25/m^2 with a maximum density of 10/m^2.	AHMS (2015, Appendix 3)
Access road from the Stuart Highway	NP-28			61m (N/S) x 80m (E/W)	Artefact Scatter	A moderate density artefact scatter on an undulating rise at the start of the valley floor as it opens out to the west into a wider plain. Stone artefacts include quartz cores, flakes, retouched flakes, and flaked pieces; a dolerite pounding stone; an ortho-quartzite grindstone fragment; gneiss grindstone fragments and pounding stones. Artefacts are partially visible owing to the erosion and redisposition of soils. Average artefact densities are 0.25/m^2 with a maximum density of 10/m^2. Historic artefacts noted at the site included a c.1930-	AHMS (2015, Appendix 3)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
						40s glass jar with metal lid, embossed on the body above the base - THIS JAR ALWAYS REMAINS THE PROPERTY OF THE JAR JAM MFS. ASSOCIATION OF N.S.W.	
Access road from the Stuart Highway	NP-29			Shelter: 2.5m (W) x 1.5m (L) x 1.6m (H); surrounding artefact scatter: 30m x 20m	Rockshelter; Artefact Scatter	On the western end of the outcrop a slab of gneiss forms a small overhang approximately 1.5m above the surrounding sand plain. The shelter has a sand and gravel floor overlying gneiss bedrock. Deposits associated with the shelter have an estimated depth of <20cm, and have potential to contain evidence of Aboriginal occupation. A low scree slope (gradient <20°) is located to the north of the shelter with fragments of gneiss, gravel, and sand. A high density scatter of stone artefacts is located in the shelter area and down the slope. Stone artefacts include quartz cores, flakes, and flaked pieces; with a high proportion of retouched quartz flakes (average length 20mm). Other artefacts include silcrete, chert and chalcedony flakes and retouched flakes. A number of marble grinding slabs with retouched margins were also found at the site. Artefact densities were highest on the scree slope, exceeding an average of 10/m^2. Artefact densities on the plain within 10m of the gneiss outcrop averaged 0.25/m^2, or a maximum of 5/m^2. A background scatter of artefacts extends outwards from the site, falling to 0.001/m^2 in the north.	AHMS (2015, Appendix 3)
Access road from the Stuart Highway	NP-31			145m (N/S) x 60m (E/W)	Artefact scatter; Quarry	Quartz has been quarried at this locality and it also contains tabular outcrops with a marble-like appearance. Although there is a lag deposit and outcrops of quartz, there is a consistent amount of knapped artefacts amongst the naturally occurring scatter. The quartz scatter follows either side of the large gully onto the valley floor. Artefact types include quartz cores, flakes, retouched flakes,	AHMS (2015, Appendix 3)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
						flake pieces; bifacial flaked gneiss artefacts; gneiss pounding stones; a gneiss anvil (hammer dressed); and a chalcedony core. Significant numbers of the quartz cores showed evidence of bifacial working. Marble-like tabular quartz artefacts were found across the site with flaking around the margins to produce artefacts 100mm-150mm in diameter. Artefact densities averaged 0.1/m^2 on lower slopes with natural quartz outcrops and dense lag deposits, down to 0.05/m^2 along the gully. Maximum artefact densities noted were >10/m^2.	
Access road from the Stuart Highway	NP-ISO-16-1			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 39)
Access road from the Stuart Highway	NP-ISO-17			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 39)
Access road from the Stuart Highway	NP-ISO-16-2			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 39)
Access road from the Stuart Highway	NP-ISO-18-1			N/A	Isolated artefact	Quartz flake.	AHMS (2015, p. 39)
Access road from the Stuart Highway	NP-ISO-19			N/A	Isolated artefact	Quartz flake.	AHMS (2015, p. 39)
Access road from the Stuart Highway	NP-ISO-18-2			N/A	Isolated artefact	Quartz flake.	AHMS (2015, p. 39)
Access road from the Stuart Highway	NP-ISO-22-1			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 39)
Access road from the Stuart Highway	NP-ISO-23			N/A	Isolated artefact	Gneiss bifacial flaked artefact.	AHMS (2015, p. 39)
Access road from the Stuart Highway	NP-ISO-22-2			N/A	Isolated artefact	Quartz flake.	AHMS (2015, p. 39)
Access road from the Stuart Highway	NP-ISO-24			N/A	Isolated artefact	Gneiss bifacial flaked artefact.	AHMS (2015, p. 39)
Access road from the Stuart Highway	NP-ISO-22-3			N/A	Isolated artefact	Quartz flake.	AHMS (2015, p. 39)
Access road from the Stuart Highway	NP-ISO-25			N/A	Isolated artefact	Marble-like tabular quartz grindstone.	AHMS (2015, p. 39)
Access road from the Stuart Highway	NP-ISO-26			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 39)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
Access road from the Stuart Highway	NP-ISO-27			N/A	Isolated artefact	Quartzite muller.	AHMS (2015, p. 39)
Access road from the Stuart Highway	NP-ISO-28-1			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 39)
Access road from the Stuart Highway	NP-ISO-28-2			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 39)
Access road from the Stuart Highway	NP-ISO-29-1			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 39)
Access road from the Stuart Highway	NP-ISO-29-2			N/A	Isolated artefact	Quartz retouched flake.	AHMS (2015, p. 39)
Accommodation village	NP-12			80m (N/S) x 45m (E/W)	Artefact scatter	An artefact scatter concentrated around the base and across the surface of the gneiss pavement. Artefacts consisted of quartz cores, retouched flakes, flakes, flaked pieces; chert flakes, retouched flakes; basalt retouched flake, and a gneiss pounding stone. Quartz cores were generally 20-30mm in size. Quartz flakes had an average length of 20mm. The highest artefact densities of 4/m^2 are found on a small elevated flat area on the outcrop where artefacts have been transported by water washing over the site. Some quartz artefacts are on top of the gneiss dome. Densities average 0.01/m^2 with 0.25/m^2 in the elevated flat area of the site.	AHMS (2015, Appendix 3)
Accommodation village	NP-13			100m (E/W) x 40m (N/S)	Artefact scatter	Artefacts are scattered along the southern side of a very low rise on the alluvial plain. The artefacts have possibly been exposed due to erosion and are visible through sparse grasses. Artefacts consist of quartz cores, retouched flakes, flakes, flake pieces; chert flakes, retouched flakes; three chalcedony retouched flakes ; a gneiss pounding stone (Plate 48); two gneiss grindstones; and an ortho-quartzite pounding stone. Artefact densities were generally low with an average of 0.1/m^2 and maximum density of 3/m^2.	AHMS (2015, Appendix 3)
Accommodation village	NP-14			15m (N/S) x 10m (E/W)	Artefact scatter	Low density artefact scatter in a patch of deflated alluvial soils on a low rise. Artefacts consist of quartz cores, retouched flakes,	AHMS (2015, Appendix 3)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
						flakes , flaked pieces; chert flake and two retouched flakes; ortho-quartzite pounding stone and grindstone . Artefact densities were generally low with an average of 0.1/m^2 and maximum density of 4/m^2.	
Accommodation village	NP-15			125m (N/S) x 130m (E/W)	Artefact scatter; Potential Archaeological Deposit	This is an extensive, highly diverse and abundant artefact scatter surrounding the creek/soakage area. Artefact types include quartz cores, retouched flakes, flakes, flake pieces, utilised flakes; chert flakes, retouched flakes, tula adze, tula adze slug, utilised flakes; and chalcedony cores, flakes, retouched flakes, utilised flakes. Grindstones were made of ortho-quartzite meta-sandstone and gneiss. Pounding stones were made of ortho-quartzite and gneiss. There was a high frequency of broken grindstones with an estimated minimum of 50. There was a high diversity of chert types, which represented a large proportion of the site assemblage. Artefact densities averaged 0.25/m^2 around the gullies and open areas with higher densities of >25/m^2 within areas of erosion. A large meta-sandstone grindstone was exposed in a gully buried to a depth of 50cm, indicating high potential for stratified subsurface archaeological materials in this area. Only one historical artefact was observed at the site, consisting of a small piece of corroded tin. The potential for sub-surface archaeology at the soak site was demonstrated by a gneiss grindstone buried in-situ in the creek banks.	AHMS (2015, Appendix 3)
Accommodation village	NP-16			10m (N/S) x 10m (E/W)	Artefact scatter	A total of eight artefacts clustered in on a low gravel rise on the plain likely to have been exposed from erosion. Artefacts consist of a quartzite pounder; a chert broken flake; six quartz flakes; and a quartz core. The average artefact density is 0.08/m^2 with a maximum density of 1/m^2.	AHMS (2015, Appendix 3)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
Accommodation village	NP-ISO-13-1			N/A	Isolated artefact	Gneiss grindstone.	AHMS (2015, p. 39)
Accommodation village	NP-ISO-13-2			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 39)
Accommodation village	NP-ISO-15			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 39)
Mine site	ISO1			N/A	Isolated artefact	Quartz flake measuring 22mm length x 18mm width x 20mm thick. No cortex, feather termination.	Earthsea Pty Ltd (2010, p. 38)
Mine site	ISO2			N/A	Isolated artefact	Quartz retouched flake measuring 65mm length x 55mm width x 25mm thick. No cortex, feather termination.	Earthsea Pty Ltd (2010, p. 38)
Mine site	ISO3			N/A	Isolated artefact	Chalcedony core measuring 25mm length x 48mm width x 40mm thick. No cortex, 1 x platform.	Earthsea Pty Ltd (2010, p. 38)
Mine site	ISO4			N/A	Isolated artefact	Quartz core measuring 80mm length x 40mm width x 36mm thick. No cortex, multiplatform.	Earthsea Pty Ltd (2010, p. 38)
Mine site	ISO5			N/A	Isolated artefact	Quartz core measuring 42mm length x 28mm width x 26mm thick. No cortex, multiplatform, bipolar.	Earthsea Pty Ltd (2010, p. 38)
Mine site	ISO8			N/A	Isolated artefact	Quartz retouched flake measuring 68mm length x 43mm width x 13mm thick. No cortex, feather termination.	Earthsea Pty Ltd (2010, p. 38)
Mine site	Site 5			5m x 5m	Artefact scatter; Quarry	A discrete quarry at a high quartz source. Residual quartz of good quality with moderate level quarrying activity. Stone artefacts include flakes, cores, broken flakes, flake piece. Quartz is the only raw material present. Average artefact density is 0.25/m^2 with a maximum of 15/m^2.	Earthsea Pty Ltd (2010, p. 39)
Mine site	Scar 3			6m x 2m	Scarred tree	A fallen tree with a scar on the trunk. The scar measures 100cm length by 25cm wide. The tree is very weathered and in poor condition.	Earthsea Pty Ltd (2010, p. 39)
Mine site	Site 3			300m x 300m	Artefact scatter; Quarry; Grinding surface	A complex of quartz knapping and quarry areas amongst gneiss outcrop. Several grinding patches are located across the outcrops. A number of discrete quarrying areas are found throughout the complex. Stone artefacts consist of flakes, cores, broken flakes, flake piece. Fragments of	Earthsea Pty Ltd (2010, p. 39)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
						quartzite grindstones were found in the site complex. The site contains areas of very high artefact densities in excess of 100/m^2.	
Mine site	Scar 2			6m x 2m	Scarred tree	A fallen tree has a scar on the mid trunk. The tree had snapped just below the scar. The scar measures 60cm length by 12 cm wide. The tree is in poor condition.	Earthsea Pty Ltd (2010, p. 39)
Mine site	Site 2			3m x 3m	Artefact scatter	A small scatter of quartz stone artefacts. Several quartz cores have been knapped at this locality producing approximately 25 artefacts. Artefact sizes range from 20mm to 200mm. Some are partially buried in the aggrading sandy soil. Possibly more artefacts sub-surface. Stone artefacts include flakes, cores, broken flakes, flake piece. Quartz is the only raw material present. Average artefact density is 0.6/m^2. The site is in good condition with minimum erosion.	Earthsea Pty Ltd (2010, p. 39)
Mine site	Scar 1			5m x 5m	Scarred tree	The scar is located at the base of a large desert oak tree. The scar measures 80cm length by 20cm wide. The tree is still live and healthy.	Earthsea Pty Ltd (2010, p. 39)
Mine site	Site 1			60m x 40m	Artefact scatter; Quarry	A discrete quarry of a quartz source. Residual quartz of fair quality with a low level of quarrying. Stone artefacts include flakes, cores, broken flakes, flake piece. Quartz is the only raw material present. Average artefact density is 0.25/m^2 with a maximum of 5/m^2. The site has been impacted by the current access road.	Earthsea Pty Ltd (2010, p. 39)
Mine site	Site 8			25m x 25m	Artefact scatter; Quarry	A discrete quarry at a high quality quartz source. Residual quartz of good quality with moderate to high of level quarrying activity. Stone artefacts include flakes, cores, retouched flakes, broken flakes, and flake pieces. Quartz is the main raw material present. Hammerstones were made on granite. Average artefact density is 5/m^2 with a maximum of 30/m^2.	Earthsea Pty Ltd (2010, p. 40)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
Mine site	Site 7			35m x 30m	Artefact scatter; Quarry	A discrete quarry at a high quality quartz source. Residual quartz of good quality with moderate to high of level quarrying activity. Stone artefacts include flakes, cores, retouched flakes, broken flakes, flake piece, and hammerstones. Quartz is the main raw material present. Hammerstones were made on granite. Average artefact density is 5/m^2 with a maximum of 30/m^2.	Earthsea Pty Ltd (2010, p. 40)
Mine site	Site 6			30m x 25m	Artefact scatter; Quarry	A discrete quarry at a high quality quartz source. Residual quartz of good quality with moderate to high of level quarrying activity. Stone artefacts include flakes, cores, broken flakes, flake piece, and hammerstones. Quartz is the main raw material present. Hammerstones were made on granite. Average artefact density is 5/m^2 with a maximum of 25/m^2.	Earthsea Pty Ltd (2010, p. 40)
Mine site	Site 17			N/A	Quarry; Reduction area	Low to medium density quartz quarry and reduction site	Earthsea Pty Ltd (2012, p. 14)
Mine site	Site 16			12000 ha	Quarry; Reduction area	Low to medium density quartz quarry and reduction site	Earthsea Pty Ltd (2012, p. 14)
Mine site	Site 15			N/A	Artefact scatter	Low density artefact scatter	Earthsea Pty Ltd (2012, p. 14)
Mine site	Site 14			40 ha	Artefact scatter; Quarry	Small quartz quarry and reduction site	Earthsea Pty Ltd (2012, p. 14)
Mine site	Site 13			150 ha	Quarry	Minor quartz quarry	Earthsea Pty Ltd (2012, p. 14)
Mine site	Site 12			3000 ha	Quarry	Minor quartz quarry	Earthsea Pty Ltd (2012, p. 14)
Mine site	Site 11			1160 ha	Artefact scatter	Small artefact scatter on low granite outcrop	Earthsea Pty Ltd (2012, p. 14)
Mine site	Site 10			740 ha	Artefact scatter	Small artefact scatter on low granite outcrop	Earthsea Pty Ltd (2012, p. 14)
Mine site	Site 19			2300 ha	Artefact scatter; Potential Archaeological Deposit	Low density diverse artefact assemblage	Earthsea Pty Ltd (2012, p. 15)
Mine site	Site 18			Unknown	Artefact scatter	Low density artefact quartz artefact scatter	Earthsea Pty Ltd (2012, p. 15)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
Mine site	NB-1			15m x 10m	Artefact scatter	An eroded area revealed a quartz assemblage of two cores, 19 flakes, and 27 other “pieces”, along with a single chalcedony flake.	Gunn (2006, p. 15)
Mine site	NB-2			150m x 75m	Artefact scatter; Potential Archaeological Deposit	A light scatter of stone artefacts was located around a series of low granite domes on the western side of the creek. The scatter had a maximum density of 5/m^2, although for the most it was well below 1/m^2. A total of 40 artefacts were located, including nine cores, one retouched silcrete flake and two grindstone fragments.	Gunn (2006, p. 15)
Mine site	NB-3			N/A	Scarred tree	The scarred tree stands on the sandplain, 300 m east of the creek and in no clear association with other landscape features (Figure 5, Plate 11). The tree is an old bloodwood, with a girth of 65 cm. The scar is 96 cm long and 13 cm wide, with a bark regrowth of 6 cm and an orientation of 35o. The tree is alive.	Gunn (2006, p. 15)
Mine site	24 Isolated Artefacts			Unknown	Isolated artefact	An undifferentiated background scatter concentrated along the eastern side of Kerosene Camp Creek, consisting of 17 flakes (13 quartz, 3 chalcedony, 1 silcrete), 5 cores (3 quartz, one chalcedony, one quartzite), one retouched flake (ortho-quartzite) and one grindstone fragment (gneiss). The distribution also tends to concentrate around scatter site NB1.	Gunn (2006, p. 16)
Mine site	SP-1			N/A	Scarred tree	A bloodwood tree with “coolamon-shaped” scar. Scar is around 50 cm long and 12 cm wide, located about a metre up the trunk, and had bark regrowth of around 6 cm. The tree is alive.	Gunn (2006, p.19)
Mine site	SP-2			N/A	Scarred tree	A bloodwood tree with “coolamon-shaped” scar. Scar is around 42 cm long and 13 cm wide, located about 92 cm up the trunk, and had bark regrowth of around 5 cm. The tree is alive.	Gunn (2006, p.19)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
Mine site	NB-4			11m x 4m	Quarry; Potential Archaeological Deposit	A small outcrop of white reef quartz occurs along the base of the *Apmere Apatye.nte* hills, immediately west of Kerosene Camp Creek. The outcrop has been worked to produce cores for flake manufacture. This quarry site has a maximum artefact density of >100/m^2 at its centre. The outcrop is at ground level and, while lacking any clear signs of quarrying, flaked bedrock is apparent.	Gunn (2006, pp. 14-16)
Mine site	NB-5			5m x 2m	Quarry	A small outcrop of white reef quartz occurs along the base of the *Apmere Apatye.nte* hills, immediately west of Kerosene Camp Creek. The outcrop has been worked to produce cores for flake manufacture.	Gunn (2006, pp. 14-16)
Mine site	NB-6			3m x 1m	Quarry	A small outcrop of white reef quartz occurs along the base of the *Apmere Apatye.nte* hills, immediately west of Kerosene Camp Creek. The outcrop has been worked to produce cores for flake manufacture.	Gunn (2006, pp. 14-16)
Mine site	NB-7			7m x 4m	Quarry	A small outcrop of white reef quartz occurs along the base of the *Apmere Apatye.nte* hills, immediately west of Kerosene Camp Creek. The outcrop has been worked to produce cores for flake manufacture.	Gunn (2006, pp. 14-16)
Mine site	NB-8			10m x 10m	Quarry	A small outcrop of white reef quartz occurs along the base of the *Apmere Apatye.nte* hills, immediately west of Kerosene Camp Creek. The outcrop has been worked to produce cores for flake manufacture.	Gunn (2006, pp. 14-16)
Mine site	NB-9			5m x 4m	Quarry	A small outcrop of white reef quartz occurs along the base of the *Apmere Apatye.nte* hills, immediately west of Kerosene Camp Creek. The outcrop has been worked to produce cores for flake manufacture.	Gunn (2006, pp. 14-16)
Processing site	NP-4			25m (N/W) x 60m (E/W)	Artefact scatter	A surface scatter of approximately twelve artefacts, including two ortho-quartzite cores with pounding/ground surfaces, quartz cores and flakes, and a broken chalcedony flake. Average artefact density is 0.01/m^2.	AHMS (2015, Appendix 3)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
Processing site	NP-5			15m (N/S) x 15m (E/W)	Artefact scatter	Very low density artefact scatter with approximately 10 artefacts, consisting of quartz cores, flakes, and flake pieces. One quartz core had crushing on one platform with multiple step terminations. Cores were mostly 10-15cm in length and flakes 10-15cm in length. Quartz is of a high quality, and a high proportion of the artefacts had no cortex. Average artefact density is <0.01/m^2.	AHMS (2015, Appendix 3)
Processing site	NP-6			400m (N/S) x 800m (E/W)	Artefact scatter; Quarry	Quartz lag deposit and outcrop that has been a resource for low intensity utilisation. Quartz cores, retouched flakes, flakes, and flake pieces are located across the strike ridge and on the surrounding lower slopes. Quartz cores averaged 10- 20cm in size. One chert retouched flake was identified on the ridge top, and one silcrete retouched flake was identified on the southern slope. Average artefact densities are estimated to be 0.01/m^2 varying to 0.1/m^2 in areas, with a maximum density of >10/m^2.	AHMS (2015, Appendix 3)
Processing site	NP-7			2m (N/S) x 2m (N/S)	Artefact scatter	A total of 5 artefacts in a localised area on the edge of the thicket of mulga. Artefacts consist of one chalcedony retouched flake (40mm length), two chalcedony flakes (<10mm length), one gneiss pounder (>100mm length), and one quartz core (>20cm). Artefact density is 1.25/m^2.	AHMS (2015, Appendix 3)
Processing site	NP-8			30m (N/S) x 15m (E/W)	Artefact scatter	A low density artefact scatter located in a highly eroded zone 30m to the east of a gully. Artefacts were identified in gravel swales and consisted of five quartz cores, quartz flakes, and chalcedony flakes. Most flakes were broken. Approximately 15 artefacts were located in this area, with potential for greater artefact numbers in subsurface deposit. Cores ranged from 15-50mm in size, and flakes averaged 20mm in length. Several translucent flakes of high quality quartz with cores made of opaque material. Chalcedony	AHMS (2015, Appendix 3)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
						flakes were white. Average artefact density approximately 0.01/m^2 with a maximum density of 0.25/m^2.	
Processing site	NP-9			600m (E/W) x 300m (N/S)	Artefact scatter; Quarry; Reduction area	The rocky strike ridge contains high amounts of quartz and minor outcrops of tabular marble-like quartz that have been utilised as a stone material resource. There are extensive lag deposits of fractured quartz across the hillside and lower slopes. Artefacts were identified across the site in varying densities. Artefacts include quartz cores, flakes, retouched flakes, flake pieces, marble-like quartz slabs with retouched margins, and marble-like quartz flakes. Six chalcedony flakes, and one chert retouched flake were also noted. Artefact densities were generally concentrated around the lower slopes; however, were identified across the hilltop. Artefact densities averaged approximately 0.1/m^2 around the base of the hill and decreased to 0.01/m^2 over the top of the hillside. Maximum artefact densities were noted in reduction areas exceeding 20/m^2 especially to the south of the main ridge. Two pieces of corroded tin (with a small square of mesh attached to the side) were found on the southern side of the site indicative of early 20th century pastoral use of the area.	AHMS (2015, Appendix 3)
Processing site	Old Albies Bore and Yard				Water tank, stock yards, Southern Cross windmill		AHMS (2015, Appendix 3)
Processing site	NP-ISO-1-1			N/A	Isolated artefact	Quartz flake.	AHMS (2015, p. 38)
Processing site	NP-ISO-2			N/A	Isolated artefact	Quartz retouched flake.	AHMS (2015, p. 38)
Processing site	NP-ISO-1-2			N/A	Isolated artefact	Meta-SST grindstone.	AHMS (2015, p. 38)
Processing site	NP-ISO-3			N/A	Isolated artefact	Chalcedony retouched flake.	AHMS (2015, p. 38)

Key Area	Site	Easting	Northing	Extent	Site Feature	Description	Archaeological Survey Report
Processing site	NP-ISO-1-3			N/A	Isolated artefact	Gneiss bifacial flaked artefact.	AHMS (2015, p. 38)
Processing site	NP-ISO-4			N/A	Isolated artefact	Chalcedony distal flake.	AHMS (2015, p. 38)
Processing site	NP-ISO-5-1			N/A	Isolated artefact	Quartz retouched flake.	AHMS (2015, p. 38)
Processing site	NP-ISO-6			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 38)
Processing site	NP-ISO-5-2			N/A	Isolated artefact	Quartz distal retouched flake.	AHMS (2015, p. 38)
Processing site	NP-ISO-5-3			N/A	Isolated artefact	Marble-like quartz core.	AHMS (2015, p. 38)
Processing site	NP-ISO-7-1			N/A	Isolated artefact	Marble-like quartz core.	AHMS (2015, p. 38)
Processing site	NP-ISO-7-2			N/A	Isolated artefact	Quartz flake.	AHMS (2015, p. 38)
Processing site	NP-ISO-8			N/A	Isolated artefact	Quartz flake.	AHMS (2015, p. 39)
Processing site	NP-ISO-9			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 39)
Processing site	NP-ISO-20			N/A	Isolated artefact	Quartz flake.	AHMS (2015, p. 39)
Processing site	NP-ISO-21-1			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 39)
Processing site	NP-ISO-21-2			N/A	Isolated artefact	Quartzite pounder.	AHMS (2015, p. 39)
Processing site	NP-ISO-30-1			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 39)
Processing site	NP-ISO-30-2			N/A	Isolated artefact	Quartz core.	AHMS (2015, p. 39)
Processing site	RWA9 - Sacred site 5552-41				Hill; Swamp		APAA Authority Certificate (C2013/205)

Table A1-2. Potential impacts on identified cultural heritage items.

Key Area	Site	Coordinates (GDA/MGA Zone 53)		Site Feature	Heritage Significance	Potential Impact
		Easting	Northing			
Access road and service corridor between the processing site and the mine site	RWA8 - sacred site 5552-30			Stone arrangements; Soakages; Rockholes	High overall heritage significance	Direct
Access road and service corridor between the processing site and the mine site	NP-1 (within RWA8)			Artefact scatter; Engraving	High scientific (archaeological) significance	Indirect
Access road and service corridor between the processing site and the mine site	NP-2 (within RWA8)			Artefact scatter; Habitation structure; Grinding surface	High scientific (archaeological) significance	Indirect
Access road and service corridor between the processing site and the mine site	NP-3 (within RWA8)			Artefact scatter	High scientific (archaeological) significance	Indirect
Access road and service corridor between the processing site and the mine site	NP-10			Artefact scatter; Quarry; Reduction area	High scientific (archaeological) significance	Indirect
Access road and service corridor between the processing site and the mine site	NP-11			Artefact scatter; Quarry	High scientific (archaeological) significance	Indirect
Access road and service corridor between the processing site and the mine site	NP-32			Artefact scatter; Quarry; Reduction area; Grinding surface	High scientific (archaeological) significance	Indirect
Access road and service corridor between the processing site and the mine site	NP-30			Artefact scatter	Low scientific (archaeological) significance	Indirect
Access road and service corridor between the processing site and the mine site	NP-ISO-10			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road and service corridor between the processing site and the mine site	NP-ISO-11-1			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road and service corridor between the processing site and the mine site	NP-ISO-11-2			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road and service corridor between the processing site and the mine site	NP-ISO-12-1			Isolated artefact	Low scientific (archaeological) significance	Indirect

Key Area	Site	Coordinates (GDA/MGA Zone 53)		Site Feature	Heritage Significance	Potential Impact
		Easting	Northing			
Access road and service corridor between the processing site and the mine site	NP-ISO-12-2			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road and service corridor to the accommodation village	NP-17			Artefact scatter	Low scientific (archaeological) significance	Indirect
Access road and service corridor to the accommodation village	NP-18			Artefact scatter	Low scientific (archaeological) significance	Indirect
Access road and service corridor to the accommodation village	NP-ISO-14			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-23			Artefact scatter; Quarry; Grinding surface	High scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-26			Artefact scatter; Quarry	High scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-27			Artefact scatter; Quarry	High scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-29			Rockshelter; Artefact scatter	High scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-31			Artefact scatter; Quarry	High scientific (archaeological) significance	No Impact
Access road from the Stuart Highway	NP-22			Artefact scatter	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-24			Artefact scatter	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-25			Artefact scatter	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-30			Artefact scatter	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-ISO-16-1			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-ISO-16-2			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-ISO-17			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-ISO-18-1			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-ISO-19			Isolated artefact	Low scientific (archaeological) significance	Indirect

Key Area	Site	Coordinates (GDA/MGA Zone 53)		Site Feature	Heritage Significance	Potential Impact
		Easting	Northing			
Access road from the Stuart Highway	NP-ISO-23			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-ISO-25			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-ISO-26			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-ISO-27			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-ISO-28-1			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-ISO-28-2			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-ISO-29-1			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-ISO-29-2			Isolated artefact	Low scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-ISO-18-2			Isolated artefact	Low scientific (archaeological) significance	No Impact
Access road from the Stuart Highway	NP-ISO-22-1			Isolated artefact	Low scientific (archaeological) significance	No Impact
Access road from the Stuart Highway	NP-ISO-22-2			Isolated artefact	Low scientific (archaeological) significance	No Impact
Access road from the Stuart Highway	NP-ISO-22-3			Isolated artefact	Low scientific (archaeological) significance	No Impact
Access road from the Stuart Highway	NP-ISO-24			Isolated artefact	Low scientific (archaeological) significance	No Impact
Access road from the Stuart Highway	NP-21			Artefact scatter; Quarry	Moderate scientific (archaeological) significance	Indirect
Access road from the Stuart Highway	NP-28			Artefact scatter	Moderate scientific (archaeological) significance	Indirect
Access track and service corridor to the borefield	RWA10 - Sacred site 5552-44			Rocky ridge; Sand dune	High overall heritage significance	Indirect
Access track and service corridor to the borefield	NP-20			Artefact scatter	Low scientific (archaeological) significance	Direct
Access track and service corridor to the borefield	NP-19			Artefact scatter	Moderate scientific (archaeological) significance	Direct
Accommodation village	NP-15			Artefact scatter; Potential Archaeological Deposit	High scientific (archaeological) significance	No Impact

Key Area	Site	Coordinates (GDA/MGA Zone 53)		Site Feature	Heritage Significance	Potential Impact
		Easting	Northing			
Accommodation village	NP-16			Artefact scatter	Low scientific (archaeological) significance	Direct
Accommodation village	NP-ISO-15			Isolated artefact	Low scientific (archaeological) significance	Indirect
Accommodation village	NP-ISO-13-1			Isolated artefact	Low scientific (archaeological) significance	No impact
Accommodation village	NP-ISO-13-2			Isolated artefact	Low scientific (archaeological) significance	No impact
Accommodation village	NP-12			Artefact scatter	Moderate scientific (archaeological) significance	Indirect
Accommodation village	NP-13			Artefact scatter	Moderate scientific (archaeological) significance	No impact
Accommodation village	NP-14			Artefact scatter	Moderate scientific (archaeological) significance	No impact
Mine site	Scar 3			Scarred tree	High scientific (archaeological) significance	Direct
Mine site	Site 1			Artefact scatter; Quarry	High scientific (archaeological) significance	Direct
Mine site	Site 10			Artefact scatter	High scientific (archaeological) significance	Direct
Mine site	Site 11			Artefact scatter	High scientific (archaeological) significance	Direct
Mine site	Site 12			Quarry	High scientific (archaeological) significance	Direct
Mine site	Site 13			Quarry	High scientific (archaeological) significance	Direct
Mine site	Site 14			Artefact scatter; Quarry	High scientific (archaeological) significance	Direct
Mine site	Site 15			Artefact scatter	High scientific (archaeological) significance	Direct
Mine site	Site 16			Quarry; Reduction area	High scientific (archaeological) significance	Direct
Mine site	Site 17			Quarry; Reduction area	High scientific (archaeological) significance	Direct
Mine site	Site 18			Artefact scatter	High scientific (archaeological) significance	Direct
Mine site	Site 19			Artefact scatter; Potential Archaeological Deposit	High scientific (archaeological) significance	Direct

Key Area	Site	Coordinates (GDA/MGA Zone 53)		Site Feature	Heritage Significance	Potential Impact
		Easting	Northing			
Mine site	Site 3			Artefact scatter; Quarry; Grinding surface	High scientific (archaeological) significance	Direct
Mine site	Site 5			Artefact scatter; Quarry	High scientific (archaeological) significance	Direct
Mine site	Site 6			Artefact scatter; Quarry	High scientific (archaeological) significance	Direct
Mine site	Site 7			Artefact scatter; Quarry	High scientific (archaeological) significance	Direct
Mine site	Site 8			Artefact scatter; Quarry	High scientific (archaeological) significance	Direct
Mine site	SP-1			Scarred tree	High scientific (archaeological) significance	Direct
Mine site	SP-2			Scarred tree	High scientific (archaeological) significance	Direct
Mine site	Scar 1			Scarred tree	High scientific (archaeological) significance	Indirect
Mine site	Scar 2			Scarred tree	High scientific (archaeological) significance	Indirect
Mine site	Site 2			Artefact scatter	High scientific (archaeological) significance	Indirect
Mine site	ISO8			Isolated artefact	Low scientific (archaeological) significance	Direct
Mine site	NB-1			Artefact scatter	Low scientific (archaeological) significance	Direct
Mine site	NB-5			Quarry	Low scientific (archaeological) significance	Direct
Mine site	NB-6			Quarry	Low scientific (archaeological) significance	Direct
Mine site	NB-7			Quarry	Low scientific (archaeological) significance	Direct
Mine site	NB-8			Quarry	Low scientific (archaeological) significance	Direct
Mine site	NB-9			Quarry	Low scientific (archaeological) significance	Direct
Mine site	ISO1			Isolated artefact	Low scientific (archaeological) significance	Indirect
Mine site	ISO2			Isolated artefact	Low scientific (archaeological) significance	Indirect
Mine site	ISO3			Isolated artefact	Low scientific (archaeological) significance	Indirect

Key Area	Site	Coordinates (GDA/MGA Zone 53)		Site Feature	Heritage Significance	Potential Impact
		Easting	Northing			
Mine site	ISO4			Isolated artefact	Low scientific (archaeological) significance	Indirect
Mine site	ISO5			Isolated artefact	Low scientific (archaeological) significance	Indirect
Mine site	NB-2			Artefact scatter; Potential Archaeological Deposit	Moderate scientific (archaeological) significance	Direct
Mine site	NB-3			Scarred tree	Moderate scientific (archaeological) significance	Direct
Mine site	NB-4			Quarry; Potential Archaeological Deposit	Moderate scientific (archaeological) significance	Direct
Processing site	RWA9 - Sacred site 5552-41			Hill; Swamp	High overall heritage significance	Indirect
Processing site	NP-6			Artefact scatter; Quarry	High scientific (archaeological) significance	Direct
Processing site	NP-9			Artefact scatter; Quarry; Reduction area	High scientific (archaeological) significance	Indirect
Processing site	NP-ISO-20			Isolated artefact	Low scientific (archaeological) significance	Direct
Processing site	NP-ISO-21-1			Isolated artefact	Low scientific (archaeological) significance	Direct
Processing site	NP-ISO-21-2			Isolated artefact	Low scientific (archaeological) significance	Direct
Processing site	NP-ISO-30-1			Isolated artefact	Low scientific (archaeological) significance	Direct
Processing site	NP-ISO-30-2			Isolated artefact	Low scientific (archaeological) significance	Direct
Processing site	NP-7			Artefact scatter	Low scientific (archaeological) significance	Direct
Processing site	NP-ISO-2			Isolated artefact	Low scientific (archaeological) significance	Direct
Processing site	NP-ISO-6			Isolated artefact	Low scientific (archaeological) significance	Direct
Processing site	NP-ISO-7-1			Isolated artefact	Low scientific (archaeological) significance	Direct
Processing site	NP-ISO-7-2			Isolated artefact	Low scientific (archaeological) significance	Direct
Processing site	NP-4			Artefact scatter	Low scientific (archaeological) significance	Indirect

Key Area	Site	Coordinates (GDA/MGA Zone 53)		Site Feature	Heritage Significance	Potential Impact
		Easting	Northing			
Processing site	NP-5			Artefact scatter	Low scientific (archaeological) significance	Indirect
Processing site	NP-8			Artefact scatter	Low scientific (archaeological) significance	Indirect
Processing site	NP-ISO-1-1			Isolated artefact	Low scientific (archaeological) significance	Indirect
Processing site	NP-ISO-1-2			Isolated artefact	Low scientific (archaeological) significance	Indirect
Processing site	NP-ISO-1-3			Isolated artefact	Low scientific (archaeological) significance	Indirect
Processing site	NP-ISO-3			Isolated artefact	Low scientific (archaeological) significance	Indirect
Processing site	NP-ISO-4			Isolated artefact	Low scientific (archaeological) significance	Indirect
Processing site	NP-ISO-5-1			Isolated artefact	Low scientific (archaeological) significance	Indirect
Processing site	NP-ISO-5-2			Isolated artefact	Low scientific (archaeological) significance	Indirect
Processing site	NP-ISO-5-3			Isolated artefact	Low scientific (archaeological) significance	Indirect
Processing site	NP-ISO-8			Isolated artefact	Low scientific (archaeological) significance	Indirect
Processing site	NP-ISO-9			Isolated artefact	Low scientific (archaeological) significance	Indirect
Processing site	Old Albies Bore and Yard			Water tank, stock yards, Southern Cross windmill	Potential heritage significance	Indirect

Figure A1-1. Heritage items in the vicinity of the mine site.

Figure A1-2. Heritage items in the vicinity of the processing site.

Figure A1-3. Cultural heritage items in the vicinity of the access track and service corridor to the borefield.

Figure A1-4. Heritage items in the vicinity of the accommodation village.

Figure A1-5. Heritage items in the vicinity of the access road from the Stuart Highway.

Appendix 2 – Aboriginal Areas Protection Authority – Authority Certificates

Appendix 3 – Mitigation Measures

Exclusion Zones

Exclusion zones will be established around the perimeter of Restricted Works Areas (RWAs) within and adjacent to the Project area prior to commencement of the construction phase of the Project. The zones will be clearly marked with signs indicating no unauthorised entry, and flagging or barriers will be installed along the boundaries of key areas and access roads adjacent to the RWAs.

Signage will be highlighted in the site induction and tool-box talks.

Table A3-1. Sites to which exclusion zones will apply.

Location	Site
Access road and service corridor between the processing site and the mine site	RWA8
South west of processing site	RWA9
West of access track to the borefield	RWA10

Fencing of Scarred Trees

Where scarred trees are located outside the footprint of proposed infrastructure, the preferred management option is for them be retained *in situ*. Trees will be protected with temporary fencing installed prior to commencement of the construction phase of the Project and retained until completion of the decommissioning phase. The fencing should delineate the Tree Protection Zone.

Table A3-2. Sites where scarred trees will be fenced.

Key Area	Site
Mine site	Scar 1; Scar 2

Archival Recording of Scarred Trees

The following general approach would apply to the archival recording of scarred trees:

- Prior to construction, all scarred trees that will be directly impacted by the proposed infrastructure would be documented. Archival recording would be undertaken in accordance with the following heritage best practice standards and guidelines:
- Long, A 2003, *Scarred trees: an identification and recording manual*, Aboriginal Affairs Victoria.
- Documentation should include coordinates (taken using a hand held GPS), tree species, tree condition, girth at chest height (1.5 m above ground), scar dimensions, overgrowth dimensions, scar orientation, origin of scar, type of scar, scar preservation, tool marks, stem regrowth present, and sketches documenting the overall character and dominant features of each scar, as appropriate.
- Photographs will be taken including the entire tree showing the position of the scar, details of the scar, details of any tool marks, and the tree within its broader environmental context.
- A suitably qualified arborist (or equivalent) will be engaged to assess the age of the trees and their scars.

Table A3-3. Sites where scarred trees will be recorded.

Key Area	Site
Mine site	NB-3; Scar 3; SP-1; SP-2

Archaeological Collection / Excavations

The following general approach would apply to salvage excavations of Aboriginal archaeological sites:

- Salvage locations will depend on the outcomes of the test excavations, and would be decided based on the presence of archaeological features of interest (e.g. hearths, dense knapping layers), sites or objects with moderate or high archaeological or cultural significance (e.g. is rare in the local area or Northern Territory, or has the potential to answer research questions that can add to our understanding of pre- or post-contact Aboriginal land use and occupation of central Australia), and/or stratified deposits. Test pits where these features are present will be expanded into open area excavations within the impact area (that part of the Aboriginal archaeological site which will be impacted by the proposed works).

- Excavations will be undertaken by a team of qualified archaeologists and Traditional Owners.

- All excavation would be undertaken manually using shovels, mattocks, trowels, etc.

- Salvage excavations would be undertaken in contiguous 1 m^2 test pits and in 5 cm spits. Each test pit would be dug discretely with AHD heights being obtained every four spits to ensure vertical integrity. Each test pit would be given an alpha-numeric label for identification purposes. A standard site recording form will be used for each spit of each excavation unit. Details will include site name, date, site recorder, spit number and depth, square ID, description of finds, description of soil, sketch plan of excavation (if relevant to show feature) and a bucket tally. Excavations would continue until three consecutive culturally sterile spits are encountered. For Work Health & Safety purposes, excavations are unlikely to extend deeper than 1.5 m below the natural land surface regardless of findings.

- If depths of archaeological deposits are >75 cm it is possible that shoring (or increasing the size of the test pit to allow stepping) may be required.

- Salvage pits would be excavated to either geological units, until it proves unsafe to continue excavation, and/or the base of identified Aboriginal artefact bearing units, continuing below this depth to confirm the soils below are culturally sterile.

- All material from the salvage pits would be bucketed and sieved through 5 mm mesh sieve. Where the soil deposits prove to be fine materials and/or where Aboriginal objects prove to be small, and at the discretion of the excavation director, a 3 mm sieve may also be implemented.

- All Aboriginal objects and other archaeological material would be appropriately labelled and bagged for subsequent analysis.

- During, or immediately following, completion of the excavation, a range of soil and chronological samples would be taken. Soil and environmental samples would be taken at regular intervals through the soil profile (probably in the order of 2-5cm) and retained in labelled plastic bags for subsequent analysis. Radiocarbon and/or OSL samples would be taken in areas where Aboriginal objects are found, and generally try to bracket the deposit (to provide a maximum and minimum age). Material for radiocarbon analysis may also be undertaken opportunistically if archaeological features containing charcoal or other dateable material are evident.

- If discrete high-density artefact concentrations or cultural features, such as hearths, are revealed during the excavation, these will be excavated and recorded (by photography and planning). The locations of in situ artefacts in such features may also be individually recorded.

- Where the above methodology proves unfeasible or unsuitable, it may be revised at the discretion of the excavation director in consultation with the Proponent, Heritage Branch and Traditional Owners based on the specific circumstances of the archaeological site, timeframes and/or other issues.

Artefact Collection

The following general approach would apply to all artefact collection:

- Prior to construction, all sites of moderate and high scientific (archaeological) significance directly impacted by the project would be re-investigated by a heritage consultant and Traditional Owners.

- A sampling strategy for artefact collection would be developed in the field by the heritage consultant and Traditional Owners, based on the size of the site and area to be impacted by the Project.

- All Aboriginal objects would be bagged separately in zip-lock bags, and each tagged with a tyvek label with a unique identifier number. The number would be used to document the object location, attributes and provide context with other objects recovered.

- A record of all material collected from the surface would will be made, and should include coordinates (taken using a hand held GPS), a site plan or map, and appropriate photographs.

- This CHMP will be updated by the Environmental Manager to include the final location(s) of the collected artefacts.

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Table A3-5. Sites where artefact collection will be undertaken.

Key Area	Site
Access road and service corridor to the borefield	NP-19
Mine site	Site 10; Site 11; Site 15; Site 18; Site 12; Site 13; Site 1; Site 14; Site 5; Site 6; Site 7; Site 8; Site 3; Site 16; Site 17; Site 16; NB-2; NB-4
Processing site	NP-6

Fencing of Aboriginal archaeological sites

The following general approach would apply to fencing of Aboriginal archaeological sites:

- If proposed infrastructure is within 50m of an Aboriginal archaeological site, temporary fencing should be erected during the construction phase of the Project and sites appropriately signposted.
- A high proportion of sites are located in association with specific geological features such as outcrops of gneiss and basalt. Fencing should extend around these features. These features should be avoided, and proposed infrastructure set back from the base of steep ridges and lower gneiss foothills.
- Traditional Owners should be engaged in the process of developing and installing appropriate fencing and signage.
- Where there is uncertainty regarding the extent of an Aboriginal archaeological site, a qualified archaeologist should be involved in an inspection to identify any visible Aboriginal archaeological objects (usually stone artefacts) on the ground surface to guide installation of fencing.

Table A3-6. Sites where fencing will be installed.

Key Area	Site
Access road and service corridor between the processing site and the mine site	NP-10; NP-11; NP-32
Access road from the Stuart Highway	NP-28; NP-21; NP-26; NP-27; NP-29; NP-23
Accommodation village	NP-12
Mine site	Site 2
Processing site	NP-9

Archival photographic recording of potential historic site

The following general approach would apply to archival photographic recording of the potential historic site:

- Prior to construction, an archival record of the potential historic site that will be indirectly impacted by the proposed infrastructure would be prepared. Photographic recording would be undertaken in accordance with ICOMOS 1996, *Principles for the recording of monuments, groups of buildings and sites*.
- The photographic recording should include the landscape context of the site, and each building, structure or movable item within the site and their relationship to each other.

- An annotated plan of the site will be prepared showing each building, structure or movable item, and the position and direction of the camera for each image.

- A photographic catalogue describing each image will be prepared.

Table A3-7. Sites where photographic archival recording will be undertaken.

Key Area	Site
Processing site	Old Albies Bore and Yard

Management of Archaeological Material

Aboriginal archaeological objects

The mitigation works will result in the collection of Aboriginal archaeological objects. The following general approach would apply to artefact management:

- During the Project, all Aboriginal archaeological material would be stored with the heritage consultant for analysis and documentation. The material will remain in Northern Territory unless prior approval is granted under the Heritage Act (section 89);

- After the artefacts have been documented, the heritage consultant would return it to the Proponent for disposition in accordance with agreements following negotiations between the Proponent and Traditional Owners. Options for the disposition of material include:

- transfer of custodianship to Tradition Owners;

- return or reburial of artefacts within the Project area; or,

- in the event that the recovered artefacts are of particular significance or archaeological interest, negotiations may be undertaken with the Traditional Owners for deposition at an alternative location, such as a museum.

Historical artefacts

The mitigation works may result in the collection of historical artefactual material and the long term curation of this material needs to be ensured. This would in general require the proponent provide long-term storage.

The following general approach would apply to storage of historical artefacts:

- During the project, all historic archaeological material would be stored with the heritage consultant for analysis and documentation.

- Towards the end of the project, the heritage consultant would return the artefactual material to the Proponent for long-term storage on site.

- In the event that the recovered artefacts are of particular significance or interest, negotiations may be undertaken with an appropriate museum and/or historical body for their accession and display.

Appendix 4 – Procedure for submitting an Application to Carry Out Work on Heritage Place or Object

Procedure for submitting an Application to Carry Out Work on Heritage Place or Object

Purpose

This procedure details the process for submitting an Application to Carry Out Work on Heritage Place or Object (work approval application) to the Director of the Heritage Branch.

Scope

This procedure is applicable prior to all activities conducted by Project personnel that will have an impact on identified historic or Aboriginal cultural heritage items during the construction, operation and decommissioning phases of the Project.

Procedure – Submitting an Application to Carry Out Work on Heritage Place or Object

In the event that an identified heritage item will be impacted by the Project, the following steps shall be taken:

- The Environmental Manager will complete an Application to Carry Out Work on Heritage Place or Object for each site that is to be impacted. An single application form covering a group of comparable archaeological sites may be submitted; however, separate Work Approval applications should be prepared for all identified archaeological sites.
- If the proposed work involves disturbance of an archaeological site, the Environmental Manager will engage a qualified archaeologist to prepare a research plan for an appropriate recording and/or archaeological salvage program to be submitted with the work approval application.
- The research plan should incorporate the overarching methodologies provided in **Appendix 3** of the CHMP, as appropriate, and include:
  - the names and qualifications of key personnel who will be involved with the proposed works, and
  - the organisation(s) represented.
- When complete, the work approval application and supporting documentation should be sent to: The Director of the Heritage Branch, Department of Tourism and Culture, GPO Box 2520 DARWIN NT 0801.
- If requested, the Environmental Manager should provide the Heritage Branch with further information relevant to assessing the work approval application.
- Work should not commence in the vicinity of the heritage item until the Heritage Branch gives written approval.

The **Application to Carry Out Work on Heritage Place or Object** form approved for use under section 72 of the *Heritage Act 2011* is provided below.

Appendix 5 – Unexpected Finds Procedure – Historic and cultural heritage items

Unexpected Finds Procedure – Historic and cultural heritage items

Purpose

This procedure details the actions to be taken when an unexpected historic or Aboriginal cultural heritage item (site, place or object) is found during construction, operation or decommissioning activities. This information should be included in any heritage induction for Project personnel.

Scope

This procedure is applicable to all activities conducted by Project personnel that have the potential to uncover surface or sub-surface historic or Aboriginal cultural heritage items.

Unexpected finds do not include heritage items that have been previously identified during an archaeological assessment and are covered by a relevant approval.

Potential Types of Unexpected Finds

The following Aboriginal archaeological site features have previously been identified in the vicinity of the Project area: artefacts, quarries, scarred trees, grinding surfaces, reduction areas, rockshelter, habitation structure, engravings.

Potential historic heritage items are likely to be associated with pastoral activities in the Project area, including camp sites, fences etc.

Procedure – Historic and cultural heritage items

In the event that a potential heritage item is encountered during construction the following steps shall be taken:

- STOP ALL WORK in the vicinity of the find and immediately notify the Environmental Manager.
- The Environmental Manager will record the details of the find (a description of the item and its location), take photographs, and ensure that the area is adequately protected from further disturbance.
- The Environmental Manager will contact a suitably qualified cultural heritage consultant to conduct a preliminary assessment of the find and provide advice on how to proceed. A site inspection will be arranged, if required.
- If the find is identified as an historic or Aboriginal cultural heritage item, the Environmental Manager will notify the Heritage Branch in writing within 7 days.
- Further action such as heritage assessment, historical research, archaeological excavation and/or archival recording may be required before continuing work in the area, in accordance with any advice received from the Heritage Branch.

Contact details for regulatory bodies are provided in **Section 2.1** of the **Nolans Project Emergency Response Management Plan**.

Appendix 6 – Unexpected Finds Procedure – Suspected human remains (provided by the NT EPA on 16 November 2017)

NORTHERN TERRITORY

Protocol for reported finds of skeletal remains

In the case of any skeletal material suspected of being of human origin being brought to the notice of the Police as a result of:

- natural erosion or ground movement
- general earthworks including; mining, agricultural work and road building
- bones being handed to authorities
- archaeological exploration
- being simply located in a previously concealed situation

Where nothing of a suspicious nature is evident, and the material may be of Traditional Aboriginal origin, the **Police will:**

- Endeavour to ensure that the site or immediate area is not further disturbed until the attendance of experts
- Contact both the Aboriginal Areas Protection Authority (AAPA) and the Heritage Branch, and advise:
  - the location of the discovery (GPS)
  - features of the site
  - police in charge
  - any other relevant information – i.e. images

AAPA will:

- Advise if the location is within a sacred site, or a known burial ground, and provide authorisation to enter if it is a sacred site
- Advise if the Authority has any record of burials within that sacred site, or at the location in question
- Advise to the best of AAPA's knowledge who the relevant custodians are

The Heritage Branch will:

- Consult with custodians
- Assess the remains and decide on appropriate action in accordance with the *Heritage Act*,

seeking expert advice as necessary.

Where AAPA or the Heritage Branch are the first to be made aware of the existence of human skeletal remains they will advise the Officer in Charge of the nearest police station at the earliest opportunity.

CONTACT DETAILS:
Ben Scambary, CEO of AAPA: 0417 875624

Michael Wells, Director Heritage Branch: 0439 500480

Appendix 7 – Risk Matrix

An environmental risk assessment has been undertaken for the Project EIS using the risk matrix in **Table A6-1**. Risk assessment is based on (1) the likelihood of an impact occurring as a result of an event; and (2) the consequences of the impact if the event occurred. The descriptions of likelihood and consequence are detailed in **Table A6-2**.

Table A6-1. Risk Matrix.

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Medium	Medium

Description of Risk Rating.

Extreme	Intolerable - Risk reduction is mandatory wherever practicable. Residual risk can only be accepted if endorsed by senior management.
High	Intolerable or tolerable if managed to as low as reasonably practicable - Senior management accountability
Medium	Intolerable or tolerable if managed to as low as reasonably practicable - Management responsibility
Low	Tolerable - Maintain systematic controls and monitor

Table A6-2. Descriptions of Likelihood and Consequence.

Likelihood	Description
Almost Certain	The event is expected to occur in most circumstances. This event could occur at least once during a project of this nature. 91-100% chance of occurring during the project
Likely	The event will probably occur in most circumstances. This event could occur up to once during a project of this nature. 51-90% chance of occurring during the project
Possible	The event could occur but not expected. This event could occur up to once every 10 projects of this nature. 11-50% chance of occurring during the project
Unlikely	The event could occur but is improbable. This event could occur up to once every 10-100 projects of this nature. 1-10% chance of occurring during the project
Rare	The event may occur only in exceptional circumstances. This event is not expected to occur except under exceptional circumstances (up to once every 100 projects of this nature). Less than 1% chance of occurring during the project
Consequence	**Description**
Insignificant	Minor repairable damage to more common structures or sites. No disturbance of historic and/or cultural heritage sites.
Minor	Moderate or repairable damage or infringement to sensitive structures or sites of cultural significance or sacred value.
Moderate	Considerable damage or infringement to sensitive structures or sites of cultural significance or sacred value.

Major	Major damage or infringement to sensitive structures or sites of cultural significance or sacred value.
Catastrophic	Irreparable and permanent damage to sensitive structures or sites of cultural significance or sacred value.

Appendix 8 – Heritage Inspection Register

Heritage Inspection Register					
#	**Date**	**Time**	**Inspected By**	**Heritage Item**	**Description of Issue**
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					