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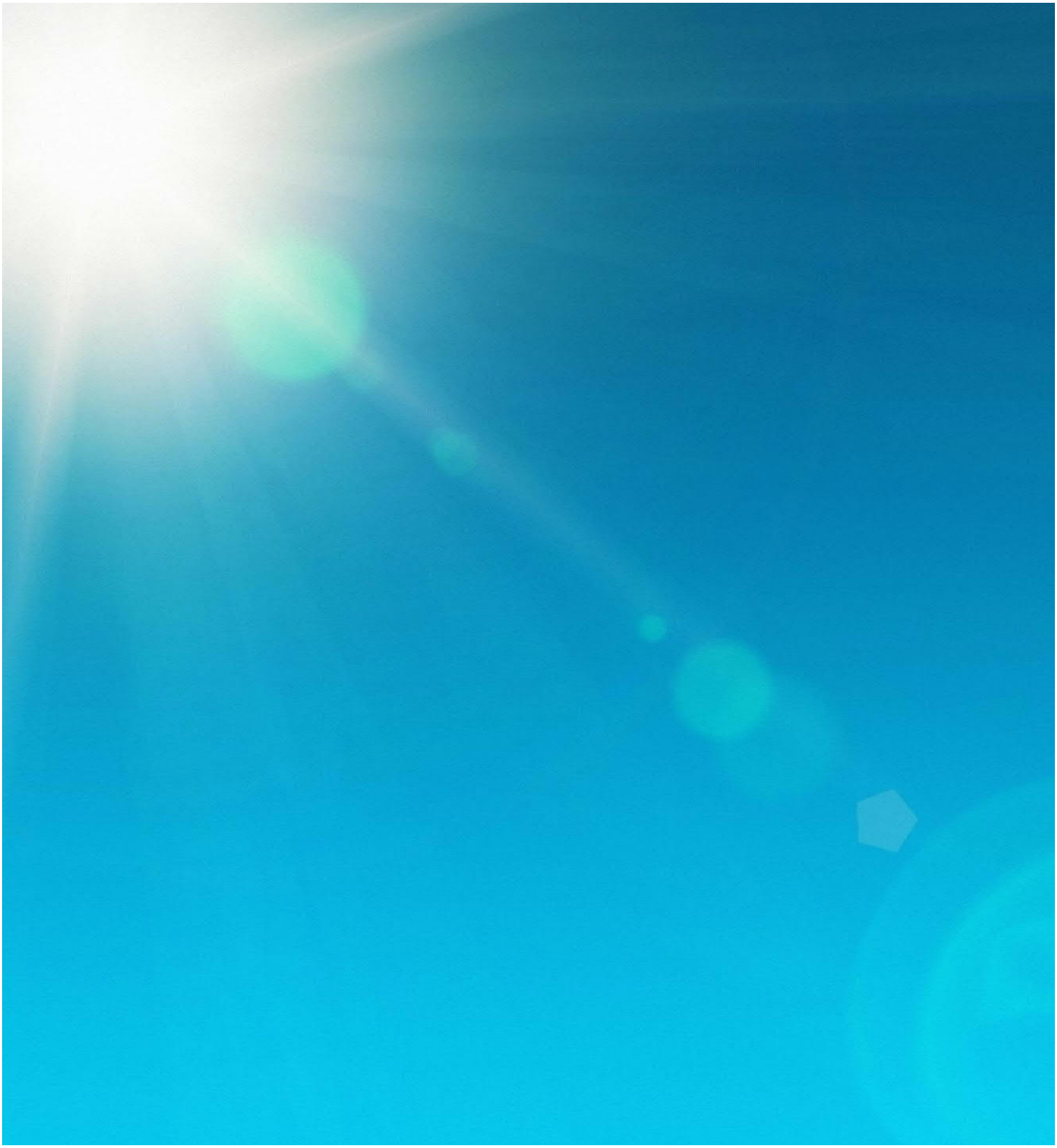
Chapter 14 – Culture and Heritage

Australia-Asia PowerLink Environmental Impact Statement



Chapter 14 – Culture and Heritage

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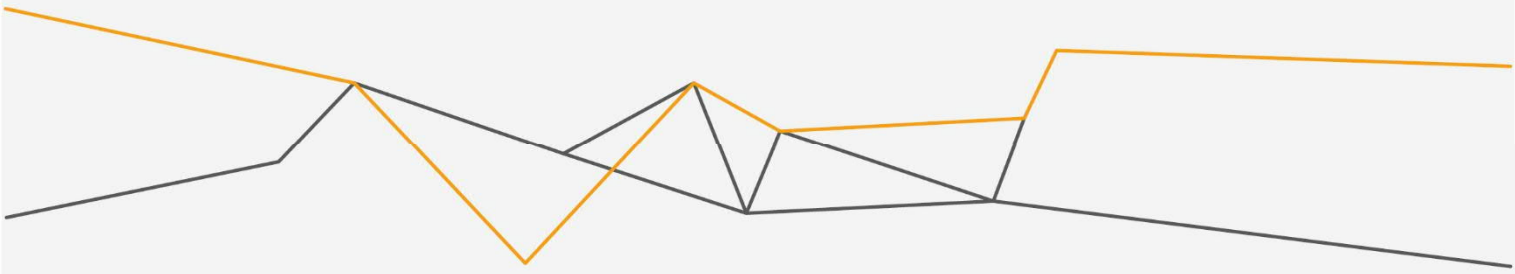

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The NT EPA's objective for the Culture and heritage factor is to:

> *"Protect sacred sites, culture and heritage."*

This chapter describes and assesses the significance of potential impacts to culture and heritage associated with the Australia-Asia PowerLink (AAPowerLink) proposal. The potential impacts to culture and heritage considered in this chapter were identified with reference to the EIS Terms of Reference (ToR) issued by the NT Environment Protection Authority (NT EPA) (Appendix A), issues raised by Traditional Owners, site custodians, and their representatives, and professional judgement of the EIS team (Appendix D) based on their knowledge and understanding of the AAPowerLink components and activities described in Chapter 2 Proposal Description. Potential impacts were then assessed using the Environmental Impact Assessment (EIA) methods described in Chapter 3 Impact Assessment. This chapter presents the findings of the EIA process undertaken for the Culture and heritage factor.

The aspects of culture and heritage addressed in this chapter are defined in Table 14-1 below. This chapter focuses on sites/places/objects of cultural and/or heritage significance. As a separate but related aspect, the potential social, cultural, and economic impacts and opportunities for Aboriginal people and communities associated with the AAPowerLink are discussed in Chapter 13 Community and Economy. Section 13.6 of that chapter assesses potential direct and indirect impacts to cultural identity, associated with reduced access to land and traditional livelihoods, damage to sites, threats to traditional leadership or dilution of shared values.

Table 14-1. Aspects addressed under culture and heritage factor

Aspect	Adopted definition
Aboriginal sacred sites	An Aboriginal Sacred Site as defined by the *Aboriginal Land Rights Act (Northern Territory) 1976* means a site that is sacred to Aboriginals or is otherwise of significance according to Aboriginal tradition, and includes any land that, under a law of the Northern Territory, is declared to be sacred to Aboriginals or of significance according to Aboriginal tradition. Aboriginal sacred sites are protected under the *Aboriginal Sacred Sites Act 1989.*
Aboriginal archaeological places	An Aboriginal archaeological place as defined by the *Heritage Act 2011* is a place that relates to the past human occupation of the Territory by Aboriginal people; and has been modified by the activities of those people.
Aboriginal archaeological objects (artefacts)	An Aboriginal archaeological object as defined by the *Heritage Act 2011* is a relic that relates to the past human occupation of the Territory by Aboriginal people; and is in an Aboriginal archaeological place; or stored in a place in accordance with Aboriginal tradition, for example in an Aboriginal keeping place.
Declared heritage places or objects	A non-Aboriginal place declared to be a heritage place under Part 2.1 or 2.2 of the *Heritage Act 2011* following assessment of significance by the Heritage Council.
Cultural landscape features	Landscape features, such as creeks, waterholes, swamps, trees, that have cultural importance to Aboriginal people but may not be defined by Sacred Sites or as an archaeological place. These features were identified by Cultural Managers (monitors) who participated in the field surveys.
Historic Place	A historic place means any land or building or feature that forms part of the historical and cultural heritage of the Northern Territory. Historic places as exemplified by the *Heritage Act 2011*, may include but limited to, historical features or buildings, or parts of a buildings, the site of a shipwreck or aircraft crash, World War II infrastructure and fortifications, places and objects associated with the Australian Overland Telegraph Line and certain railway features.

Aspect	Adopted definition
Contact sites & features	Places or objects of primarily Aboriginal cultural origin that include 'modern' materials to manufacture flaked artefacts. Sites that include foreign materials, such as glass, ceramics or metal that exhibit modification by Aboriginal people are regarded as contact sites

14.1 Information sources

The key information sources used to prepare this chapter are the AAPowerLink Heritage Impact Assessment (HIA) Reports (Earthsea, 2022a, b, c) (Appendix V, Appendix W, Appendix X) and the AAPowerLink Social Impact Assessment (SIA) (TrueNorth, 2022) (Appendix I). These sources describe knowledge shared by Traditional Owners, site custodians or their representatives, Native Title Holders and other community members during field surveys, site visits, meetings and/or interviews. They also report the findings of field surveys undertaken, under the guidance of Aboriginal representatives to identify archaeological resources and areas of cultural heritage significance within the AAPowerLink footprint.

The HIA accessed a range of information sources to identify and assess sites of significance, including:

- Cultural knowledge shared by Aboriginal people
- NT Heritage Register Database
- NT Archaeological Site Database
- Aboriginal Sacred Sites Register (NT)
- National Heritage Database (Commonwealth)
- Commonwealth Heritage List
- Native Title Register
- Published literature pertaining to the ethnographic, archaeological, and historic background of the areas of interest, and heritage studies.
- Unpublished industry consulting reports pertaining to cultural heritage and archaeological assessments previously undertaken within or proximal to the areas of interest or within comparable land systems.

The HIA Reports appended to the EIS are public versions that do not contain location details or maps of recorded sites. These details are kept confidential to avoid inadvertent impacts to sites from unauthorised public access. Sun Cable will use the information collated in the Confidential versions of the HIA Reports for the express purpose of ensuring the AAPowerLink is designed, constructed, and operated in a manner that minimises impacts to sites of significance, and there are no unacceptable impacts to cultural or heritage values.

The SIA drew on records of consultation with Aboriginal people undertaken by the NLC and Sun Cable's Aboriginal Affairs team with families and individuals, as well as the consultation undertaken as part of the HIA described above.

14.2 Relevant policies and guidelines

The EIA for the Culture and Heritage factor references the following legislation, policies, and guidelines:

Aboriginal Land Rights (Northern Territory) Act 1976 (ALRA)

The ALRA mandated the formation of Land Councils to act in the interests of NT Aboriginal people in the areas of land, access to lands, employment, and the development of businesses. The AAPowerLink is in the area predominantly represented by the Northern Land Council (NLC), with a short segment of the OHTL in the area

represented by Central Land Council (CLC). The NLC was engaged in relation to the AAPowerLink HIA and SIA and assisted with identifying Aboriginal representatives to accompany and advise the field survey teams for surveys on Native Title lands and lands not subject to Native Title. Sun Cable will continue to engage with the NLC and CLC in relation to the establishment of agreements for development on land where Native Title exists (see below), the economic interests of Aboriginal people and protecting sites of cultural significance.

Native Title Act 1993 (NTA)

The NTA gives Indigenous Australians who hold native title rights and interests (including native title claims) the right to access and use traditional lands, be consulted and, in some cases, to participate in decisions about activities proposed to be undertaken on Native Title lands. Native Title exists within the AAPowerLink proposal footprint at the Solar Precinct and in sections along the OHTL within the Railway Corridor. No Native Title currently exists within the OHTL that is proposed within the NTG Utilities Corridor, Darwin Converter Site or Cable Transition Facilities. Where Native Title exists, Sun Cable is consulting with the NLC and other Native Title Representative Groups to establish Indigenous Land Use Agreements (ILUA) in relation to the AAPowerLink.

Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The Act is intended as a last resort defence for significant sites, meaning that the Act is meant to provide emergency protection for Aboriginal and Torres Strait Islander heritage sites when all other avenues have been exhausted. To the knowledge of Sun Cable, there are no known applications under this Act for any areas or features within the AAPowerLink proposal footprint.

Underwater Cultural Heritage Act 2018

This Act provides the protection of Australia's shipwrecks, sunken aircraft and other types of underwater cultural heritage including Australia's Aboriginal and Torres Strait Islander Underwater Cultural Heritage in Commonwealth waters. The Subsea Cable System traverses Commonwealth waters through the extent of the Australian Exclusive Economic Zone (AEEZ) up to the outer limit of the Commonwealth marine area. Whilst the HIA desktop study did not identify any underwater cultural heritage features within the areas of interest, some areas traversed by the Subsea Cable System have the potential to contain unidentified features which are protected by the *Underwater Cultural Heritage Act*. Sun Cable is committed to developing a Maritime Cultural Heritage Management Plan (CHMP) to manage any inadvertent discoveries encountered during the construction of the Subsea Cable System.

Aboriginal Sacred Sites Act 1989

The stated purpose of the Northern Territory *Aboriginal Sacred Sites Act* is to '*effect a practical balance between the recognised need to preserve and enhance Aboriginal cultural tradition in relation to certain land in the Territory and the aspirations of the Aboriginal and all other peoples of the Territory for their economic, cultural and social advancement.*' The Act protects sites that are 'sacred and otherwise of significance in the Aboriginal Tradition', whether the location of the sites is known or not by any person or company seeking to do work on lands.

The Act is administered by the Aboriginal Areas Protection Authority (AAPA), who following an application from a development proponent for an Authority Certificate have the responsibility for engaging with Traditional Owners and site custodians to conduct Sacred Site avoidance surveys. Sun Cable has applied to AAPA for Authority Certificates across the AAPowerLink proposal footprint and these will be used as the primary tool for ensuring protection of Sacred Sites.

Heritage Act 2011

The *Heritage Act* protects heritage places and objects using a community-based nomination and declaration system. The Act also provides a 'blanket' or 'presumptive' protection for Aboriginal and Macassan

archaeological places and objects, with other features (such as historic and WWII heritage features) declared as heritage places following an assessment of significance by the Heritage Council. The Act provides penalties for accidental or deliberate damage to sites, whether they are known sites or otherwise.

The HIA surveys have identified declared heritage places and Aboriginal archaeological sites within the AAPowerLink proposal footprint. Sun Cable has committed to working with Traditional Owners, site custodians and their representatives to develop a Cultural Heritage Management Plan (CHMP) that will prescribe the site protection and management measures required for each site. The *Heritage Act* includes provisions for making an *Application to Carry Out Work on a Heritage Place or Object* where impacts cannot be avoided, and it is anticipated that Sun Cable will need to make applications in relation to several sites.

Heritage best-practice guidelines

In addition to statutory law, several guidelines have been developed to support the protection and management of Indigenous heritage places on Commonwealth land. These include but are not limited to:

- *Ask First, A guide to respecting Indigenous heritage places and values (Australian Heritage Commission 2002)*
- *Engage Early Guidance for proponents on best practice Indigenous engagement for environmental assessments under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (2016)*
- *Practice Notes for the Australian ICOMOS Burra Charter 2013 (hereafter referred to as the "Burra Charter").*

The cultural heritage values of sites and objects recorded during the AAPowerLink surveys followed key Indigenous heritage management and significance assessment principles from the *Burra Charter*.

14.3 Existing environment and values

The sections below summarise the cultural and historical context that informed the assessment of impacts to culture and heritage undertaken in the HIA and SIA and provide details of sites of cultural and heritage sites recorded in the AAPowerLink proposal footprint and surrounding areas.

14.3.1 Cultural context

The AAPowerLink proposal footprint lies across the traditional lands of many Aboriginal groups. The sections below summarise current knowledge and understanding of Aboriginal rights, traditional use and contemporary interests and use of the land. There is still extensive consultation to be done with Aboriginal people to establish the agreements needed for the AAPowerLink to proceed, and additional information is likely to come from these consultations that will inform AAPowerLink planning and operations. There is evidence of traditional use of the land by Aboriginal people across the AAPowerLink footprint, in the form of Aboriginal archaeological sites and objects, and details of these are provided in Section 14.3.3 below. Further ethnographic background information is provided in the HIA reports (see Section 3 of Appendix V and Section 4 of Appendix W).

Aboriginal occupation of Central Australia

Aboriginal occupation of Central Australia is dated to at least 35,000 before present (BP), through age determinations obtained at Puritjarra Rock Shelter in the Cleland Hills, 700 km south-west of the Solar Precinct Project Area (Smith et al. 2017) and Kulpi Mara Rock Shelter (Thorley et al. 2011) located 165 km to the east of Puritjarra. Evidence from other archaeological sites in the wider central Australian region suggest Aboriginal groups in the Pleistocene were generally small and highly mobile, using wider territories than used in the Holocene (O'Connor et al., 1998, p. 21; Smith, 1989, Smith et al., 1998; Thorley, 1998, p. 316).

Hiscock and Wallis (2005, p. 35) suggest this phase of colonisation of Central Australia most likely coincides with a period of higher rainfall, resulting in better surface water and greater abundance of resources. This notion is supported by Bowler (et al. 1998, p.205) who suggests Lake Woods was up to 10 times its current size during the same period, which would have meant it covered the proposed AAPowerLink Solar Precinct site. Horton (1981) and Bird et al. (2016) proposed that paleo-drainage systems, comparable to those feeding into Lake Woods, may have acted as critical corridors allowing people to move into drying parts of Australia in the pre-Last Glacial Maximum (LGM) period. To date no Pleistocene occupational areas have been recorded in the surrounding region; however, some potential has been noted at Lake Woods (Bowler et al. 1998, Shipton et al. 2021 and Smith 1986).

During the mid-to late Holocene period of increased occupational activity (5,000-3,000 years), hafted tools such as tula adzes and backed blades, along with a seed grinding economy appeared to develop in Central Australia (Smith 1986). According to Flood (1990, p. 57), more than 70 of the 140 known plant food species in Central Australia were exploited for seeds. Although a time intensive method of gaining food, the exploitation of seeds in this way is far more reliable than hunting game or gathering other plant foods. Studies at Lake Woods indicate a significant seed grind economy also existed, with grindstones being very common throughout most sites recorded (Shipton et al. 2021, p. 176). Ethnographic accounts indicate the importance of grass seed procurement and processing also existed at the time of European contact, and accounts by Ashwin (1927, p. 64 see also Shipton et al. 2021, p. 176) during his visits to Newcastle Waters, 40 km north of the Solar Precinct, noted the abundance of native grass seed production.

Powell Creek Area

The proposed Powell Creek Station Solar Precinct site is on Country held under Native Title by six estate groups on the Powell Creek Pastoral Lease (National Native Title Tribunal Number: DCD2020/007), as determined by the Federal Court on 28 October 2020. Native title rights extend to possession, occupation, use and enjoyment to the exclusion of all others, including the right to access and take for any purpose the resources of those areas. Sun Cable acknowledges these rights and is in the process of negotiating ILUAs for the AAPowerLink with the Native Title holders through the NLC.

The NLC nominated five representative site custodians for the AAPowerLink heritage impact assessment, and they shared knowledge about contemporary and traditional use of the survey areas and identified sites of significance. The HIA states that the Country should be considered a significant cultural landscape, given its spiritual importance to site custodians and other Aboriginal people who have had a long history with the region. Aboriginal people continue to access Powell Creek Station for hunting and fishing, particularly in the Lake Woods Conservation Area to the north-east of the proposed Solar Precinct.

Comparable to much of arid Australia, water resources within Powell Creek Station have traditionally played a significant role in shaping cultural and subsistence practices for the estate groups from the area. Permanent or large water resources such as Lake Woods were visited seasonally for ceremony, resources, and trading by Warlmanpa, Mudburra, Jingili and other estate groups (Site custodian pers comm. 2021). Conversely, the ephemeral nature of water resources across the Solar Precinct, would have been considered a high-risk environment to traverse outside heavy rainfall events (Site custodian pers. comm. 2021), and people only visited out of necessity to travel from west to east (and vice versa). There are number of dry claypans, and drainage depressions known as *ngulya*, which would hold water for various periods of times following heavy rainfall events, and subsurface water was traditionally recovered from these areas by digging the low points of the drainage depressions with a *kapirli* (digging stick). As noted elsewhere, these types of remote ephemeral water sources were also prioritised for foraging following rainfall events, before groups would settle closer to more permanent water resources (Gould 1969, in Bird et al. 2016, p. 11477).

The closest permanent water resources are located 26 km to the northeast of the Solar Precinct Project Footprint, at Powell Creek Telegraph Station, referred to by site custodians as Pamayu. The permanency of water at Pamayu was well known by Aboriginal people, which attracted a number of neighbouring estate groups during times of drought and displacement following colonisation. Powell Creek Telegraph Station also

acted as ration depot to sustain the increased numbers of Aboriginal people displaced from the wider areas. It is unknown how many people Traditionally utilised or sought refuge at Pamayu, however it is suggested that while permanent wells and water sources were refuges during drought that enabled people to continue living in an area, they may soon exhaust the food supplies in the vicinity of the water (Macfarlane and McConnell 2017).

Overhead Transmission Line (OHTL)

The proposed OHTL passes through a large number of Aboriginal language group areas between the Solar Precinct and Livingstone, with the identification of Traditional Owners, and site custodians, and consultation being guided by the NLC. This work remains ongoing and will support the upcoming OHTL heritage impact assessments which are proposed for early to mid-2022.

Traditional culture and economy changed for many nations along the OHTL route according to the increased rainfall and permanent water access for the more northerly groups. The Kungarakany around the Adelaide and Finniss River for example, had greater access to food resources, near constant fresh water, a higher population and smaller estate areas than the arid zone estate groups. This factor is reflected in the archaeological record, the ethnographic accounts, and the post contact histories of each language group.

While native title determinations and native title determination applications (under the *Native Title Act 1993* (Cth)) and Aboriginal land (under the *Aboriginal Land Rights (Northern Territory) Act 1976* (Cth)) currently only affect those sections of the rail corridor (and proposed OHTL route) presented in Table 14-2 below, it is acknowledged that native title rights and interests continue in relation to most of the proposed OHTL route and Sun Cable recognises that the OHTL traverses the traditional lands of Aboriginal people.

The OHTL also traverses through the Black Jungle Conservation Reserve between KP[1] 752.5 and 755 km. This section of the OHTL will impact on lands managed under the Black Jungle /Lambells Lagoon Conservation Reserve ILUA. Under the ILUA, the parties (i.e., Northern Land Council, the Northern Territory of Australia, and the Native Title Parties) consent to the execution of a joint management agreement for the Black Jungle /Lambells Lagoon Conservation Reserve.

It is noted that the *Heritage Act 2011* and *Aboriginal Sacred Sites Act 1989* apply to all lands in the Northern Territory irrespective of land tenure.

Table 14-2. Native Title Determinations and ALRA land traversed by proposed OHTL corridor

Short Name	Case/Application Name or Parcel Number	Legal Process or Tenure Status	Determination Date or Date Extracted	Outcome	Approx. KP
Karlantijpa North Aboriginal Land Trust	NT Portion 2845	Freehold (Aboriginal Land (Scheduled under ALRA))	16/09/2019	NA	86 to 104 km
Murranji Aboriginal Land Trust	NT Portion 3637	Freehold (Aboriginal Land (Scheduled under ALRA))	16/09/2019	NA	140 to 167.4 km
Buchanan Downs Pastoral Lease	Dixon on behalf of the Narrwan, Ngayirrirni and Kinbininggu Estate Groups v	Consent	29/10/2020	Native title exists in parts of the	167.4 to 192.4 km

[1] KP = Kilometre point, and represents kilometres along the Overhead Transmission Line, with 0 at the Solar Precinct and the end (~788) at the Darwin Converter Site at Murrumujuk.

Short Name	Case/Application Name or Parcel Number	Legal Process or Tenure Status	Determination Date or Date Extracted	Outcome	Approx. KP
	Northern Territory of Australia			determination area.	
Hidden Valley Pastoral Lease	Dixon on behalf of the Narrwan and Badpa Estate Groups v Northern Territory of Australia	Consent	29/10/2020	Native title exists in parts of the determination area.	192.4 to 233 km
Town of Katherine #2	Joshua Hunter & Ors on behalf of the Wubojgun-Jurugin-Wungayajawun, Jorrolam, Gayn-Jalarr, Wungayajawun-Wumelemellewun, Dumditja and Jambalawa Groups v Northern Territory of Australia	Registered Application	16/11/2018	NA	465 to 466.6 km and 473.2 to 475.5
Pine Creek Township	Coleman on behalf of the Wagiman and Jawoyn Bolmo, Matjba and Wurrkbarbar Groups v Northern Territory of Australia	Consent	09/04/2019	Native title exists in parts of the determination area	544.2 to 546.5 km
Mary River West	Daphne Huddleston & Ors obo The Wagiman, Warai & Jawoyn Peoples (Mary River West) v Northern Territory of Australia & Ors	Registered Application	01/03/2001	NA	546.5 to 578.8 km
Finniss River Aboriginal Land Trust	NT Portion 4036	(Aboriginal Land (Scheduled under ALRA))	16/09/2019	NA	666.1 to 670 km and 671.4 to 676.4 km
Finniss River Aboriginal Land Trust	Section 198	(Aboriginal Land (Scheduled under ALRA))	16/09/2019	NA	688.4 to 689.1 km

Wulna

The Wulna people of the Adelaide River floodplains maintain traditional connections to land traversed by some northern and western parts of the OHTL (Utilities Corridor) for hunting and gathering, ceremonial and recreational uses (Site custodian pers. comm. 2022).

Larrakia

The land where the AAPowerLink Darwin Converter Site and Cable Transition Facilities and OHTL (Utilities Corridor) are proposed to be located is the traditional land of the Larrakia people. Larrakia people have strong connections across their country through maintaining Dreamings, sacred and archaeological sites knowledge, engaging in cultural activities, and land and water management through the Larrakia Ranger program. The area around Murrumujuk is an important cultural and recreational area for Larrakia people (Larrakia Development Corporation pers. comm. 22/07/2021), with Larrakia Rangers also providing land management programs across the region in the past. There are aspirations to be involved in similar land management works in the future (Larrakia Rangers pers. comm. 9/09/2021).

Traditionally, the Larrakia people have occupied and used the lands surrounding Darwin since pre-European contact. Parkhouse, the paymaster of South Australian railways at Port Darwin for some years, wrote “The territory of the Larrakia, in which Port Darwin is situated, embraces the seaboard from Shoal Bay to Southport, and extends inland to the forty-sixth mile on the railway line” (Parkhouse 1895:638). He noted that the Larrakia

were closely allied and intermarried with the Wulna people occupying the territory to the east and west of Adelaide River. Similarly, Goyder in the 1860s recognised that his surveys through the same areas transected the traditional lands of the Larrakia and Wulna (Woolna) people. The ethnographic and historical accounts reveal a rich material culture and ceremonial life practiced by the Larrakia and neighbouring groups (Basedow 1907; 1925, pp. 248-382; Foelsche 1882, pp. 4-7; 1886, p. 255; Parkhouse 1895).

Two Larrakia representatives were involved in the AAPowerLink HIA surveys (see Section 14.3.3.2 below). The representatives were nominated by Larrakia Nation Aboriginal Corporation (Larrakia Rangers). Both Larrakia representatives also identified as having shared descendance with Wulna people.

Jampalampi Tiwi

The Tiwi people maintain important customary ties to country at Murrumujuk and many Tiwi families, particularly those living in the Greater Darwin Area, continue to use the Gunn Point Peninsula for hunting and recreational purposes. Traditionally, Tiwi People travelled between Gunn Point Peninsula and the Tiwi Islands via the Vernon Islands on canoes (Site custodian, personal communication, 2021). The Tree Point (Durduga) Community have freehold tenure, located approximately 5 km southwest of the Darwin Converter Site. The Tiwi also have many, burial places and resource areas which extend along Gunn Point Peninsula (Site custodian, pers. comm. 2021; Calnan, 2006). Many of these Tiwi burials are considered important ceremonial sites where families traditionally gathered to perform *pukumani* or mortuary ceremonies. At some sites, hand-carved ironwood mortuary poles known in Tiwi language as *tutini* still remain.

Two Tiwi representatives were involved in the AAPowerLink HIA surveys. The representatives were nominated by the Tiwi Land Council in consultation with custodians.

14.3.2 Historical context

Historic objects and places associated with the Overland Telegraph Line, North Australian Railway, historic mining, and WWII, are present in the AAPowerLink footprint and surrounding areas. The sections below provide a summary of European settlement and history for the Barkly, Katherine, Pine Creek and Darwin regions as context for the assessment of non-Aboriginal heritage values within and surrounding the AAPowerLink footprint. This history is also intrinsically linked with recent Aboriginal history through the displacement, dispossession, exploitation, and violence that was subjected to Aboriginal people since first contact (Moses 2004). Trauma caused by colonial impacts, including the loss of culture and land is intergenerational and continues to impact individuals, families, and communities (McCallum 2021).

Additional detail is available in the HIA Reports at (see Section 3 of Appendix V and Section 4 of Appendix W).

Macassan contact in the Darwin Region

The Macassans were traders and fishers from the now Indonesian island of Sulawesi who carried on a trepang (sea slug) fishing and curing industry along the coasts of north Australia from the 18th century (MacKnight 1976). The industry start date is still academically disputed, with time frames as early as 1650 possible. Casual visits earlier are also possible, given that the dingo arrived on Australian shores approximately 4,000 years ago. The trepang industry was likely underway by 1754 with more than 1,000 Macassans in over 50 praus visiting the coast during the northern wet season (Powell 2009, p. 29). In 1803 Matthew Flinders recorded contact with the Macassan leader Pobasso who led 60 praus and 1,000 Macassans to the coast yearly over for at least twenty years. The Macassans stayed until the early dry season, building villages and trepang processing sites. There are around 150 loan words from the Macassans in Aboriginal languages in Arnhem Land, including ‘Balanda ‘meaning white person and ’rupeea’ meaning money (Powell 2009, p. 29). There is evidence that the Macassans visited Darwin Harbour and had contact with the Larrakia and Tiwi long before the coming of European settlement in 1824 (Powell 2010, p. 6).

Early European contact with north coast of Australia

Early European maritime exploration included voyages by the Dutch, who from 1606 to 1705 made contact with Aboriginal people from Cape York to Arnhem Land and possibly the Western Australia coastline down to Carnarvon. The early Dutch explorations were often disastrous, with massacres of both seaman and Aboriginal people common (Powell 2009, p. 27).

The British came to northern Australia starting in 1688 with William Dampier then followed more than a century later by Matthew Flinders. Flinders mapped much of the north coast of Australia but missed Darwin Harbour due to issues with his ship's hull. Flinders was followed by King (1817-1822) who explored much of the remaining coastline of Arnhem Land, the Tiwi Islands, and the Kimberley. King did not see Port Darwin but did transit Gunn Point and noted an opening to the south that could have been a large bay (Powell 2009, p. 27, Hordern 1997). King was followed by John Lort Stokes in the Beagle, made famous by Charles Darwin's presence during exploration of South America. In 1839, Stokes rounded Gunn Point and explored Hope Inlet before heading into a large harbour, which he named Port Darwin after his former ship mate (Powell 2009, p. 36). Stoke's comments on the suitability of Port Darwin for a settlement were ignored until 1869.

Early Land Exploration of NT

The first non-Aboriginal person to successfully transit the Northern Territory from south to north was John McDouall Stuart who reached the Chambers Bay on the coast east of Port Darwin on 24 July 1862. Stuart's 1861 and 1862 expeditions traversed parts of the AAPowerLink footprint on their route north. On 1 May 1861 Stuart's party camped at Hunter Creek, which is located approximately 5 km southeast of the Solar Precinct. Stuart notes that the bank of the creek is 'beautifully grassed'; however, with a 1 mile (1.6 km) the country changes to spinifex scrub with sandy soils. Stuart suggests his party traversed these surrounding desert areas for 9 miles (14.4 km), not finding a creek or any indication of one. The location descriptions noted in Stuart's diary are consistent with those observed within the Solar Precinct.

During the 1861 expedition, Stuart's party on return also camped close to the proposed Solar Precinct site at several watercourses and subsequently named them Burke Creek, Gleeson Creek and Powell Creek, noting their abundance of water. Similarly, Stuart's 1862 expedition traversed near the Solar Precinct, with the party camping at Gleeson Creek on 3 April 1862. The expedition passed to the west of the Powell Creek water holes on 3 or 4 of April 1862 before making a more permanent camp at Newcastle Waters on 5 April (McDouall Stuart 1865). On return in September 1862, they highlighted the absence of water in Powell Creek, Gleeson Creek and other watercourses but found some pools in the Hunter Creek.

Although Stuart tried to avoid confrontation with Aboriginal groups, some level of contact was inevitable as the explorers used the same water holes as Aboriginal people (McLaren 1996, p. 250). The result of Stuart's expedition was the opening up of Central Australia and the Tennant Creek region to future pastoralism, mining, and communications infrastructure. The establishment of pastoralism inevitably led to clashes with Aboriginal people over land and resources to the detriment of the traditional lifeways in the region. This observation was made by representative site custodians on the AAPowerLink HIA surveys who shared their knowledge about people being displaced from the region and congregating at the Powell Creek Telegraph Station as described below.

Settlement of Port Darwin - 1869

A party led by South Australian Surveyor General George Goyder arrived in Port Darwin aboard the Moonta on 5 February 1869. Goyder's original camp was placed between Fort Hill and the escarpment of modern Darwin, which is located approximately 30 km southwest of the AAPowerLink Darwin Converter Site. Goyder's teams then went on to survey Virginia, a village between Coolalinga and modern Palmerston, then Southport (now abandoned) located 13 km southwest of the AAPowerLink OHTL corridor (KP 722).

Overland Telegraph Line - 1870

Construction of the Overland Telegraph Line (OTL) began in Darwin in 1870 and the line was operational by October 1872. There is a 2 km section of the Overland Telegraph Line route within the AAPowerLink OHTL corridor (from approximately KP 722.1 to 724.3); however, as the telegraph poles have been highly sought by Territory locals as a source of building material, there are very few extant poles left, and there are no materials remaining in the AAPowerLink OHTL corridor. Several Telegraph Stations remain in the Territory, one of which is the Powell Creek Telegraph Station (a declared heritage site) located 26 km north-east from the Solar Precinct.

An Aboriginal ration depot was established at the Powell Creek Telegraph Station site between 1889 and 1912, funded by the South Australian then Commonwealth Governments (SA Protector of Aborigines 1912, p. 5). A Mr J.R.B. Love reported for the Presbyterian Church in 1913 that the Telegraph Station staff were issuing rations to Aboriginal people at the Tennant Creek, Powell Creek and Daly Waters Stations (Love 1915, p. 37). Love also reports that in a good year it is not unusual to find 10-20 Aboriginal people camped at the Telegraph Stations and in a drought year between 100 and 200 people.

During the AAPowerLink HIA surveys, a senior representative site custodian reported that the Powell Creek Telegraph Station acted as refugee camp for people displaced from mining, pastoralism and conflict in Tanami Desert and surrounding areas. It is suggested that people were drawn to Powell Creek due to the several large spring fed waterholes that never ran dry and the ration depot. He also stated that there were several sacred sites nearby where ceremony continued in living memory, including those he had participated in the 1940s or early 1950s. The archaeological results also support this, with a number of large artefact scatters, contact artefacts and hearths surrounding the Station (see Section 6 of Appendix V for details)[2].

Mining - 1872

No historic places or objects associated with past mining activities have been identified in the parts of the AAPowerLink footprint surveyed to date; however, it is possible that these features will be present in sections of the OHTL in the Railway Corridor that are yet to be surveyed, especially through the Katherine to Adelaide River sections.

Intensive mining activity in the Territory commenced in 1872, when there was a gold rush at Yam Creek near Pine Creek. In 1889, new gold discoveries were made at Mt Todd, approximately 40 km to the north of Katherine. This was followed by the discovery of tungsten (Wolfram Hill), tin and copper in the same area (Jones 1997, p. 143). Mining has been a major economic feature of the Top End since the 1872 gold rush, and nearby areas with recurring boom and bust cycles based on transport costs and events far from Darwin and the source of the gold around Pine Creek (Powell 2009). Mining in the Pine Creek-Mt Todd area was one of the primary drivers of building the North Australia Railway.

In 1906 gold was discovered at the Granites in the Tanami Desert. This brought a mini gold rush to the region, with around 500 prospectors heading out into the Tanami. By the 1920s, periods of drought and competition for water resources brought on by the destruction of water holes and wells by cattle led to escalating tensions and violence between Europeans and Aboriginal people in the Tanami. This tension resulted in largescale Government sanctioned massacres in the late 1920s (Elder 1988, p. 141), which also saw the movement of some displaced Aboriginal people into the Powell Creek area from the Tanami Desert (Site custodian pers. comms.). Areas around Tennant Creek have been associated with gold prospecting and mining since the 1930s. Despite the success of the Tennant Creek fields, official records of early gold exploration in the Powell Creek area are sparse.

[2] Details of the heritage values associated with the Powell Creek Telegraph Station are provided in the HIA (Appendix V) but are not repeated in this chapter as the site is located 26 km away from the Solar Precinct and will not be disturbed by the AAPowerLink activities.

North Australia Railway - 1883

There are objects and places in the AAPowerLink footprint that are remnants of the North Australia Railway as detailed in Section 14.3.4.1 below.

The South Australian Government planned to build a transcontinental railway linking Adelaide and Port Augusta with Port Darwin. In 1883, the SA Government authorised the construction of the first Top End section from Darwin to Pine Creek (Powell 2009, p. 74), which includes the proposed AAPowerLink OHTL corridor from KP 722.1 to 724.3. This section was completed by Chinese and Indian labour in 1889. The North Australia Railway was closed on 30 June 1976, following the loss of iron ore freight from Frances Creek due to damage to the Iron Ore Wharf by Cyclone Tracy in 1974. The remaining railway yards were demolished during the 1980s.

World War II History 1924-1941

There are objects and places in the AAPowerLink footprint that are remnants of the WWII era as detailed in Section 14.3.4.1 below.

Between 1935 and 1938, mobilisation of military forces to Darwin accelerated. Plans were made to construct permanent facilities for battalion sized units at Adelaide River and Batchelor to protect airfields there and support Darwin in the event of a Japanese attack. When war came on 7 December 1941, Darwin was already a major military base, with forces thought capable of defending the Top End from Japanese attack. The initial Japanese air raid on Darwin commenced at 09:58 on 19 February 1942. Alford (2011) research indicates that the initial attacks destroyed fighter aircraft and attacked and sunk ships in Darwin Harbour. The RAAF Station, the Darwin township and the Stokes Hill Jetty were also bombed.

The attack by the Japanese on Darwin in February 1942 had a profound effect on the lives of people living in the Northern Territory. Along the main axis of supply, the Stuart 'Highway' and the track that is now called the Barkly Highway, Allied transport services moved hundreds of thousands of troops and millions of tons of supplies from southern ports to Port Darwin, a major steppingstone into Southeast Asia. Darwin and the Top End hosted squadrons from the US Army Air Force, the Royal Airforce and the Royal Australian Airforce flying out of over 40 airfields supporting operations into the Southwest Pacific Theatre (Netherlands, East Indies, Papua, and New Guinea, Rabaul, Timor and the Philippines).

World War II also impacted upon the Powell Creek area, primarily through the development of a strategic road network to link the existing road between Alice Springs and Tennant Creek with the North Australian Rail head at Birdum. In 1940, the engineers and workers of the South Australian Highway Board, the Queensland Main Roads Commission and the NSW Department of Main Roads built 490 km of gravel road between Larrimah (Birdum) and Tennant Creek in 90 days (Powell 2009, p. 144). The whole length of the Stuart Highway, from Alice Springs to Birdum was sealed by October 1943. Powell Creek featured in this development by becoming a supply depot for the road construction crews at least during the initial period of construction.

14.3.3 Heritage field surveys

The AAPowerLink HIA focussed on identifying and assessing the significance of archaeological sites of Aboriginal origin, historical features associated with the post-contact to modern period and areas which have intangible cultural heritage values. Assessment of intangible heritage includes consideration of Aboriginal Sacred Sites and other sites or places of cultural significance (cultural landscape features), with the latter being the focus of assessment because Sacred Sites will be assessed in full by the AAPA.

The heritage assessment strategy adopted involved targeted surveys of representative parts of the proposal footprint that are determined to be high-risk[3] environments for archaeological and/or heritage sites. These

[3] High-risk environments are those which have a high potential for containing cultural heritage features. These environments are identified following comprehensive background research and consultation.

areas were identified based on representative site custodian consultations, and site distribution patterns derived from regional archaeological studies, and assessment of physical environmental factors (i.e., existing site databases, land systems, geology, hydrology, and pre-existing ground disturbance factors). The high-risk areas were then surveyed in partnership with Aboriginal representatives nominated by custodians.

Archaeological field surveys were undertaken at the Solar Precinct, along 66 km of the Overhead Transmission Line (OHTL) from KP 722 through to Murrumujuk, Darwin Converter Site and Cable Transmission Facilities. The survey transects are shown on Figure 14-1 and Figure 14-3.

The section of the OHTL located in the Railway Corridor (approximately 722 km) and the Subsea Cable System route are yet to be surveyed and so heritage information for these components has been compiled from desktop review of existing sources of information. The OHLT (Railway Corridor) is scheduled to be surveyed in early to mid-2022. The Subsea Cable System geophysical surveys of the cable route are scheduled for early 2022, which will identify the presence of any objects on the seafloor and inform final route selection to avoid impacts to heritage values. For all other parts of the proposal footprint where the final locations are yet to be selected (i.e., temporary construction areas/camps, borrow areas, OHTL route diversions, electrode sites), heritage assessments will be undertaken in high-risk areas using the same heritage assessment strategy adopted in the surveys undertaken to date.

14.3.3.1 Powell Creek Solar Precinct field survey

At the Solar Precinct, archaeologists undertook field surveys between 2 and 10 June 2021 under the guidance of five representative site custodians. The field survey team representatives were nominated by the NLC in consultation with site custodians. During their field time, the representatives provided cultural heritage significance information under the governance of Traditional Law, language names and advice regarding the appropriate management of cultural heritage features identified during the study.

The survey employed a pedestrian sampling methodology, which was based on a stratified sampling strategy that included all accessible land units and systems, creek crossings, geological outcrops and representative drainage depressions identified through satellite imagery. Areas with geology identified to potentially contain artefact bearing raw materials and watercourses were targeted as priority survey areas. The unsealed access road leading east from the Solar Precinct was surveyed at 50 % owing to the lack of access through sections of Ashburton Ranges. Similarly, approximately 60 % of the proposed sealed access corridor was surveyed. A survey of the whole footprint was not considered necessary or practical given the lack of archaeological potential in several land systems and access and safety constraints arising from the remoteness of the area.

The results of the field survey included the recording of 13 archaeological sites and 26 isolated artefacts. These places and objects are further described in Section 14.4.4.

In addition, several landscape features of cultural significance were recorded during the surveys, which included three watercourses and related drainage features, intersected at 12 separate locations by the proposed access roads and a geological feature. These places and objects are further described in Section 14.3.8.1 below.

Site custodians have also noted that culturally, Aboriginal groups connected to Powell Creek Station have a wide distribution of sites including Dreamings, campsites, rock art sites, quarries, ceremony places, resource sites and areas and travel routes across their traditional lands. It is noted that Sacred Sites and culturally significant sites will be captured during the AAPA Authority Certificate process and through ongoing consultation with custodians for development of the ILUAs and Cultural Heritage Management Plans (CHMPs) that are required to be in place for the AAPowerLink to proceed (see Section 14.5).

The HIA report documents the locations of 38 ‘Cultural Heritage Risk Areas’ that will require further survey and/or additional cultural heritage management measures (see Table 8 Appendix V). These locations are classified as potential risk areas on the basis that they have not been subject to sufficient investigations to confidently identify all archaeological features or were not included in the sampling strategy but have

subsequently been identified as areas which have a higher potential for containing archaeological features. These areas, and other 'Cultural Heritage Risk Areas' identified in the parts of the proposal footprint that are yet to be defined, will be surveyed prior to commencement of works and site protection measures included in the CHMP/s (see Section 14.5).

14.3.3.2 OHTL corridor and Murrumujuk field survey

Along the OHTL (Utilities Corridor), and within the footprints of the proposed Darwin Converter Site and Cable Transition Facilities, archaeologists undertook field survey between 9 and 17 September 2021, with the participation of two representatives of the Larrakia people and two representatives of the Tiwi people.

The Larrakia field survey team representatives were nominated by Larrakia Nation Aboriginal Corporation (Larrakia Rangers) and through consultation with site custodians. Both Larrakia representatives also identified as having shared descendance with Wulna people. Tiwi people representatives were nominated by the Tiwi Land Council in consultation with site custodians. During their field time, all four representatives provided cultural heritage significance information and advice regarding the appropriate management of cultural heritage features identified during the study under the governance of Traditional Law and knowledge.

The survey employed a pedestrian sampling methodology, which centred on targeting all accessible watercourses, swamp margins and representative land units. Areas with geology identified to potentially contain artefact bearing raw materials were targeted as priority survey areas. Approximately 80% of the AAPowerLink footprint was sampled. Corridor sections which were excluded from the surveys are shown on Figure 14-3 as Cultural Heritage Risk Areas and included:

- Approximately 5 km of the OHTL corridor that traverses areas which had been subjected to significant extractive mining activities. These areas had no original ground surfaces in-situ, and therefore there is a low likelihood of archaeological objects or places being present and no survey is required.
- Approximately 1.6 km of the OHTL corridor that traverses across NT Section 572 which was not permitted for access at the time of survey.
- Approximately 3 km of the OHTL corridor through parts of Black Jungle Conservation and the adjoining Section 1603 owing to limited access, fires, and density of vegetation.

The results of the field survey included the recording of 47 archaeological features. These places and objects are further described in the sections below.

Site custodians have also indicated that Dreaming sites, Dreaming corridors and other sites of cultural significance exist within the OHTL corridor. It is noted that these sites will be captured during the AAPA Authority Certificate process and through ongoing consultation with Traditional Owners, and custodians for development of the ILUAs and CHMPs that are required to be in place for the AAPowerLink to proceed (see Section 14.5).

The HIA report documents the location of 33 'Cultural Heritage Risk Areas' that require additional survey or cultural heritage management measures (see Table 7 Appendix W). These locations are classified as potential risk areas on the basis that they have either not been subject to sufficient investigations to confidently identify all archaeological features, were recommended as key risk areas by site custodians, or were not included in the sampling strategy but have subsequently been identified as areas which have a higher potential for containing archaeological features. These areas, and other 'Cultural Heritage Risk Areas' identified in the parts of the proposal footprint that are yet to be defined, will be surveyed prior to commencement of works and site protection measures included in the CHMPs (see Section 14.5).

14.3.3.3 Significance Assessments

Significance assessments were undertaken on each recorded site in accordance with the accepted guidelines and principles referenced earlier in Section 14.2. In summary, cultural heritage landscapes, places, sites, and objects can be significant in a number of ways:

Cultural significance

- Significant to a group or many groups of people due to their connection to the past.
- Significant to a specific group of people because they have religious or spiritual significance to those people (Sacred Sites, Dreaming Sites or Story Places, for example).
- Significant to a group or many groups due to the relationship of a place in the wider context of an ecological and cultural landscape.

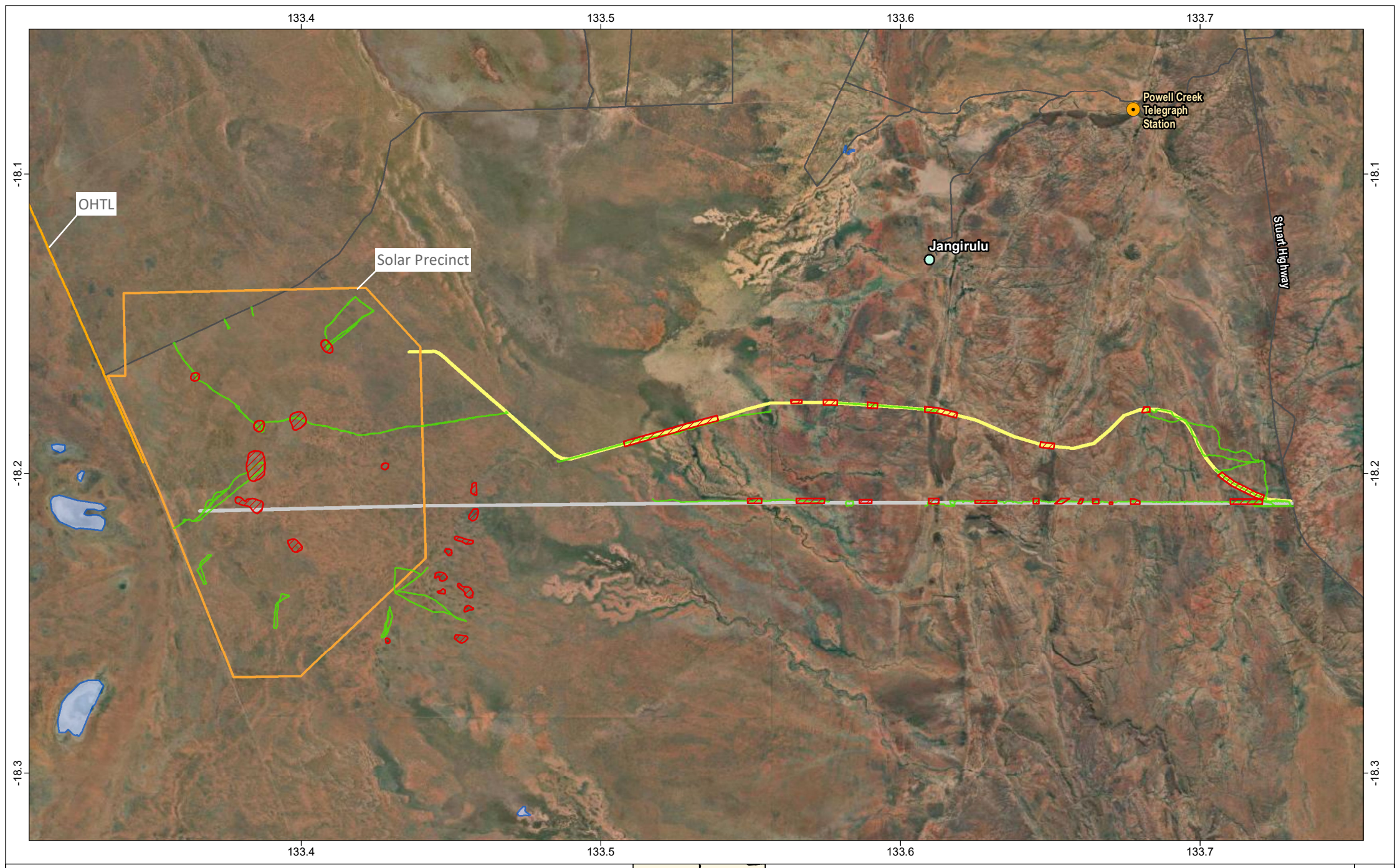
Archaeological significance

- Significant because of their research potential: the importance of the site in answering questions about the past and in some instances, current human behaviour.
- Significant due to their representativeness or uniqueness: sites or places that are rare or unique and are therefore conserved as a representative example.

Significance ratings (Low, Medium, High) were provided for archaeological significance (as rated by archaeologists) and cultural significance (advised by Aboriginal representatives).

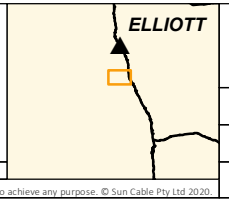
The assessment of significance will be used to guide the level of protection to be applied to each site under the AAPowerLink CHMPs (refer Section 14.5). The future conservation of a heritage place is decided by weighing up the level of assigned significance against the feasibility and practicality of conserving the place. For Aboriginal sites of significance, these decisions will be made through direct consultation with Traditional Owners, and custodians undertaken as part of the CHMP, ILUA and AAPA Authority Certificate processes. For historical features, these decisions will primarily be made through consultation with the NT Heritage Branch.

Where impacts to heritage places are unavoidable, Sun Cable will seek for an approval to 'carry out work on a heritage place or object' (a work approval) under 72 of the *Heritage Act* and in accordance with the conditions set out in the CHMP.



Legend

- AAPowerLink infrastructure
- Main access road (sealed)
- All-weather access road (unsealed)
- Outstations
- Lakes
- Roads
- Declared heritage place
- Cultural Heritage risk areas
- Cultural Heritage survey effort



Source:Sun Cable, EcOz, NTG (NR Maps)

Figure 14-1: Map of declared heritage places and cultural heritage risk areas relevant to the Solar Precinct (at March 2022)

Project: Australia-Asia PowerLink	Reference: M-Files ID 208676	Revision: 0
Coordinate System: GDA2020	Date: 22/03/2022	
0 5 Kilometers	Scale: 1:175,000	A4

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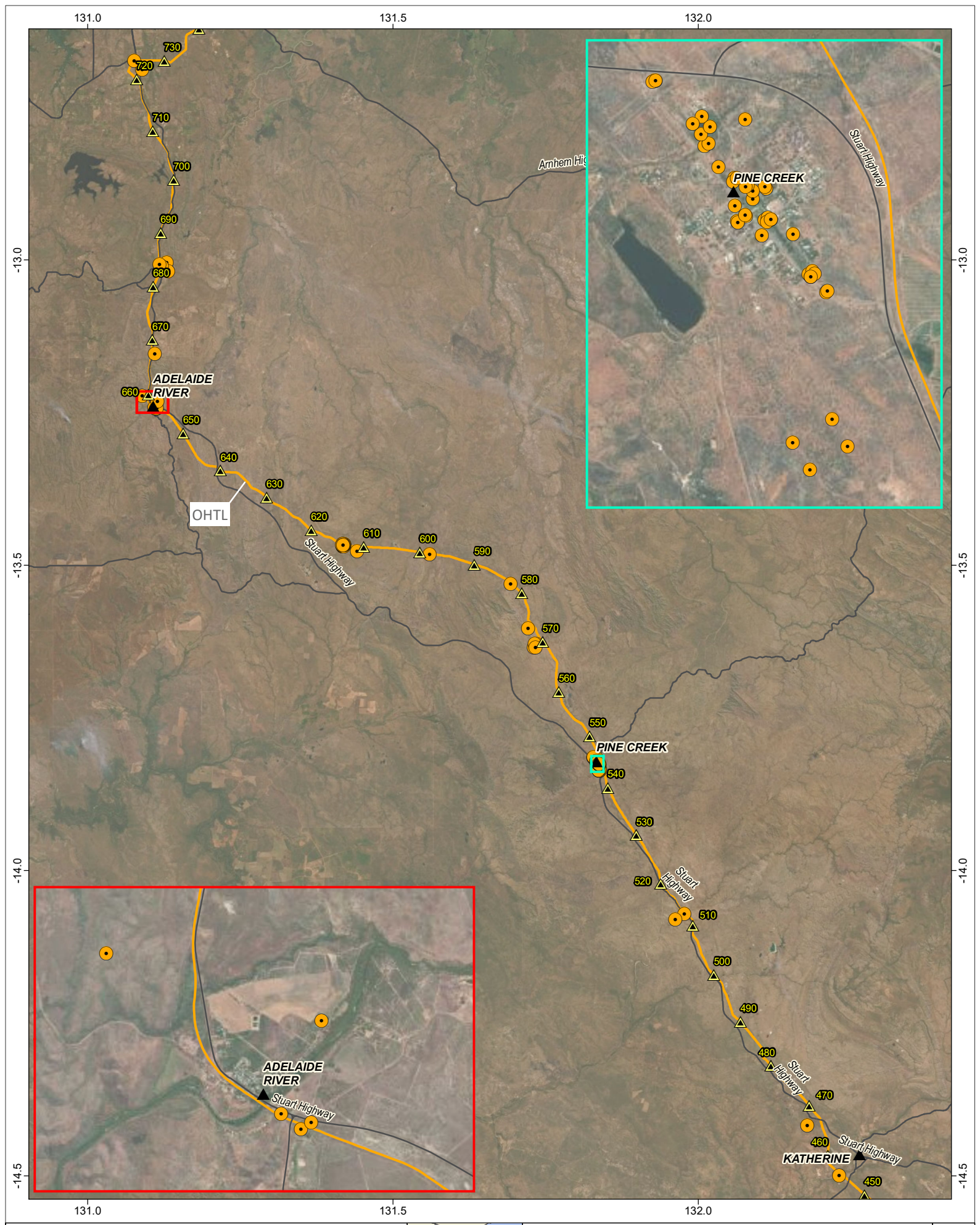

Legend

- AAPowerLink infrastructure
- Roads
- OHTL Kilometre Points
- Declared heritage place

Figure 14-2: Map of declared heritage places relevant to the OHTL (at March 2022)

Project: Australia-Asia PowerLink

0 25 Kilometers

Scale: 1:850,000

Coordinate System: GDA2020

A4

Reference: M-Files ID 208676

Date: 22/03/2022

Revision: 0

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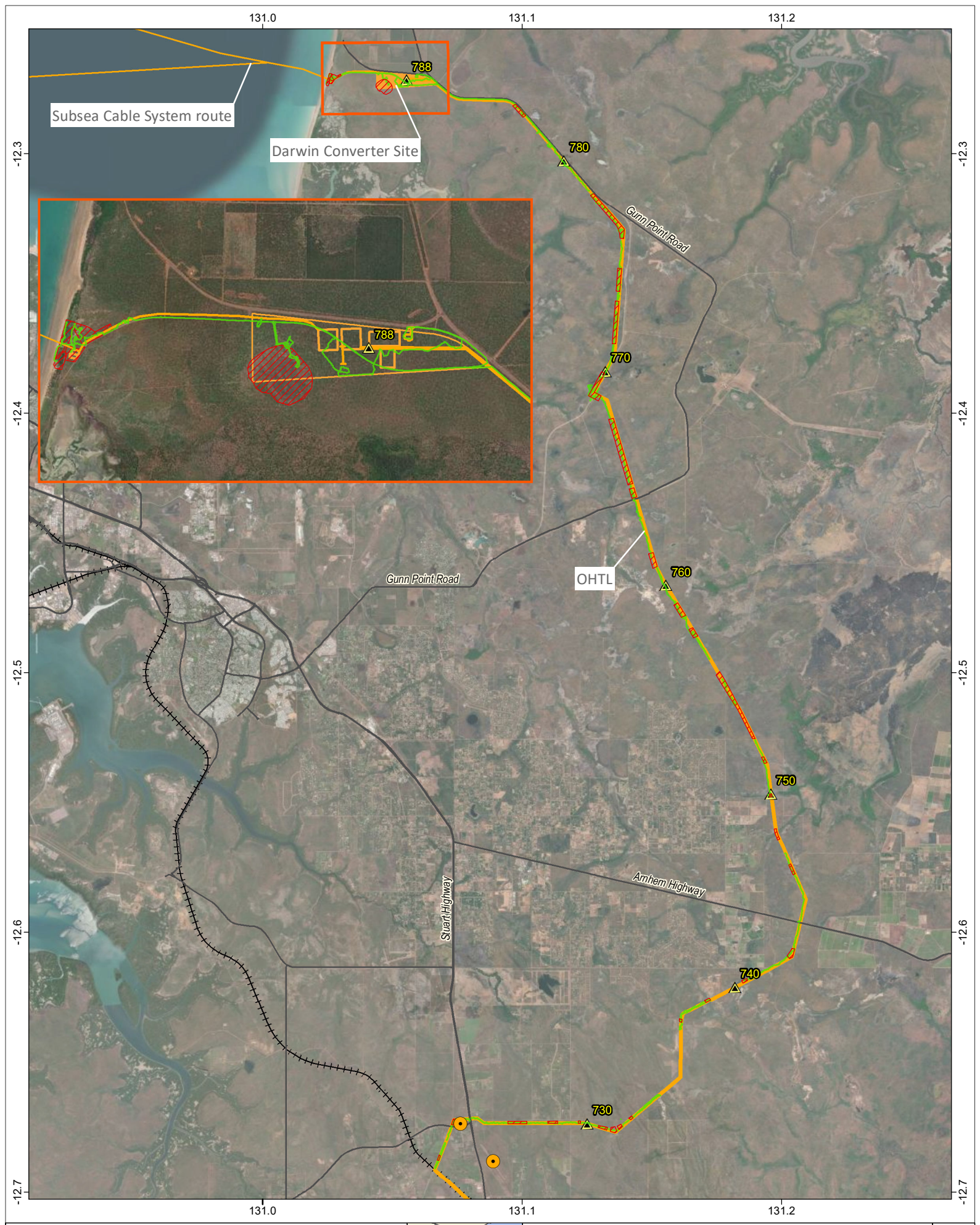
Source: Sun Cable, EcOz, NTG (NR Maps), Earth Sea 2022



Legend

- AAPowerLink infrastructure
- Railway
- Roads
- OHTL Kilometre Points
- Declared heritage place
- Cultural Heritage risk areas
- Cultural Heritage survey effort

Source: Sun Cable, EcOz, NTG (NR Maps)

Figure 14-3: Map of declared heritage places and cultural heritage risk areas relevant to the OHTL Utilities Corridor (at March 2022)

Project: Australia-Asia PowerLink

0 5 Kilometers

Scale: 1:200,000

Coordinate System: GDA2020

A4

Reference: M-Files ID 208676

Date: 22/03/2022

Revision: 0

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14.3.4 Areas listed on NT and Commonwealth heritage registers

NT and Commonwealth heritage register searches and results are presented in the sections below.

14.3.4.1 Declared heritage places (NT)

The NT Heritage Register contains details of all heritage places and objects declared under the *Heritage Act*. The register contains 13 records of declared heritage places which are proximal or adjoined and/or underlie the current railway corridor which is to house the AAPowerLink footprint. These sites are summarised below, and locations are shown on Figure 14-1, Figure 14-2, Figure 14-3.

Powell Creek Telegraph Station

Powell Creek Telegraph Station, located 26 km northeast of the Solar Precinct, was gazetted on 20 December 2000. The declaration included NT Portion 5988(A) as delineated by Survey Plan S2000/37. This parcel includes the building structures, the lone grave and stone artefact scatters.

Springvale Homestead Heritage Sites

Springvale Heritage Homestead Sites, located 300m south of the OHTL crossing at the Katherine River (OHTL KP 455.9), was gazetted on 4 November 1998. The declaration includes the Ronan Graves within NT Portion 1277, the homestead, and ancillary structures within NT Portions 5050 and 1455 designated as NT Portion 5603 (A), and the Alice Spriggs Grave Site within NT Portion 5050 designated as NT Portion 5609(A).

Fergusson River North Australia Railway Bridge and Boiler

The Fergusson River North Australia Railway Bridge and Boiler, located at the current railway crossing of the Ferguson River approximately 33 km south of Pine Creek (OHTL KP 512.7 to 512.9), was gazetted on 29 October 2008. The railway bridge was reused as part of the existing railway infrastructure and the boiler is located on the southern bank of the Fergusson River between the Stuart Highway and current railway. The declaration encompasses an area of approximately 3,280 square meters within NT Portion 5836 designated as NT Portion 7000(A).

Burrundie Explosives Magazines

The Burrundie Explosives Magazines, located within the current rail corridor approximately 1 km north of Burrundie (OHTL KP 582.5), was gazetted on 11 January 1995. The declared magazines encompass a 1.6ha area within NT Portions 2683 (Douglas) and 3653 designated NT Portion 4680(A).

Grove Hill Hotel

The Grove Hill Hotel, located 30m south of the current railway corridor on the Mount Wells Road, Douglas Daily (OHTL KP 598.3), was gazetted on 2 November 1994. The declared hotel encompasses a 7790m^2 area designated as NT Portion 4641(A).

Brocks Creek Township, Railway Siding and Military Detention Barracks

The Brocks Creek Township, Railway Siding and Military Detention Barracks site, underlies and extends out from the current railway corridor between OHTL KP 613.4 and 614. The site was gazetted on 17 July 1996. The declared area encompasses 10.32ha which includes parts of NT Portions 1344, 2683, 3655, 3945, 3946, and Road which together with Lots 1 to 5 inclusive, Town of Brocks Creek as designated NT Portion 4857(A).

Diesel Locomotive NSU63

The Diesel Locomotive NSU63, located between the Stuart Highway and current railway at Adelaide River (OHTL KP 656.7), was gazetted on 26 April 2017. The declared area falls 60m north of the existing railway corridor within Lot 177 Town of Adelaide River.

Adelaide River Railway Siding and Railway Bridge

The Adelaide River Railway Siding and Railway Bridge adjoins the southern boundary of the current railway corridor at Adelaide River (OHTL KP 656.6 to 657.4). The site was gazetted on 23 July 1997. The declared area extends for approximately 800m and encompasses an area of 2.67ha within parts of Lots 168, 186, 187 and 189, Town of Adelaide River and NT Portion 2849 designated Lot 194(A).

Adelaide River Pioneer Cemetery

The Adelaide River Cemetery adjoins the north boundary of the current railway corridor at Adelaide River (OHTL KP 657.12). The site was gazetted on 10 October 1996. The declared area encompasses approximately 151m^2 and is bound within Lot 100, Town of Adelaide River.

WWII RAAF No.1 Medical Receiving Station

The WWII RAAF No.1 Medical Receiving Station, located at 6220 Stuart Highway, Coomalie Creek, was gazetted on 5 November 2008. The site lies 60m to the southeast of the Batchelor Rd and current railway corridor intersection and encompasses 7.8ha, designated as Section 1261(A) within Section 227.

WWII Sites

Three WWII declared heritage places are located within 500m of the AAPowerLink OHTL corridor between KP 724 and 726. These declarations include the following features:

- **WWII Noonamah Cricket Pitch & Oval:** Gazetted on 21 November 2007. This site is located 110m from the OHTL corridor.
- **WWII Noonamah Railway Siding and Store Depot:** Gazetted on 21 November 2007. This site is located 318m from the OHTL corridor.
- **WWII Strauss Anti-Aircraft Gun Emplacement**. Gazetted on 26 September 2007. This site is located 485m from the OHTL corridor.

14.3.4.2 Archaeological Sites Database (NT)

The NT Archaeological Site Database is maintained by the Heritage Branch, NT Department of Families, Housing and Communities. Database search results for each component of the AAPowerLink are summarised below. The absence of records on the NT Archaeological Site Database does not necessarily reflect the lack of archaeological sites within the area, but rather a lack of archaeological survey.

Solar Precinct, Powell Creek

There are no records in the database within the Solar Precinct footprint. Sites were identified during the AAPowerLink archaeological field surveys as described in Section 14.3.6.

Overhead Transmission Line

The NT Archaeological Database records 27 archaeological and historic sites within and in close proximity to the proposed OHTL alignment. These sites were largely recorded when the Railway Corridor was surveyed prior to completion of the railway in September 2003. Table 3 below summarises the sites that still exist, were

salvaged or were partially salvaged. Note that salvaged stone artefact sites may still have stone artefacts present if the ground surface was not destroyed by the construction of the railway.

Table 14-3: NT Archaeological Database Sites within or overlapping OHTL corridor

Site ID	Site Name	Site Type	Approx. KP (km)	Relationship to proposed corridor	Notes
51710004	Railway Survey 1; Bridge Creek site 29	Stone artefact scatter, historic object/place, grindstone portable	627.1	Within corridor	Salvaged
51710008	Railway site	Stone artefact scatter	635.15	Within corridor	
51710066	Adelaide River north Military F.S.D. & railway siding	Historic object/place	658.7	Within corridor	Not recommended for declaration
NR	BCP6	stone artefact scatter, historic object/place	613.3	Within corridor	
51720056	Livingstone Airfield	Historic object/place	719.25	Within corridor	Not recommended for declaration
52690001	Baker & Cundy site	Stone artefact scatter	511.4	Within corridor	Salvaged
52700191	Bs1	Isolated stone artefact	560.75	Within corridor	Salvaged
52700277	Site 2 Stone artefact scatter and historic digging	Stone artefact scatter, historic object/place	545.1	Within corridor	Salvaged
52700280	Site 5 stone artefact scatter	Stone artefact scatter	549.05	Within corridor	Salvaged
52700283	Site 8 stone artefact scatter	Stone artefact scatter	553.4	Within corridor	Salvaged
52700286	Bs4	Isolated stone artefact	559.7	Within corridor	
52700329	Starkes Creek1	Quarry	583.95	Within corridor	Salvaged
NR	Manbulloo 1	Quarry	448.45	Within corridor	Large site likely partially salvaged.
NR	Novus Creek Quarry 1	Quarry	454.15	Within corridor	Salvaged
53690048	Baker's site (Leight Creek 5)	Quarry	473.3	Within corridor	Salvaged
53690194	Leight Creek 1	Quarry	467.1	Within corridor	Salvaged
53690198	Leight Creek 6	Quarry	473.6	Within corridor	Salvaged
53690199	Leight Creek 7	Rock shelter deposit, stone artefact scatter	474.1	Within corridor	Salvaged
54660002	Buchanan Highway Heritage Site 2 (Western Creek 2)	Quarry	306.25	Within corridor	Likely salvaged for rail construction.
51710007	Coomalie Waterhole	Historic object/place	683.35	Overlaps corridor	5 m to east. Historic place
52700279	Site 4 historic mine diggings and shafts	historic object/place	545.55	Overlaps corridor	5m west. Historic place
52700282	Site 7 historic military WWII encampment	Historic object/place, isolated stone artefact	551.2	Overlaps corridor	5m west. Historic place

Site ID	Site Name	Site Type	Approx. KP (km)	Relationship to proposed corridor	Notes
NR	Manbulloo 4	Quarry	451.7	Overlaps corridor	Approx. 20m west
NR	Manbulloo 8	Stone artefact scatter	446.3	Overlaps corridor	Approx. 30m west
53690196	Leight Creek 3	Quarry	470.98	Overlaps corridor	Approx. 10m west.
53690202	Edith River 2	Quarry	491.55	Overlaps corridor	Overlaps western boundary
53690205	Edith River 5	Quarry	491.4	Overlaps corridor	Overlaps western boundary

Darwin Converter Site, Murrumujuk

There are no records in the database, but sites were identified during the AAPowerLink archaeological field surveys (see Section 14.3.6).

Cable Transition Facilities, Murrumujuk

There are two known archaeological sites within the AAPowerLink Cable Transition Facilities footprint at Murrumujuk. These features are listed below:

- **Shoal Bay 1:** Shell scatter and isolated artefacts. This site is located inside the Cable Transition Facilities underground cable corridor.
- **Shoal Bay 3:** Shell scatter. This site is located inside the Cable Transition Facilities underground cable corridor.

Another archaeological site (Shoal Bay 2) is a shell midden recorded as being located approximately 330m to the north of the same area.

Additional sites were identified during the AAPowerLink archaeological field surveys (see Section 14.3.6).

Subsea Cable System, Shoal Bay and Timor Sea

There are no records in the database for the Subsea Cable System corridor. Geophysical surveys of the Subsea Cable System route are scheduled for early 2022 and will be used to assess for the presence of potential archaeological features on the seafloor.

14.3.4.3 Australian National Heritage Database and Commonwealth Heritage List

There are no Listed places proximate to the AAPowerLink on the Australian National Heritage Database or Commonwealth Heritage List.

The closest Listed place is the Powell Creek Telegraph Station, 26 km northeast of the Solar Precinct. The site is included on the Australian Heritage Database, having been previously registered on the Register of the National Estate (ID: 14934, 15/05/1990). The existence of Powell Creek Telegraph Station on the Register of the National Estate does not in itself create a requirement to protect the place under Commonwealth law. Nevertheless, information in the register may continue to be current and relevant to statutory decisions about protection.

14.3.5 Aboriginal Sacred Sites

Sacred Sites will be assessed in full by the AAPA through the Authority Certificate process that is underway pursuant to the *Aboriginal Sacred Sites Act*. Notwithstanding this, to inform the preliminary site selection process, Sun Cable made applications to AAPA to review the Authority Certificate Public Register and obtain Abstract of Records for the proposal footprint of key infrastructure. Details of Register or Recorded sites are provided below; however, it should be noted that an Abstract of Records is not an exhaustive list of Sacred Sites in the area. There may be other Sacred Sites of which the Authority is not yet aware which would be identified through the Authority Certificate process. The Authority Certificate and ILUA will be used as the principal documents guiding the protection of Sacred Sites.

Solar Precinct

An AAPA Abstract of Records received on 12 October 2020, for NT Portion 2094, Powell Creek Station shows that a number of Registered and Recorded Sacred Sites are located within Powell Creek Station; however, none lie within the AAPowerLink footprint. The representative site custodians on the cultural heritage surveys advised that Aboriginal groups connected to Powell Creek Station have a wide distribution of sites including Dreamings, campsites, dance grounds, quarries, ceremony places resource sites and areas, and travel routes across their traditional lands. Further sites may be identified through the Authority Certificate process.

Overhead Transmission Line (Railway Corridor & KP 722 to Murrumujuk)

Sun Cable has applied to AAPA for Authority Certificates across the AAPowerLink proposal footprint and these will be used as the primary tool for ensuring protection of Sacred Sites. Sacred Sites locations and constraints along the OHTL will be informed by the Authority Certificate process. The conditions outlined in the Authority Certificates will be captured in the proposed CHMPs to guide works in areas where Sacred Sites exist.

Darwin Converter Site and Cable Transition Facilities, Murrumujuk

An AAPA Abstract of Records received on 29 July 2021 for the AAPowerLink Darwin Converter Site and Cable Transition Facilities footprint at Murrumujuk shows a number of Registered and Recorded Sacred Sites are proximate but outside the AAPowerLink footprint. The Aboriginal representatives on the cultural heritage surveys advised that culturally, the Larrakia, Wulna and Tiwi have a wide distribution of sites including Dreamings, campsites, quarries, ceremony places, burials, resource areas, and travel routes across their traditional lands. Further sites may be identified through the Authority Certificate process.

Subsea Cable System, Shoal Bay and Beagle Gulf

The Northern Territory waters for the purposes of the *Sacred Sites Act* extends to three nautical miles from the low tide mark or territorial sea baseline (as relevant). Sun Cable has applied to AAPA for an Authority Certificate which encompasses the Shoal Bay section of the Subsea Cable System. Sacred Sites locations and constraints, should they exist along the Subsea Cable Route, will be informed by the Authority Certificate process. The conditions outlined in the Authority Certificates will be captured in the proposed maritime CHMP to guide works in areas where Sacred Sites exist.

14.3.6 Aboriginal archaeological places or objects

Archaeological field surveys across the AAPowerLink footprint recorded numerous Aboriginal archaeological sites (places) and isolated artefacts (objects), in addition to the few already recorded on the NT Archaeological Sites Database (refer Section 14.3.4.2 above). For each of the recorded sites, significance assessments were undertaken as described in Section 14.3.3.3. Table 14-4 below summarises the number of archaeological sites recorded in the surveyed components of the AAPowerLink footprint and their archaeological and cultural significance. In addition, numerous isolated artefacts (objects) were recorded (25 at the Solar Precinct and 11

along the OHTL), all of which have a low level of archaeological and cultural significance and are not included in the table[4].

Table 14-4. Aboriginal archaeological sites (places) recorded in AAPowerLink field surveys

Component	Total Recorded Sites	Archaeological Significance Of the recorded sites			Cultural Significance Of the recorded sites		
		Low	Medium	High	Low	Medium	High
Solar Precinct	11	6	5	-	-	4	7
OHTL (Railway Corridor)	Not yet surveyed						
OHTL (KP722 to end)	14	14	-	-			
Darwin Converter Site	0	-	-	-	-	-	-
Cable Transition Facilities	3	2	1	-	1	2	-
Subsea Cable System	Not yet surveyed	-	-	-	-	-	-
TOTAL	28						

Solar Precinct

The results of the field archaeological assessment at the proposed AAPowerLink Solar Precinct site included the recording of 11 Aboriginal archaeological sites (places) and 26 isolated artefacts (objects) in or close to the footprint. The survey also recorded Aboriginal archaeological sites at the Powell Creek Telegraph Station because the site custodians advised of the significance of the area; however, it is well outside the Solar Precinct footprint.

The Aboriginal archaeological sites recorded in the field surveys included minor lithic scatters (6 sites), minor stone quarry (3 sites), drainage depression/soaks (3 sites) and sites associated with the Powell Creek Telegraph Station. All the sites are within or in very close proximity to the AAPowerLink footprint, excepting the Powell Creek Telegraph Station, which is located 26 km northeast of the Solar Precinct. Details of the site type, size, significance, condition, and distance to the AAPowerLink footprint are documented in Table 8 of Appendix V.

The surveyed area contained a site distribution pattern analogous to those identified in other areas of the arid interior of Australia. There was a clear correlation between archaeological features, raw material sources and their proximity to watercourses. Conversely, there was a distinct absence of archaeological materials across land areas without water and/or raw materials suitable for the manufacture of stone artefacts.

Flakes stone artefacts dominated the archaeological site assemblages with 10 sites containing flaked stone materials and/or grindstones. In common with other parts of arid Australia, tula slugs were represented in two of the sites (see Holdaway et. al. 2004, p.253 for a description of tula adzes and tula slugs).

The significance assessment advice provided by senior representative site custodians indicated that the 11 Aboriginal archaeological sites recorded in the Solar Precinct footprint were held with medium to high cultural significance due to their connection to Old People and Dreamings. Notwithstanding these assessments, from an archaeological perspective, seven sites were assessed as low significance and five sites as medium significance, with only Powell Creek Telegraph Station, being considered as high significance. The sites with a medium-high level of archaeological significance are due to their rarity and potential ability to provide valuable information on the past human occupation of the area (including potentially historical information in the case of Powell Creek Telegraph Station). All isolated finds were considered of low archaeological and cultural

[4] All proscribed archaeological sites and objects are protected under the *Heritage Act*. The permitting requirements of the Act will apply to isolated artefacts.

significance due to their abundance in the landscape and understanding that minimal scientific information would be lost if they were salvaged from their current in-situ locations.

As stated earlier in Section 14.3.3.1, the HIA identified a number of 'Cultural Heritage Risk Areas' that have not been sufficiently surveyed and where there is a moderate to high potential for additional archaeological places and objects to be found when these areas are assessed. It is also possible that the significance rating of the recorded sites could change to a lower or higher rating following additional investigations such as targeted archaeological excavations, and detailed recordings of whole site complexes or wider regional studies.

Overhead Transmission Line (Railway Corridor)

The archaeological inspections of the OHTL Corridor from the Solar Precinct to Livingstone (KP 722) are scheduled to be completed in early to mid-2022. Notwithstanding this, as outlined in Section 14.3.4.2 above, the NT Archaeological Database records 27 archaeological and historic features within and in close proximity to the proposed OHTL alignment. These features were largely recorded when the Railway Corridor was surveyed prior to completion of the railway in September 2003 (ADrail 2003a, b; Dames and Moore 1997; Niemoeller 2000).

Fourteen of the abovementioned archaeological features within the railway corridor were noted as salvaged or partially salvaged. However, it is acknowledged that salvaged stone artefact scatters may still have stone artefacts present if the depositional environment was not destroyed by the construction of the railway.

It is also likely that other unrecorded sites also exist within the proposed OHTL footprint that were obscured by vegetation and sediments during the previous railway corridor surveys or lie in land units that were not subject to surveys. These archaeological features, should they exist, would likely consist of concentrations of stone artefacts, isolated artefacts, stone quarries, subsurface deposits, contact sites and historic features. The risk of encountering these features increases in land units adjacent to watercourses and/or outcropping geology which contains suitable material for the manufacture of stone artefacts.

The proposed archaeological assessments of the OHTL Corridor will be guided by reviewing the existing site databases, previous heritage studies, historical mapping, surface geology, hydrology, and any pre-existing ground disturbance. A survey strategy will be developed following this review to ensure all areas which have a higher risk of containing cultural heritage features are identified and assessed.

Overhead Transmission Line (KP 722 to Murrumujuk)

The results of the archaeological field survey along the OHTL corridor included the recording of 15 Aboriginal archaeological sites and 11 isolated artefacts. The archaeological sites consisted of 13 Culturally Modified Trees (CMT) and two artefact scatters. In addition, a small stone arrangement of unknown origin was recorded. Details of the site type, size, significance, condition, and distance to the AAPowerLink footprint are documented in Table 8 of Appendix W.

The surveyed areas contained site distribution patterns analogous to those identified in other areas across the Top End of Australia. There was a clear correlation between archaeological features, raw material sources (including ironwood trees) and their proximity to watercourses and swamps. Conversely, there was a distinct absence of archaeological materials across land areas without water and/or raw materials suitable for the manufacture of stone artefacts and ironwood trees.

Flaked stone artefacts dominated the archaeological site assemblages with 13 features recorded (including isolated artefacts). The stone artefacts scatters were largely small with limited diversity of raw materials and artefact types. However, it is noted that visibility was constrained in several locations.

CMTs were the second most common archaeological feature. The CMTs likely all reflected the traditional procurement of sugarbag, with varying stages of site preservation left in the archaeological record. The distribution pattern of CMTs centre on the margins of swamps in land units with higher densities of ironwood.

The frequency of CMTs increase closer to areas with good access and were historically important hunting and resources zones, such as the swamps along the margins of Gunn Point Road.

The significance assessment advice provided by senior site custodians indicated that most archaeological sites recorded during this study were held with medium or low-medium cultural significance due to their connection to Old People. Isolated artefacts were considered of lower significance by the Aboriginal representatives on the field survey team. Notwithstanding these assessments, from an archaeological perspective, two of the individual Aboriginal archaeological sites recorded were assessed as low-medium significance due to their rarity and potential ability to provide valuable information on the past human occupation of the area. The remaining sites and all isolated finds were considered of low archaeological significance due to their abundance in the landscape and understanding that minimal scientific information would be lost if they were salvaged from their current in-situ locations.

As stated earlier in Section 14.3.3.2, the HIA identified 'Cultural Heritage Risk Areas' that have not been surveyed. There are 28 'Cultural Heritage Risk Areas' identified in the OHTL corridor and where there is a moderate to high potential for additional archaeological places and objects to be found when these areas are surveyed. These areas are generally associated with watercourses, swamps, and rocky outcrops.

Darwin Converter Site

The archaeological field survey did not find any Aboriginal archaeological sites or objects in the Darwin Converter Site footprint. The survey did record the nearby swamp as a cultural feature and determined that this area has a high potential for isolated artefacts and CMT's. This area was also identified as a Cultural Heritage Risk Area' requiring further assessment.

Cable Transition Facilities

The results of the archaeological field survey in the Cable Transition Facilities footprint included the recording of three Aboriginal archaeological sites, midden/shell scatters, with two of these being previously recorded on the NT Archaeological Sites Database as described in Section 14.3.4.2 (i.e., Shoal Bay 1 and Shoal Bay 3). All three sites showed a diversity of shell species present including, *Marcia hiantina* (dominant), *Telescopium, Anadara sp., Polymesoda erosa, and Terebralia palustris*. In general, the three midden sites were in a poor to fair state of preservation from human intervention, erosion, and road development/maintenance.

As stated earlier in Section 14.3.3.2, the HIA identified 'Cultural Heritage Risk Areas' that have not been surveyed. There are four 'Cultural Heritage Risk Areas' identified in the Cable Transition Facilities footprint where there is a moderate to high potential for additional archaeological places and objects to be found when these areas are surveyed. These are associated with dunes and low hills where there is potential for shell middens and burials.

Subsea Cable System

Geophysical surveys of the Subsea Cable System route options are scheduled for 2022, which will identify the presence of any objects on the seafloor. The survey data will be reviewed by a maritime archaeologist to determine whether any objects have potential to be archaeological objects. If potential archaeological objects are identified that cannot be avoided, then further survey will be undertaken to record and assess the significance of the objects to inform impact avoidance and mitigation measures.

14.3.7 Historic heritage features (non-Aboriginal)

Archaeological field surveys across the AAPowerLink footprint recorded a limited number of historic non-Aboriginal heritage features (places or objects). One feature was recorded at the Solar Precinct site, which was noted by the Aboriginal representatives of the field survey team as potentially being a Chinese well or prospecting diggings. Seventeen historic heritage features were recorded in a 3 km section of the OHTL corridor between KP722 and 725 (see Figure 14-3), which included:

- Three North Australian Railway sites (a railway bridge, railway embankment and railway cutting)
- Remnants of an old road recorded near the railway are potential part of the Old Coach Road.
- Thirteen WWII sites.

It is likely that additional features will be recorded in the sections of the OHTL corridor that are yet to be surveyed.

For each of the recorded sites, significance assessments were undertaken as described in Section 14.3.3.3. Table 14-5 below summarises the number of historic heritage features recorded and their archaeological significance. Cultural significance was only assessed for the 'well/digging' site at the Solar Precinct as the Aboriginal representatives on the field survey teams elsewhere did not assign cultural value to the North Australian Railway or WWII sites.

Table 14-5. Historic heritage features (non-Aboriginal) recorded in AAPowerLink field surveys

Component	Total Recorded Sites	Archaeological Significance of the recorded sites			Cultural Significance of the recorded sites		
		Low	Medium	High	Low	Medium	High
Solar Precinct	1	1	-	-	1	-	-
OHTL (Railway Corridor)	Not yet surveyed						
OHTL (KP722 to end)	18	14	3	1	-	-	-
Darwin Converter Site	0	-	-	-	-	-	-
Cable Transition Facilities	0	-	-	-	-	-	-
Subsea Cable System	Not yet surveyed	-	-	-	-	-	-
TOTAL	**19**						

14.3.8 Culturally significant landscape features

Aboriginal representatives on the field survey teams identified several landscape features of cultural significance. For each of the features, cultural significance ratings were assigned based on the advice from the Aboriginal representatives. As there were no archaeological materials present, archaeological significance assessment was not undertaken. Table 14-6 below summarises the number of culturally significant landscape features recorded in the surveyed components of the AAPowerLink footprint and their cultural significance.

Table 14-6. Culturally significant landscape features recorded in AAPowerLink field surveys

Component	Total Recorded Sites	Cultural Significance of the recorded sites		
		Low	Medium	High
Solar Precinct	13	-	-	13
OHTL (Railway Corridor)	Not surveyed	-	-	-
OHTL (KP722 to end)	2	-	-	2
Darwin Converter Site	1	-	-	1
Cable Transition Facilities	1	-	-	1
Subsea Cable System	Not surveyed	-	-	-
TOTAL	**17**			

14.3.8.1 Solar Precinct

Thirteen landscape features of cultural significance to the site custodians were recorded during the field surveys, which included three watercourses and related drainage features, intersected at 12 separate locations by the proposed access roads and a geological feature.

Powell Creek Telegraph Station, located 26 km north-east of the Solar Precinct, was also recorded during the surveys, given its high archaeological and cultural significance and proximity to the current pastoral access track to the site. Powell Creek Telegraph Station was classified as a significant, as it includes several potential sacred sites, the Powell Creek Telegraph Station (a declared heritage place), grave sites and three substantial stone artefact scatters that included contact era materials such as metals and glass.

14.3.8.2 Overhead Transmission Line (KP722 to Murrumujuk)

Two landscape features of cultural significance to the custodians were recorded during the field surveys of the OHTL. These were a swamp located within the OHTL corridor around KP783 and a Banyan Tree located around KP772.

Black Jungle Conservation Reserve was also highlighted by custodians as an important men's place and was identified as a 'Cultural Heritage Risk Area' requiring further survey and assessment.

14.3.8.3 Darwin Converter Site

The seasonal swamp immediately south-west of the Darwin Converter Site footprint was recorded as a culturally important resource area, with moderate to high potential for isolated stone artefacts, low density scatters and CMTs.

14.3.8.4 Cable Transition Facilities

A minor watercourse located south-west of the Land Sea Joint Station, outside of the direct disturbance footprint, was identified as a culturally important resource area. There is potential for shell middens and subsurface heritage features in the area. A burial site is located approximately 150 m to the south of the area.

14.4 Potential impacts

The potential impacts to culture and heritage associated with the construction and operation of the AAPowerLink were identified and assessed using the EIA methodology described in Chapter 3 – Impact Assessment and the findings of the HIAs. The EIA identified and assessed the following impacts:

- Direct impact to heritage features, including Aboriginal Sacred Sites, Aboriginal archaeological places and objects, historic heritage features and culturally significant landscape features.
- Indirect impact to heritage features listed above.
- Direct or indirect impact to unrecorded heritage features.

The EIA considered the impact avoidance and mitigation measures detailed in Section 14.5 below and assessed the residual impacts to culture and heritage assuming these measures are effectively implemented. A residual impact rating was then assigned taking into consideration the scale, magnitude and duration of the impacts, the presence/absence of environmental values and/or sensitive receptors and the level of certainty with respect to the intensity of the impact and the effectiveness of the mitigation measures. The residual impact ratings adopted in the assessment are provided in Table 14-7.

The outcomes of the EIA are summarised in Table 14-8 and Table 14-9 below from the Impact Assessment Register provided at Appendix E and discussed in the subsequent sections.

Table 14-7. Residual impact ratings adopted for the AAPowerLink EIA

Ratings and Description
Minor: A minor residual impact is unlikely to be significant.
A minor impact generally has two or more of the following characteristics: Scale: Limited/Localised Magnitude: Negligible/Minor Duration: Short-term/ Medium-term/Reversible. **OR** There are no sensitive receptors or land uses present, and the environment does not contain any aspects that are valuable or otherwise important or unique (i.e., Very Low/Low rating), and there is moderate to high degree of certainty about the likelihood and intensity of the impact, and the effectiveness of proposed mitigation measures.
Moderate: A moderate residual impact has potential to be significant. The significance depends on the acceptability of the impacts and the effectiveness of mitigation measures.
A moderate impact generally has two or more of the following characteristics: Scale: Localised/Regional Magnitude: Moderate Duration: Medium-term/Long-term **AND/OR** There are sensitive receptors or land uses present, or environmental aspects that are valuable or otherwise important or unique (i.e., Medium-High value rating), and there is a low degree of certainty about the impact, and the effectiveness of proposed mitigation measures.
Major: A major residual impact is likely to be significant. The level of acceptability will depend on offsets or benefits compensating for the impact.
Impact generally has two or more of the following characteristics: Scale: Regional/ Widespread Magnitude: Moderate/Major Duration: Long-term/Permanent **AND** There are sensitive receptors or land uses present, or environmental aspects that are valuable or otherwise important or unique (i.e., Medium-High value rating).

Table 14-8. Summary of EIA results – Culture and heritage factor – Construction

Impact	Location	Likelihood	Scale	Duration	Magnitude	Value rating	Certainty	Residual Impact
Direct impact to heritage features	Solar Precinct	**Likely** Construction will involve ground disturbance in areas where heritage features have been recorded.	**Limited** Limited to isolated locations within direct disturbance footprint.	**Permanent** Heritage features disturbed during construction will be permanently impacted.	**Moderate** Disturbance will occur across a culturally significant landscape with some direct impact to recorded heritage features. No impact to Sacred Sites.	**High** Culturally significant landscape features recorded and many of the recorded archaeological sites have High Aboriginal Significance.	**Low** Heritage surveys undertaken (Appendix V). Sacred Sites clearance are pending. Site-specific mitigation measures to be determined.	**Moderate**
	OHTL	**Likely** Construction will involve ground disturbance in areas where heritage features have been recorded.	**Limited** Limited to within direct disturbance footprint, which is 22m wide.	**Permanent** Heritage features disturbed during construction will be permanently impacted.	**Minor** Direct impacts to heritage features of high significance will be avoided during final route selection and pole placement. Other features will be salvaged.	**High** There are declared heritage places and sites of Aboriginal Significance in the OHTL corridor.	**Low** Surveys undertaken in Utilities Corridor section (Appendix W). Railway Corridor section not yet surveyed. Sacred Sites clearances are pending. Site-specific mitigation measures to be determined.	**Moderate**
	Darwin Converter Site	**Unlikely**	Not assessed as no heritage features recorded in direct disturbance footprint – no direct impact.				**High** Heritage surveys undertaken (Appendix W)	**None**
	Cable Transition Facilities	**Likely** Construction will involve ground	**Limited** Limited to within direct disturbance	**Permanent** Heritage features disturbed during	**Minor** Direct impacts to heritage features of	**High** There are archaeological sites	**Low** Heritage surveys undertaken	**Moderate**

Impact	Location	Likelihood	Scale	Duration	Magnitude	Value rating	Certainty	Residual Impact
		disturbance in areas where heritage features have been recorded.	footprint, which is a 70m wide corridor.	construction will be permanently impacted.	high significance will be avoided during final route selection and pole placement. Other features will be salvaged.	and sites of Aboriginal Significance recorded in the footprint.	(Appendix W). Site-specific mitigation measures to be determined.	
	Subsea Cable System	**Unlikely**	Not assessed as desktop heritage assessment (Appendix X) indicates low risk of maritime heritage features. Cable route will be surveyed to confirm, and Sacred Sites clearances will also be undertaken. Direct impacts to significant maritime archaeological sites or Sacred Sites will be avoided.				**High** There is flexibility in the final route selection to avoid direct impact to heritage features.	**None**
Indirect impact to heritage features	All sites (on land)	**Possible** Construction activities could create deposited dust and erosion and sedimentation impacts.	**Limited** Impacts will be mitigated and therefore limited to within several hundred metres of footprint.	**Permanent** Heritage features disturbed during construction could be permanently impacted.	**Minor** Some loss of site integrity could occur but sites unlikely to be destroyed.	**High** Landscape is culturally significant and contains heritage features both inside and outside footprint.	**High** Sedimentation and dust deposition will affect small areas – see Chapter 5 & 11. Routine mitigation measures are proven effective for minimising offsite impacts.	**Minor**
	Subsea Cable System	**Unlikely**	Not assessed as sediment transport modelling indicates sediment mobilised during cable installation will disperse over wide area. Deposition onto heritage features is unlikely to occur.				**High** Sediment transport modelling used to assess area of impact (Appendix R).	**None**

Impact	Location	Likelihood	Scale	Duration	Magnitude	Value rating	Certainty	Residual Impact
Direct or indirect impact to undetected heritage features	All sites (on land)	**Possible** Some undetected archaeological features may remain.	**Limited** Predictive models indicate sites will be limited to along watercourses and on swamp margins.	**Permanent** Heritage features disturbed during construction could be permanently impacted.	**Minor** Undetected sites are generally unlikely to be of high significance due to the level of survey effort undertaken. Loss of low significance sites will not affect heritage value of landscape.	**Low** Undetected sites are generally unlikely to be of high significance due to the level of survey effort. Medium rating assigned due to potential for burials in dunes crossed by Cable Transition Facilities.	**Low** The heritage surveys and AAPA Authority Certificate process will identify most heritage features present in the footprint, but there remains a risk of undetected or subsurface features.	**Minor**
	Subsea Cable System	Unlikely	Not assessed as desktop heritage assessment (Appendix X) indicates low risk of maritime heritage features. Cable route will be surveyed to confirm, and Sacred Sites clearances will also be undertaken.				**High** There is flexibility in the final route selection to avoid direct impact to heritage features.	**None**

Table 14-9. Summary of EIA results – Culture and heritage factor – Operation

Impact	Location	Likelihood	Scale	Duration	Magnitude	Value rating	Certainty	Residual Impact
Direct or indirect impact to heritage features associated with operations and maintenance activities	Solar Precinct	**Unlikely**	Not assessed as no additional disturbance proposed during operations. Sites in footprint will be removed prior to construction so heritage value rating is low.				**High** No disturbance proposed	**None**
	OHTL	**Possible** Some public access could occur along OHTL corridor.	**Limited** Public access impacts would be limited to within OHTL and immediate surrounds.	**Short-term** Public access could occur intermittently over the operations phase.	**Minor** Public access unlikely to significantly impact sites as locations not made public.	**Low** Sites within direct disturbance footprint removed during construction.	**High** Public access along OHTL corridor will be managed.	**Minor**
	Darwin Converter Site	**Possible** Cultural resource use in seasonal swamp could be affected by access and changes to hydrological regimes or water quality.	**Limited** Impacts to would be limited to the seasonal swamp.	**Permanent** Cultural resource use could be permanently altered.	**Minor** Swamp is expected to persist, but there could be some change to the aquatic ecosystem (refer Chapter 8).	**Medium** Seasonal swamp assessed as having High Aboriginal significance but is not a known Sacred Site.	**Low** Types of resource use not recorded and therefore potential for impact is uncertain.	**Moderate**
	Cable Transition Facilities	**Unlikely**	Not assessed as no additional disturbance proposed during operations. Sites in footprint will be removed prior to construction so residual heritage value rating is low.				**High** No disturbance proposed	**None**
	Subsea Cable System	**Unlikely**	Not assessed as impact is u				**High**	**None**

14.4.1 Areas of potentials impacts

14.4.2 Proposal footprint (direct disturbance)

The area within which heritage features may be directly impacted covers the extent of the proposal footprint where land clearing and disturbance will occur and AAPowerLink infrastructure will be installed as described in Chapter 2 Proposal Description. The direct disturbance footprint where heritage features could be impacted encompasses both the permanent footprint of the infrastructure, access tracks and the temporary works areas used during construction.

14.4.3 Area of influence (indirect disturbance)

Indirect impacts to heritage features outside of the proposal footprint will generally be limited to within a few hundred meters of the works areas where there may be increased access by AAPowerLink workers and/or the public on new access tracks, and erosion and sedimentation, and dust deposition could impact site condition. At the Darwin Converter Site, the area of influence could extend to the nearby seasonal swamp, which has been identified as having cultural significance. Along the Subsea Cable System corridor, the area of influence in terms of sediment deposition is predicted to be spread over a wide area and therefore is unlikely to impact marine heritage features. More broadly, the HIA report prepared for the Solar Precinct notes potential for impacts to the Powell Creek Telegraph Station located 26 km away due to increased access and activity in the area leading to increased interest in/and access to the site.

14.4.4 Construction

The potential impacts to culture and heritage will be greatest during the AAPowerLink construction phase when there will be significant land clearing, ground disturbance and increased access along newly created tracks, which has the potential to cause direct and indirect impacts to heritage features. Maritime heritage is also at greatest risk of impact during the construction phase when cable laying activities will disturb the seafloor and mobilise sediments. A range of Aboriginal and non-Aboriginal heritage features have been recorded in the terrestrial components of proposal footprint as described in Section 14.3 above, with varying levels of cultural significance and archaeological significance assigned. The sections below discuss the potential direct and indirect impacts to heritage features associated with the construction activities.

14.4.4.1 Direct impact to heritage features

The HIAs found that the direct impacts associated with the AAPowerLink may include, but are not limited to:

- Damage or desecration of Aboriginal Sacred Sites or culturally significant landscape features
- Clearing of surface archaeological remains especially lithic material
- Destroying the integrity of a site complex when only a portion of the site has been surveyed and understood
- The unexpected revealing and/or destruction of subsurface material culture or human remains
- Removal of culturally significant artefacts by workers.

In relation to Aboriginal Sacred Sites, the AAPA Authority Certificate process provides a robust framework for avoiding and minimising impacts. There are no known Sacred Sites in the proposal footprint; however, it is possible that Sacred Site clearance surveys will identify previously unrecorded sites. Authority Certificate applications have been submitted by Sun Cable and AAPA will now undertake site clearance surveys in consultation with the NLC, Traditionl Owners and site custodians. Sun Cable has committed to comply with all conditions of Authority Certificates issued for the AAPowerLink, including ensuring that the site protection measures are effectively communicated to all workers. The AAPA Authority Certificate process is well-established and is expected to ensure there are no unacceptable impacts to Sacred Sites.

The heritage features that could potentially be directly impacted by the AAPowerLink construction activities are summarised in Table 14-10. These include 28 archaeological sites (places), 36 isolated artefacts and 19 historic heritage features. Seventeen culturally significant landscape features will also be intersected, all of which are located along the Solar Precinct access roads, OHTL corridor or Cable Transition Facilities corridor, where the disturbance footprint is limited to a narrow corridor. As there is some flexibility in where the AAPowerLink infrastructure and temporary construction works areas are located, not all these sites will necessarily be disturbed or destroyed.

Table 14-10. Heritage features potentially directly impacted by AAPowerLink

Component	Aboriginal archaeological sites	Isolated artefacts	Historic heritage features	Cultural landscape features	Heritage risk areas (unsurveyed)
Solar Precinct	5	7	0	0	8
Solar Precinct Sealed access road	4	14	1	9	12
Solar Precinct Unsealed access road	2	4	0	4	9
OHTL (Railway Corridor)	Unsurveyed. Likely to contain heritage materials at locations where corridor intersects watercourses, floodplains, swamps and/or rocky country. Railway construction likely to have disturbed/destroyed sites.				Not yet assessed
OHTL (KP722 to end)	14	11	18	2	28
Darwin Converter Site	0	0	0	1	1
Cable Transition Facilities	3	0	0	0	4
Subsea Cable System	Unsurveyed. Low to moderate risk of undetected heritage features – see Table 6 Appendix X. Absence of heritage features to be confirmed by geophysical survey.				Not yet assessed
TOTALS	**28**	**36**	**19**	**16**	**62**
No. assessed as High cultural significance	**7**	**0**	**1**	**16**	**27**
No. assessed as High archaeological significance	**0**	**0**	**1**	**NA**	

Of the heritage features that could be directly impacted, 25 sites/features were assessed as having High Aboriginal Significance meaning they are significant to a group or many groups of Aboriginal people. Thirteen are cultural landscape features (watercourses and boulders) associated with Rain Dreaming (*ngapa puwarrijpa*) which are crossed by the access roads into the Solar Precinct. Other sites assessed as having High Aboriginal Significance are a swamp and Banyan tree recorded in the OHTL corridor, the seasonal swamp at the Darwin Converter Site (which is just outside the direct disturbance footprint), and a minor drainage line south of the Land Sea Joint Station. The remaining sites assessed as having Moderate-High Aboriginal Significance are archaeological sites that are significant due to their connection to Old People and Dreamings.

Most of the heritage features that will be directly impacted were assessed as having Low Archaeological Significance, meaning the sites are not rare or unique and have limited research potential. Seven sites at the Solar Precinct, one in the Cable Transition Facilities footprint and three along the OHTL corridor were assessed as having Moderate archaeological significance. One site was assessed as having Moderate-High archaeological significance, which is a railway bridge structure from the North Australian Railway. While this feature is not protected by the *Heritage Act*, placement of OHTL infrastructure will consider this feature during the design phase in recognition of its historical value.

The HIA concluded that from an archaeological perspective (based on the predictive model outlined in the HIA reports, survey results and other regional studies results) it is highly likely that further archaeological sites would be intersected if realignments were made to the current footprints to avoid recorded heritage features. Consultation with Traditional Owners and site custodians undertaken by Sun Cable during site selection for the Solar Precinct led to several footprint location refinements made to avoid areas of High Aboriginal Significance. The Solar Precinct footprint was agreed by Senior Traditional Owners and site custodians as offering the least impact to culturally significant and cultural resource areas overall. Notwithstanding this, Sun Cable has indicated that some realignments of the OHTL corridor and access road corridors may be possible to avoid significant heritage features.

Options for avoiding or minimising impacts to each recorded heritage feature will be considered in consultation with Traditional Owners and site custodians through the process of negotiating ILUAs. Options for avoiding sites located along the OHTL corridor will be explored, which could include strategic placement of poles and the access tracks to avoid disturbing heritage features as described in Chapter 2 Proposal Description. A commitment has also been made to ensure that locations for temporary construction works areas and the AAPowerLink components that are yet to be sited (i.e., OHTL diversions, electrode sites) avoid significant heritage features (either entirely or to the extent practicably possible) as described in Chapter 2 Proposal Description. Agreed impact avoidance and mitigation measures will be documented in the CHMP/s, which will also contain measures to ensure that heritage features and/or Sacred Sites are not deliberately or inadvertently removed by AAPowerLink workers.

Where the AAPowerLink is on Native Title or Aboriginal Land Trust Land, the ILUA process will provide an additional mechanism for minimising the potential for unacceptable impacts to heritage features of both Aboriginal and archaeological significance. Outside of these areas, the AAPA Authority Certificate process and permitting processes under the *Heritage Act* will provide the regulatory framework for avoiding and minimising impacts to heritage features and Sacred Sites. With these measures in place, the AAPowerLink is predicted to have localised, minor-moderate impacts associated with disturbance of culturally significant landscape features, and minor impact on existing archaeological sites within the direct disturbance footprint.

14.4.4.2 Indirect impacts to heritage features

The HIAs identified potential for indirect impacts associated with the submersion of significant surface archaeological remains by dust and sediments generated during construction. The predicted scale and magnitude of dust deposition and erosion and sedimentation associated with the AAPowerLink construction activities are discussed in Chapter 5 Terrestrial Environmental Quality and Chapter 11 Air Quality. As discussed in those chapters, erosion and dust deposition impacts are predicted to be localised to areas immediately surrounding the proposal footprint. As the archaeological sites recorded during field surveys were mostly assessed as having Low to Moderate Archaeological Significance, and the area affected by indirect impacts is localised, there is a low likelihood that any heritage features of High Archaeological Significance would be destroyed as a result of indirect impacts.

There is potential for indirect impact to the seasonal swamp adjacent to Darwin Converter Site, which has been assessed as having High Aboriginal Significance. The assessment of impacts to surface water flows and water quality presented in Chapter 6 Hydrological Processes and Chapter 7 Inland Water Environmental Quality, indicate there is a possibility that the swamp could be impacted if there are changes to surface water runoff and/or sediment discharges from the Darwin Converter Site. These impacts are unlikely to affect Aboriginal archaeological sites around the swamp margins; however, it is possible that the swamp's value as a culturally important resource area for Aboriginal people could be altered by changes to existing environmental conditions.

The HIA considered there is potential for indirect impact to the Powell Creek Telegraph Station declared heritage place. The site is located 26 km from the Solar Precinct and so is not at risk of direct impact; however, as the site is of interest there is potential for increased visitation by AAPowerLink workers. The CHMPs will

include the requirement for site inductions to provide AAPowerLink workers with a Code of Conduct that addresses respect for cultural and heritage values.

14.4.4.3 Impacts to undetected heritage features

The surveyed components of the proposal footprint encompass 62 'Cultural Heritage Risk Areas' assessed as potentially containing undetected archaeological materials. Additional 'Cultural Heritage Risk Areas' are also likely to be present in the unsurveyed parts of the footprint, and it is likely that further survey work in these areas will record additional archaeological sites, isolated artefacts, historic heritage features and culturally significant landscape features. In accordance with the HIA recommendations, the established predictive models will be used to identify 'Cultural Heritage Risk Areas' across all components of the AAPowerLink footprint and all such areas will be surveyed to record the presence/absence of heritage features. This stratified sampling strategy is widely used in HIAs and is expected to be effective in detecting most heritage features present within the direct disturbance footprint

Table 14-11. Cultural heritage risk areas identified in Heritage Impact Assessments (Source: Earthsea 2022a, b)

Component	Heritage risk areas (unsurveyed)
Solar Precinct	8
Solar Precinct - Sealed access road	12
Solar Precinct - Unsealed access road	9
OHTL (Railway Corridor)	Not yet assessed
OHTL (KP722 to end)	28
Darwin Converter Site	1
Cable Transition Facilities	4
Subsea Cable System	Not yet assessed
TOTALS	62

It is still inevitable that some materials will remain undetected due to poor ground visibility or other factors. The HIA identified there is a high potential for undetected buried archaeological features at the following locations:

- Within the drainage depression areas of the Solar Precinct and adjacent to major watercourses along the access road corridors given the incidences of archaeological features recorded in these land units and an understanding of depositional environments from other regional studies.
- Adjacent to watercourses and swamp margins along the OHTL corridor and at the Darwin Converter Site.
- Adjacent to the foredune system at Murrumujuk Beach where there are shell middens and burials recorded nearby.

The CHMPs will include measures to manage and report inadvertent discoveries of heritage features so that impacts to these features can be minimised.

14.4.5 Operations

There will be limited potential for further impacts to culture and heritage to occur once the AAPowerLink is constructed. Heritage features within the direct disturbance footprint will be removed prior to construction in accordance with Works Permits under the *Heritage Act*. Once these features are removed there will be no heritage features present in the operational areas. There is some potential for increased public access along the OHTL corridor; however, as the locations of heritage features will not be made public, this access is unlikely to result in further direct impacts. There will be no need for workers to access areas outside the footprint and so any Sacred Sites present in surrounding areas are unlikely to be impacted. The CHMPs will include workforce training and inductions that will address all aspects of cultural awareness and heritage protection.

14.5 Avoidance, mitigation, and monitoring

Sun Cable is committed to applying the environmental decision-making hierarchy when making decisions that could affect the environment. Consistent with Section 26 of the *EP Act* this involves applying the following approaches in order of priority:

1. Avoid – Ensure that actions are designed to avoid adverse impacts on culture and heritage.
2. Mitigate – Identify management options to mitigate adverse impacts on culture and heritage to the greatest extent practicable.
3. Offset – If appropriate, provide for environmental offsets for residual adverse impacts that cannot be avoided or mitigated.

The environmental management framework that will be adopted for the construction and operation of the AAPowerLink is detailed in Chapter 17 Environmental Management. A key component of the framework will be Cultural Heritage Management Plan/s. These plans will be prepared in consultation with Traditional Owners, site custodians and the NT Heritage Branch, and will consider best industry practice, drawing on the archaeological and cultural values of heritage features recorded in the proposal footprint and surrounding areas. In accordance with recommendations made in the HIAs the CHMPs will address:

- Measures to protect and manage individual heritage places, during and post-construction.
- Measures to manage and report inadvertent discoveries, such as:
  - Discovery of Aboriginal archaeological sites and objects.
  - Discovery of human remains.
- Defined responsibilities for the protection and monitoring of heritage features.
- Traditional Owner and custodian liaison/consultation requirements regarding cultural heritage management and reporting of incidents.
- Protocols for Traditional Owners and custodians to access areas during the construction phase, and the right to access cultural heritage features and areas of significance post-construction (within the constraints of Health & Safety risks).
- A process for the management and availability of cultural heritage information (taking into consideration the confidentiality of culturally sensitive areas and any cultural protocols).
- Processes for Breach Investigation & Dispute Resolution, including timeframes for responses.

For each of the impacts to heritage features discussed in this chapter, **Error! Reference source not found.** summarises the key actions that will avoid impacts (through site selection and design) and actions proposed to minimise impacts during construction, operation and decommissioning of the AAPowerLink.

Table 14-12: Culture and heritage - Avoidance, mitigation, monitoring and reporting commitments

Impact	Avoidance	Mitigation	Monitoring	Reporting
Direct impacts to heritage features	Consult with Traditional Owners and sites custodians through the ILUA and AAPA Authority Certificate processes to identify Sacred Sites and culturally significant landscape features and determine the most appropriate site protection measures. Avoid direct impacts to recorded heritage features where practicable when finalising the locations of AAPowerLink infrastructure and temporary construction works areas.	Prepare Cultural Heritage Management Plan/s (CHMP) in consultation with Traditional Owners, custodians and the NT Heritage Branch. Comply with conditions of Authority Certificates and ensure conditions are made available to all authorised personnel. Where impacts to archaeological heritage features are unavoidable, obtain an approval to carry out work on a heritage place or object (work) under the Heritage Act. Mitigation works on heritage features covered by Works Approvals will be undertaken ahead of commencing site preparation activities. Workforce training and inductions will address all aspects of cultural awareness and heritage protection.	Visual inspection of heritage features identified for protection. Ongoing engagement with Traditional Owners and custodians to identify emerging issues or concerns regarding heritage protection.	Internal environmental performance reporting. Reporting of incidents to Traditional Owners/custodians/AAPA/NLC and NT Heritage Branch and consultation to determine appropriate response. External reporting in accordance with environmental approval and heritage works approval conditions.

Impact	Avoidance	Mitigation	Monitoring	Reporting
Indirect impacts to heritage features	Restrict unauthorised public access along AAPowerLink access tracks and roads. Design criteria for engineered stormwater management systems and roads to maintain flows similar to pre-development conditions to avoid indirect impacts to heritage features associated with watercourses and swamps. Develop and implement site-specific Erosion and Sediment Control Plans (ESCPs) to minimise erosion and off-site sedimentation that could smother heritage features. Implement dust control measures to minimise dust deposition into arounds surrounding the proposal footprint where heritage features are present.	Rectify emerging issues associated with unauthorised access, alteration of flows, erosion and sedimentation, water quality and dust, to minimise potential for indirect impacts to heritage features.	Visual inspection of OHTL corridor and access tracks for signs of unauthorised access. Provision of reporting processes for landholders and community to report unauthorised use of AAPowerLink access tracks. Visual inspection of discharge points and monitoring of water levels and water quality in seasonal swamp at Darwin Converter Site monthly during the wet season. Visual inspections of disturbed areas and erosion and sediment controls as per ESCP (after significant rainfall events, at a minimum). Visual inspection of recorded heritage features adjacent to proposal footprint for signs of disturbance.	Internal reporting on environmental performance. External reporting in accordance with conditions of environmental approvals and permits.

Impact	Avoidance	Mitigation	Monitoring	Reporting
Impacts to undetected heritage features	Use archaeological predictive models developed through the HIAs to identify Heritage Risk Areas where clearance survey is required. Undertake clearance surveys in all Heritage Risk Areas to inform final site/route selection and heritage mitigation measures.	CHMPs will provide measures for managing the inadvertent discovery of heritage features. Consultation with NT Heritage Branch to determine appropriate response. Where further impacts to archaeological heritage features are unavoidable, obtain an approval to carry out work on a heritage place or object (work) under the Heritage Act. Workforce training and inductions will address all aspects of cultural awareness and heritage protection.	Monitoring of site protection or mitigation works by a qualified heritage practitioner.	Internal reporting on environmental performance. External reporting in accordance with conditions of environmental approvals and permits. Reporting of incidents and unexpected finds to Traditional Owners/custodians/AAPA/NLC and NT Heritage Branch. Reporting outcomes of site protection and mitigation works to Traditional Owners/custodians/AAPA/NLC and NT Heritage Branch.

14.6 Residual impact

As stated at the start of this chapter, the NT EPA's objective for the Culture and heritage factor is to:

> *"Protect sacred sites, culture and heritage."*

The residual impact of the AAPowerLink proposal is summarised below, assuming the adoption of impact avoidance, mitigation and monitoring measures described in this chapter.

Each impact to culture and heritage was assigned a residual impact rating taking into consideration the scale, magnitude and duration of the impacts, the presence/absence of environmental values and/or sensitive receptors and the level of certainty with respect to the intensity of the impact and the effectiveness of the mitigation measures. The residual impact ratings adopted in the assessment were provided earlier in Table 14-7. The combined residual impact to culture and heritage from AAPowerLink construction and operations is summarised in Table 14-13.

Table 14-13. Residual impact ratings for impacts to culture and heritage

Impacts	Residual Impact Rating
Construction	
Direct impact to heritage features	**Moderate**
Indirect impacts to cultural heritage features	**Minor**
Impacts to undetected heritage features	**Minor**
Operations	
Direct or indirect impact to heritage features associated with operations and maintenance activities	**Moderate**

The results of the EIA undertaken for the culture and heritage factor indicate the proposal is likely to have a Minor to Moderate level of residual impact heritage features and associated cultural values.

The Moderate residual impact rating relates to the potential for direct impact to heritage features across the AAPowerLink footprint where sites of High Aboriginal and/or Archaeological significance have been recorded and where additional survey effort is required in identified cultural heritage risk areas and to conduct Sacred Sites clearances. Site-specific mitigation measures for all sites are to be determined in consultation with site custodians, AAPA and Heritage Branch, and will be documented in a Cultural Heritage Management Plan (CHMP). Sun Cable has committed to consulting with Traditional Owners, and site custodians through the ILUA negotiation and AAPA Authority Certificate processes, and these processes are expected to ensure no unacceptable impacts to sites of cultural significance (both Sacred Sites and culturally significant landscape features). The Moderate residual impact rating reflects that there is further work to be done to provide certainty that no unacceptable impacts occur; however, as these processes are well-established, once this work is complete it is considered likely that the residual impact rating can be reduced to Minor.

The residual impact to cultural heritage features outside the direct disturbance footprint from erosion and sedimentation, dust, and other disturbance, was assessed as Minor. At most locations, there is a high level of certainty that impacts will be limited to within a few hundred meters of the direct disturbance footprint and will occur for short periods. Because the density of heritage features is low in the landscape, there is a low likelihood that sites of High significance would be indirectly impacted.

The residual impact to undetected heritage features was also assessed as Minor because the survey effort (archaeological and sacred sites clearances) is expected to ensure all sites of High significance are identified and either avoided or impacts mitigated to an acceptable level. Any sites that remain undetected are most likely to be isolated artefacts with a Low level of significance. The CHMPs will include measures for managing

unexpected finds and this process is expected to ensure that impacts are mitigated to as low as reasonably practicable (ALARP).

The residual impact associated with indirect impacts from unauthorised access, erosion and sedimentation and dust deposition during construction was assessed as Minor. There is a high level of certainty that these impacts will be localised in proximity to the proposal footprint as the mitigation measures are standard for land development activities.

The residual impact to heritage features associated with operations and maintenance activities was assessed as Minor for the OHTL and Moderate at the Darwin Converter Site, with no residual impacts predicted for the proposal components. Along the OHTL there is potential for Minor residual impact associated with unauthorised access along the OHTL corridor where it traverses culturally significant landscapes and heritage features. A Moderate residual impact rating was assigned for the Darwin Converter Site where it is possible that the nearby seasonal swamp could be altered by changes to existing environmental conditions, and access, which could alter the swamp's value as a culturally important resource area for Aboriginal people. All other operations and maintenance activities on land involve limited ground disturbance and no requirement to clear or disturb new areas, and heritage features recorded in the footprint will be removed prior to construction. In the marine environment, cable repair activities (if required) could disturb new areas of the seabed; however, impacts to maritime heritage are considered unlikely to occur because geophysical surveys will be undertaken prior to cable laying and any heritage features will be avoided.

14.7 Cumulative impacts

The framework used to assess cumulative impacts from the AAPowerLink, and other existing and future developments is described in Chapter 3 Impact Assessment. The process involves considering the cumulative or combined impacts to culture and heritage associated with the residual impacts from the AAPowerLink, existing impacts from other developments and land uses, and impacts associated with reasonably foreseeable developments described in Chapter 3. The following key areas of potential cumulative impacts to culture and heritage were identified:

- Combined land clearing and development in the Barkly region associated with the AAPowerLink, mining and Beetaloo-Sub-Basin onshore gas developments has potential to cause incremental loss of access to land for Aboriginal people and loss of heritage features across the region. As the region currently has a low level of development, the potential for cumulative impacts relates to the significant change that could occur across the region associated with industrial development on a scale not seen in the past. The region is rich in cultural heritage and so it is likely that all developments will have some impact on heritage features.
- Construction of the OHTL within the Railway Corridor has potential to both contribute to and minimise cumulative impacts. There could be localised cumulative impacts to heritage features associated with the combined loss of heritage features associated with the Railway construction and the AAPowerLink. The location of the OHTL in the Railway Corridor also has potential to minimise cumulative impacts by making use of previously cleared and disturbed areas.
- Combined land clearing and development in the Greater Darwin region associated with existing and future developments has potential to cause further loss of access to land for Aboriginal people and loss of heritage features, many of which are becoming increasingly rare as heritage features are destroyed to make way for residential and industrial development on the urban fringe. The remaining heritage features are likely to become more significant to Aboriginal people as the cultural landscape is progressively fragmented and sites are destroyed. Non-Aboriginal heritage features, such as WWII sites and objects are also becoming increasingly rare as these sites are often not protected by the Heritage Act and targeted by collectors.

- Combined land clearing and development at Gunn Point Peninsula, from the AAPowerLink Darwin Converter Site and Seafarms' neighbouring Project Sea Dragon Hatchery, will disturb approximately 200 ha of land that is currently undeveloped and identified as an important recreational and cultural resource area for Aboriginal people. The broader Gunn Point Peninsula is also identified as a Priority Development Zone for a rural centre and a Future Renewable Energy Hub. It is reasonably foreseeable that large parts of the Gunn Point Peninsula will be developed, which may result in incremental loss of heritage features across the wider landscape.
- The renewable energy generated by the AAPowerLink has the potential to drive economic development in the NT, by providing a significant source of secure and affordable electricity. The type and scale of development that could occur is difficult to predict, but it is reasonably foreseeable that mining and manufacturing-based industries could be made more feasible by having access to this resource. Where these activities involve clearing and disturbance of large areas of land and/or extraction of water resources, there is potential for incremental loss of heritage features.
- The SIA identified a range of potential cumulative opportunities and impacts that have potential to affect the cultural identity of local Aboriginal people as discussed in Chapter 13 Community and Economy.

The Subsea Cable System component of the AAPowerLink is unlikely to contribute to cumulative impacts to maritime heritage as there are no recorded heritage features on the proposed route options. The routes will be subject to geophysical survey and the final cable route will avoid impacts to maritime heritage features.

14.8 Offsets

The EIA/HIA did not identify any significant impacts that require offsets; however, Moderate residual impacts have the potential to be unacceptable and so depending on the outcomes of further survey works and consultation with Traditional Owners, site custodians and regulatory agencies, it is expected that measures may be required to compensate for impacts to heritage features. The ILUA negotiations, AAPA Authority Certificates and permitting processes under the *Heritage Act* each provide a framework for compensatory measures where impacts cannot be avoided. Sun Cable has committed to these processes. These measures may include detailed recording and/or relocation of sites or other measures determined in consultation with Traditional Owners and site custodians.

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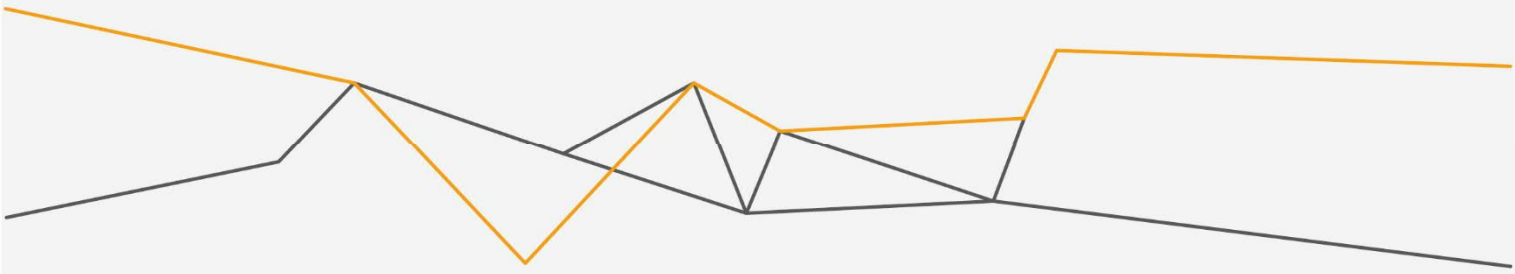

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