Jemena Northern Gas Pipeline Pty Ltd

Northern Gas Pipeline

Draft Environmental Impact Statement

APPENDIX Q – CULTURAL HERITAGE MANAGEMENT PLAN

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PLAN

NGP CULTURAL HERITAGE MANAGEMENT PLAN

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INTERNAL

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1 INTRODUCTION

This Cultural Heritage Management Plan (CHMP) has been prepared for the purpose of managing the protection of cultural heritage through the planning, construction and operations phases of the Northern Gas Pipeline Project (the NGP Project).

In the context of this CHMP, “cultural heritage” is defined collectively as:

- Sites and places registered on the World Heritage Register, the National Heritage Register or the Commonwealth Heritage Register.
- Sacred Sites as defined in the *Aboriginal Land Rights (Northern Territory) Act* 1976 (Cth) and the Northern Territory *Aboriginal Sacred Sites Act* 1989.
- Aboriginal or Macassan archaeological places and objects as defined in the *Heritage Act* 2011 (NT).
- Historic sites as defined in the *Heritage Act* 2011 (NT), including Declared Heritage Places and Parks and Reserves.
- Cultural Heritage as defined in the *Aboriginal Cultural Heritage Act* 2003 (QLD).
- Heritage sites as defined in the Queensland *Heritage Act* 1992.

This CHMP outlines the standards and processes to be implemented to mitigate any potential impacts of the NGP project on cultural heritage.

A CHMP is also a requirement of the Environmental Impact Statement (EIS) Terms of Reference (ToR) for the NGP Project issued pursuant to the *Environmental Assessment Act* (NT).

The NGP Project involves the construction and operation of a 12 inch diameter, 622km buried gas pipeline from Warrego, 45km northwest of Tennant Creek to a location 7km south of Mount Isa. The NGP Project will transport gas from northern Australian gas fields to the east coast gas markets through linking the existing Amadeus to Darwin Gas Pipeline (AGP) with the Carpentaria Gas Pipeline (CGP).

A start of line compressor station is to be constructed at Warrego and an end of line compressor station is to be constructed at Mount Isa. The overall project location is shown below.

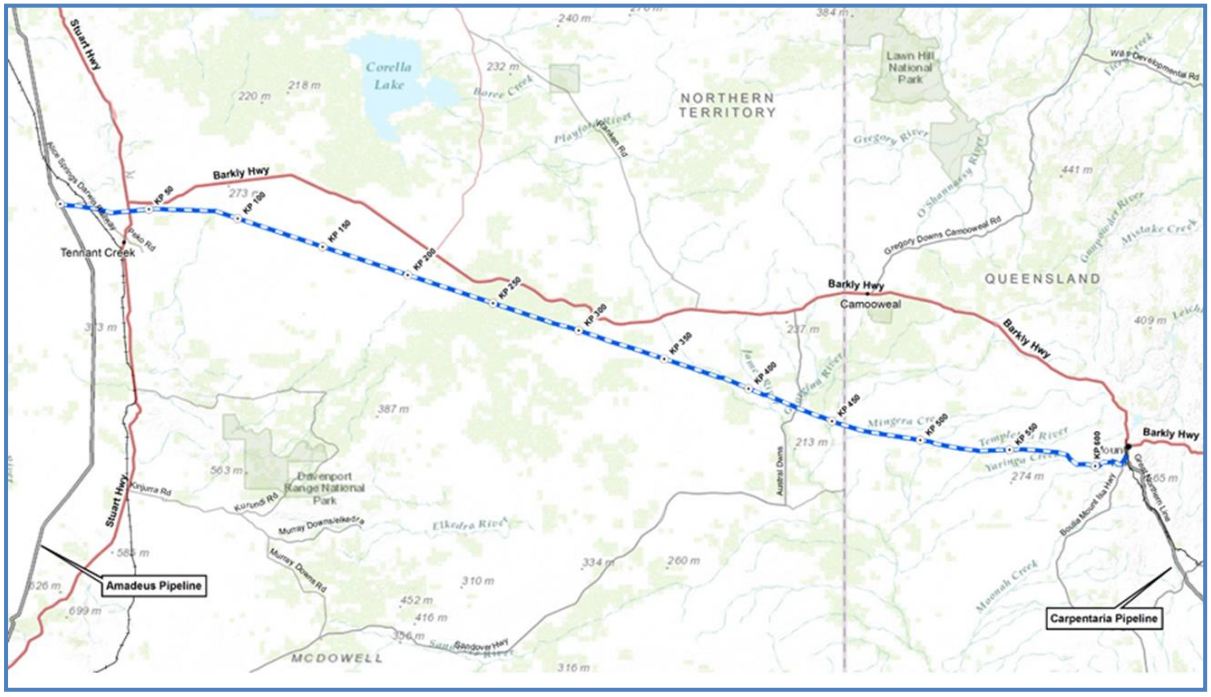


Figure 1 NGP Project Location

This CHMP documents the activities and practices which are presently in place for the planning phase and which will be established for the construction phase and to this extent presents a living document that will be finalised during the remainder of the NGP Project planning phase in 2016.

The standards and processes to be adopted in this CHMP, when finalised, will be incorporated into the NGP Project Construction Management Plan, including the Construction Environment Management Plan (CEMP) and implemented throughout the project.

1.1 SCOPE

The scope of this CHMP is to cover the whole NGP Project construction footprint, including:

- the proposed compressor station sites,
- the pipeline construction Right of Way (ROW),
- existing and new access tracks to and from the ROW,
- Main Line Valve (MLV) sites and Cathodic Protection (CP) sites,
- the installation and use of any new extractives (sand and gravel) borrow pits and water bores, dams and the like,
- any additional work areas required, and,
- the final pipeline easement.

The CHMP will outline all relevant cultural heritage aspects, the risk assessment undertaken, the potential impacts relating to the NGP Project and the mitigation plans to minimise those impacts.

1.2 OBJECTIVES

The Objectives of the CHMP is to put in place a plan that will:

- avoid and protect places registered on the World Heritage Register, the National Heritage Register or the Commonwealth Heritage Register;
- avoid and protect Sacred Sites (often termed dreaming or story places in other states);
- avoid, protect or minimise any impacts on Aboriginal archaeological places and objects;
- avoid and protect NT historic sites, declared heritage places and parks and reserves;
- avoid, protect or minimise any impacts on Aboriginal cultural heritage (Qld); and
- avoid and protect Queensland heritage places.

Within this CHMP specific plans and actions are set out that will achieve the objectives listed above.

2 NORTHERN GAS PIPELINE PROJECT OVERVIEW

This project overview summarises the scope of the NGP Project in general terms and in doing so identifies areas of potential risk to cultural heritage as a result of the project activities.

The NGP Project involves the construction and operation of a 12 inch diameter, 622km buried gas pipeline from Warrego, 45km northwest of Tennant Creek to a location 7km south of Mount Isa. The NGP Project will transport gas from northern Australian gas fields to the east coast gas markets through linking the existing Amadeus to Darwin Gas Pipeline with the Carpentaria Gas Pipeline.

A start of line compressor station is to be constructed at Warrego and an end of line compressor station is to be constructed at Mount Isa.

The project will construct the following infrastructure and facilities described in order from west (NT) to east (Qld):

- 12-inch buried underground gas pipeline; approximately 457km of which will traverse land in the NT and 165km in Queensland.
- Start of line (SOL) receipt/compressor station at Warrego, 45km north-west of Tennant Creek (NT); referred to as the Phillip Creek Compressor Station (PCCS), this facility will cover an area of approximately 9ha (300m x 300m).
- Four (4) main line valve (MLV) facilities at locations along the pipeline, each covering and area of approximately 0.25ha.
- Five (5) cathodic protection (CP) stations spaced between the MLV sites, each covering an area of approximately 0.04ha.
- End of line (EOL) delivery station located to the south of the Diamantina Power Station near Mt Isa. This is referred to as the Mt Isa Compressor Station (MICS). The proposed footprint for the MICS is will cover an area of approximately 9ha (300m x 300m).

The construction phase of the project is planned to commence in February 2017. Construction of the pipeline is proposed over a period of 10 months with completion planned by November 2017 to avoid the wet season. Construction of the PCCS and MICS is proposed to extend through to February 2018, as access to these locations is less dependent on dry weather conditions. The construction schedule is driven by the project objective to achieve commencement of gas transportation services by 1st July 2018.

The construction footprint for the pipeline will comprise a 30m wide pipeline construction Right of Way (ROW) and the temporary facilities required to support construction will include workforce accommodation camps, access tracks (existing and new), additional works areas (turn-around points and laydown areas), water supply bores and dams for storing water required for dust suppression and hydrostatic testing (pressure testing) of the pipeline.

The construction ROW and all temporary facilities, access tracks and works areas will be decommissioned and rehabilitated on completion of the construction phase. The only components to be retained are access tracks to the permanent above-ground facilities (i.e. compressor stations, MLV and CP stations) and any access tracks or dams requested by Landholders.

Following construction of the pipeline, Landholders will be able to resume use of the land, other than the conduct of excavation activities or erection of permanent structures or buildings over the buried pipeline. Pipeline warning signs will be provided at fences, road crossings and other locations as required by Australian Standard AS2885.

2.1 CONSTRUCTION ACTIVITIES AND CULTURAL HERITAGE

The planning and construction activities that may pose risks to cultural heritage include:

- Early survey works, including non-ground disturbing and low impact ground disturbing works.
- Mobilisation of construction workforce.
- Clearance and disturbance activities along the alignment, access roads, camps and other areas.
- Transportation of personnel, machinery and materials during construction and installation of the pipeline.
- Trenching activities and installation of the pipeline.
- Construction of the compressor station facilities.

3 APPLICABLE LEGISLATION AND APPROVALS

The NGP project falls within the legal jurisdiction of the Commonwealth of Australia, the Northern Territory of Australia and the state of Queensland.

Australia has a hierarchy of legislation protecting cultural heritage. Overarching Commonwealth legislation provides protection to the range of cultural heritage materials and sites from prehistoric Indigenous rock art to historical structures, including the *Aboriginal Land Rights (Northern Territory) Act* 1976 (Cth) (ALRA) which provides specific protection to Aboriginal cultural heritage in the Northern Territory.

The Northern Territory administers legislation to provide protection for cultural heritage while allowing for the reasonable management of development and ongoing land use in the Territory. This includes the *Northern Territory Aboriginal Sacred Sites Act* 1989 *(NT)* (ASSA) which puts in place arrangements for the protection and management of sites considered sacred or significant to Indigenous people and highlights a commitment to recognise Indigenous culture and their complex and fundamental connection to country.

The various current legislative acts providing protection of cultural heritage as well as administrative controls of land and development that apply in the Northern Territory are set out below.

3.1 COMMONWEALTH LEGISLATION

***Aboriginal Land Rights (Northern Territory) Act* 1976 (Cth) (ALRA):** The ALRA was established to recognise existing land held by Aboriginal Traditional Owners based on Aboriginal Tradition and to provide the basis upon which Aboriginal people in the Northern Territory could claim rights to land. The ALRA has a number of provisions relating to the conditions upon which access to and use of Aboriginal Land can occur, including mining developments and developments such as the NGP.

The ALRA defines Sacred Sites as places ‘sacred or otherwise of significance in the Aboriginal Tradition' meaning that protected sites include all sites of cultural significance when associated with traditional culture. The functions of the Land Councils established under the ALRA include assisting Aboriginals in the taking of measures likely to assist in the protection of sacred sites on land (whether or not Aboriginal land) in the area of the Land Council (Section 23(1) of the Act).

***Native Title Act* 1993 (Cth) (NTA)**: The NTA was established for the purposes of the recognition of Aboriginal native title in Australia and to provide the basis upon which Aboriginal native title holders could claim native title to land, except where it had been validly extinguished. The NTA has a number of provisions relating to how developments can occur where native title exists and consequently, affords various levels of rights to native title holders relating to the impacts that such developments, e.g. the NGP, might have on their native title rights. The NTA allows for agreements to be made between parties in relation to native title and often this will include matters relating to Aboriginal cultural heritage.

***Aboriginal and Torres Strait Islander Heritage Protection Act* 1984**: This Act may override all State and Territory cultural heritage acts where there are conflicting provisions and provides for site protection as a ‘last resort'. It is meant to provide emergency protection for Aboriginal and Torres Strait Islander heritage sites when all other avenues have been exhausted. Generally, an Indigenous group must apply to the Minister to have protective covenants placed over an area or site. The power to provide such protection resides in Section 51 of the Constitution.

The *Environment Protection and Biodiversity Conservation Act (EPBC);* The EPBC replaces the old Register of the National Estate with National and Commonwealth Heritage Registers designed to protect significant heritage places. The National List includes places such as Gallipoli and Uluru, and only includes places that are of broad national significance. The Commonwealth Register provides

protection for significant places on Commonwealth owned or leased property. The Act provides a set of criteria for listing places to these registers and conservation management principles for their protection. The Heritage Division of Department of Environment and Heritage is the Commonwealth agency responsible for the administration of the EPBC and providing support to the Australian Heritage Council. The Australian Heritage Council is to be supported by an Indigenous Heritage Committee which deals with Indigenous heritage issues for both registers and the *Aboriginal and Islander Heritage Protection Act*.

3.2 NORTHERN TERRITORY LEGISLATION

NT Coroner's Act* 1993*: Confers the jurisdiction of coronial services in the Northern Territory onto the Territory Coroner to ensure that deaths which are reportable to the coroner undergo the necessary inquiry or inquest. The Act provides the mechanisms and procedures to be followed in the event of a reportable death in the Northern Territory; including those aspects of the nature of the death that require the matter to be reported. Notably these include circumstances where the identity of the deceased is unknown. This Act is relevant to the NGP in the event that skeletal remains are discovered during the construction of the project.

***Northern Territory Aboriginal Sacred Sites Act* 1989:**

This Act protects sites that are 'sacred and otherwise of significance in the Aboriginal Tradition' following the definition contained in the ALRA. Sacred Sites are protected whether the location of the sites are known or not by any person or company seeking to do work on lands, however the Act does maintain a defence for ignorance of the location of sites.

The Act is administered by the Aboriginal Areas Protection Authority (AAPA). The AAPA maintains two site registers, one for registered Sacred Sites and another for recorded Sacred Sites. A registered Sacred Site is a site that has been identified by the site custodians as being highly significant in the Aboriginal tradition. In many cases the site custodians have requested a site be added to the register. Recorded Sacred Sites are sites that require further investigation to substantiate their significance. Both types of site are protected under the provisions of the Act.

The Authority can issue a Certificate indemnifying a proponent for accidental damage to a Sacred Site upon application and payment of a fee. The Certificate will contain conditions limiting or preventing works in and around registered and recorded Sacred Sites. The Authority Certificate will contain maps outlining any restricted work areas in the area of application.

Northern Territory Heritage Act* 2011 and *Regulations: The Act provides a system for the identification, assessment, recording, conservation and protection of places and objects of prehistoric, proto-historic, historic, social, aesthetic or scientific value. The Heritage Branch maintains an Archaeological Sites Register and the NT Heritage Register, which protects sites of heritage value prescribed under the *Heritage Act*. Any disturbance of a place or object under this Act requires Ministerial permission. This power can be delegated to the Heritage Council or the Heritage Branch in certain circumstances.

This Act sets out processes for permanent protection of places by gazettal to the NT Heritage Register. Sections 17 and 18 of the Act define all Aboriginal and Macassan archaeological places and objects as Heritage Places and Objects. Works Permits for Aboriginal and Macassan sites can be issued to a proponent following appropriate consultation with Traditional Owners and or Site Custodians of these places. An archaeological survey must be completed prior to issue of a Works Permit. Traditional Owners must be consulted and have the right to be involved in decision making about these places. A permit to carry out works on archaeological places or object may carry conditions for the grant of such permits. These may include scientific salvage of artefacts, study of such artefacts and repatriation to Traditional Owners at the conclusion of any study.

The *Heritage Act* also includes a provision for the declaration of classes of places or objects that are known to be of significance in the NT but where not all locations are currently mapped and recorded, and will likely be extended to include relics of the Overland Telegraph Line, WWII aircraft crash sites, lone graves (not in regular cemeteries) and Shipwrecks.

Where necessary Jemena will make applications for Work Approvals under the *Heritage Act*.

3.3 QUEENSLAND LEGISLATION

The relevant legislation in Queensland is:

***Aboriginal Cultural Heritage Act* 2003 (Qld):** The main purpose of the Act is to provide for the effective recognition, protection and conservation of Aboriginal cultural heritage. The key principles in the Act include:

- that the recognition, protection and conservation of Aboriginal cultural heritage should be based on respect for Aboriginal knowledge, culture and traditional practices;
- that Aboriginal people should be recognised as the primary guardians, keepers and knowledge holders of Aboriginal cultural heritage;
- that it is important to respect, preserve and maintain knowledge, innovations and practices of Aboriginal communities and to promote understanding of Aboriginal cultural heritage;
- that activities involved … are important because they allow Aboriginal people to reaffirm their obligations to 'law and country'; and
- that there is a need to establish timely and efficient processes for the management of activities that may harm Aboriginal cultural heritage.

The Act also provides for the negotiation and agreement of Cultural Heritage Management Plans (CHMP) with recognised Aboriginal Parties for developments such as the NGP.

***Queensland Heritage Act* 1992:** This Act was established to provide for the conservation of Queensland's cultural heritage and in doing so establishes the Queensland Cultural Heritage Council and a register of places, the Queensland Heritage Register. The Act requires the reporting of the discovery of archaeological artefacts and provides for the management of places of local cultural heritage significance by local governments. The Act also allows for the regulation of development affecting Queensland heritage places, in conjunction with other legislation. The Queensland Heritage Act applies to historic heritage places and archaeological sites. Therefore, the Act does not deal with sites of significance in the Aboriginal tradition.

4 PREHISTORIC AND HISTORIC CONTEXT

4.1 PREHISTORIC AND HISTORIC OVERVIEW

In reaching Australia c.50,000ya Indigenous Australians established several international 'firsts' including successful water travel and edge-ground axes [O'Connell *et.al*. 2004:835-853]. Despite lower-than-current sea levels during the period 40,000 to 60,000 years BP [Allen *et.al* 1977, Yokoyama *et. al.* 2011:54-69], a substantial sea crossing was always required to reach Sahul.

Edge-ground axes are found sporadically throughout northern Australian archaeological contexts over 30,000 years [Geneste et. al.2010:66-69]. During the Holocene production and trade of axes became a major occupation. The largest documented axe quarry in Australia is located near Mount Isa [McBride 1987: 252-273] making this archaeology directly relevant to the Northern Gas Pipeline. This quarry produced millions of axes which were traded over much of the Lake Eyre Basin [Tebbit

2002:22-29] as well as into Cape York [Davidson 2005, Sharp 1952]. It is highly likely that this trade in axes flowed at least in small part to the west into the current study region and that other trade goods flowed across the route of the Northern Gas Pipeline (see below).

While the region is currently outside the accepted definition of the arid zone, it has effectively been more or less arid throughout the last 50,000 years [Gentilli 1972]. Despite this, there is good evidence that the region has been occupied for 2/3 of that period with earliest evidence of occupation sometime around 30,000 BP[Fitzsimmons 2013. Csiro 2014].[1] It is likely that the Northern Gas Pipeline may cut through a region where short term, sporadic occupation by small nomadic bands was common. This activity may leave long-lasting archaeological traces that do not necessarily equate to intensive ongoing occupation.

In the mid-Holocene, marked changes in archaeological remains occur, including an increase in the number of sites occupied [Smith 1989, Smith 2011, Thorley 1998] and a measurable increase in complexity and sophistication in technology [Lourlandos 1985]. During this period a microlithic technology was adopted in much of the country, and around 3,700 years BP new tool types entered the Australian tool kit including the tula [Hiscock 2007, Hiscock *et. al*.1980]. Tulas are a well-documented, highly standardised and unique Australian stone artefact [Veth *et. al.* 2011]. These woodworking tools were made and used over more than 2/3 of the continent, predominantly in the rangelands. There is some suggestion that the implementation of these new tool types were a response to resource stress associated with climate change and specifically the onset of the ENSO [Holdaway *et.al*. 2004].

Tulas[2] were also highly prized and curated and were among a suite of items that were traded throughout inland Australia [Veth *et. al.* 2011, Hiscock 1994, Moore 2004]. Native narcotic 'pituri' was collected in naturally occurring groves west of the Georgina and Mulligan Rivers [Davidson et.al. 2005, Hiscock 1988], and to the south of the study area and traded in large quantities through the Lake Eyre basin [Johnston *et.al.* 1933]. It was part of a highly developed trade network that included ochre, gypsum, axes, boomerangs, spears and stone blades.

This intensive trade activity was taking place on the margins of the region of the Northern Gas Pipeline. To the northwest of the NGP other sources of trade goods were manufactured including grindstones that were traded over an area greater that 135,000 km2 [Donovan 2010, Mulvaney1976, Roth 1897]. To the north, on the Barkly Tableland, stone blades were made at large quarries and distributed over a wide area [Mulvaney *et. al.*1995, Mulvaney 1997].

4.2 REGIONAL ARCHAEOLOGICAL STUDIES NEAR THE NGP

Archaeological projects have tended to occur at the regional margins of the Northern Gas Pipeline. These have established the antiquity of the occupation of the arid and semi-arid centre of the continent including the current study area. The oldest site in the region, Puritjarra Rockshelter, dating to nearly 30,000 BP [Paton 1987], lies approximately 400km to the southwest of the origin of the NGP (at Warrego). Other research in central Australia makes it clear that there is a persistent occupation in the central Australian range country [Smith 2001], although this may have involved marked decreases in population during periods of greater aridity [Thorley 1998].

[1] Some caution is advised regarding the intensity of occupation by Veth 11. CSIRO. *CSIRO Land Research Surveys*. 2014; Available from: http://www.publish.csiro.au/nid/289/aid/16090.htm., who points out that in some instances extreme climatic conditions may have limited the extent of occupation of the region.

[2] Importantly, they were part of a highly effective portable toolkit. Tulas, as well as axes were manufactured in the range country to the east of the Northern Gas Pipeline. Tulas were typically mounted on a woomera with string and resin. Used as an adze they were able to maintain the suite of wooden items in the Aboriginal tool kit and could be re-sharpened and reused over relatively long periods. With a small amount (volume) of material the inhabitants of the Tennant Creek – Mount Isa district were able to travel fully equipped to meet their economic nee

Lake Woods, about 170km to the north of the pipeline origin was subject to extensive excavation by Smith [Veth 1995] who expected to find Pleistocene remains similar to those in lunette dunes in the semi-arid west of NSW [Smith 1986]. This research failed to find evidence of either extensive occupation or Pleistocene occupation.

Excavations by Hiscock at Lawn Hill Gorge, approximately 140 km north of Camooweal documented a tradition of occupation of the well-watered gorge system from the height of the last glacial maximum, approximately 17,000 years BP. Occupation continued through to the Holocene with an intense range of sites, including ochre and stone quarries, art sites and ceremonial grounds incorporated into the National Park and surrounding country.

Hiscock also initiated research into the manufacture of axes at the Lake Moondarra prehistoric quarry c.27km north of Mount Isa [Bowler 2003]. As noted above, this quarry produced several million axes that were manufactured in a highly organised production sequence specifically for the purpose of trade.

Further to the south, and approximately 200km from the end point of the NGP, research indicates that another type of stone tool, the tula, was also manufactured in quantities for trade [Tebbit 2002].

4.3 CONSULTING ARCHAEOLOGICAL SURVEYS IN BARKLY AREA

In addition to the regional archaeology, a number of specific projects have been undertaken adjacent to the NGP. These include:

1. Proposed Minemakers Phosphate Mine MLA27244) Archaeological Survey Arruwurra Block Barkley. Report for Central Land Council by Tim Hill, June 2009.
2. The Telstra Optic Fibre Cable Archaeological Survey
3. Archaeological Survey of the Proposed Alice Springs to Darwin Railway Route, Report to Adrail by Gerard Niemoeller, 2001
4. Archaeological Clearance of the Proposed Blue Bush Bore and Bend Construction Camps, Report for Adrail by Gerard Niemoeller 2001.
5. Archaeological Survey of Railway Realignments and Ancillary Construction Area. Report to Adrail by Gerard Niemoeller 2003.
6. Tennant Creek to Katherine Optical Fibre Cable Route by I Coates 1991

While these studies have been relatively few in number over a large land surface, they have identified consistent patterns in site and artefact distribution across the Barkly Region;

1. Low site frequency and artefact densities in the most of the Wonarah Land System;
2. Higher site frequencies and artefact densities along watercourses and around soaks across the region;
3. Very high site frequencies and artefact densities in Land Systems and Geological Formations where outcropping rock suitable for flaked stone tools occurs, particularly in braided channel river systems.

The archaeological specialist report will address the archaeological background for each land system across the NGP Route.

4.4 SUMMARY OF REGIONAL ABORIGINAL HERITAGE SITES

Taken as a whole, past research in the Barkly Region indicates:

1. An extensive time-depth of occupation of the Tennant Creek/Mount Isa region.
2. A well-developed network of prehistoric trade, focussing on the Lake Eyre basin, but extending in other directions as well.

3. A high quantity of durable goods traded throughout the network, including two highly specialised forms of stone artefact.

Further it identifies key questions that can be addressed by archaeological field work such as the proposed survey conducted in the planning phase of this project. For example:

1. What influence do environment and landscape features have on the production and distribution of stone artefact assemblages?
2. What is the nature and extent of trade networks in arid and semi-arid Australia?
3. What responses to climate changes are indicated in the archaeological record of this region?
4. What contribution can development surveys contribute to the body of knowledge about prehistoric cultures and lifestyles?

4.5 HISTORICAL OVERVIEW

4.5.1 EARLY EXPLORATIONS AND THE OVERLAND TELEGRAPH LINE

A number of European explorers traversed country near or through the NGP route in the years after 1840. The first successful crossing of the continent was by John McDouall Stuart who completed six expeditions into Central Australia in the attempt to cross the continent from south to north between 1858 and 1862 [Powell 2009]. Stuart's sixth expedition successfully crossed the continent from Adelaide to Chambers Bay in the Northern Territory, mapping a route that would eventually be used to establish a telegraph line that could take advantage of the Top End coast's proximity to south East Asia [Powell 2009:57-59]. The Overland Telegraph was completed in 1872 and led to a rapid increase in non-Aboriginal people 'exploring' and 'settling'. It was during this period that the first reports of major landscape features such as Uluru were made and that missionaries first brought Christianity to the wider region [Powell 1982].

The telegraph line required repeater stations to boost the electrical signal every 150km or so. The establishment of the Tennant Creek Telegraph Station 10km south of the NGP Project Area had profound implications for the Aboriginal community in the region as well as for incoming adventurers [Lohe *et.al.*1977]. The Telegraph line provide a relatively secure route for transport of persons and stock as well as a potential source of resources including reliable water for the local (Warramungu) community.

4.5.2 PASTORAL STATIONS

The Northern Territory's first 'legal' pastoral station, Undoolya near Alice Springs to the south of the project area was stocked between 1872 and 1874 [CCNT 1992, Ashenden 2010]. Pastoralism in the Barkly began in the east, with John Sutherland moving a flock of sheep from Rockhampton to the Georgina River district in 1863 [O'Brien 1988] with Alroy and Dalmore Downs established in 1877 and Austral Downs in 1883 [Sutherland 1913]. Avon Downs (a Declared Heritage Place) was acquired by Thomas Guthrie in 1882 [Low 1985]. Its first wool clip was in 1884. Initially these properties were stocked with sheep, but the transition to cattle saw the completion of the pattern of pastoral production which is now exclusively beef production.

4.5.3 MINING

The NGP is 'bookended' by mining provinces. Both Tennant Creek and Mount Isa were established as major mining centres in the 1920s [NT Heritage Branch Assessment Report]. Smaller scale mines have opened through the project area from time including the Wonarah Phosphate Mine within the project area on Arruwurra land [Pearce 1984].

Mining and pastoralism have been the economic drivers in the region for most of the last 130 years. The limited number of declared heritage places reflects the sparse European population and the tyranny of distance across the Barkly.

4.5.4 ELDO SHELTERS

One additional type of heritage feature in the project area is another reflection of the Territory's strategic position nationally and globally. These are the ELDO shelters at Austral Downs and Burramurra. The European Launcher Development Organisation (ELDO) was the precursor to the European Space Agency. The program including the development of the Blue Streak rockets which were to form a key platform of the United Kingdom's nuclear deterrent, armed with warheads containing uranium sourced from mines in the Top End of the Northern Territory [Coffey Environments 2009]. The Blue Streak rockets were launched from Woomera in South Australia with a flight path traversing the eastern half of the Northern Territory. The potential for rocket stages (or indeed the entire vehicle) to fall to earth and impact on people and structures in remote communities and pastoral stations across the region led to the construction of shelters from 1966 [Dermoudy 1998]. Two of these shelters are located to the south of the NGP Project Area on the AACO owned cattle stations. Neither can be considered at threat from the proposed pipeline

4.6 SACRED SITES OVERVIEW

The NGP passes through land that has been owned by Aboriginal people for time immemorial. At least four language groups occupy various sections of the route including Warramungu, Kaytej, Wakaya and Balrnu [NT Heritage Branch Assessment Report 2010] each with their own institutions and associations with the land.

The language groups that Jemena has been engaged with through the Land Councils are the Warumungu, the Wakaya, the Arruwurra (a subset land owning group of the Wakaya), the land owning groups associated with the Burramurra Native Title Claim, the Indjalandji-Dhidhanu and the Kalkadoon, the latter two groups having Native Title Determined Areas with the areas associated with the NGP in Queensland.

This long standing ownership was recognised by the Aboriginal Land Rights Royal Commission [Horton 2000] which led to the establishment of the *Aboriginal Land Rights (Northern Territory) Act* (ALRA). An understanding of the holistic and religious nature of Aboriginal Traditional Owners connection to land is a crucial component of the Royal Commission's findings and is enshrined in the ALRA. This connection has been characterised by WEH Stanner, (1976) an anthropologist who assisted the Royal Commission stating:

> If Aboriginal culture had an architectonic idea I would say that it was a belief that all living people, clan by clan, or lineage by lineage, were linked patrilineally with ancestral beings by inherent and imperishable bonds through *territories* and totems which were either the handiwork or parts of the continuing being of the ancestors themselves. [Woodward 1974] (my emphasis)

The ALRA therefore establishes a universal or 'blanket' protection for sites or places that are "sacred or otherwise significant according to Aboriginal tradition". These sites are commonly referred to in the Northern Territory (including by Aboriginal people) as 'sacred sites'. Their nature varies from wholly natural features to artificially modified landscapes such as stone arrangements. Sacred sites may also include more prosaic man made elements such as archaeological remains, although most archaeological remains are not sacred sites.

5 CULTURAL HERITAGE SITES IDENTIFICATION

5.1 REGISTERED SITES

Jemena undertook a search of the relevant cultural heritage registers at the Commonwealth, Northern Territory and Queensland levels.

The table below sets out listings of places and objects on these registers that are within 20km of the project footprint.

Table 1 Places and objects on National, NT and Queensland heritage registers

Register	No. of Places	Name of Place	Distance from Proposed NGP Right of Way.
World Heritage Register	0	-	-
National Heritage Register	0	-	-
Commonwealth Heritage Register	0	-	-
Aboriginal Sacred Sites Register	15	AAPA Site #: 5959-1, 6058-1, 6158-3, 6257-10, 6257-11, 6257-12, 6257-1A, 6257-1B, 6257-3, 6257-7, 6257-8, 6257-9, 6257-9, 6456-13, 6457-2	Various
NT Archaeological Database (*Heritage Act*)	30	Various quarries and artefact scatters.	Within 20 km radius
NT Historic Places *Declared Heritage Places*	4	Tennant Creek Telegraph Station	8km south
		Burramurra ELDO Rocket Shelter	15km south west
		Austral Downs ELDO Rocket Shelter	3.6km (0.6km from access track upgrade)
		Avon Downs Pastoral Station	46km (8km from access track upgrade)
NT Historic Places	2	North Star Mine Battery Complex Reserve	17km north of RoW

Parks and Reserves		Tennant Creek Telegraph Station Reserve	8km south of RoW
Queensland Aboriginal Cultural Heritage Register	16	Artefact scatters, rock art, culturally modified trees, ceremonial grounds	Various distances up to 20 km radius
Queensland Heritage Register	0		

5.1.1 WORLD, NATIONAL AND COMMONWEALTH HERITAGE REGISTERS

There are no heritage sites within 20km of the NGP Project that are listed on the World Heritage Register, the National Register or the Commonwealth Heritage Register.

5.1.2 ABORIGINAL SACRED SITES AND ABORIGINAL ARCHAEOLOGICAL SITES, PLACES AND OBJECTS

There are currently 30 sites recorded on the NT Archaeological Database located within 10 km of the NGP alignment or track alignments. Of these, 11 are no longer in existence, having been salvaged as part of other projects. The recording of these sites should be seen as the result of the requirement for surveys prior to development rather than a comprehensive archaeological survey of the region.

It is also important to note that while there were some Aboriginal Sacred Sites and Aboriginal and Macassan sites identified on the NT Aboriginal Sacred Sites Register and on the NT Archaeological Database, it is noted that all such sites are provided a ‘blanket’ protected status, i.e. they do not have to be on a register in order to be protected. In fact, commonly there are many such sites that may or may not have been recorded previously and which are not on the registers.

Consequently, desktop review and field surveys have been undertaken to identify and assess the occurrence of these site types within the project footprint. These activities are described in more detail in the sections below.

5.1.3 NT HISTORIC SITES, DECLARED PLACES AND PARKS AND RESERVES

While there are four NT historic sites and four NT parks and reserves identified, the NGP Project will not impact on these but they will be noted in project plans to ensure inadvertent access or disturbance does not occur.

5.1.4 QUEENSLAND ABORIGINAL CULTURAL HERITAGE

There are registered Aboriginal Cultural Heritage Sites within the vicinity of the NGP Project pipeline alignment and Jemena is in discussions regarding these and other cultural heritage sites identified during cultural heritage surveys. The Parties to these discussions are the Kalkadoon Native Title Aboriginal Corporation RNTBC and the Indjalandji-Dhidhanu Aboriginal Corporation RNTBC.

5.1.5 QUEENSLAND HERITAGE

There are no sites on the Queensland Heritage Register that will be impacted by the Project.

5.2 SACRED SITES CONSULTATIONS AND SURVEYS

In the development of this CHMP and in managing cultural heritage for the NGP Project, Jemena engaged the services of Circle Advisory Pty Ltd (Circle).

Circle has managed all of the interactions with the relevant stakeholders including consultations with Aboriginal Traditional Owners regarding the arrangements put in place for the protection and management of Sacred Sites. These Aboriginal parties included:

1. Central Land Council
2. Northern Land Council
3. Arruwurra Aboriginal Corporation
4. Indjalandji-Dhidhanu Aboriginal Corporation
5. Kalkadoon Native Title Aboriginal Corporation

The following section presents the results of those consultations.

5.2.1 NORTHERN TERRITORY

In the Northern Territory, the NGP traverses the regions covered by both the Central Land Council and the Northern Land Council.

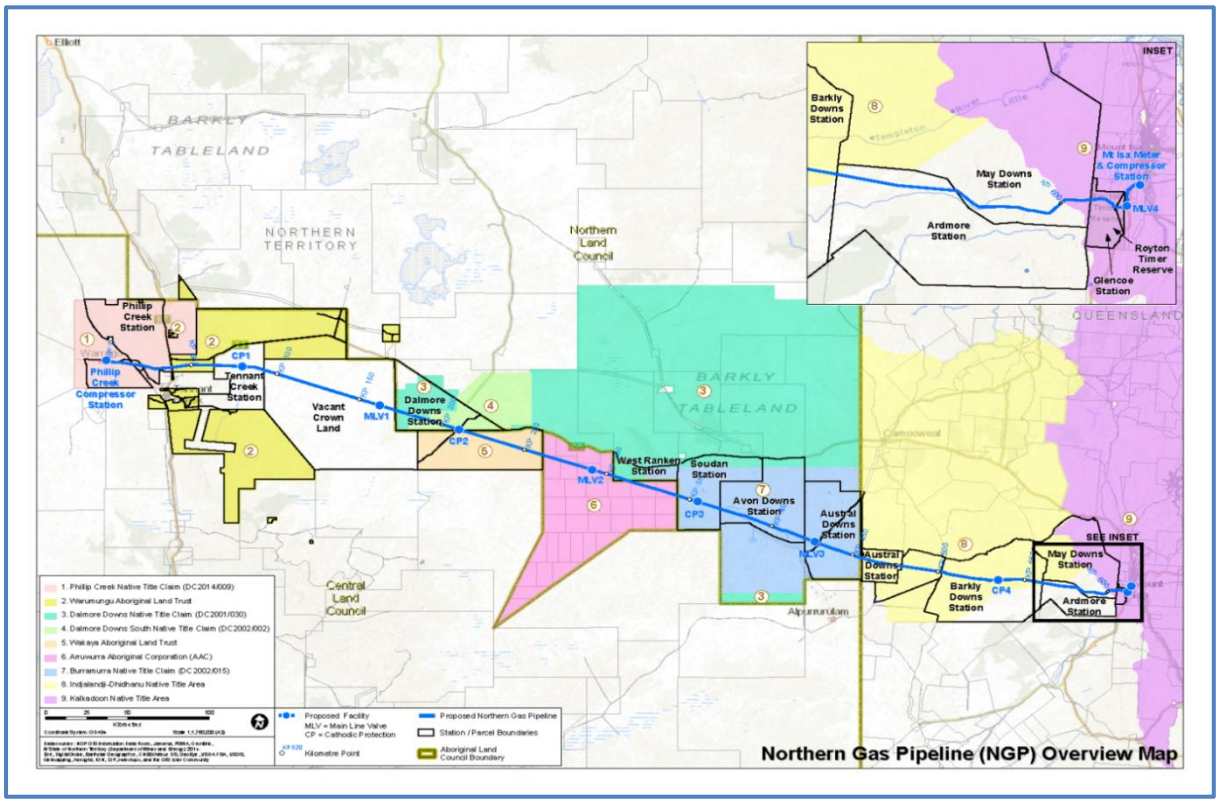


Figure 2 Aboriginal Land and Native Title Claims and Determined Areas

5.2.1.1 Central Land Council

During the NT Government competitive process, Jemena commenced consultations with the Central Land Council (CLC) in May 2015 regarding the NGP Project. In August 2015, entered into a Cultural Heritage Survey Agreement (CHSA) with the CLC and through which Jemena commissioned the CLC to undertake consultations with the relevant Traditional Aboriginal Owners and Custodians regarding its preferred pipeline route for the NGP. This Sacred Sites Survey and consultation was undertaken over a 1km wide corridor within the 20km wide Planning Corridor nominated by Jemena.

The Traditional Owners, through the CLC, then provided a preliminary route that the NGP could follow that avoided Sacred Sites within the CLC region. Jemena's initial preferred route was amended in several areas to avoid some Sacred Sites at the request of the Traditional Owners.

On the basis of the above, the CLC provided Jemena with a CLC issued Sacred Sites Clearance Certificate that provided Jemena with an indication that the project could be constructed without any damage to Sacred Sites.

After the award in November 2015 to Jemena of the right to build, own and operate the NGP, Jemena further commissioned the CLC through its existing arrangements to carry out a Sacred Sites Clearance Survey over all of the associated access tracks for the NGP, in accordance with the existing CHSA. In doing so the CLC consulted extensively with the relevant Traditional Owners and Custodians.

Through an iterative process of discussions and consultations with the CLC, Jemena is in the process of finalising an agreement with the CLC that will see the NGP Project able to be constructed in a

manner that protects Sacred Sites through all phases of the project and also to underpin its application to the AAPA for an Authority Certificate.

The resulting conditions that are contained in the Authority Certificate in the CLC region, when granted, will form a part of this CHMP.

The arrangements that were and have been put in place with the CLC have been carried through into the arrangements with the Northern Land Council (NLC), as described in the following subsection.

5.2.1.2 Northern Land Council

During the NT Government competitive process, Jemena commenced consultations with the Northern Land Council (NLC) regarding the NGP Project. Consistent with the approach taken with the CLC, Jemena entered into arrangements with the NLC in April 2016 and commissioned the NLC to undertake a Sacred Site Clearance Survey which was completed in May and June.

The NLC survey also identified a number of Sacred Sites in the vicinity of the proposed NGP pipeline alignment and access roads and subsequently, alterations have been made to the pipeline alignment and access road to avoid the Sacred Sites identified.

Through an iterative process of discussions and consultations with the NLC, Jemena is in the process of finalising an agreement with the NLC that will see the NGP Project able to be constructed in a manner that protects Sacred Sites throughout all phases of the project and also to underpin its application to the AAPA for an Authority Certificate.

The resulting conditions that are contained in the Authority Certificate in relation to Sacred Sites in the NLC region, when granted, will form a part of this CHMP.

5.2.1.3 Arruwurra Aboriginal Corporation

In December 1989 an agreement was reached between the Northern Territory Government and Jack Punch (dec'd) of the Arruwurra land owning group, as a party of the Wakaya / Alyawarre Land Claim, for the grant of freehold title to the Arruwurra Aboriginal Corporation (AAC). The terms of the grant include reference to the members of the AAC being those Arruwurra claimants and those Aboriginal people entitled to use, enter or occupy the land in accordance with Aboriginal tradition.

The inference that Jemena has drawn from this is that the AAC also has a responsibility to protect any Sacred Sites that exist on the Arruwurra Freehold and in particular, the members of the AAC.

The area of land held by the AAC also lies within the CLC region and so in accordance with section 23 (1) (ba) of the ALRA, the CLC has a responsibility "…to assist Aboriginals in the taking of measures likely to assist in the protection of sacred sites on land (whether or not Aboriginal land) in the area of the Land Council".

Jemena's approach to managing the respective responsibilities of both the AAC and the CLC has been to enter into Cultural Heritage Agreements with both the AAC and the CLC (as referred to above) to allow them to fulfil their responsibilities to their respective constituents.

Jemena's consultations and negotiations with the AAC are expected to result in an agreement that will see the NGP able to be constructed in a manner that protects Sacred Sites, from the perspective of the Arruwurra, throughout all phases of the project and also to underpin its application to the AAPA for an Authority Certificate.

The approach that Jemena has taken and will continue to take in relation to Sacred Sites on the Arruwurra freehold land is intended to satisfy both the responsibilities of the CLC and the AAC in relation to the protection and management of Sacred Sites in that area.

The resulting conditions that are contained in the Authority Certificate, when granted, in relation to Arruwurra Freehold, when granted, will form a part of this CHMP, for the protection of Sacred Sites on the Arruwurra Freehold land.

Throughout the Planning Phase of the NGP Project, Jemena has successfully undertaken its project activities without incursion onto or any damage to any Sacred Sites within the CLC region and on the Arruwurra freehold land.

5.2.2 QUEENSLAND

The NGP Project extends into Queensland through the traditional lands of the Indjalandji-Dhidhanu people and the Kalkadoon people. Jemena's approach to managing cultural heritage in Queensland (sites sacred to Aboriginal people and archaeological evidence of Aboriginal occupation), mirrors that of its approach in the NT and is in compliance with the *Aboriginal Cultural Heritage Act* (Qld).

5.3 ARCHAEOLOGICAL HERITAGE CONSULTATION AND SURVEYS

In the development of this CHMP and in managing cultural heritage for the NGP Project, Jemena engaged the services of Circle Advisory Pty Ltd (Circle).

Circle engaged archaeological specialists with significant and senior standing in the Northern Territory and Queensland, sufficient for the size of the project, to carry out field archaeological surveys and prepare reports on their findings.

Information regarding Circle and these specialists is included at Appendix A.

Archaeological field surveys commenced in late April 2016 and continued throughout the period May to July sufficient to cover all of the project footprint known to date.

The process that has been put in place to identify and assess archaeological materials protected by the Heritage Act has been designed to avoid, minimise or mitigate the impacts of the planning, construction and operation of the NGP.

This has involved systematic field surveys to:

- identify the presence or absence of archaeological material within the footprint of the NGP;
- assess the significance of any archaeological material located;
- assess options for minimising the impact of the NGP on the cultural heritage found by the survey
- develop a highly accurate predictive model for management and monitoring of cultural heritage during design, construction and operation; and,
- inform this CHMP.

The information contained in the following subsections explains the process that has occurred to date for field surveys across both the Northern Territory and Queensland.

5.3.1 NORTHERN TERRITORY

5.3.1.1 Archaeological Survey Methodology

The Northern Territory section of the survey covered approx. two thirds of the total area of the proposed NGP footprint, with over 457km of pipeline and 980 km of access tracks. None of this land has been subject to archaeological survey in the past. Therefore, the scale of the project necessitated a stratified sampling methodology for some sections of the proposed alignment and other parts of the footprint. The planning for the survey methodology proceeded with the following assumptions:

- The scope of works for the study was based on a clearance survey strategy as well as a study to ascertain the type and density of archaeological materials likely to be encountered on the proposed pipeline route.;
- This survey traversed land that had seen few or no archaeological surveys in the past;
- The remoteness of some sections of the alignment and proposed tracks necessitated a practical survey methodology that ensured the safety of the survey team.

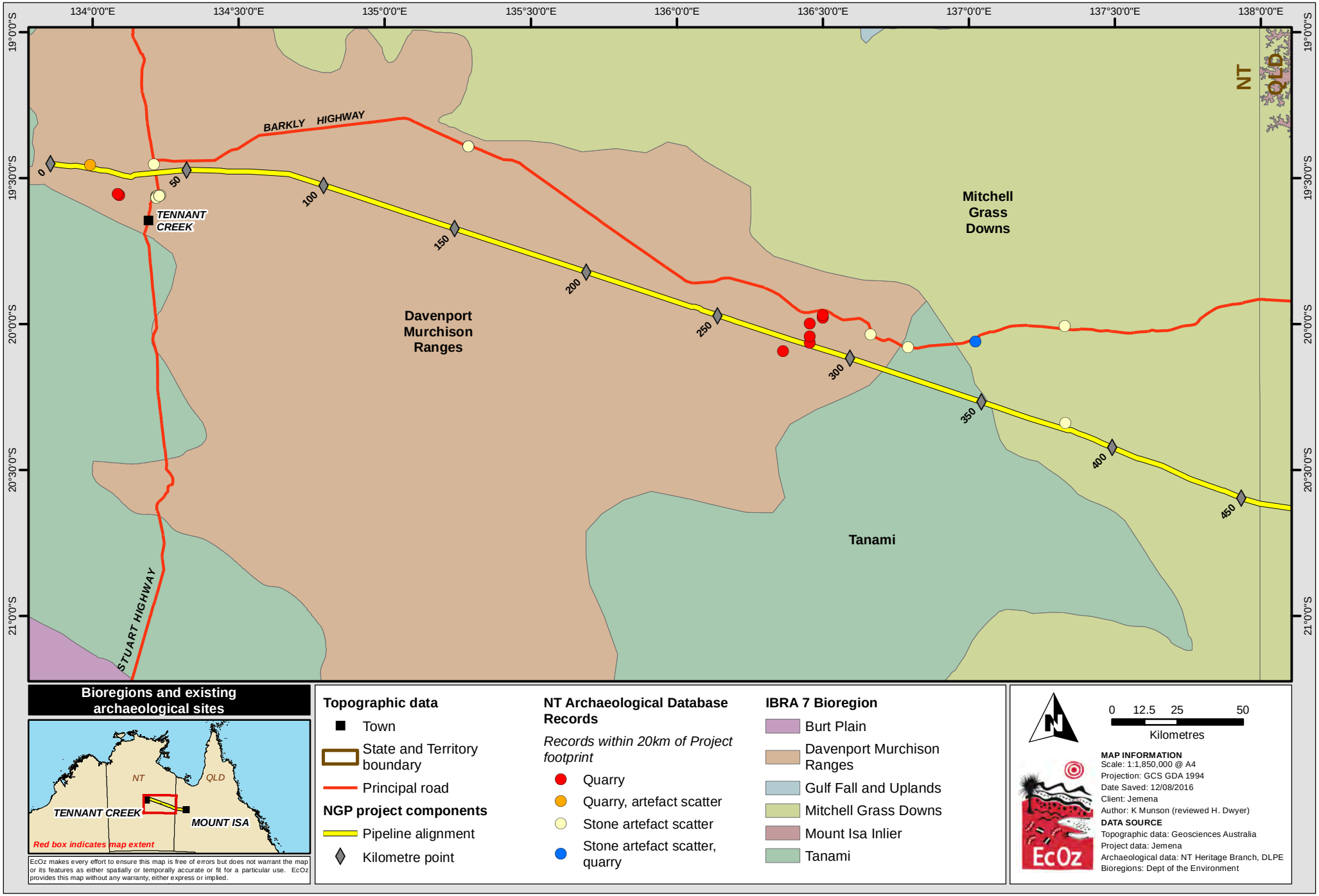
After assessing the above, the survey teams decided to base their methodology on:

- Surveying the entire proposed pipeline route;
- Surveying proposed work areas (compressor stations, camp sites, main line valve locations etc.) close to the proposed pipeline route where the predictive model (developed below) warranted a close ground inspection; and,
- Surveying the proposed and existing access tracks where the predictive model warranted a close ground inspection;

The predictive model is based on previous archaeological work in the region (David, 1991,1992; Lance, 19 90), landform, geology, history, hydrology and the expert knowledge of the archaeological team conducting the project. Figure 3 below portrays the Land Systems of the project area together with existing archaeological sites. The outcropping lithology mapping compiled by the Northern Territory and Queensland Geological Survey Offices indicates that cherts, silcretes, quartzites, quartz, silicified tuff, basalts and dolerites all occur across the Project Area. The outcropping lithology GIS layers were projected over the Land System layers to develop a GIS model indicating areas that are more likely to hold archaeological materials. The predictive model established three tiers of landscape archaeological sensitivity:

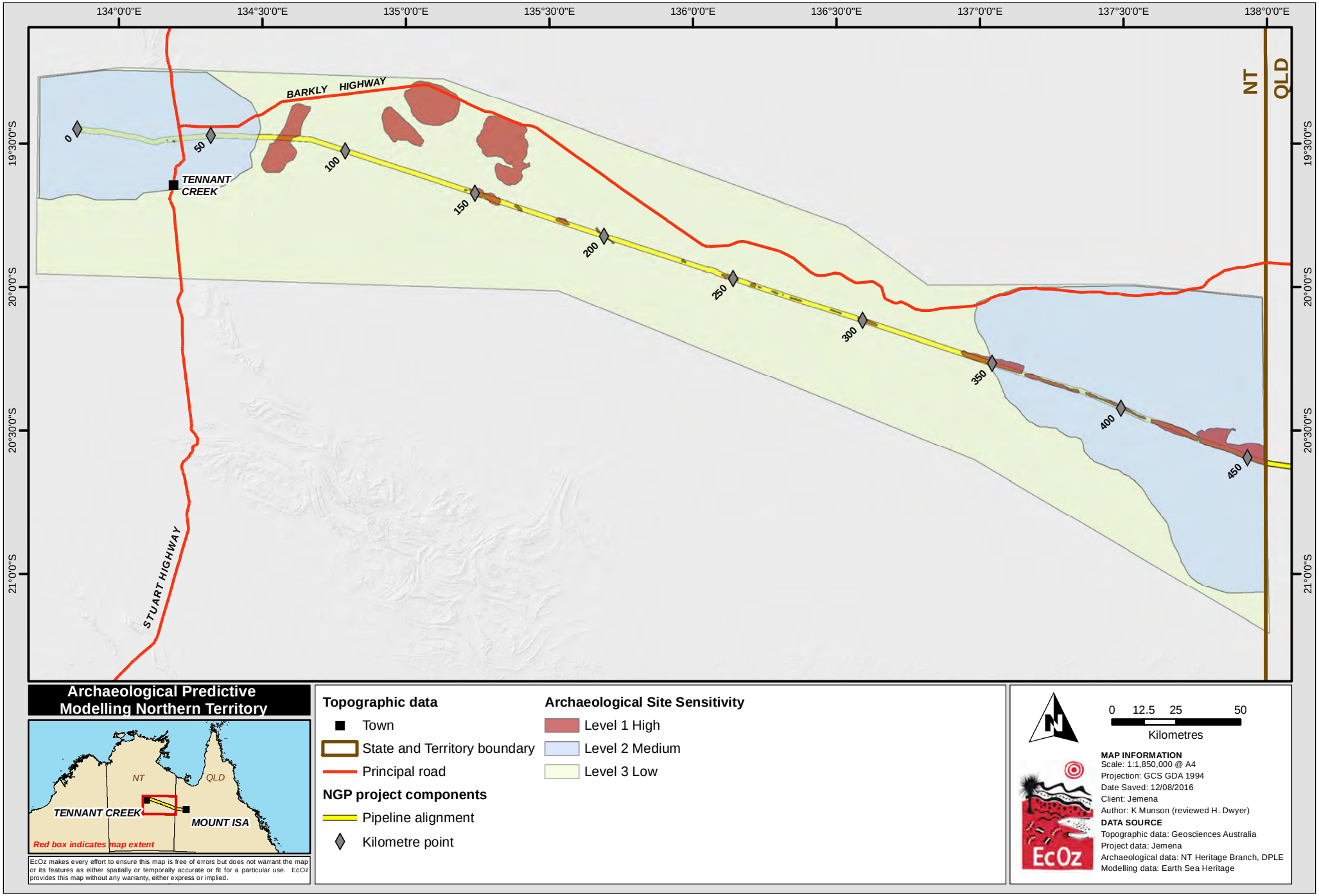
1. Level 1 Landscapes are predicted to be the most likely to contain archaeological materials. These areas include an intersection of Land Systems (Christian et al., 1954; CSIRO, 2014) and outcropping rock of types often used in the past for flaked or ground stone tools. Landscapes.
2. Level 2 Landscapes include areas where one of the two above criteria are satisfied.
3. Level 3 Landscapes include areas where neither of the two criteria are met. An example of this landscape would be major parts of the Wonarah Land System (turpentine scrub).

Figure 4 below maps the three-tiered predictive model for archaeological sites.



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\JEMENA\EIS (NT)\01 Project Files\Ch8\Figure 8-X. Map.mxd

Figure 3. Land systems and existing archaeological sites



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\JEMENA\EIS (NT)\01 Project Files\Ch8\Figure 8-2. Map of archaeological sites predictive model results.mxd

Figure 4. Archaeological sites predictive model

5.3.1.2 Survey Results

At the time of writing, cultural heritage surveys had been completed for the Right of Way, the infrastructure footprint and most of the access tracks.

The archaeological survey has identified a suite of sites with variations in site abundance in different landforms across the Project area. The vast majority of sites are stone artefact scatters, quarry sites, background scatters and isolated stone artefacts. Sites and site types located across the Project area included:

1. a large stone artefact quarry in the Wonorah Land System. The specialist archaeological reports will recommend avoiding this site

2. a background scatter of artefacts occurs across the Mitchell Grass Downs areas of the alignment on both sides of the border. This background scatter will be fully documented in the specialist reports. The specialist report for the Northern Territory jurisdiction will likely recommend a works approval under Section 72 of the Heritage Act (*NT*).

3. several large artefact scatters were recorded in the Mitchell Grass Downs areas, primarily located on higher land. The specialist report for the Northern Territory jurisdiction will likely recommend a works approval under Section 72 of the Heritage Act (*NT*).

The specialist archaeological heritage reports are currently in preparation. Four reports are being prepared:

- two reports for the Northern Territory side of the border
- one report for the Indjalandji-Dhidhanu country on the Queensland side of the border
- one report for the Kalkadoon country on the Queensland side of the border.

Following completion of site documentation and assessment, prior to commencement of construction, all necessary approvals will be obtained. Relevant approvals are discussed in Section 5.4.

5.3.2 QUEENSLAND

The NGP Project extends into Queensland through the traditional lands of the Indjalandji-Dhidhanu people and the Kalkadoon people. Jemena's approach to managing cultural heritage in Queensland (sites sacred to Aboriginal people and archaeological evidence of Aboriginal occupation), mirrors that of its approach in the NT and is in compliance with the *Aboriginal Cultural Heritage Act* (Qld).

5.4 APPROVALS REQUIRED

5.4.1 AUTHORITY CERTIFICATE

In relation to the protection of Sacred Sites in the NT, Jemena formally applied to the Aboriginal Areas Protection Authority for an Authority Certificate pursuant to the ASSA in May 2016. Conditions contained in the Authority Certificate when granted, will form a part of this CHMP.

The conditions of the Authority Certificate are being discussed between Jemena and the CLC, NLC, the AAC and the AAPA.

5.4.2 WORKS APPROVALS

In relation to the protection and proper management of Aboriginal archaeological places and objects in the NT and once the archaeological surveys have been completed and the reports prepared, Jemena will make applications for Work Approvals as required for the Project in accordance with Section 72 of the NT *Heritage Act*.

5.4.3 CULTURAL HERITAGE MANAGEMENT PLANS (QLD)

In relation to the recognition, protection and conservation of cultural heritage in Queensland, once the cultural heritage surveys have been completed and reports have been finalised, Jemena will negotiate agreed CHMPs with each of the relevant Aboriginal parties.

Once this has been completed Jemena intends to submit the agreed CHMPs to the Queensland Department of Environment and Heritage Protection consistent with the Part 7 provisions of the ACHA.

Notices regarding Jemena's intention to conclude CHMPs for the relevant areas were posted and provided to the Aboriginal Parties in May 2016, surveys are either completed or underway and negotiations over CHMPs are in progress.

6 CULTURAL HERITAGE MANAGEMENT PLANNING

Jemena has undertaken an initial risk assessment regarding the protection of cultural heritage, the summary results of which, including initial mitigation plans, are set out below.

The full risk assessment is included in 6.4 below.

Throughout the third quarter of 2016 the risk assessment and mitigation plans will be further refined through consultations and negotiations with the relevant Aboriginal parties and associated Government agencies.

This CHMP is expected to be finalised in the fourth quarter of 2016 and then incorporated into the Project Construction Management Plans as required.

6.1 RISK ASSESSMENT

The risk assessment uses a standard risk based approach. In accordance with the requirements of the NT EPA *Guidelines for the Preparation of an Economic and Social Impact Assessment*, cultural heritage was included in the social and economic risk assessment approach for the project.

As a consequence there are risks that were identified in the cultural heritage domain more related to cultural life than strictly to cultural heritage per se. These have been retained in this CHMP due to their intrinsic relationship but in the EIS are dealt with in the economic and social section (Chapter 9).

The approach taken assesses likelihood (or frequency) vs consequence (or impact) and is based on a standard industry approach for pipeline developments:

Likelihood

1. The risk may occur only in exceptional circumstances and is not likely to occur in this location.
2. The risk would be an uncommon occurrence and would occur in remote circumstances and has occasionally occurred on pipeline developments.
3. The risk occurs on an irregular basis, but has occurred on pipeline developments.
4. The risk has a history of occurrence for pipeline development or is difficult to control due to external influences of the region.

5. The risk has occurred recently and is likely to occur again. It is an expected occurrence on a pipeline development project in similar regions.

Consequence

A. Low level or no disruption to cultural life or damage to cultural heritage sites, places or objects.
B. Minor short term disruption to cultural life and / or minimal damage to cultural heritage sites, places or objects that can be avoided or mitigated.
C. Serious medium term disruption to cultural life and / or serious damage to cultural heritage sites, places or objects that cannot be avoided or mitigated.
D. Major medium to long term disruption to cultural life and / or irreversible damage to cultural heritage sites, places or objects.
E. Major long term disruption to cultural life and / or major, irreversible damage to cultural heritage sites, places or objects.

Drawing on the above, the combination of both **Likelihood** and **Consequence** allows for an assessment of the **Level of Risk** associated with phase of the project and for each element of project activities in relation to the protection and management of cultural heritage.

6.2 RISK MITIGATION SUMMARY

Table 2 below summarises the identified risks and the initial recommended mitigation plans contemplated at this time.

Table 2 Archaeological survey predictive model

ID#	Risk	Mitigation
Planning Phase		
	Unauthorised entry onto or damage to Sacred Sites.	Sacred Site Surveys undertaken by Land Councils and reports received setting out Restricted Work Areas and Exclusion Zones. Cultural Heritage Survey Agreements in place with all other Aboriginal Parties, to identify Restricted Work Areas and Exclusion Zones. No low impact ground disturbing works to be undertaken without Sacred Site clearance by Aboriginal Parties.
	Unauthorised entry onto Aboriginal Land	Compliance with the Aboriginal Land Act and issue of individual permits
	Damage to cultural heritage sites, places or objects.	No low impact ground disturbing works to be undertaken without cultural heritage sites survey by archaeologist.
	Uninvited entry into Aboriginal living areas, e.g. family outstations.	Identification of family outstations and inclusion of access restrictions in project land access line list.

ID#	Risk	Mitigation
Construction Phase		
	Unauthorised entry onto and / or damage to sacred sites	Inclusion of access restrictions for workers in project area in accordance with Sacred Site Authority Certificate. All clearance activities undertaken in accordance with Sacred Sites Act Authority Certificates. Authority Certificate conditions incorporated into Project Construction Management Plans and incorporated into all subcontracts. Specific conditions set out in Project Cultural Heritage Management Plan (CHMP), including all clearance areas defined by line of site pegs prior to clearance activities. Traditional Owner participation in clear and grade team ahead of construction in Restricted Work Areas.
	Uninvited entry into Aboriginal living areas, e.g. family outstations.	Identification of family outstations and inclusion of access restrictions in project land access line list.
	Unauthorised entry onto Aboriginal Land.	Agreement with the Central Land Council regarding the issue of Project permits to access the Warumungu and Wakaya Aboriginal Land Trust lands.
	Damage to known cultural heritage sites, places or objects.	Incorporating site management conditions in Work Approvals under the Heritage Act. Archaeological Heritage Field Hands working alongside Traditional Owners during clear and grade in Restricted Work Areas. Archaeological Field Hands working during clear and grade in areas of high archaeological potential. Marking out and fencing off of heritage site areas in close proximity to construction activities.
	Discovery and disturbance of previously undiscovered cultural heritage sites, places or objects.	Inclusion of procedures in CHMP for management of further site discovery during clear and grade activities in accordance with the relevant Work Approval conditions.
	Skeletal remains discovery and disturbance.	Inclusion of procedures in CHMP for skeletal remains discovery and management.
Operations Phase		
	Unauthorised entry onto or damage to sacred sites.	Inclusion of access restrictions for operations workers in project area in accordance with Sacred Site Authority Certificate implementation.

ID#	Risk	Mitigation
	Uninvited entry into Aboriginal living areas, e.g. family outstations.	Individual permit access in accordance with Aboriginal Land Act and Land Agreement conditions and local relationship development.
	Unauthorised entry onto Aboriginal Land	
	Damage to known cultural heritage sites, places or objects.	Workers restricted to approved access tracks, public roads and pipeline easement and respect of Authority Certificate conditions. No ground disturbing activities outside approved areas.

6.3 RISK MITIGATION PLANS

The following sets out the further detail about the initial risk mitigation plans.

6.3.1 SACRED SITES PROTECTION

The statutory processes undertaken in accordance with the Sacred Sites Act provides for the protection of Sacred Sites and so underpins the main mitigation measures for the protection of Sacred Sites that are included in the CHMP.

Sacred Sites Clearance Surveys were completed by the CLC, NLC and the AAC to ensure NGP Project activities do not result in unauthorised entry to, or damage to Sacred Sites. The resulting reports to the AAPA will inform the conditions placed on the Authority Certificate applied for by Jemena.

The surveys, subsequent reports and close working relationships with the CLC, NLC and the AAC have allowed for the provision of maps and spatial data containing Restricted Work Areas and Exclusion Zones. These have applied during the planning phase and will continue to apply during the construction and operations phases.

Specific measures during the construction and operations phases of the Project will include:

- Project activities in Restricted Work Areas only undertaken in accordance with agreed conditions
- Exclusion Zones being designated as “No-Go Zones”
- any No-Go Zones in close proximity to the Project footprint y be cordoned off if necessary
- the conditions of the Authority Certificate, when granted, will form a part of the contractual conditions of all contractors and subcontractors on the Project
- all workers on the Project will undergo inductions that will include information regarding the Sacred Sites protection.

The detailed controls and processes established in the final CHMP, e.g. Authority Certificate conditions, will be incorporated into the Construction Environmental Management Plan (CEMP).

These measures will reduce the residual risk to low.

6.3.2 UNAUTHORISED ENTRY ONTO ABORIGINAL LAND

During the planning phase, protocols have been established with the CLC to allow access to Aboriginal Land using the existing CLC permit system.

During the construction phase, entry onto Aboriginal Land, specifically the Warumungu and Wakaya Aboriginal Land Trust lands will be closely regulated in accordance with an agreement with the CLC.

Through this agreement, a project, access permit system will be established and implemented in a way that ensures compliance with the Aboriginal Land Act and the agreement with the CLC.

The processes above render the residual risk as low.

6.3.3 DAMAGE TO KNOWN CULTURAL HERITAGE SITES, PLACES OR OBJECTS

During the planning phase (May – July 2016) a comprehensive program of archaeological survey was undertaken over the whole known project footprint, including the compressor station sites, pipeline ROW, access roads and additional work areas.

The resulting reports will include recommendations in relation to the management of specific archaeological sites, places and objects discovered.

Jemena will make the required applications, considering the recommended site management conditions, to the Heritage Branch (Northern Territory) for Work Approvals, in accordance with the Heritage Act (*NT*).

Work Approval conditions may include:

- site protection, e.g. through marking out and fencing off heritage site areas in close proximity to construction activities, i.e. the establishment of No-Go Zones
- relocating and/or reinstating heritage objects
- destruction of sites.

The detailed controls and processes established in the final CHMP, e.g. Work Approval conditions, will be incorporated into the Construction Environmental Management Plan (CEMP).

6.3.4 DAMAGE TO PREVIOUSLY UNDISCOVERED CULTURAL HERITAGE SITES

During construction the development of infrastructure and access for the NGP requires the disturbance of the earth surface and so alterations to the natural environment, i.e. through clearing and grading of the ROW and access tracks, trenching for the pipeline or the requirement for additional work spaces that have not yet been surveyed.

In relation to additional work spaces, as these are identified and prior to any non-low impact disturbance to the land, they will undergo archaeological survey and as required, they will be located to avoid areas of high archaeological significance or Work Approvals will be sought in accordance with the *Heritage Act.*

In relation to areas already surveyed, land clearing may expose shallow sub-surface material or cultural materials that were previously obscured by vegetation. With the exception of skeletal remains discovery (see 6.3.5 below), such previously undiscovered heritage places or objects will be managed in accordance with any Work Approvals granted.

Implementation of any Work Approvals granted will be overseen by an archaeologist with good standing in the Northern Territory, the practical implementation of which may be undertaken through the employment of trained and experienced Aboriginal archaeological field survey hands.

The detailed controls and processes, e.g. Work Approval conditions, established in the final CHMP will be contained in the Project Construction Environmental Management Plan.

6.3.5 SKELETAL REMAINS DISCOVERY

In the event that remains are discovered during the planning and construction phase of the project immediate compliance with the *Coroner's Act (NT)* will apply. The procedure will be as follows:

- cessation of work in the immediate area;
- establishment of a 50m radius exclusion zone for all personnel and activities;
- immediate notification of the NT Police; and,
- immediate notification of the NT Heritage Branch CEO;
- noting that the project activities would continue beyond the exclusion zone to allow for the continuation of the project.

In the event that the NT Police advise that no further police investigation is warranted, Jemena will comply with the instructions of the CEO regarding procedures to investigate and secure the remains and only resume works on the site after receiving a Works Approval from the CEO.

6.3.6 ABORIGINAL LIVING AREAS

Consistent with the protections that will be put in place for Sacred Sites, Aboriginal living areas will be designated as No-Go Zones during the construction and operations phases of the Project, except for specifically authorised personnel.

Consistently, all workers on the project will undergo inductions that will include information regarding the enforcement of No-Go Zones, including Aboriginal Living Areas.

6.4 RISK ANALYSIS & MANAGEMENT PLANNING

ID #	Project activity	Cause	Impacts	Likelihood	Consequence	Risk with no mitigation in place	Proposed mitigation measures	Effectiveness of mitigation	Likelihood	Consequence	Residual risk after mitigation measures
PLANNING PHASE											
1	Early survey works.	Field access for non-ground disturbing works.	Unauthorised entry onto and / or damage to sacred sites that results in anxiety or distress to Traditional Owners / site custodians.	4	B	Significant	Sacred Site surveys undertaken by Land Councils and reports received setting out Restricted Work Areas and Exclusion Zones. Cultural heritage survey agreements in place with all other Aboriginal Parties, to identify Restricted Work Areas and Exclusion Zones.	Complete control of access and establishment of Restricted Work Areas and Exclusion Zones.	1	B	Low
2			Unauthorised entry onto Aboriginal land, causes breach of the Aboriginal Land Act (ALA) and offence to Traditional Owners.	4	B	Significant	Compliance with the ALA and issue of individual permits	Complete control of access to Aboriginal land by CLC.	1	B	Low
3		Field access for low impact ground disturbing works.	Unauthorised entry onto and / or damage to sacred sites that results in anxiety or distress to Traditional Owners / site custodians.	4	B	Significant	No low impact ground disturbing works to be undertaken without Sacred Site clearance by Aboriginal Parties.	Complete control of access and establishment of Restricted Work Areas and Exclusion Zones.	1	B	Low
4			Damage to cultural heritage sites, places or objects in breach of the Heritage Act and that results in anxiety or distress to Traditional Owners.	3	B	Moderate	No low impact ground disturbing works to be undertaken without cultural heritage sites survey by archaeologist.	Low impact activities are undertaken in areas where no cultural heritage sites exist.	1	B	Low

ID #	Project activity	Cause	Impacts	Likelihood	Consequence	Risk with no mitigation in place	Proposed mitigation measures	Effectiveness of mitigation	Likelihood	Consequence	Residual risk after mitigation measures
5			Uninvited entry into Aboriginal living areas, e.g. family outstations and so causes anxiety and concern among residents.	3	A	Moderate	Identification of family outstations and inclusion of access restrictions in Project land access line list.	All early works personnel comply with land access rules.	1	A	Low
CONSTRUCTION PHASE											
12	Mobilisation of construction workforce.	Increased traffic on remote roads.	Unauthorised entry onto and / or damage to sacred sites that results in anxiety or distress to Traditional Owners / site custodians.	3	D	High	Inclusion of access restrictions for workers in Project area in accordance with Sacred Site Authority Certificate.	Complete control of access and establishment of Restricted Work Areas and Exclusion Zones	1	B	Low
13			Uninvited entry into Aboriginal living areas, e.g. family outstations.	3	A	Moderate	Identification of family outstations and inclusion of access restrictions in Project land access line list.	Complete control of access and establishment of Restricted Work Areas and Exclusion Zones	1	A	Low
14	Clearance and disturbance activities along the alignment, access roads, camps and other areas.	Ground disturbance within approved areas.	Unauthorised entry onto and / or damage to sacred sites that results in anxiety or distress to Traditional Owners / site custodians.	3	C	Significant	All clearance activities undertaken in accordance with Authority Certificates from Aboriginal Areas Protection Authority (AAPA). Authority Certificate conditions incorporated into Project Construction Management Plans and incorporated into all subcontracts. Specific conditions set out in Project Cultural Heritage Management Plan (CHMP), including all clearance areas defined by line of site pegs prior to clearance activities. Traditional Owner participation in clear and grade team ahead of construction in Restricted Work Areas.	All clear and grade activities carried out in accordance with approvals and CHMP. Sacred sites avoided and protected.	1	B	Low

ID #	Project activity	Cause	Impacts	Likelihood	Consequence	Risk with no mitigation in place	Proposed mitigation measures	Effectiveness of mitigation	Likelihood	Consequence	Residual risk after mitigation measures
15			Unauthorised entry onto Aboriginal Land.	2	B	Low	Agreement with the Central Land Council regarding the issue of Project permits to access the Warumungu and Wakaya Aboriginal Land Trust lands.	Project workforce access controlled.	1	B	Low
16			Damage to known cultural heritage sites, places or objects.	3	C	Significant	Implement Construction Phase CHMP including: - Incorporating site management conditions in Work Approvals under the Heritage Act. - Archaeological Heritage Field hands working alongside Traditional Owners during clear and grade in Restricted Work Areas. - Archaeological Field hands working during clear and grade in areas of high archaeological potential. - Marking out and fencing off of heritage site areas in close proximity to construction activities.	All known cultural heritage sites avoided or managed in accordance with relevant approvals. Control of all risk elements in CHMP through incorporation of controls in project management plans and contractual provisions.	1	B	Low
17			Discovery and disturbance of previously undiscovered cultural heritage sites, places or objects.	3	B	Moderate	Inclusion of procedures in CHMP for management of further site discovery during clear and grade activities.	Procedures for site mitigation approved under legislation and agreements with Aboriginal Parties.	1	B	Low
18			Skeletal remains discovery and disturbance.	2	B	Low	Monitoring of initial clearance of treed areas through Traditional Owner participation in clear and grade team ahead of construction. Inclusion of procedures in CHMP for skeletal remains discovery and management.	Procedures in place for the management of skeletal remains in accordance with legal requirements, approved under legislation and agreements with Aboriginal Parties.	1	B	Low

ID #	Project activity	Cause	Impacts	Likelihood	Consequence	Risk with no mitigation in place	Proposed mitigation measures	Effectiveness of mitigation	Likelihood	Consequence	Residual risk after mitigation measures
19	Transportation of personnel, machinery and materials during construction and installation of the pipeline.		Unauthorised entry onto sacred sites.	2	C	Moderate	Inclusion of access restrictions for workers in Project area in accordance with Sacred Site Authority Certificate implementation.	Complete control of access and establishment of Restricted Work Areas and Exclusion Zones.	1	B	Low
20			Uninvited entry into Aboriginal living areas, e.g. family outstations.	3	A	Moderate	Identification of family outstations and inclusion of access restrictions in Project land access line list.	All construction personnel to comply with land access rules.	1	A	Low
21	Trenching activities and installation of the pipeline.		Discovery and disturbance of previously undiscovered cultural heritage sites, places or objects.	3	B	Moderate	Inclusion of procedures in CHMP for management of further site discovery during trenching activities.	Procedures for site mitigation approved under legislation and agreements with Aboriginal Parties.	1	B	Low
22			Skeletal remains discovery and disturbance.	2	B	Low	Inclusion of procedures in CHMP for skeletal remains discovery and management.	Procedures in place for the management of skeletal remains in accordance with legal requirements, approved under legislation and agreements with Aboriginal Parties.	1	B	Low
OPERATIONS PHASE											
74	Operation and maintenance of pipeline.	Access to above ground facilities in remote areas.	Unauthorised entry onto sacred sites.	1	B	Low	Inclusion of access restrictions for operations workers in Project area in accordance with Sacred Site Authority Certificate implementation.	Complete control of access and establishment of Restricted Work Areas and Exclusion Zones.	1	B	Low
75			Unauthorised entry onto Aboriginal Land.	1	B	Low	Individual permit access in accordance with Aboriginal Land Act and Land Agreement conditions and local relationship development.	Complete control of access and regular communication.	1	B	Low
76			Damage to cultural heritage sites, places or objects.	1	B	Low	Workers restricted to approved access tracks public roads and pipeline easement and respect of Authority Certificate conditions. No ground	Complete control of access and regular communication.	1	B	Low

ID #	Project activity	Cause	Impacts	Likelihood	Consequence	Risk with no mitigation in place	Proposed mitigation measures	Effectiveness of mitigation	Likelihood	Consequence	Residual risk after mitigation measures
							disturbing activities outside approved areas.				
77			Uninvited entry into Aboriginal living areas, e.g. family outstations.	1	B	Low	Individual permit access in accordance with Aboriginal Land Act and Land Agreement conditions and local relationship development.	Complete control of access and regular communication.	1	B	Low

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APPENDIX A: CIRCLE EXPERTISE & SPECIALISTS

Cultural Heritage Management

The overall management of cultural heritage across the pipeline route has been managed by James Kernaghan, Managing Director of Circle Advisory Pty Ltd.

James Kernaghan has in excess of 29 years' experience in resources development in Australia, including mining, oil and gas, including gas infrastructure experience in the Northern Territory.

Projects that James has worked include Pluto LNG, Timor-Leste and the JPDA, the Sunrise Project, the Blacktip Project and the Trans Territory Pipeline, the Otways Gas Project and the North West Shelf Venture.

James' portfolio of experience covers a range of government and public affairs matters, particularly in the areas of stakeholder engagement and consultation, stakeholder issue management, indigenous and developing community affairs and economic development, local content, land access, heritage management and external relations and communications.

James holds a post graduate qualification in Social Impact from the University of Western Australia.

Cultural Heritage Coordination

Cultural Heritage Coordination has been undertaken by:

- Steve Sutton – SHIM Consulting
- Ben Garwood – Circle Advisory Pty Ltd

Steve Sutton

Steve Sutton was Regional Cultural Heritage Manager for Parks North Queensland before moving to the Northern Territory where he was Director of Heritage Conservation for the Northern Territory Government. Since leaving government Steve has provided cultural heritage consulting services to a range of mining and development projects.

Steve has extensive experience in cultural heritage regulation and management, site recording in remote northern Australia, extensive field work experience in both Queensland and the Northern Territory, extensive experience liaising and working collaboratively with Aboriginal people on country and maintaining large field teams in remote locations for long field periods.

Steve also has extensive experience planning, managing and implementing development and cultural heritage projects in Queensland and the Northern Territory and has developed an extensive collaborative network while working on large scale and linear projects such as the Bradshaw Field Training Area, the Katherine to Gove Pipeline and the Alice Springs to Darwin Railway project.

Ben Garwood

Ben is a senior external relations and Indigenous affairs professional with over 15 years' experience working across government, non-government and industry. Ben has highly developed skills in stakeholder engagement, cross cultural consultation and negotiation, land access agreement negotiation and implementation, cultural heritage management and approvals, Indigenous employment, training and business participation, corporate social investment and community development project management.

Ben has coordinated cultural heritage matters for Woodside Energy Ltd and BHP Billiton and has worked on a number of major projects in Australia including Pluto LNG, Browse LNG, Olympic Dam, Atlas Iron and Roy Hill.

Ben has also held land management and community liaison roles with the Western Australian Department of Aboriginal Affairs and was an Assistant Case Manager at the National Native Title Tribunal (Future Act Unit).

Ben has a Bachelor of Arts Degree in Aboriginal and Torres Strait Islander Studies.

Field Archaeology Survey and Reporting

Field Archaeology Survey and Reporting have been conducted by:

- Richard Woolfe – Earth Sea Heritage Surveys (Earthsea Pty Ltd).
- Gerard Niemoeller – On Site CHM.

Richard Woolfe

Richard has extensive experience undertaking large scale cultural heritage survey and assessment projects in the Northern Territory, Western Cape York and the Pilbara. Richard has a degree in archaeology, a post grad dip in survey and GIS and a MA in Heritage Management and GIS. Richard's initial experience in the field was to review the NT *Heritage Conservation Act* and prepare drafting instructions for the current NT *Heritage Act*. Prior to that Richard worked as a manager for Centrelink Remote Aboriginal Services in Arnhem Land. Earthsea Pty Ltd commenced operating in early 2005 in the Northern Territory. Since then, Earthsea have successfully completed over 200 archaeological survey and cultural heritage management projects in the NT, Western Cape York and the Pilbara.

Notable projects include:

- Darwin River Dam, archaeological surveys of areas effected by flooding at full supply level.
- Arnhem Land rock art surveys for Cameco, Alligator Energy, UXA and UEL.
- Archaeological surveys along the Plenty Highway, the Victoria Highway and the Mereenie Loop.
- Territory Iron heritage management project which included over 400 square kilometres of archaeological survey, recording of nearly 800 sites resulting in the salvage of approx. 80 sites. This project ran from 2007 to 2015 employing 9 archaeologists and approx. 40 Traditional Owners working on Territory's mining tenements.

Gerard Niemoeller

Gerard is a highly experienced heritage professional with over 20 years' experience in Aboriginal and non-Aboriginal cultural heritage management within the consulting, government and industry sectors.

Since forming On Site CHM, Gerard has successfully managed and completed over 60 Aboriginal and historic heritage projects in the Northern Territory and NSW. Gerard is a specialist in Aboriginal cultural heritage management having spent much of his professional career working with Aboriginal people and their heritage across Australia. Gerard has extensive experience with leading remote area surveys in the NT, WA and NSW.

Relevant projects include:

- Aboriginal and Historic Heritage Assessment Bayview – The Boulevarde Northern Territory, Environmental Impact Statement.
- Cultural Heritage Management Plan for Aboriginal and Historic heritage values, Bayview – The Boulevarde, Environmental Impact Statement.
- Heritage Clearance Works and Advice Relating to Application of EPBC Act Considerations - Section 5623 (145) Howard Springs Road, Howard Springs, Northern Territory.
- Archaeological survey of the proposed Central Arnhem Highway realignment and Goyder River Crossing, Central Arnhem Land
- Archaeological baseline survey for the proposed City of Weddell Middle Arm Peninsula.

- Alice Springs to Darwin Railway - Gerard was the Project Archaeologist and was responsible for the management of Aboriginal and historic cultural heritage places and project compliance along the 1400 kilometre construction project.