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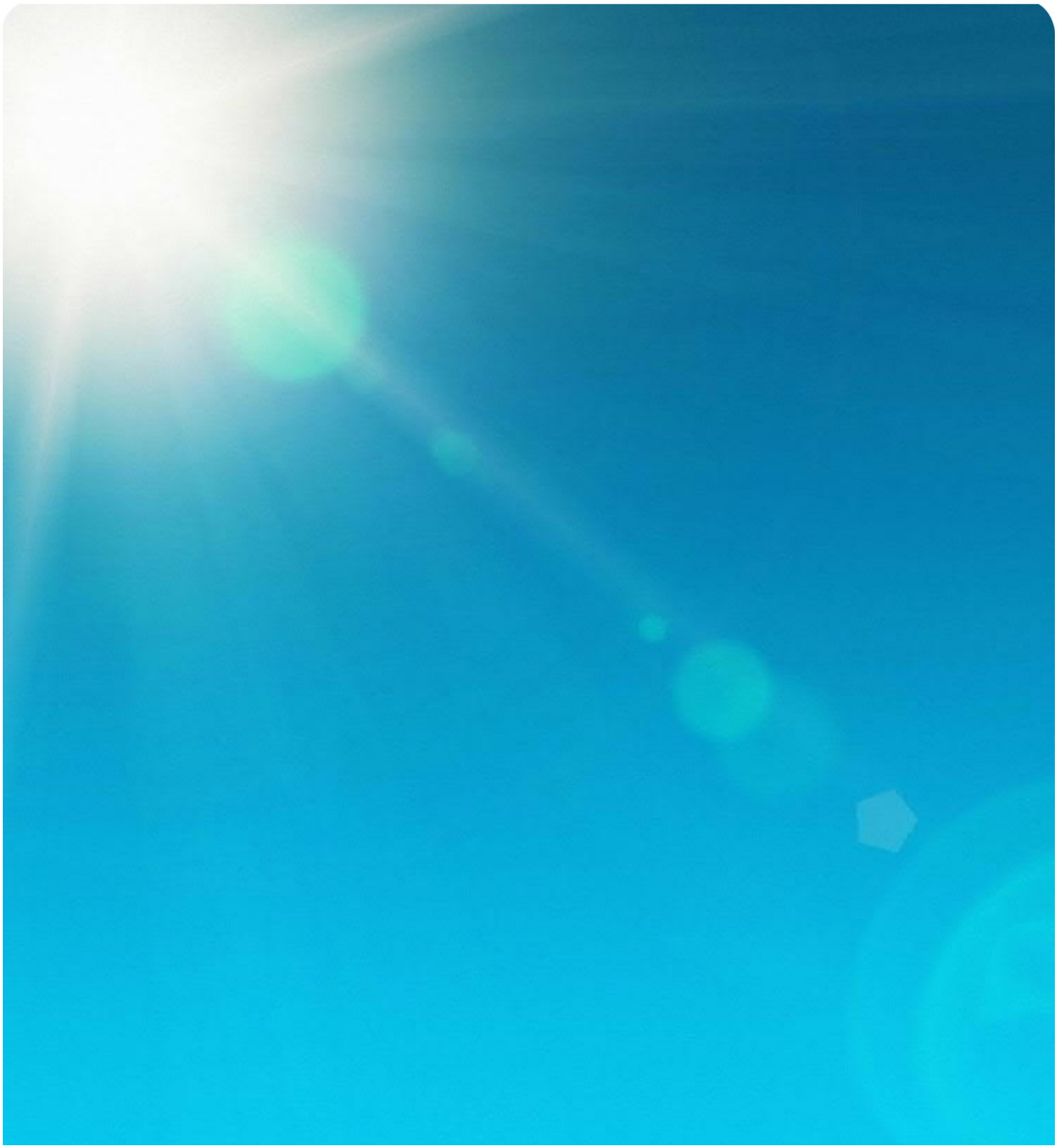
Appendix I – Social Impact Assessment

Australia-Asia PowerLink Environmental Impact Statement



Sun Cable
Australia-Asia PowerLink (AAPowerLink)
Social Impact Assessment

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True North Strategic Communication
March 2022

Version No.	Issue Date	Prepared by:	Approved by:	Approval Date
V1	20 December 2021	Jane Munday & Claire Butler	Draft for SC input	
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Consultation statement
True North Strategic Communication is guided by the principles of good community engagement, based on people's level of interest and concern as outlined by the International Association for Public Participation (IAP2).
Our role is to provide stakeholders and the general public with objective information, so they can provide informed feedback on consultation projects. We give people the opportunity to provide input that is balanced and reflective of the range of community views to independently provide the best possible guidance to decision makers.
Our practice reflects professional standards and ethical standards for human research including anonymity, confidentiality, record storage and keeping people informed.

Limitations

This Social Impact Assessment is based on desktop research, an initial scoping exercise, client input, a literature review of relevant policies, projects and academic papers and targeted consultation with key stakeholders. While True North Strategic Communication has applied its best efforts to produce a reliable and accurate study based on ethical research methodology, some limitations of this Social Impact Assessment are:

- The subjective and variable nature of many social impacts, which makes it difficult to predict and assess the significance of risks and opportunities with accuracy.
- The complexity and linear nature of the AAPowerLink's terrestrial and marine footprint, including land and seas covered by three Aboriginal land councils, numerous pastoralists and towns and many hard-to-reach stakeholders. The breadth of affected communities expanded with the August 2021 variation to the Project, which affected much of the Darwin rural area.
- A compressed timeframe for consultation, due largely to delays beyond Sun Cable's control (such as the death of a respected elder, changes to the AAPowerLink, COVID-related travel restrictions, some key stakeholders not being available).
- The fact that much of this consultation was the first contact by Sun Cable, particularly with regional stakeholders.
- The multi-faceted nature of the Project means engagement is ongoing, with some negotiation with stakeholders being commercial in confidence (such as negotiations of Indigenous Land Use Agreements, railway corridor).
- Many potential cultural impacts are covered by other studies. The SIA aims to address the key issues without duplicating the work of the Northern Land Council and Earthseas' Heritage Impact Assessment in particular.
- The economic impact assessment component of the SIA was removed from True North's scope but the public version of PricewaterhouseCoopers (PwC) Economic Assessment was received only in March 2022, therefore baseline data and analysis relied heavily on Department of Treasury and Finance material and insights from business stakeholders.
- Gaps in relevant workforce data to inform a skills audit due to the early stages of planning and a rapidly changing national labour market.
- Difficulties accessing up-to-date and relevant data on some issues, lags in data sets (the last Census data being from 2016) and aggregated data often not conveying local realities.
- The pioneering nature and scale of the AAPowerLink, with project design work happening in parallel with the assessment of Project impacts.

Executive Summary

This Social Impact Assessment (SIA) has been prepared by True North Strategic Communication for Sun Cable, in conjunction with EcOz Environmental Consulting, which is coordinating the Environmental Impact Statement (EIS) for the Australia-Asia PowerLink (AAPowerLink) Project.

The purpose of a SIA is to combine community insights with expert judgement in order to determine how the consequences of projects are likely to be felt or perceived by affected people, communities and service providers. Effective studies will:

- reduce uncertainty about the consequences of projects (or policy changes)
- inform and influence decision-making by regulators, project proponents and affected communities
- provide data and insights that improve project planning (such as project design, alternatives and workforce and accommodation issues)
- provide baseline quantitative and qualitative data against which to track project and cumulative change across the life span of the project, from conception to closure
- inform effective management plans and proponents' long-term social performance (including enhancement of social and economic benefits, trust and relationships).

The SIA and consultation report (Appendix F) cover the planning, construction and operational phases of the AAPowerLink. The Terms of Reference issued by the Northern Territory Environment Protection Agency (NT EPA) in November 2021 require consideration of closure and rehabilitation (which is difficult to assess with any rigour given the multi-generational nature of the Project) and cumulative effects of the AAPowerLink Project.

An internal scoping exercise in February 2021 drew on public submissions to the proponent-initiated referral, the draft Terms of Reference (ToR) for the Project, an initial literature review, analysis of other impact assessments in the region, issues analysis and stakeholder identification. Scoping included a desktop risk and opportunity matrix of potential impacts, based on the predicted likelihood of impacts and the

- scale
- extent
- duration, and
- community sensitivity

to the effects of change. The risk and opportunity ratings helped determine the materiality of topics for assessment in the SIA and key data required. The scoping study suggested a comprehensive study was warranted, given the:

- large and extended footprint of the AAPowerLink
- diversity of affected communities and language groups
- depth and breadth of likely stakeholder values and perspectives
- pioneering nature and technical complexity of the Project
- limited previous consultation
- level of interest by affected communities
- cultural sensitivity of some impacts
- academic and stakeholder interest in the equitable distribution of Project benefits and potential trade-offs
- Sun Cable's expressed desire to leave a positive legacy.

Consultation began with Native Title Holder meetings coordinated by the Northern Land Council in March 2021 but was then deferred due to a combination of COVID-19 travel restrictions and the relocation of project infrastructure in the Darwin region from Middle Arm to Murrumujuk on Gunn Point Peninsula. Formal consultation resumed in September 2021, after a Notice of Significant Variation was referred to the NT EPA. True North Strategic Communication, along with sub-contractor Mark Stoyles Consulting, worked in partnership with Sun Cable staff for much of the consultation, in addition to dedicated SIA and workforce development interviews. The SIA also draws on substantial fieldwork by Earthsea Heritage Survey's Heritage Impact Assessment, other technical studies and separate consultation by Sun Cable covering use of the railway corridor.

The SIA characterises the AAPowerLink's social area of influence, describes people and communities and economic sectors likely to be affected by the AAPowerLink Project, gathers baseline data and draws on stakeholder and public consultation for qualitative insights and local knowledge on how impacts might be experienced.

A risk and opportunity assessment outlines ways in which negative impacts might be avoided, mitigated or managed and positive impacts enhanced, particularly legacy benefits for the Barkly and Greater Darwin Areas. The full table of impacts, management strategies and residual ratings is contained in the Social Impact Management Plan (Appendix J).

In summary, the SIA identifies 61 potential impacts, of which 20 are potentially positive and 41 are potentially negative (most of them low). Given that impact assessment is designed to ensure proponents understand and can manage project harms or risks, it is to be expected that assessments will identify a disproportionate number of negative impacts.

Potentially transformational positive impacts identified were: more sustainable regional economies by boosting manufacturing, industry, population growth and taxes; the social and economic benefits to the NT from access to affordable, reliable power; Aboriginal jobs and legacy skills development; and the Project's contribution to reducing Territory and global greenhouse gas emissions.

The highest rated potential negative impacts identified were: reduced affordability and availability of public and private housing; a loss of cultural heritage should sites be damaged or access reduced; and the cumulative impacts of industrial development in the Barkly and on Gunn Point.

Table 0- 1: Summary of potential impacts identified

Potential impacts identified			
Positive		Negative	
Transformational	4	Catastrophic	nil
Beneficial	5	High	3
Noticeable	9	Medium	15
Barely perceptible	2	Low	23
Total positive	20	Total negative	41

The SIA provides an overview of the Project, engagement and social research methodology, baseline data on affected communities, prediction and assessment of potential impacts and advice on how positive and negative impacts might be managed and monitored.

The AAPowerLink is a pioneering project that should contribute to legacy benefits for the Barkly, Greater Darwin and the Northern Territory. Nonetheless, realising Sun Cable's a meaningful legacy will require strong communication, continued community engagement and good will that goes beyond statutory requirements in Sun Cable's area of operations. This is addressed in the Social Impact Management Plan (Appendix J), as well as a Territory Benefits Plan and Regional (Aboriginal) Legacy Strategy being developed as a separate exercise by Sun Cable.

Issues raised during consultation

The key issues raised in submissions to the Terms of Reference and during consultation were:

- comments that the Project will generate wealth for its owners and export energy to Singapore, but what benefits will it generate for Territory businesses and the Barkly region, which is occupied by some of Australia's most disadvantaged people;
- a particularly strong expectation that Sun Cable's approach to community benefits will include energy solutions for towns, homelands, outstations[1] and businesses in the Northern Territory, with comments that business viability and quality of life are undermined by unreliable and expensive power supplies;
- stakeholders repeatedly raised the dilemma of how to create pathways from endemic unemployment and poverty in the Barkly to the hundreds of jobs opportunities with the Project;
- however, an equally strong theme was crippling skills shortages across all sectors and challenges recruiting and retaining Aboriginal workers;
- the Northern Territory Government sees major projects as growing the economy, jobs and the Territory's population and there was general support for the project from the business community;
- however a housing crisis was described as a major constraint to growth, with a chronic shortage of public, government and private housing rental stock, inflationary pressures and overcrowded and sub-standard public housing;
- support for the project's contribution to decarbonisation and the expansion of renewable energy;
- however, this support was tempered by concerns at the extent of land clearing, which led to groups such as Arid Lands Environment Centre (ALEC) and Environment Centre NT (ECNT) commenting that support was conditional on equitable distribution of benefits.

[1] homelands and outstations are interchangeable terms used to describe small, often remote, Aboriginal communities where people have traditional ownership or historical association (https://tfhc.nt.gov.au/housing-and-homelessness/homelands)

Summary of findings against Terms of Reference

The following table summarises NT EPA Terms of Reference (ToR) requirements for the social, cultural and economic components of the Environmental Impact Statement (EIS), including consultation and the social, economic, public health and cultural considerations. The SIA cross-references the findings of other technical studies that address issues raised in consultation (see Consultation Report at Appendix J).

Table 0- 2: Summary of findings

Requested in ToR	Key findings	Where addressed
Statement of reasons, January 2021 – against environmental factors		
Community and economy: the proposed action has the potential to significantly impact communities, including Aboriginal communities, within its area of influence, both adversely and beneficially.	The SIA finds substantial potential for transformational positive impacts from the Project, particularly: • stronger and more sustainable regional economy • access to affordable and reliable power • Aboriginal jobs, training and legacy skills development • contribution to greenhouse gas reductions. High-risk potential negative impacts are: • reduced quality, affordability and availability of public and private accommodation • loss of cultural heritage due to damage or reduced access • cumulative industrial development of the Barkly with other oil and gas, mining, agribusiness, pipelines and other renewable energy projects.	SIA Consultation report (Appendix F)
Culture and heritage: sacred sites and cultural and historical heritage may be impacted during construction of the proposed action. The significance of impacts is currently uncertain.	Covered by the Heritage Impact Assessments (HIA) and initial engagement with the Aboriginal Areas Protection Authority in order to obtain Authority Certificates.	Heritage Impact Assessments (Earthsea) (Appendices V, W and X)
Human health: significant adverse impacts to human health from the proposed action are not anticipated but this must be demonstrated.	The EIS and SIA do not find any significant human health effects from biting insects and electromagnetic fields, however the SIA does cover potential impacts on health and wellbeing, including the mental health of workers.	Human Health (Chapter 15 of EIS) SIA – Section 6: People and Communities

Requested in ToR	Key findings	Where addressed
Requires a standard EIS: Based on the significance of potential impacts of the proposed action and the need to improve the NT EPA's level of confidence including: • the benefits to the NT of the proposed action, including to the NT Government's greenhouse gas emissions target • information about the social and cultural impacts that may arise through engagement and consultation with communities affected by the proposed action, including Aboriginal communities. • the need to develop measures to avoid, mitigate or manage potential significant impacts and increase the NT EPA's confidence in the effectiveness of proposed measures, including potential social and cultural impacts • the limited extent of community engagement that has occurred in relation to the proposed action, and therefore the capacity for communities to access and understand information about the proposed action. This includes avoidance of negative social and economic impacts and maximisation of benefits • in general, the high level of uncertainty regarding the values that may be impacted by some components of the proposed action and the magnitude of those impacts due to the limited nature of the information available. Measures proposed are high level and require further development during preparation of the EIS in consideration of values identified through studies and stakeholder engagement.		
Terms of Reference for an EIS, incorporating Gunn Point variation, issued November 2021		
Site layout maps, including adjacent licences and permits and other interests in land, including native title, Aboriginal freehold, pastoral land	Proposal Description	Proposal Description (Chapter 2 of EIS)
Design proposal: including options and selection processes. Adaptation for climate change	Proposal description.	Proposal Description (Chapter 2 of the EIS)

Requested in ToR	Key findings	Where addressed
Traffic and transport: Describe traffic and transport activities during construction and operations including transport methods (including rail, marine, vessel and road freight), forecast vehicle/vessel movements, details on access, routes, vehicle/vessel types and volume of traffic, details or rail use and proposed rail siding.	Transport activity will include 3000 containers a month to by sea to East Arm Port and 1100 train movements (five or six a week) to move 150,000 containers by rail between East Arm and Powell Creek. The 2600 poles for the OHTL will be transported by road and rail, with an estimated 5000 trailer loads and 150 oversized movements to the Solar Precinct and staging areas along the OHTL. In addition to poles, the transport task includes 5000 cable drums, graders, eight 65-tonne cranes and 7300 kilometres of cables. Worker transport to construction sites in Darwin and Powell Creek will be by bus and air. Buses will travel from 'park and ride' facilities. An estimated 16 light planes a week are planned to fly to the Elliott air strip during the first 20 months of civil works, with workers transferred by bus to site. It is then proposed to fly six jet aircraft a week to an all-weather sealed airstrip at Powell Creek. Two roads to the Solar Precinct are proposed: a 30-kilometre unsealed all weather access road and a 42-kilometre sealed road. One or two railway sidings are planned at Powell Creek.	Transport Impact Statement (Byrne Consulting) (Appendix K)
Workforce: For each phase of the proposal: • estimated number of people to be employed • skills base required • likely sources (local, regional, overseas) • on-site facilities provided (including any accommodation)	Sun Cable has provided employment data for the construction phase, which has informed the Local Workforce Strategy (attached to SIA). About 1750 jobs are expected for the construction stage from 2024 to 2029, mostly at the Solar Precinct. The main demand will be for machinery operators and drivers (41%), technicians and trade workers (38%), professionals (10%) and labourers (8%). While most jobs would be suitable for Aboriginal workers and other locals, a range of skills shortages and barriers to local employment are identified, making it likely that the Project will rely heavily on FIFO workers for the construction phase. Local jobs is a priority of Sun Cable's Territory Benefit Plan and Regional (Aboriginal) Legacy Strategy. The SIA, Consultation Report (Appendix F) and Local Workforce Strategy identify a number of strategies for building pathways to local employment, likely to be achieved incrementally. Sun Cable estimates 350 operational jobs for the Project.	Proposal Description (Chapter 2 of EIS) SIA – Section 7: Economies and Jobs Local Workforce Strategy (Attachment to SIA) ICN business capability mapping (Appendix Y)

Requested in ToR	Key findings	Where addressed
Rehabilitation and closure: To include stakeholder engagement on procedures for decommissioning and rehabilitation The biological, cultural, economic and social viability of options for decommissioning, removal and disposal of infrastructure and components, including the implications of solar panels' disposal at the end of the proposal's life Proposed rehabilitation measures, Alternatives for land use after closure	Some areas will be rehabilitated post-construction, for example cleared areas in the utilities corridor. Sun Cable is preparing a plan for the safe disposal of panels, including the potential for repurposing. Sun Cable's ongoing engagement strategy will include consultation for decommissioning. Given that this may be 70 years away, it would be unrealistic to do more than outline a best practice approach.	Proposal description (Chapter 2 of EIS) SIMP (Appendix J)
Marine environmental quality: any temporary impacts to fishing, recreation, and industry use of the harbour during construction	With the change of the Project footprint from Middle Arm to Murrumujuk, impacts on high value recreational fishing will be minimised. Given that Sun Cable will operate outside the greater harbour area, impacts on other industry uses, such as commercial fishing, should be negligible and addressed with good communication (in conjunction with the Darwin Harbour Master) during trenching of subsea cables.	Marine Environmental Quality and Marine Ecosystems (Chapters 9 and 10 of EIS, Appendices R, S and T) SIA – Section 11: Living Environment SIMP (Appendix J)
Air quality: Impacts of dust and diesel exhaust during construction and operations.	The Air Quality report (Air Environmental Consulting) found the impacts of dust and diesel exhaust (including nitrogen) were not expected to cause adverse impacts at the Solar Precinct, on the OHTL route or at Murrumujuk, given low levels and distance from sensitive receptors[2]. Separation distances would be incorporated in the Project's Construction Environmental Management Plan to ensure compliance with air quality criteria. Impacts on air quality, including dust, were not raised during consultation but should be monitored during construction.	Air Quality (Chapter 11 of EIS, Appendix U) SIA – Section 11: Living Environment

[2] Sensitive receptors are people or ecological systems more susceptible to noise, dust, smells, pollution or other nuisance impacts

Requested in ToR	Key findings	Where addressed
Community and the economy: Describe environmental values: Enhance communities and the economy for the wellbeing, amenity and benefit of current and future generations of Territorians. Describe the existing socio-economic profile of the proposal's area of influence, including reference to:		
• key landowners, custodians, stakeholders, communities and other persons with overlapping or intersecting interests	The social area of influence is profiled in the SIA, while the Heritage Impact Assessment describes Aboriginal groups with ties to various parts of the Project footprint. The Solar Precinct is on Warlmanpa Country. The railway and utilities corridors cross a range of tenures. Gunn Point Peninsula is the traditional land of the Larrakia people but Wulna and Tiwi people have customary ties to the land. The Subsea Cable System crosses through seas to which Tiwi people maintain strong spiritual ties. The SIA describes other land owners and communities along the route.	SIA – Sections 5 and 6: People and Communities Heritage Impact Assessments (Appendices V, W and X)
• social values as identified by stakeholders	Social values to emerge most strongly from the stakeholder consultation report included: • valued rural lifestyles in Litchfield • enduring cultural values of Traditional Owners from their spiritual connections to land and seas • the strong value placed by non-Aboriginal society and Aboriginal leaders on education and work • community safety and wellbeing, including appropriate housing (which are threatened by crime and alcohol abuse) • economic development to be sustainable and benefit the NT and local communities • societal concerns about climate change and the need for renewable energy solutions to decarbonisation.	SIA – all sections Stakeholder Consultation Report (Appendix F)
• demographics, including skills audit of affected communities and workforce characteristics	The characteristics of local and regional populations are contained under People and Communities. Key features include the predominance of Aboriginal residents in the Barkly and high Aboriginal youth unemployment. Stage 1 of a Local Workforce Strategy is covered under Economies and Jobs and as an attachment to the SIA.	SIA – Sections 6 and 8: People and Communities; Economies and Jobs Local Workforce Strategy (attached to SIA)

Requested in ToR	Key findings	Where addressed
• relevant accommodation type and quantity	Sun Cable is proposing to accommodate the construction and operations workforce at a purpose-built onsite accommodation camp at Powell Creek with capacity for about 1000 people, reducing to 100-200 during operations. The camp will include a mess, recreation office and accommodation facilities. Construction of the OHTL will operate from about six temporary site camps or mobile 'fly camps', about 100 kilometres apart. Existing town accommodation and services will be used where available in more remote sections of the OHTL. The fly camp locations will be negotiated with landholders and centre around existing rail corridor access points. Remote fly camps will provide transportable caravan and mobile shed style accommodation and amenities for up to 20 people. Camps are expected to be in use at each location for up to six months. Sun Cable will closely manage the housing needs of management staff and contractors in the Barkly and Greater Darwin Region and explore solutions to mitigate against resultant pressures on housing markets. In Greater Darwin, it is assumed the workforce will be recruited locally. However, skills shortages may necessitate a level of FIFO accommodation. No worker accommodation is proposed for Murrumujuk. Housing data and stakeholder consultation suggest a scarcity of public and private rental accommodation throughout the Territory, overcrowded public housing and a limited supply of new housing.	Proposal Description (Chapter 2 of EIS) SIA – Section 7 : Social Infrastructure and Services
• existing and required local businesses necessary to supply chain, construction and operations	The SIA draws on ICN NT industry capability mapping based on scopes of work provided by Sun Cable. Industry groups and the ICN mapping suggest good availability of civil, construction, electrical, fabrication, transport and professional services with experience of major projects and remote construction, including a number of Aboriginal-owned businesses in the Territory. While most are small, with a turnover of less than $10 million, 26% of civil construction companies turn over more than $20 million a year and 12% employ more than 200 people.	SIA – Section 8: Economies and Jobs

Requested in ToR	Key findings	Where addressed
• primary economic characteristics within the proposal area	The SIA draws on NT Government documents, such as the Budget Papers, Barkly Regional Deal and other studies to describe the primary economic characteristics of the Barkly and Greater Darwin areas. Key economic sectors across the Barkly region are pastoral, tourism, Aboriginal arts and culture and mining, while economic activity and jobs are driven by government services, pastoral and mining-related activities. Onshore oil and gas activity in the Beetaloo, to the north of the Barkly, is an emerging economic sector.	SIA – Section 8: Economies and Jobs
• primary employment source/s of townships/cities/communities within or near the proposal area	The SIA and Local Workforce Strategy (attached to the SIA) provide an outline of the current labour market, likely skills shortages and general work-readiness that may inhibit levels of local participation.	SIA – Section 8: Economies and jobs Local Workforce Strategy (attachment to SIA)
• proximity to existing infrastructure and associated operators (eg rail, gas pipeline, cables)	The Solar Precinct was partially selected for its proximity to the AustralAsia Railway Line and Stuart Highway. Part of the Project was moved from Middle Arm to Murrumujuk on the Gunn Point Peninsula to avoid conflict with other marine cables and potential future pipelines.	Proposal Description (Chapter 2 of EIS)
• social amenity and use of the proposal area and adjacent areas for other purposes including residential, commercial, industrial, recreational/leisure, tourism and traditional land use	The social area of influence is described in the SIA, including current land and sea uses, cultural and recreational activities and other industries. The Solar Precinct is pastoral land that is also used by local Aboriginal people for cultural activities, in particular hunting and camping. The Gunn Point Peninsula is a popular camping and recreational area with rural residential living.	SIA – Section 6: People and communities

Requested in ToR	Key findings	Where addressed
Describe potential impacts during construction and operations, including:		
• changes to population (local and NT), employment market and businesses and indirect impacts to housing market, community and social infrastructure and economy	While construction will create 1750 direct and many more indirect jobs, this does not necessarily mean population growth, particularly during construction. Longer-term, the AAPowerLink and other projects may provide commercial investors with the confidence to invest in the local housing market to support regional population growth. While companies winning tenders are likely to draw on existing workforces, a tight labour market and skills shortages in both the Barkly and Greater Darwin areas means some positions probably will be filled by FIFO workers or perhaps skilled migration for specialist skills. While the Greater Darwin has more capacity to absorb a growing population, rental and private markets have come under pressure and new housing approvals have slowed. Increased populations, including local people returning in search of work, would also put pressure on a stressed social housing market.	SIA – Section 6: People and communities; Section 7: Social infrastructure and services
• social integration of non-local construction personnel during construction	There is virtually no capacity for non-local construction workers to be absorbed into regional communities. Workers will be accommodated in a workers' accommodation camp on the Solar Precinct site. The Greater Darwin Region has greater capacity to absorb non-local workers and their families should they relocate. Operational workers, particularly if they are drawn from the local labour market, will be more readily absorbed.	SIA – Section 6: People and Communities
• direct and indirect impacts to recreational and commercial areas and industries including Lake Woods, Murrumujuk, Gunn Point and offshore areas (eg fisheries)	Lake Woods on Newcastle Waters Station includes the Longreach Conservation Area and substantial birdlife, which would be sensitive to disruption. Murrumujuk is a popular camping area and already suffers from significant coastal erosion from 4WD vehicles access the beach and illegal rubbish disposal. Recreational amenity could be disturbed by the large number of workers, industrial activity and light pollution at night. Adhering to Sun Cable's company policies, procedures and Code of Conduct will be important in controlling worker behaviour at both sites. The Subsea Cable System is expected to avoid high value fishing areas. Any disruption to recreational fishing is expected to be of a limited scale and duration. Sun Cable is doing further studies to understand whether its activities will impact on commercial fishing operations.	SIA – Section 10: Healthy Country; SIA - Section 11: Living Environment

Requested in ToR	Key findings	Where addressed
• impacts to waste management facilities, particularly from disposal or recycling of solar panels and batteries during the life of the proposal and following decommissioning	Sun Cable is preparing a study on management of high level wastes, including potential recycling and repurposing of solar panels and batteries. They will not be placed in landfill. Sun Cable will follow the NT EPA's waste management hierarchy as subject to the *Waste Management and Pollution Control Act*. This ranks waste avoidance and reduction as the optimal approach, followed by reuse through recycling and recovery options, with disposal as the least preferred approach.	Proposal Description (Chapter 2 of EIS)
• changes or restrictions on railway access by local traffic due to transmission line corridor during construction, operation and maintenance	Sun Cable advises that any changes to existing access along the railway line or utilities corridor are highly unlikely. Any temporary disruption during construction will be communicated to relevant operators and landholders.	Proposal Description (Chapter 2 of EIS) SIA – Living Environment
• changes or restrictions to local traffic due to development of new roads and intersections and construction vehicles resulting in delays or inconvenience to local communities and other road users	Sun Cable will use the railway to transport most materials to site, with an estimated 5-6 train movements a week. This may increase delays at railway crossings but is not a substantial increase in rail traffic. Road freight includes an estimated 5000 full trailer loads to OHTL staging areas, including 2600 poles, 5000 cable drums, 7300 kilometres of cable and eight 65-tonne cranes. Road freight on the Stuart Highway during construction is likely to compound impacts from expected industrial traffic for onshore gas exploration and production, particularly at 'pinch points'. Stakeholders felt this cumulative impact may create detriment, in particular to 'grey nomads' and self-drive tourists. Sun Cable plans to fly workers direct to the Solar Precinct to avoid workers' vehicles adding to traffic on the Stuart Highway. Buses will transport local workers from 'park and ride' facilities. Increased over-sized traffic on the Stuart Highway and between East Arm Port and Gunn Point Road may cause delays for local traffic, which will be mitigated to some extent by scheduling and good communication. The highway passes directly through Katherine and Mataranka.	Transport Impact Statement (Appendix K) SIA – Section 11: Living Environment

Requested in ToR	Key findings	Where addressed
• potential future land use conflicts within the footprint, eg mineral and petroleum titles	The 12,000 hectare Solar Precinct will mean the loss of grazing country for Consolidated Pastoral, which operates Powell Creek and Newcastle Waters. However, the station's manager was not unduly concerned. Top End Energy is the manager of Exploration Permit Application EP (A) 256. The company has advised Sun Cable that it sees no land use conflict and the two projects should be able to co-exist with good communication. Empire Energy holds EP 169, which overlaps with existing tracks and Sun Cable's proposed bituminised road near Lake Woods. Lake Woods is classified as a 'no go zone' under the Petroleum Reserve Block Policy of the NT's *Petroleum Act.* In a meeting with Sun Cable, Empire Energy advised that it has no operations scheduled on EP 169 at present and raised no concerns about any aspect of the Project.	SIA – Section 8: Economies and jobs
• visual impact of infrastructure	Some stakeholders were concerned about the size of the OHTL towers and asked whether they could be undergrounded. In general, these towers will follow the railway line to Livingstone, then a utilities corridor set aside by the NT Government. The Darwin Converter Site at Murrumujuk will be a visible change of land use, together with Seafarms' adjacent Project Sea Dragon facility. OHTL poles will be visible at various points along the route, particularly within the Darwin region. The Solar Precinct will be visible to passing trains and from the air.	SIA – Section 11: Living Environment
• impacts to amenity, eg noise and dust	The impact of noise and dust was not raised during consultation. Technical studies suggest disturbance is unlikely at the Solar Precinct due to the site's distance (10 km) from residential dwellings. One pastoralist expressed concern at the potential for a 'heat island' effect from the solar panels, which technical studies suggest is unlikely.	Air Quality (Chapter 11 of EIS, Appendix U) Terrestrial Ecosystems (Chapter 5 of EIS) SIA – Section 11: Living Environment

Requested in ToR	Key findings	Where addressed
• interference with aviation/flight paths and shipping channels (current and planned)	The main impact on aviation would be increased safety risks from Sun Cable charter flights interacting with helicopters and light planes operating on pastoral properties around the Solar Precinct. There are potential safety issues with the OHTL, which should be manageable with good communication and awareness. Pastoralists would be concerned about impacts on aerial mustering but most state that they already work around powerlines. One landholder suggested Sun Cable install 'balls' on the wires to increase visibility. Any risk of collisions with other boating traffic as cables are laid on the sea floor should be minimised through good communication with AFANT and the fishing community, as well as Harbour Master's Notices.	SIA – Section 6: People and Communities
• economic assessment of the proposal's impact on the NT economy	PwC modelling suggests a net positive impact on the Northern Territory economy, including stimulating economic activity, increasing employment and consumption of goods and service. This finding is supported by industry groups and businesses. The increase in employment and project expenditure will drive growth in NT household consumption up to $15 billion across the project lifespan. This equates to an average $1.3 billion a year during the construction phase and an average $190 million a year during operations. AAPowerLink aims to provide lower-cost renewable electricity, which has the potential to improve the NT's competitiveness to attract growth industries such as green hydrogen, data centres and critical minerals processing.	SIA – Section 8: Economies and Jobs Economic Assessment (PwC) (Appendix G)
• details of the financial capacity to implement the proposal and the potential risks to Project implementation	Sun Cable intends to formally commence the process to raise capital to fund the construction of the AAPowerLink in January 2022. The AAPowerLink is expected to reach financial close by Q4 of 2023 and be funded through a combination of equity, debt (including commercial, project and structured finance), export credit agency and non-dilutive government funding support (Sun Cable, personal communication).	SIA – Section 8: Economies and Jobs
• total contribution to Gross Territory Product and Gross Domestic Product over the economic life of the proposal	PwC modelling suggests the AAPowerLink Project will stimulate economic activity and raise aggregate demand in the NT economy. Real Gross Territory Product (GTP) is projected to increase by $20.6 billion from FY24-FY69. Gross Domestic Product (GDP) is projected to increased by $4 billion over the 46 years to FY69.	SIA – Section 8: Economies and Jobs Economic Assessment (PwC) (Appendix G)

Requested in ToR	Key findings	Where addressed
• expected employment and availability of appropriately skilled labour during construction and operation phases of the project	AAPowerLink will create about 1750 jobs during the construction phase and about 350 direct jobs during operations. Further economic impact modelling of the AAPowerLink predicts the average annual increase in employment in the NT is more than 1200 jobs (FTE including direct and indirect jobs) from FY24-FY69, with an average of about 6800 annual (FTE, direct and indirect jobs) created during the construction phase alone. Labour market challenges and national and regional skills shortages present a major potential risk to Sun Cable. While the Project has the capacity to create jobs and training, employers in the Barkly struggle to attract and retain staff. Longer-term, workers relocating to the Greater Darwin and Barkly Regions may be accompanied by spouses and partners with skills in demand. A Local Workforce Strategy (attached) suggests creating gradual pathways into jobs and enhanced skills in the operational phase.	SIA – Section 8: Economies and Jobs Local Workforce Strategy (attached tp SIA)
• potential adverse impacts to local and regional industries due to competition for limited labour resources	Economic impact modelling shows that in FY28 (a representative year of the construction phase), the AAPowerLink has the potential to cause between 2-21% reduction in economic activity in the NT sectors of Tourism, Manufacturing and Agriculture, Forestry and Fishing as employment transfers to the Construction and Utilities industries. During the operations phase (FY28 onwards) adverse economic impacts are negligible for all NT industries. Widespread positive economic activity is expected across most industries. Government, local government and business may lose staff to Sun Cable, which would be difficult to backfill except by growing the potential workforce at a regional scale. Pastoralists in the Territory are suffering from labour force shortages but Consolidated Pastoral Company did not feel pastoral workers would leave for construction work.	SIA – Section 8: Economies and Jobs Economic Assessment (PwC) (Appendix G)

Requested in ToR	Key findings	Where addressed
• use of non-local workforce	The use of non-local workers may be inevitable, given a tight labour market and skills shortages. This would help avoid the 'boom-bust' cycle associated with large construction projects, including impacts on housing and tourism. External workers during the construction phase will be quarantined from the community in a workers' accommodation village on site at Powell Creek. Workers will be expected to adhere to Sun Cable's policies, procedures and protocols to mitigate against the risk of discrimination and to ensure respect for local cultural protocols. Sun Cable will establish and enforce zero tolerance policies to handle incidents of racism, bullying, harassment, sexism and homophobia in the workplace. Non-local workers are likely to be better absorbed in the Greater Darwin Region. The long-term nature of the project may encourage some non-local workers and their families to relocate permanently to the NT.	SIA – Section 8: Economies and Jobs Local Workforce Strategy (attached to SIA)
• estimated capital and annual operational expenditure	Capital expenditure (Capex) for the AAPowerLink is estimated to be more than $30 billion. Operational expenditure is forecast to provide a multi-million dollar annual spend year on year post-construction.	SIA – Section 8: Economies and Jobs Economic Assessment (PwC) (Appendix G)
• value of residual infrastructure at end-of-life of the proposal	Sun Cable is not in a position at present to provide the residual value of the infrastructure at the end-of-life of the proposal due to the 70-year Project lifespan.	
• impact on the local and NT energy market and energy prices	The aim of the AAPowerLink is to provide dispatchable electricity at materially lower wholesale prices than the current average cost of gas-based electricity in the NT. This clean renewable energy produced by the AAPowerLink has the potential to attract new growth industries, reduce carbon emissions and contribute to climate objectives such as the NT Government's climate change policy and renewable energy targets.	Economic Assessment (PwC) (Appendix G)

Requested in ToR	Key findings	Where addressed
• future NT government infrastructure within utility corridors, eg future electricity transmission	Some business stakeholders were concerned that Sun Cable's use of the railway corridor and utilities corridor could potentially preclude other economic uses and that any requirement to widen the corridor would create Native Title challenges. Sun Cable advises that its infrastructure in the NTG utilities corridor will not preclude other future users, including gas. Sun Cable is seeking an easement of up to 60 metres wide. Most of the actual footprint is 12 metres wide, whereas the corridor is 200 metres wide in some areas.	SIA – Section 8: Economies and Jobs
Provide a SIA including assessment of potential impacts, benefits and risks to communities and the economy using modelling, outcomes of investigation and/or other relevant information. The assessment must quantify the significance of potential impacts and risks to the communities and economy. The assessment of each aspect should consider cumulative impacts and the reversibility of potential impacts.		
Management		
Outline the measures for avoiding, mitigating or offsetting adverse impacts and maximising benefits identified above.	All impacts are listed in the SIMP as part of a risk and opportunities matrix. The matrix includes recommended measures for management negative impacts and enhancing benefit effects of the Project.	SIMP (Appendix J)
Develop a stakeholder engagement plan and communication strategy.	The SIMP will outline key measures in Sun Cable's ongoing engagement strategy for the Project.	SIMP (Appendix J)
Discuss adaptation to a changing climate, including design and resultant viability of the proposal	Sun Cable has commissioned a Greenhouse Gas Abatement plan (Xodus 2021) to meet the requirements of the EIS and the Northern Territory's Large Emitters Policy (2021). This covers construction, workforce travel, transport and logistics and land-clearing. The Plan finds that the Project is carbon positive. An expected 4.4 MT of emissions (the largest source being marine transport) compares with avoidance of 115 MT from electricity and power generation in the Northern Territory, with net avoided emissions of 110 MT over the life of the project, including decommissioning.	Greenhouse Gas Abatement Plan (Xodus) (Appendix H) SIA – Section 10: Healthy Country
All mitigation measures should be substantiated and in accordance with best practice, including advice from relevant NTG advisory agencies.	The SIA has been prepared based on national and international best practice.	SIA – Section 4: Methodology
Monitoring and reporting		
Outline proposed monitoring and reporting activities related to potential impacts and risks to community and economy, and mitigation and management measures.	Outlined in the SIMP	SIMP (Appendix J)
The proposed monitoring and reporting should specify which project phase it relates to, ie construction or operations.		SIMP (Appendix J)

Requested in ToR	Key findings	Where addressed
All monitoring activities should be substantiated and in accordance with best practice advice from relevant NTG advisory agencies.	n/a	
Assess the significance of any residual impact or risk to identified values	Part of risk and opportunity assessment	SIMP (Appendix J)
Where a significant residual impact may remain after applying the environmental decision-making hierarchy, identify offsets and describe how any proposed offset is consistent with the NT Offset Framework (as published) and EPBC Act environmental offsets policy.	n/a for SIA	n/a
Culture and heritage: Includes the following (see 3.11 for more detail)		
Describe the local Aboriginal communities and Traditional Owners within (or in proximity to) the proposal area and any native title claims	Discussed in Heritage Impact Assessment and throughout SIA	Heritage Impact Assessments (Earthsea) (Appendices V, W and X)
Describe the nature and location of Aboriginal and non-Aboriginal historic cultural heritage	Heritage Impact Assessment	Heritage Impact Assessments (As above)
Direct and indirect disturbance to traditional and/or contemporary Aboriginal values, uses of land (eg hunting and ceremonial use)	Consultation suggested the importance of continued access to country for cultural activities. This includes hunting, which is popular with Elliott residents. Gunn Point is Larrakia land, however Wulna and Tiwi people retain customary connections. There are Tiwi and Larrakia burial sites along the coast and throughout the Gun Point Peninsula.	Heritage Impact Assessments (as above) SIA – Section 9: Cultural Identity
Tangible and intangible impacts to cultural values and landscape due to cultural connection to country and potential disturbance to flora and fauna, ecosystems, landscapes and landforms from construction, operation or maintenance	Traditional Owners were engaged as cultural monitors for the cultural heritage and ecology surveys on Powell Creek and the Gunn Point Peninsula, totalling 33 days of field work.	As above
Human health Human exposure to electromagnetic fields, biting insects, ticks and mites.	The human health study suggests little risk from exposure to electromagnetic fields from HVDC cables and biting insects. The SIA does point to health and wellbeing impacts, including potential substance abuse and the mental health of workers living away from families.	Human Health (Chapter 15 of EIS) SIA – Section 6: People and Communities

Requested in ToR	Key findings	Where addressed
General requirements		
Incorporate any other issues that arise during consultation	The Consultation Report (Appendix F) outlines methodology, stakeholders spoken to and issues raised by category.	Stakeholder Consultation Report (Appendix F)
Stakeholder engagement and consultation (as outlined in EPA guidelines), including: • identified stakeholders • stakeholder consultation and outcomes, including decision-making and any adjustments to the proposal as a result of consultation • future engagement activities intended during the assessment process and post-approval, including during construction and operations.	The Consultation Report identifies stakeholders, methods used, and the key issues raised during consultation. Sun Cable is developing a Territory Benefit Plan, Regional (Aboriginal) Legacy Strategy, community investment framework and ongoing engagement strategy for the Project. This includes a plan to promote culturally appropriate and transparent dialogue with Aboriginal stakeholders.	Stakeholder Consultation Report (Appendix F) SIMP (Appendix J)
The proponent must recognise the role and interests of Indigenous peoples, promote the conservation and ecologically sustainable use of natural resources, and seek to: • obtain the views of any group of Indigenous people directly affected • promote the cooperative use of Indigenous peoples' knowledge of biodiversity and Indigenous heritage • where it is appropriate, treat the views of Indigenous peoples as the primary source of information on the value of Indigenous cultural heritage.	Extensive consultation with Native Title Holders, Traditional Owners, Custodians, Aboriginal representative bodies and other Aboriginal people living in or near the Project footprint included: • Native Title meetings coordinated by the NLC • general community meetings to reach people not covered by statutory consultative processes • 'on country' meetings with the NLC and Sun Cable • cultural monitors working with ecological and cultural heritage surveys for 33 days in 2021 • meetings with Tiwi and Larrakia people and representative bodies • Authority Certificates lodged with the Aboriginal Areas Protection Authority (AAPA) will facilitate extensive engagement with Aboriginal custodians across the AAPowerLink footprint and enhance protection of sacred sites. This engagement is ongoing and outlined in the SIMP.	Heritage Impact Assessments (Earthsea) (Appendices V, W and X) SIA – Section 9: Cultural identity Stakeholder Consultation report (Appendix F) SIMP (Appendix J)

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Abbreviations and terminology

AAPA	Aboriginal Areas Protection Authority
AAPowerLink	Australia-Asia PowerLink (AAPowerLink)
AARC	AustralAsia Railway Corporation
ABS	Australian Bureau of Statistics
ACARA	Australian Curriculum, Assessment and Reporting Authority
AEEZ	Australian Exclusive Economic Zone
AFANT	Amateur Fishermen's Association of the NT
AHAC	Anyinginyi Health Aboriginal Corporation
ALEC	Arid Lands Environment Centre
ALRA	*Aboriginal Land Rights Act (Northern Territory) 1976 (Commonwealth)*
AMSANT	Aboriginal Medical Services Alliance Northern Territory
BESS	Battery Energy Storage System
CDU	Charles Darwin University
CLC	Central Land Council
DCA	Development Consent Authority
DCMC	Department of the Chief Minister and Cabinet
DHAC	Darwin Harbour Advisory Committee
DIPL	Department of Infrastructure, Planning and Logistics
DITT	Department of Industry, Tourism and Trade
DEPWS	Department of Environment, Parks and Water Security
ECNT	Environment Centre of the Northern Territory
EIS	Environmental Impact Statement
EP Act	*Environment Protection Act 2019* (NT)
EPBC	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
ERP	Estimated Residential Population
FASD	Foetal Alcohol Spectrum Disorders
GDP	Gross Domestic Product
GSP	Gross State Product
GTP	Gross Territory Product
GW	Gigawatts
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current

IAIA	International Association for Impact Assessment
IAP2	International Association for Public Participation
ICN	Industry Capability Network
ICSEA	Index of Community Socio-Educational Advantage
ILOC	Indigenous location (ABS statistical area)
ILUA	Indigenous Land Use Agreement
LDC	Larrakia Development Corporation
LDC	Land Development Corporation
LGA	Local Government Area (ABS statistical area)
LNAC	Larrakia Nation Aboriginal Corporation
LSJ station	Land Sea Joint station
MCA	Minerals Council of Australia
MNES	Matters of National Environmental Significance
NAXA	North Australia Exercise Area
NLC	Northern Land Council
NIAA	National Indigenous Australians Agency
NT	Northern Territory
NTA	*Native Title Act 1993* (Commonwealth)
NTEPA	Northern Territory Environment Protection Authority
NTG	Northern Territory Government
NTIBN	Northern Territory Indigenous Business Network
OHTL	Overhead Transmission Line
PV	Photovoltaic
SEIFA	Socioeconomic Indexes for Areas
SIA	Social Impact Assessment
SIMP	Social Impact Management Plan
TBP	Territory Benefit Plan
TERC	Territory Economic Reconstruction Commission
TLC	Tiwi Land Council
ToR	Terms of Reference (issued by the NTEPA)
VSC	Voltage Source Converter
VET	Vocational Education and Training

1 Introduction

1.1 Purpose of this report

The purpose of a social impact assessment (SIA) is to combine community insights with expert judgement in order to determine how the consequences of projects are likely to be felt or perceived by affected people, communities and service providers. Effective studies will:

- reduce uncertainty about the consequences of projects (or policy changes)
- inform and influence decision-making by regulators, project proponents and affected communities
- provide data and insights that improve project planning (such as project design, alternatives and workforce and accommodation issues)
- provide baseline quantitative and qualitative data against which to track project and cumulative change across the life span of the project, from conception to closure
- inform effective management plans and proponents' long-term social performance (including enhancement of social and economic benefits, trust and relationships).

The NT EPA's requirements for the SIA and social impact management plan (SIMP) are outlined in the Terms of Reference (see Table 0- 2 above).

Social Impact Assessment

"A Social Impact Assessment includes the process of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any change processes invoked by those interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment."

Source: International Association for Impact Assessment, Principles of SIA, (Vanclay 2003)

1.2 Objectives of the Social Impact Assessment

The SIA for Sun Cable's Australia-Asia PowerLink (AAPowerLink) Project will:

- define the Project's social, cultural and economic footprint (local, regional and Territory)
- describe existing social, cultural and economic conditions in:
    - the Project's immediate footprint: Powell Creek Solar Precinct, the overhead transmission line (OHTL), Murrumujuk Darwin Converter Site, Cable Transition Facilities and Subsea Cable System route through Darwin Harbour and all affected people and communities
    - secondary footprint – or zone of influence – such as regional areas that may form part of the Project's workforce catchment area and supply chain, service providers and communities that are home to people with social, cultural and economic ties to the land on which the Project is located
- incorporate best practice community consultation to capture qualitative insights

- provide impartial, timely and accurate communication about the Project, so stakeholders can provide objective and relevant input and feedback
- describe contextual factors and complexities that may compound the experience of negative impacts or act as barriers to maximising opportunities
- predict and assess the likely significance of key social, cultural and economic impacts, whether positive or negative, direct or indirect, tangible or intangible, long or short-term
- produce concise and relevant reports that give regulators and stakeholders confidence that the proponent has a comprehensive understanding of the social, cultural and economic environment in which its contractors will be operating
- produce a social impact management plan (SIMP) that:
    - outlines proponent commitments and measures to alleviate or manage potentially negative impacts and enhance beneficial impacts
    - provides for ongoing monitoring and measurement to capture and adapt to emerging issues throughout the life cycle of the Project.

1.3 Scope

Temporal

Long life: The Social Impact Assessment provides a whole-of-life assessment, from project planning to closure and rehabilitation. A limitation on effectively considering this issue is the declining certainty of predictions over the Project's 70-year life, therefore management plans will adopt an adaptive management approach to track change, respond to emerging issues and engage with stakeholders to meet changing community expectations.

The SIA considers potential impacts at the following stages of the Project:

- project planning
- the construction stages
- operations
- rehabilitation and closure (including alternatives for land use after closure)

Spatial

Broad and complex: The Project footprint is particularly complex as it includes:

- the Solar Precinct on Powell Creek Station
- the OHTL in the railway corridor from Powell Creek to Livingstone, then the NT Government utilities corridor to Gunn Point Road
- a Land-sea Joint Station at Murrumujuk on Gunn Point Peninsula
- route of a Subsea Cable System through Darwin Harbour to the limits of Australia's Economic Exclusion Zone.

Social

Multiple locations and diverse values: The social area of influence captures Traditional Owners who maintain spiritual and cultural connections to the site, many of whom no longer live locally. It covers direct and indirect impacts on people whose businesses and livelihoods may be affected by the project, including pastoralists, towns and other communities that may experience the ripple effects of social change processes as a result of the Project.

Economic

Potentially transformative but equitable distribution benefits needs to be considered: Economic impacts will be more diffuse, impacting at local, regional, Northern Territory and Australian scales. Economic assessment needs to consider distributive equity, or how the economic benefits and costs are distributed. This will take account of labour markets and supply chains, including towns and other communities such as Elliott, Marlinja, Tennant Creek, Alice Springs, Katherine and Darwin as well as the broader Barkly Region.

Statistical boundaries

The Project footprint is covered by a number of statistical boundaries, which often fail to align with each other. To maintain consistency, Census data generally will be gathered at the Australian Bureau of Statistics (ABS) levels of:

- Northern Territory
- SA4: Outback Territory and Greater Darwin
- SA3: Litchfield
- SA2: Tennant Creek
- Elliott: State suburb
- Local Government Area: Barkly (as opposed to SA3 Barkly Region).
- IARE and IERG (Indigenous Area and Indigenous Region for specific Aboriginal data, such as unemployment rates).

Other relevant boundaries include:

- Northern Territory Government: Central, Barkly, Big Rivers
- Local Government regions (Barkly, Katherine, Big Rivers, Roper, Victoria-Daly Coomalie, Litchfield, Palmerston, Darwin)
- Northern Territory and Australian Government electoral boundaries.

Quantitative data will focus on priority areas and will be reported along with qualitative data from community consultation.

Local vs regional

Multi-scale: For the purpose of this SIA:

- 'local' means directly affected people, families and communities namely Elliott, homelands occupied by Traditional Owners, pastoral properties, businesses and residential areas along the Project corridor, including Larrakia people and the Litchfield municipality;
- 'regional' means broader catchment for potential workers and sourcing services and supplies, in particular Tennant Creek and the Barkly and the Greater Darwin Region;
- Northern Territory covers Territory-wide impacts, including economies, government policies, programs and development of human capacity.

1.4 Structure of this report

The report includes an introduction and project description, then outlines True North's methodology and the policy context for the SIA. It outlines the approach to community and stakeholder engagement and key findings. Section 5 provides a profile of communities in the AAPowerLink footprint. Sections 6 to 13 predict and assess impacts categorised against the dimensions outlined in Section 3.

Section 1	Introduction
Section 2	Project description
Section 3	Methodology and policy context
Section 4	Community and stakeholder engagement
Section 5	Community profiles
Section 6	People and communities
Section 7	Social infrastructure and services
Section 8	Economies and jobs
Section 9	Healthy country
Section 10	Living environment
Section 11	Cultural identity
Section 12	Strong voice
Section 13	Cumulative impacts
Section 14	Bibliography
Section 15	Attachment: Local Workforce Strategy (Mark Stoyles Consulting)

2 AAPowerLink description

Sun Cable is an Australian, world-leading renewable energy company founded in 2018 with a mission to supply renewable electricity from resource-abundant regions at scale. The Australia-Asia PowerLink (AAPowerLink) is Sun Cable's flagship project that features a high-capacity solar system that will store and transmit renewable electricity from the Barkly region of the Northern Territory to Darwin and Singapore markets. The Project involves six key components:

- Powell Creek Solar Precinct
- about 800 kilometres of a circa 6.4 GW capacity overhead transmission line (OHTL) from the Powell Creek Solar Precinct to the Darwin Converter Site at Murrumujuk
- Darwin Converter Site, including Voltage Source Converters (VSCs), energy storage and network connection supply
- Cable Transition Facilities to enable transition of power cables between land and sea
- a Subsea Cable System extending about 4200 kilometres from the Darwin Converter Site to Singapore
- Singapore Converter Site, including a VSC, network connection and energy storage.

The SIA assesses only those components of the Project that are on Australian land or within the Australian Exclusive Economic Zone (AEEZ).

Powell Creek Solar Precinct

Electricity will be generated at the 12,000-hectare Powell Creek Solar Precinct, which will consist of multiple large-scale solar and storage fields. The precinct will house various energy storage systems, converters, transmission lines, workforce accommodation, offices, carparks, access roads, an airfield, rail siding, fencing and other supporting infrastructure.

Overhead Transmission Line (OHTL)

A new High Voltage Direct Current (HVDC) Overhead Transmission Line (OHTL) will transmit electricity from the Solar Precinct to the Darwin Converter Site. The OHTL will generally follow the footprint of the AustralAsia Railway Corridor, from Powell Creek Station to Livingstone in the north, where it will divert to follow a designated utilities corridor to Murrumujuk on the Gunn Point Peninsula. The OHTL will comprise mostly steel poles from 44-56 metres high contained within a 60-metre easement and permanently cleared four-metre wide access track.

Darwin Converter Site

The OHTL will terminate at the Darwin Converter Site, which will convert electricity from high voltage direct current (HVDC) to high voltage alternating current (HVAC) for dispatch to local networks. It will then be converted back to HVDC for export to Singapore. The site will be the junction point between the onshore and offshore power networks and will enable connection to the local Darwin electrical network.

The Darwin Converter Site will include up to four voltage source converters (VSC), a battery energy storage system (BESS), substation and switchyard, an operations and maintenance facility and

ancillary infrastructure including parking, laydown, warehousing, offices, a communications tower and ablutions. The facilities will be in a fenced compound with lighting and surveillance.

Cable Transition Facilities

The Cable Transition Facilities at Murrumujuk will comprise three separate components to transfer power from onshore to offshore: an underground cable corridor, land-sea joint station (LSJ Station) and shore crossing site.

Power leaving the Darwin Converter Site enroute to Singapore will be transferred by underground cables to the LSJ Station via an underground cable corridor about 2.7 kilometres long and 35 metres wide.

The LSJ Station will be a fenced one-hectare site about 300 metres inland from the beach near the junction of access tracks to the Gunn Point Beach and Tree Point Conservation Reserve. The station site will include a construction area to accommodate excavators, generators, pumps, winches, surge arrestors, joint workshop, pipe storage, and ancillary infrastructure. It will include construction site offices, lighting, fuel storage and amenities.

The shore crossing site will consist of cables to be laid in temporary trenches about two metres wide and up to two metres deep from the LSJ Station across the shoreline and out to the low water mark. After construction, the land surface and seafloor will be reinstated, the site will be revegetated and normal access reinstated.

Subsea Cable System

A High Voltage Direct Current (HVDC) Subsea Cable System comprising three cables, will be installed to transfer electricity about 5000 kilometres from Darwin to Singapore. This SIA incorporates the impacts of the 886-kilometre section of Subsea Cable System to be installed from the shore crossing at Murrumujuk out to the edge of the Australian Economic Exclusion Zone (AEEZ) in the Timor Sea.

Ancillary infrastructure

Two sites of ancillary infrastructure have already received statutory planning approval and are not covered by the Environmental Impact Statement but are important contextual topics for consideration of workforce development and potential pressures on social infrastructure in Darwin. These are a battery facility on Middle Arm Peninsula, near Darwin, and a proposed Solar Array Assembly Facility near the railway line in the East Arm Business Park.

2.1 Location and footprint

The Project will operate across seven Local Government Areas, as outlined in Table 2-1 below. The solar precinct site is in the Barkly Regional Council's area of responsibility, while the utilities corridor and Darwin Converter Site are in the Darwin rural area covered by Litchfield Council. The OHTL traverses several other local government areas.

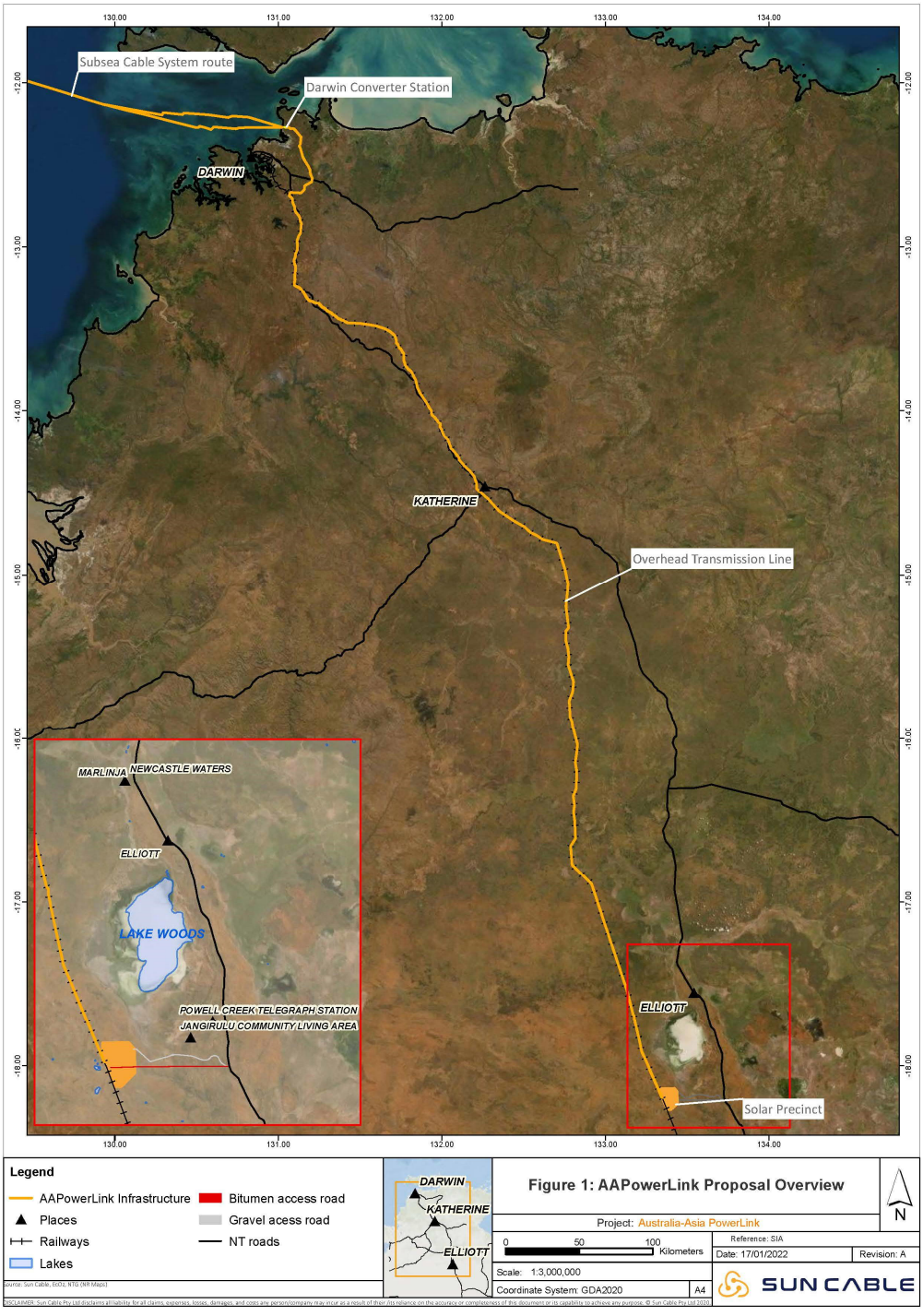

Figure 2-1: Proposal overview

Table 2-1: Local Government areas

Project component	Location	Local Government Area
Powell Creek Solar Precinct and ancillary infrastructure	Powell Creek Station	Barkly Regional Council
Overhead transmission line	Powell Creek Station to Murrumujuk	• Barkly Regional Council • Roper Gulf Regional Council • Katherine municipality • Victoria Daly Regional Council • Unincorporated (Marrakai-Douglas Daly) Area • Coomalie Council • Litchfield Council
Darwin Converter Site	Murrumujuk	Litchfield Council
Cable transition facilities, including underground cables, land sea joint station and shore crossing site	Murrumujuk	Litchfield Council

2.1.1 Powell Creek Solar Precinct

The Solar Precinct will be on Powell Creek Station. The pastoral lease is held by Consolidated Pastoral Company Pty Ltd and operated for cattle production. The station is about 70 kilometres south-west of Elliott and 30 kilometres west of the Stuart Highway, next to the AustralAsia Railway line. The station has established access tracks, fence lines and bores. Although the area is occasionally used for grazing, pastoral activities on the station are concentrated to the north of the property.

The Solar Precinct will occupy about 12,000 hectares, with an additional 100 hectares required for access roads and the airfield (see Figure 2-2 below).

Access

The Project requires two separate access roads, sealed and unsealed, to provide all-weather access from the Stuart Highway. Two rail sidings will be used to offload materials and equipment during construction and retained for operational purposes. An airfield and associated infrastructure will allow for transport of personnel during construction and operations, as well as emergency access.

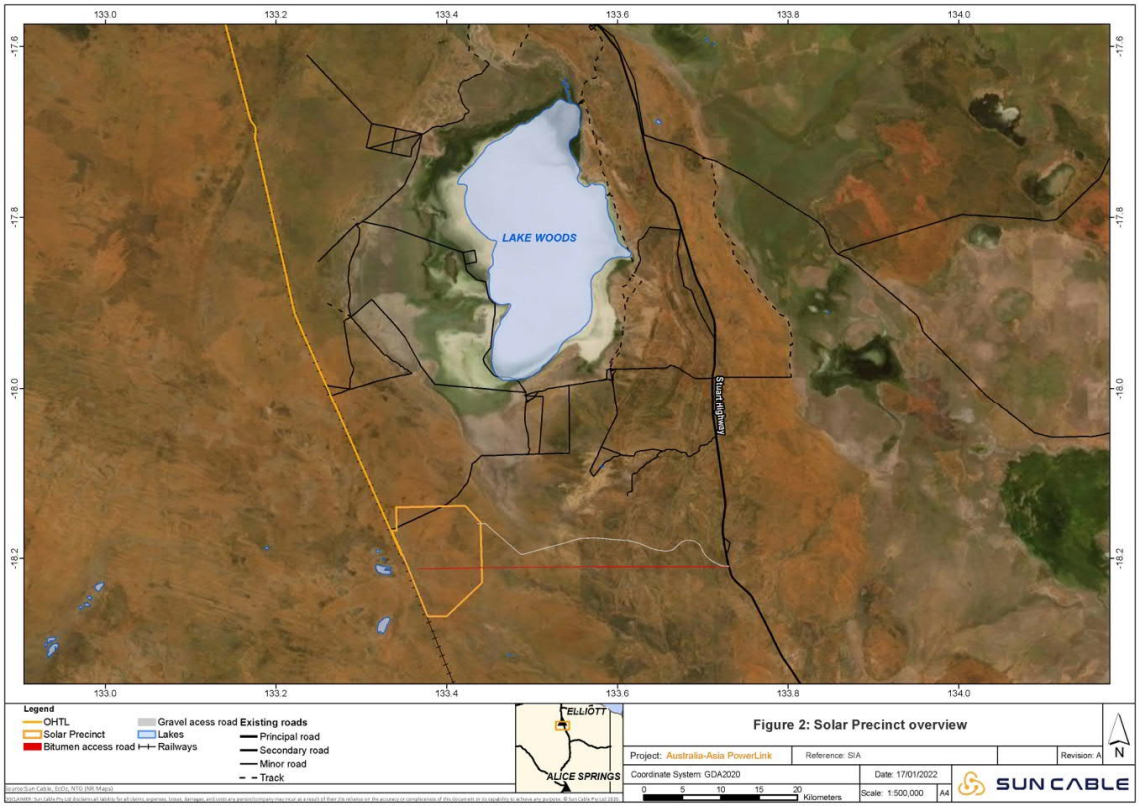

Figure 2-2: Solar Precinct

2.1.2 Overhead Transmission Line

The OHTL will mostly align with the Alice Springs to Darwin Railway Corridor which is managed by the AustralAsia Railway Corporation (AARC). Some sections of the OHTL may leave the railway corridor to avoid townships as well as the final 66 kilometres from Livingstone to the Darwin Converter Site.

Much of the OHTL corridor traverses remote, sparsely populated areas where the main land use is broad-scale pastoral production. North of Katherine, the corridor passes through smaller land holdings for agriculture and horticulture and rural living. The OHTL will extend across public roads and infrastructure at multiple locations, without affecting their ongoing use and operation (see Figure 2-3 below).

The OHTL diverts from the railway corridor at Livingstone to follow a designated Northern Territory Government future utilities corridor. The corridor traverses the eastern outskirts of Darwin's rural area and passes through some extractive mineral title areas and the Black Jungle Conservation Reserve. The OHTL crosses Gunn Point Road then, for the final 19 kilometres, runs parallel to the west of the road corridor (see Figure 2-4 below).

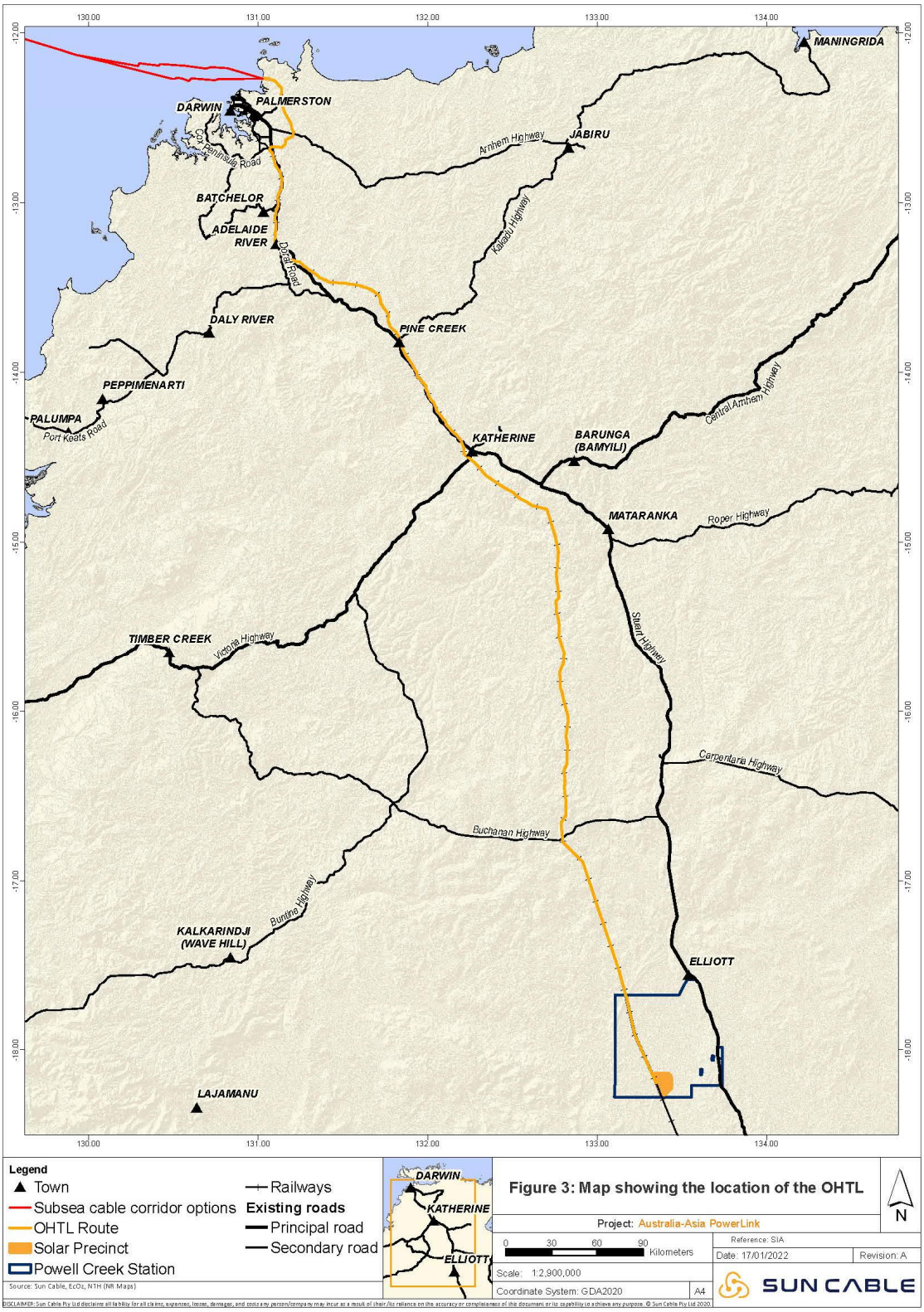

Figure 2-3: OHTL route

Figure 2-4: Utilities corridor from Livingstone to Murrumujuk

2.1.3 Darwin Converter Site and Cable Transition Facilities

The Darwin Converter Site and Cable Transition Facilities will be take up about 55 hectares of a 124-hectare site at Murrumujuk, south of the Murrumujuk and Gunn Point Beach access road and about 30 kilometres east of Darwin. Immediately to the west, a prawn aquaculture facility is proposed as part of the Seafarms Group's Project Sea Dragon. To the north-west, Gunn Point Beach is a popular recreation and camping area. To the south is the Tree Point Conservation Reserve.

Murrumujuk is considered Larrakia country, while Wulna and Tiwi people also maintain customary connections to areas around Gunn Point. The Durduga Tree Point Aboriginal Association, or Tree Point Community, is six kilometres south of the site (see Section 5).

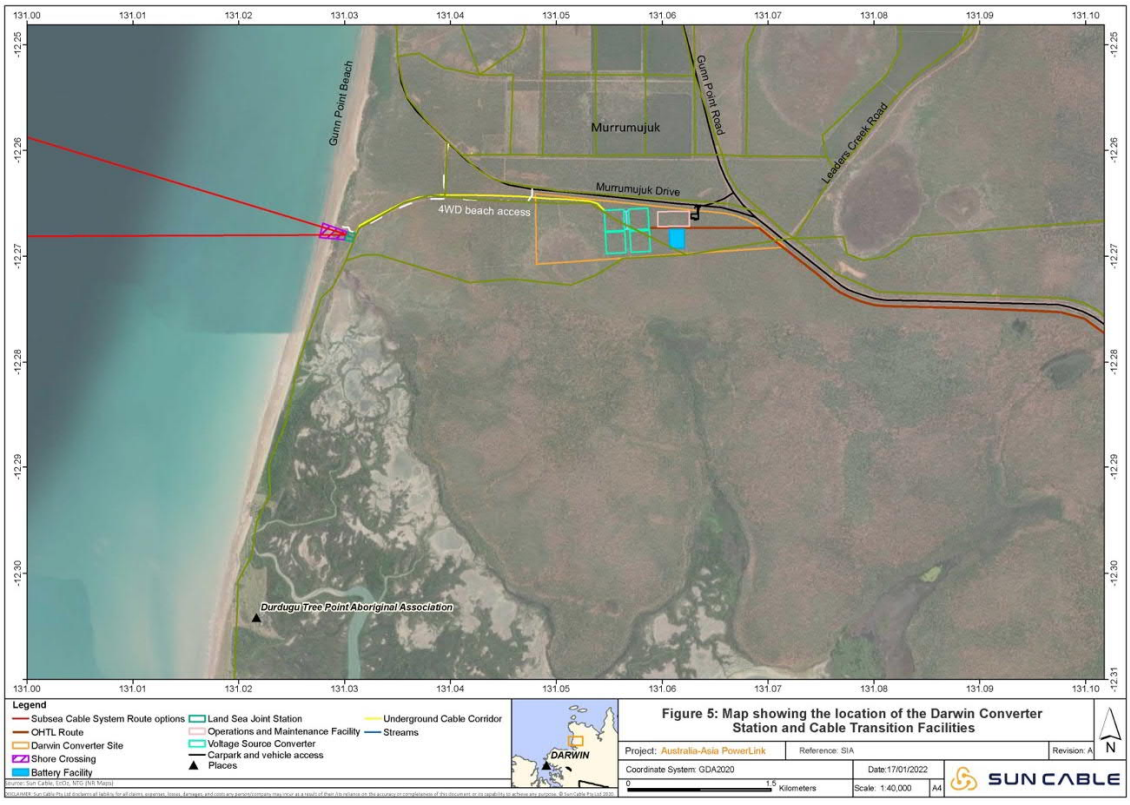

Figure 2-5: Darwin Converter Site and Cable Transition Facilities

2.1.4 Subsea Cable System

The subsea cable corridor route options, which will house the subsea cable system, extends from the shore crossing site at Gunn Point Beach to the edge of the Australian Economic Exclusion Zone (AEEZ) and onwards to Singapore. For the first 22 kilometres the corridor options traverse the shallow waters of outer Shoal Bay and coastal waters of Timor Sea, then the outer areas of Darwin Harbour outside the Darwin Port boundary. The route options lie about seven kilometres offshore of Lee Point and 15 kilometres offshore of Charles Point. Both options avoid known high value recreational fishing areas (natural and artificial reefs and fish attracting

devices). The dredge spoil disposal area used for the INPEX dredging campaign is 300 metres north of the route options.

Beyond the NT Coastal Waters limit, the corridor traverses Commonwealth marine waters. The route crosses the Bayu Undan gas pipeline and the North West Telecommunications Cable, next to the boundary of the North Australia Exercise Area (NAXA). It traverses the Oceanic Shoals Marine Park (Multiple Use Zone 3 & Special Purpose (Trawl) Zone 4) before leaving the AEEZ about 886 km offshore. The rest of the route is outside the AEEZ and therefore not covered by this SIA.

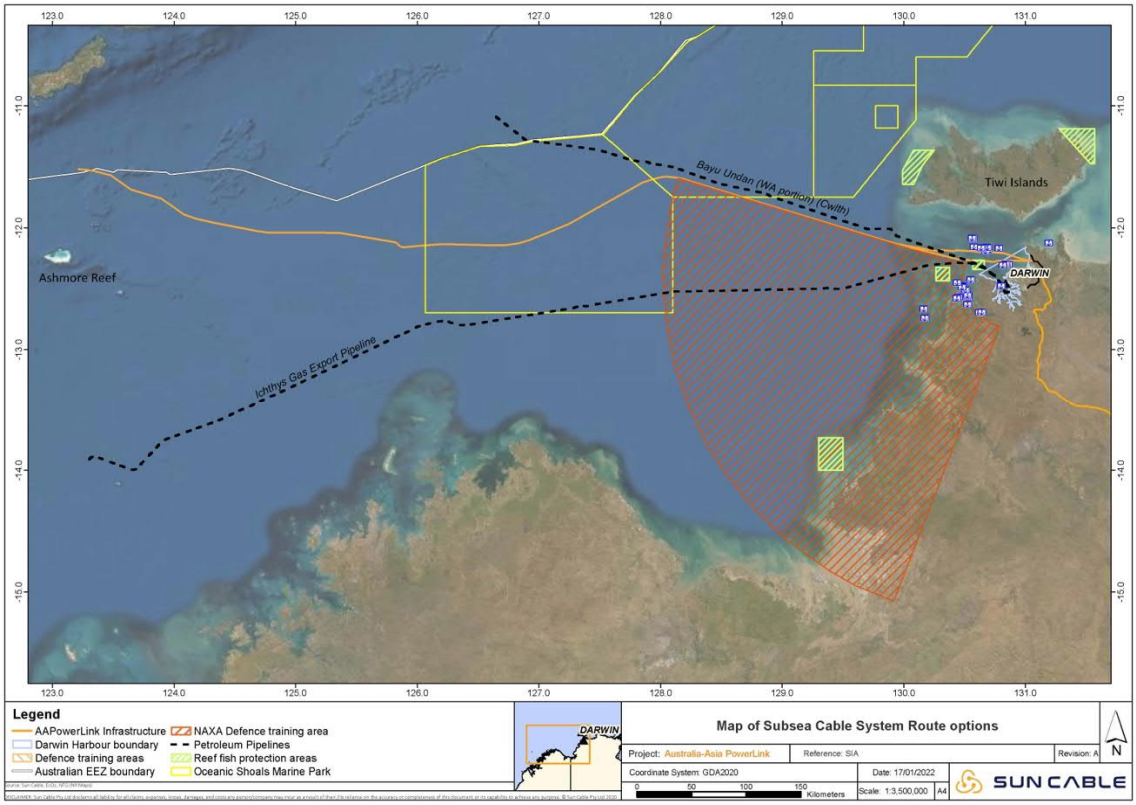

Figure 2-6: Subsea cable route options

2.2 Timeframes

The Project will be commissioned and built in stages over four to five years. It is proposed to start construction at the end of 2023. Network connection availability for the Northern Territory is planned for 2026, with full supply to Singapore to be operational by the end of 2028.

The onshore construction program is scheduled to start in the first quarter of 2024 and will run for about 60 months. The offshore construction program is scheduled to start in the second quarter of 2024 and will run for 57 months.

Manufacture of the submarine cables is expected to start in 2024. Installation of the marine cables is scheduled to begin in 2025 and be finalised by 2029. The capacity of the cable manufacturer will influence the overall schedule of the Project.

2.3 Workforce

The Project is expected to employ 1750 people over the construction phase and 350 during operations. Sun Cable plans to employ workers from the Northern Territory and Australia for the Australian components of the Project. The construction workforce will operate on a roster basis from Tennant Creek, Elliott, Katherine, Alice Springs and Darwin regions, subject to labour market conditions and skills shortages. Labour may also come from Mount Isa, in Queensland.

The table below outlines the proposed employment figures, location of the workforce and expected duration of various components of the Project. It does not include the solar array manufacturing facility at East Arm.

Table 2-2: Workforce overview

Project component	Estimated workforce numbers	Duration (months)	Location of workforce
Construction			
Powell Creek Solar Precinct	1,000	30	Workers accommodation village for 1000 during construction and 100 during operations
OHTL	460	30	Mobile 'fly' camps between Elliott and Darwin. Existing accommodation providers to be used where possible. Temporary camps to be established in remote areas.
Darwin Converter Site and Cable Transition Facilities	230	30	It is assumed workers will be drawn from the Greater Darwin Region's existing labour force.
Subsea cables	60	4-5 years	Specialist contractors mobilised from overseas with additional support vessels and crew from the Darwin region.
Total	1750		
Operations			
Powell Creek solar precinct	200 personnel		
Darwin	150 personnel		Including OHTL maintenance

In addition to Indigenous Land Use Agreements (ILUAs) negotiated with Native Title Holders, Sun Cable is developing a Regional (Aboriginal) Legacy Strategy and a Territory Benefit Plan (TBP) which outline strategies to maximise local workforce and industry participation. The TBP will outline the approach to employment, training and contractor engagement to maximise use of local Aboriginal and non-Aboriginal skills, labour and businesses. These strategies are being developed in consultation with the Northern Land Council, business and industry groups, Larrakia and Tiwi representatives and the Northern Territory Government.

2.4 Workforce accommodation

Sun Cable is proposing to accommodate the construction and operations workforce at a purpose-built onsite accommodation camp at Powell Creek with capacity for about 1000 people, reducing to 100-200 during operations. The camp will include a mess, recreation office and accommodation facilities. Construction of the OHTL will operate from about six temporary site camps or mobile 'fly camps', about 100 kilometres apart.

Existing town accommodation and services will be used where available in more remote sections of the OHTL. The fly camp locations will be negotiated with landholders and centre around existing rail corridor access points. Remote fly camps will provide transportable caravan and mobile shed style accommodation and amenities for up to 20 people. Camps are expected to be in use at each location for up to six months.

Sun Cable will closely manage the housing needs of management staff and contractors in the Barkly and Greater Darwin Region and explore solutions to mitigate against resultant pressures on housing markets.

In Greater Darwin, it is assumed the workforce will be recruited locally. However, skills shortages may necessitate a level of FIFO accommodation. No worker accommodation is proposed for Murrumujuk.

3 Methodology

3.1 Requirements of the NTEPA

The NTEPA provided a Statement of Reasons and final Terms of Reference (ToR) for the Project in January 2021. Revised Terms of Reference were issued in November 2021, incorporating the Notice of Significant Variation submitted in August 2021.

The Terms of Reference require:

- a summary of the EIS, produced as a stand-alone document (Section 2.1 of the ToR)
- a project description (Section 2.2 of the ToR), including details of transport and traffic and the construction and operational workforce
- details of rehabilitation and closure (Section 2.2.6)
- information against environmental factors, including community and economy, culture and heritage and human health (Section 3)
- stakeholder engagement and consultation, in line with the NT EPA's *Stakeholder Engagement and Consultation – Environmental impact assessment guidance for proponents* (NTEPA 2021)

These Terms of Reference are outlined in greater detail in the summary of findings at the beginning of this SIA Report, along with an indication of where they are addressed in this SIA and the EIS.

3.2 Overview of approach

The methodology for this study and categorisation of impacts is in accord with best practice social impact assessment guidelines and principles. This includes the New South Wales *Social Impact Assessment Guideline for Statement Significant Projects* (2021), the NT EPA's *Guidance for Economic and Social Impact Assessment* (2013), a *Guide to Social Impact Assessment* (Munday 2020), the International Association for Impact Assessment's Principles (Vanclay 2003) and Guidelines (Vanclay et al. 2015) for Social Impact Assessment, the International Finance Corporation's Performance Standards for Environmental and Social Assessment (2012) and internal research by True North into best practice social and cultural impact assessment.

The following diagram (Figure 3-1) outlines the steps of our approach.

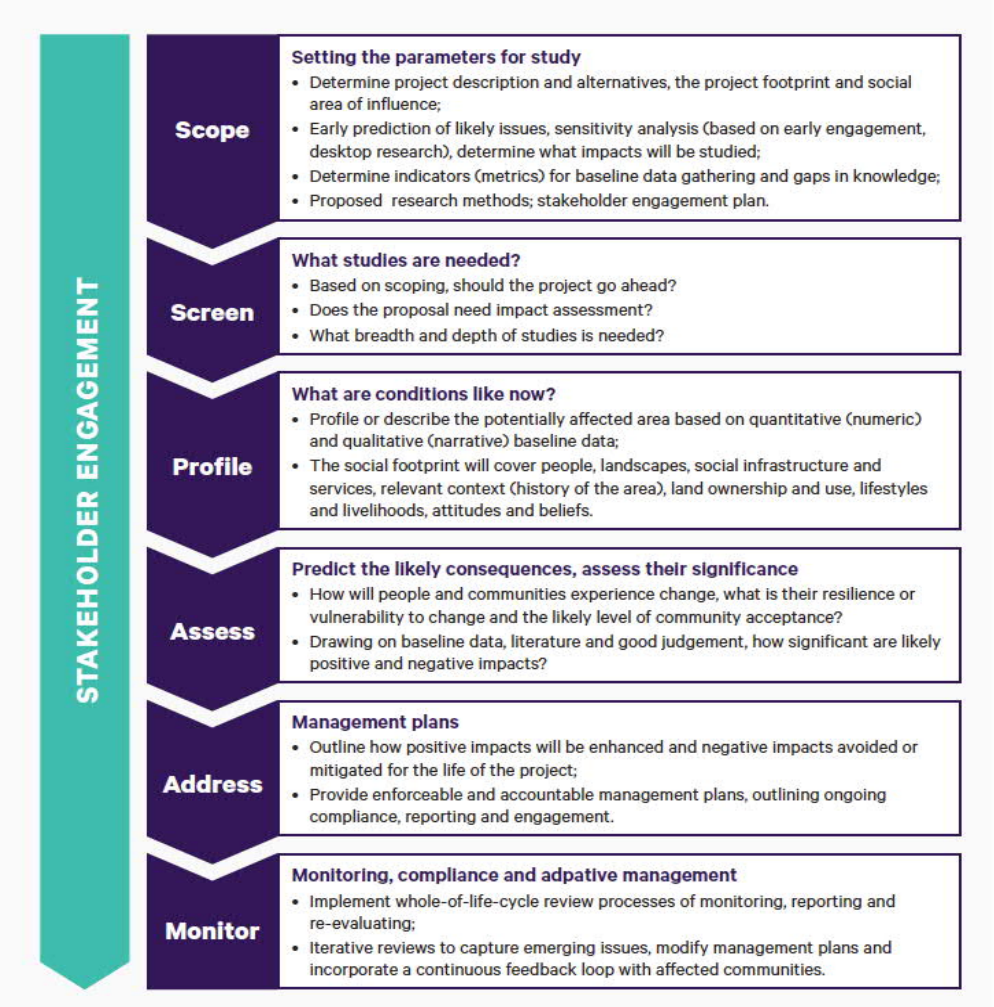

Figure 3-1: Methodology

3.2.1 Scoping

A scoping exercise for this SIA in February 2021 (based on a literature review, analysis of submissions to the NT EPA on the Draft Terms of Reference, issues analysis and sensitivity assessment) suggested a comprehensive study was warranted, given the:

- large and extended footprint of the Project
- diversity of affected communities and language groups
- depth and breadth of likely stakeholder values and perspectives
- pioneering nature and technical complexity of the Project
- limited previous consultation
- level of interest by affected communities
- cultural sensitivity of some impacts
- academic and stakeholder interest in the equitable distribution of Project benefits and potential trade-offs
- Sun Cable's expressed desire to leave a positive legacy.

The purpose of a scoping exercise is to guide research and analysis so social impact assessment was targeted and relevant to the material issues, including potential impacts, perceptions or issues of concern to people and communities. The scoping study aimed to identify existing knowledge, highlight gaps and uncertainties in knowledge, prioritise key areas for study and ensure integration with other EIS studies.

The scoping study listed all potential issues that might be considered in a social impact assessment. It applied a preliminary significance assessment, prioritised those impacts that required further analysis and screened out those likely to be inconsequential unless raised by stakeholders.

The scoping study was further refined to accommodate the Notice of Significant Variation referred to the NTEPA in August 2021, when key parts of the Project were moved to Murrumujuk on the Gunn Point Peninsula. While the variation didn't substantially change the issues considered, it did add to project complexities and the breadth and diversity of affected people and communities.

The scoping exercise was refined after baseline data gathering and consultation. The full risk and opportunity matrix can be found as part of the Social Impact Management Plan (SIMP), which includes suggested mitigation of potential negative impacts and enhancement of potential beneficial impacts. Risks and opportunities are categorised and assessed in corresponding sections of this SIA. A summary of the residual risk and opportunity ratings are as follows (see methodology at Section 3.2 below for an explanation of the descriptors). Note that impact assessment tends to focus on predicting and assessing risk, so the imbalance of positive and negative impacts is to be expected. However, social impact assessment extends the analysis to include opportunities from the perspective of affected people and communities. In summary, final residual ratings are:

Table 3-1: Potential impacts identified

Potential impacts identified			
Positive		Negative	
Transformational	4	Catastrophic	nil
Beneficial	5	High	3
Noticeable	9	Medium	15
Barely perceptible	2	Low	23
Total positive	20	Total negative	41

3.2.2 Potentially positive

Transformational:

- Stronger and more sustainable regional economy (longer-term) through contracts, wages and economic diversification (EJ-3)
- Access to affordable, reliable power provides long-term social and economic benefits in the Northern Territory and sustains new economic sectors (EJ-7)
- Aboriginal jobs, training and legacy skills development as a result of the Project and community benefits packages (EJ-9)
- Contribution to Territory and global reduction in greenhouse gas emissions (HC-6)

Beneficial:

- Stronger and more sustainable Territory and Australian economy through boosting manufacturing, industry, population growth and taxes (EJ-2)
- Local businesses benefit from winning work and enhanced capabilities, including Aboriginal businesses and pastoralists (EJ-6)
- Enhanced human capital and skills as a result of jobs and training over the lifetime of the Project (EJ-8)
- Enhanced cultural identity by using ranger groups and cultural services (CI-4)
- Cumulative opportunities to invest benefits and build capacity from multiple projects (CU-3)

Noticeable:

- Enhanced community vitality, through investment in social and community infrastructure, social enterprises, community activities (PC-4)
- Improved transport infrastructure (SI-4)
- Improved access to utilities, such as power, water and telecommunications for remote communities (SI-8)
- Improved quality and range of community infrastructure due to project investments (SI-9)
- Stronger Australian economy through contracts, stronger renewable energy sector, export income and taxes (EJ-1)
- Enhanced opportunities to care for country (HC-7)
- Enhanced labour force and skills from the relocation of spouses and partners of the construction workforce and management team (EJ-14)
- Enhanced agency in project planning and empowered decision-making (SV-1)
- Cumulative opportunities for development of human capital and business capacity (CU-4)

Barely perceptible:

- Enhanced public health, through higher wages and improved socioeconomic status, reduced substance abuse (PC-8)
- Enhanced access to schools and childcare (SI-5)

3.2.3 Potentially negative

Catastrophic
Nil

High

- Reduced affordability and availability of public and private accommodation, particularly in Tennant Creek, Elliott and Katherine as workers or families seek local housing (SI-1)
- Loss of cultural heritage due to damage, or reduced access, including fears and anxieties of damage to sites or custodians' responsibilities (CI-1)
- Cumulative impacts of other developments, including oil and gas, mining, horticultural developments, other renewable energy projects and pipelines in the region (CU-2)

Medium

- Reduced sense of public safety and wellbeing as a result of project-induced substance abuse and alcohol-related crime (CP-1)
- Reduced sense of wellbeing and safety from influx of workers and project activities (CP-2)
- Reduced community cohesion and resilience, through changed demographics, community conflict and jealousies over the perceived distribution of benefits (CP-3)
- Higher levels of road trauma on the Stuart Highway and access routes (CP-5)
- Reduced mental health and wellbeing of workforce leads to loneliness or family pressures, increased drug and alcohol use, self-harm and suicide (CP-9)
- Reduced quality of municipal services, particularly in Elliott and Tennant Creek, due to loss of staff, pressures on budget and staff time (SI-10)
- Frustration by businesses who fail to win tenders (EJ-4)
- Failure to deliver on expectations of local jobs, due to lack of interest, skills shortages, poor work readiness (EJ-10)
- Reduced capabilities and productivity of other economic sectors because of loss of workers to Sun Cable (EJ-12)
- Reduced values, cultural and spiritual connections to land and seas through reduced access or physical changes (CI-2)
- Degraded biodiversity and habitat in the Project footprint (HC-1)
- Reduced aesthetic values of the landscape through land clearance, industrialisation (LI-4)
- Reduced sense of place through changes to the landscape, land use, negative worker behaviour, changed values (LI-5)
- Disempowerment of Aboriginal and other community groups who feel they have not been afforded an influential voice in decision-making (SV-1)
- Communities and stakeholders reluctant to engage due to consultation fatigue (CU-5)

Low

- Reduced safety along the railway and high voltage transmission line corridor (PC-6)
- Reduced public health, though noise, dust, human exposure to electromagnetic fields, biting insects, waste and contamination (PC-8)
- Reduced welfare of girls and young women due to exploitation by workers, sexual liaisons, sexually transmitted diseases and unwanted pregnancies (PC-10)
- Deaths, injuries or disruptions to recreational traffic on the harbour during trenching and cabling (PC-11)
- Reduced affordability and access to health services (SI-2)
- Reduced access, affordability or quality of transport infrastructure, including road and rail (SI-3)
- Pressure on quality and availability of childcare and educational services in the Barkly (SI-6)
- Pressure on emergency services, necessitating increased staffing and enhanced infrastructure (SI-7)
- Businesses become overly dependent on the project or renewables sector and over-invest due to unrealistic expectations of benefits during the construction phase (EJ-5)
- Reduced pastoral productivity around the project site: grazing and mustering, through noise, dust, introduction of weeds, reduced access to bores and productive grazing land, erosion, leaving gates open (EJ-11)
- Crowding out or reduced productivity of other economic sectors, such as tourism, pastoral and horticulture (EJ-13)
- Inflationary effects on other businesses and economic sectors (EJ-15)
- Reduced ability to engage in traditional hunting, fishing, camping, foraging, gathering art materials, bush medicines or other livelihood activities (CI-3)
- Reduced ability to pass on culture, traditional knowledge, undermining of cultural authority due to loss of cultural heritage or access (CI-5)
- Loss or damage to declared or valued European heritage sites disturbed by project activities (CI-6)
- Damage to features with cultural significance, such as waterholes, access to groundwater for livelihoods, or loss of water-dependent species (HC-2)
- Reduced quality of fish health, marine biodiversity, foraging habitat and iconic species such as turtles, dolphins and dugong (HC-3)
- Contribution to greenhouse gas emissions from land clearing, transport and other construction activities (HC-4)
- Reduced access to recreational activities (LI-1)
- Reduced amenity due to project noise, particularly at night, dust, heat and noise pollution (LI-2)
- Reduced amenity from congestion and pinch points creating traffic delays with project traffic (LI-3)
- Reduced enjoyment of human rights, in particular the right of vulnerable Aboriginal people and communities to Free Prior and Informed Consent, gendered impacts, breaches of labour laws, racism in the workplace (SV-2)
- Reduced social, cultural, recreational and ecological values of the harbour due to large-scale changes to land and sea use (SV-1)

Assessment methodology

Assessment of the significance of – or community sensitivity to – possible impacts of the Project is based on an analysis of likelihood and consequence. Likelihood is an assessment of how likely it is that the impact (perceived or not) will actually happen. Consequence is the extent to which impacts are felt. Social risk and opportunity ratings may differ from those of technical studies in that they are measuring how environmental factors are valued and used and perceptions of how change will be experienced (sensitivity to change).

The following criteria (Munday, 2020) was used to determine consequence from the community's perspective:

1. Extent: how many people may experience the impacts
2. Duration: how long the impacts are expected to last
3. Severity: the scale of change from the current conditions
4. Sensitivity: based on the level of controversy, disturbance to values, people's resilience and capacity to absorb change.

Likelihood descriptors (based on NSW Department of Planning, Industry and Environment 2021):

1. Almost certain: definite or almost definitely expected (eg has happened on similar projects)
2. Likely: high probability
3. Possible: medium probability
4. Unlikely: low probability
5. Rare: improbable or remote probability.

The tables below show the methodology and descriptors used to assess social risks and opportunities.

Table 3-2: Ratings for negative impacts (based on AS/NZS ISO 31000:2009 Risk Management – Principles and Guidelines)

		Negative consequence (for harms, disturbance)				
		1	2	3	4	5
Likelihood	Descriptor	Insignificant	Minor	Moderate	Major	Extreme
A	Almost certain	A1	A2	A3	A4	A5
B	Likely	B1	B2	B3	B4	B5
C	Possible	C1	C2	C3	C4	C5
D	Unlikely	D1	D2	D3	D4	D5
E	Rare	E1	E2	E3	E4	E5

Table 3-3: Descriptors for negative impacts

Catastrophic	Intolerable social, cultural and economic cumulative impacts that are unlikely to be amenable to management.
High	Intolerable cumulative impacts that might be accepted if managed to as low as reasonably practicable, taking account of community perceptions, values and resilience.
Medium	Tolerable (depending on the level of community acceptance) cumulative impacts if managed effectively, but requires close monitoring.
Low	Tolerable, barely perceptible negative impacts, but implement adaptive management approaches to ensure the threat level doesn't increase and exacerbate emerging threats as development unfolds across the region.

Table 3-4: Ratings for positive impacts

		Importance consequences (for benefits, opportunities)				
		1	2	3	4	5
Likelihood	Descriptor	Insignificant	Minor	Important	Very Important	Extremely Important
A	Almost certain	A1	A2	A3	A4	A5
B	Likely	B1	B2	B3	B4	B5
C	Possible	C1	C2	C3	C4	C5
D	Unlikely	D1	D2	D3	D4	D5
E	Rare	E1	E2	E3	E4	E5

Table 3-5:: Descriptors for positive impacts

Transformational	Transformational collective and socially, culturally and economically sustainable opportunities for the region, by building enduring capacity that benefits future generations.
Beneficial	Beneficial cumulative benefits across the region that may be of a smaller scale or incremental, but which may suit culturally appropriate sustainable development.
Noticeable	Benefits are noticeable but may be quickly absorbed.
Barely perceptible	Little change in the way of life, livelihoods and lifestyles of the region.

3.3 Categorising impacts

The potential key impacts and opportunities were categorised using the dimensions of social impacts adapted for a North Australia context (Munday 2020). These categories are adapted from the International Association for Impact Assessment (IAIA) Principles (Vanclay 2003) and Guidelines (Vanclay et al. 2015) and are illustrated in Figure 3-2 below.

Figure 3-2: Dimensions of social impacts adapted for a North Australia context (Munday 2020)

3.4 Standards and statutory framework

The primary standards guiding consultation and social research for this SIA are:

- *Environment Protection Act 2019* (NT) and Regulations. The purpose of impact assessment is to allow the NT EPA to analyse the significant potential environmental impacts of a development proposal, make recommendations to the Minister about the acceptability, or otherwise, of these potential impacts and proposed mitigation measures.
- *Stakeholder Engagement and Consultation: Environmental impact assessment guidance for proponents (*NT EPA 2021). The guideline adopts as best practice the IAP2 principles for stakeholder engagement. It outlines expected formal feedback processes for projects on public exhibition and encourages proactive approaches to early engagement during preparation of environmental impact statements, starting at the scoping phase. The guideline defines engagement as including 'communication, dialogue, listening and responding' (see Section 4 for more detail).
- *Environmental Protection and Biodiversity Conservation Act 1999* (Cwth) provides for Australian Government assessment of projects likely to have an impact on Matters of National Environmental Significance (MNES). For this Project, MNES covers threatened species, listed marine and migratory species and the Commonwealth marine environment.
- International Association for Impact Assessment (IAIA), *Social Impact Assessment Principles* (Vanclay, 2003), which is regarded as leading practice for SIA.
- IAIA's *Social Impact Assessment: Guidance for assessing and managing the social impacts of projects* (Vanclay et al., 2015).

- New South Wales *Guidelines for Social Impact Assessment of State Significant Projects* (revised 2021), which is regarded as leading practice in Australia and included in recent NT EPA Terms of Reference.
- *Guidelines for the Preparation of an Economic and Social Impact Assessment,* Northern Territory Environment Protection Authority (November 2013).
- International Association for Public Participation (IAP2*) Core Values, Spectrum of Participation* and *Quality Assurance Standard* (2015) which are regarded as industry best practice for public participation (or community and stakeholder engagement) (see www.iap2.org.au).
- *Guiding Principles on Business and Human Rights*, United Nations Human Rights, Office of the High Commissioner, 2011.
- *United Nations Declaration on the Rights of Indigenous Peoples* (2007).
- *Guidelines for the Preparation of an Economic and Social Impact Assessment*, Northern Territory Environment Protection Authority, November 2013.
- *AS/NZS ISO 31000:2009 Risk Management – Principles and Guidelines*.
- *International Finance Corporation's Performance Standards and Guidance Notes (2003*; 2012).

3.5 Strategic context

A number of Northern Territory policy documents and reports relevant to this SIA are listed below for context:

Table 3-6: Key policy documents relevant to this SIA

Policy or strategy	Year	Released by	Relevant points
2021 Infrastructure Priority List	2021	Infrastructure Australia	This document provides a comprehensive overview of nationally-significant infrastructure needs, as well as an investment roadmap to guide Australia's economic recovery. Key themes include regional economic development and new sources of energy. Proposals are assessed for inclusion on the Priority List using Infrastructure Australia's detailed *Assessment Framework*, which includes strategic fit; the social, economic and environmental value of the project; and deliverability. New energy proposals listed in 2021 included: • expanding the role for renewable energy in the National Electricity Market • delivering enabling infrastructure for hydrogen exports • investing in dispatchable energy sources to ensure the reliability and security of our energy networks • identifying a program of works to provide renewable energy or hybrid generation and new storage solutions to remote communities in the Northern Territory.
Territory Economic Reconstruction Commission	2020	Northern Territory Government	The Territory Economic Reconstruction Commission (TERC) final report in November 2020 outlines strategies to support the Government's ambition of a $40B economy by 2030. Priorities are creating jobs, attracting private investment, supporting current and emerging industries, building on the Territory's competitive advantages and unlocking the potential of the Territory's regions

Policy or strategy	Year	Released by	Relevant points
			The TERC report identifies the Territory's strengths as including its strategic location for both trade and defence, a deep-water harbour and intermodal logistics, world-class mineral deposits and highly prospective onshore gas resources. Key sectors identified as contributing to economic growth were mining and energy, manufacturing and agribusiness. Other focus areas include tourism, renewable energy, national security and defence, the maritime industry and digital and space industries.
Northern Territory Roadmap to Renewables (Langworthy et al. 2017)	2017	NT Government	This report was prepared by an expert panel, chaired by Alan Langworthy. It assumes a population of 245,048 by 2030 with the percentage of renewable energy forecast to increase from 4% to 50%. The panel's role was to provide a roadmap to achieve this target, while maintaining the affordability of energy supply and without compromising network reliability and security. Downward pressure on wholesale electricity prices would stimulate significant economic development, job creation, industry growth and new investment in the Territory, the panel found (see p.4). The report notes that most remote communities rely on diesel generators for their electricity. To reduce this reliance on diesel, the Power and Water Corporation, in partnership with the Australian Renewable Energy Agency (ARENA) is rolling out the Solar SETuP program to 30 communities in the NT: "There is considerable scope, building on the learning developed through this program, to create high penetration renewable energy systems in these communities utilising battery storage technology" (p.5).
Darwin-Katherine Integrated System Plan	2021	Northern Territory Government	The Darwin-Katherine Integrated System (DKIS) 10-year plan aims to meet the NT Government's objectives of 50 per cent renewables by 2030 and 100 nett zero emissions by 2050. "Abundant and low-cost solar in the region provides the perfect opportunity to replace ageing thermal generators. About 40% of the target can be met by solar generated during the day, including from rapid upscaling of large-scale solar complemented by continual growth in the small-scale sector" (p.5). The plan outlines a proposed renewable energy hub close to the existing network to enable new opportunities for low-emissions industrial growth and advances in battery technology that will enable both large scale and home and community batteries to help meet targets. At p.22 it identifies a Future Renewable Energy Hub on Gunn Point Peninsula.
NT Climate Change Response: Towards 2050	2020	Northern Territory Government	The Response outlines the Northern Territory Government's approach to addressing climate risk and harnessing the potential opportunities associated with the transition to a low-carbon economy.

Policy or strategy	Year	Released by	Relevant points
Northern Territory Renewable Hydrogen Strategy	2020	Northern Territory Government	The Northern Territory's vision is to be recognised as a leader in the world transition to renewable hydrogen (H2). Its aspiration is to be an international scale renewable hydrogen technology research, production and downstream manufacturing centre. The plan supports a National Hydrogen Strategy, released by the Council of Australian Governments in 2019.
Territory Benefit Policy	2019	Northern Territory Government	The Territory Benefit Policy aims to 'maximise the contribution to the NT economy by private sector investments in the NT'. The policy must address all phases of the Project's life. It applies to: • private sector projects granted major project status • private projects where the NT Government provides support valued at or greater than $500,000 • projects where a Territory Benefit Plan is specified as a condition of an NT Government agreement. It covers: • local workforce development and employment • regional and Aboriginal economic and community development • local business participation and small to medium enterprise capability development • economic, industry and social infrastructure investment. A Territory Benefit Plan is consistent with the objectives of the Australian Industry Participation (AIP) National Framework.
Buy Local Plan	2018	NTG Department of Industry, Tourism and Trade	The primary objective of the Buy Local Plan is to maximise retention of the NT Government's procurement spend within the Northern Territory. The plan's objectives include: • giving competitive Territory businesses the chance to take part in the Territory's growth • improving recognition and evaluation of local content.
Darwin Region Land Use Plan	2015	NT Planning Commission	The Darwin Region Land Use Plan (DRLUP) provides a strategic framework to manage future growth, including planning for land use, transport and infrastructure needed to support growth. The plan, based on broad community consultation, identifies the essential characteristics and needs of the region. It is supported by a number of sub-regional area plans. The vision of the plan is: "A Darwin Region that is alive and prosperous, led by a thriving global city with high-quality amenity and connectivity" and "A region with a diverse economy and strong society that promotes innovation and tropical concepts, and holds an enduring connection to the natural environment." The plan states that the proposed urban area at Murrumujuk will provide opportunities for employees to live locally and transport and infrastructure corridors will provide access to the broader region. The plan shows a connector road from Glyde Point to the Stuart Highway between the suburb of Holtze and the turn off to McMillans Road.

Policy or strategy	Year	Released by	Relevant points
			The plan also identifies a Utility Corridor and railway link from East Arm to Glyde Point. Murrumujuk was identified in 1984 as a potential residential area. A Murrumujuk Land Use Concept Plan was released by the Northern Territory Government in 1990.
Sub-regional Plans	2020 and 2021	NT Planning Commission	The Litchfield Subregional Land Use Plan, updated in 2020, notes that Litchfield has relatively few residents but is heavily used for recreational purposes by Darwin and rural residents. A Holtze to Elizabeth River discussion paper (2021) includes a land capacity and needs assessment to accommodate predicted population growth in the region, with Palmerston as a primary activity centre. The plan assumes growth of 2.5% a year and discusses the Holtze Urban Area Plan, with 700 dwellings proposed around a small neighbourhood next to the hospital (this is the closest proposed urban development to Murrumujuk in the near term). A consultation report outlines concerns about social housing shortfalls, increased demand for rental accommodation and vacancy rates as low as 0.5%. It comments on the need to cater for increased traffic on Middle Arm Peninsula.
Palmerston Community Plan	2018	City of Palmerston	The plan was developed through a deliberative democracy process with community members. Its vision is for Palmerston to be "A place for people". The Mayor's foreword outlines an ambition to be the "family city of the Northern Territory". Outcomes of the strategy are: • family and community (including wellbeing, family values will determine everything we do, young people's voices are heard) • vibrant economy • cultural diversity • future focussed (can sustain itself through the challenges of the future) • environmental sustainability • governance (values and encourages participation).
Palmerston Local Economic Plan	2021	City of Palmerston	The City of Palmerston's Local Economic Plan 2021-31 (Deloitte 2021) comments on the potential of expanded industrial areas, such as Pinelands and Yarrawonga. It sees opportunities in light industry, transport and logistics, commenting that city's: "proximity to Darwin, the port and rail line, and cheaper rents, could make Palmerston an attractive location for… businesses in light industry, oil and gas service supply, manufacturing or logistics… and businesses finding commercial and residential rents in Darwin increasingly expensive". The plan's key areas of focus are: • business and industry attraction and retention • population attraction and retention • fostering business development and innovation • strategic pursuits.

Policy or strategy	Year	Released by	Relevant points
City of Darwin Strategic Plan: 2030 City for People. City of Colour	2019	City of Darwin	The City of Darwin strategic plan identifies the following strategic directions for the Darwin municipality: • a capital city with best practice and sustainable infrastructure • a safe, liveable and healthy city • a cool, clean and green city • a smart and prosperous city (including to implement an economic development plan to retain people and jobs) • a vibrant and creative city. The aim is that Darwin will be known as a vibrant, creative, innovative, connected, healthy and environmentally responsible city, with well-planned amenities and services. Values of the plan are: • diversity and acceptance (including multicultural heritage and a sense of belonging) • choice of lifestyles (unique, laid back, connected, active, safe) • environment (integrated, long-term planning, sustainable, ecologically sound decisions) • sense of community (active participation) • equality (collaborative and transparent decisions, listening and responding).
Litchfield Strategic Plan 2018-22		Litchfield Council	The vision of Litchfield's strategic plan is "for a place where social and community wellbeing stems from four unique attributes": • wellbeing (personal, social, community) • natural and scenic (large blocks with attractive scenic outlooks) • spacious (but close to everything) • opportunity and prosperity (fully employment, strong industries and business) • family-friendly and connected ("the best place to live in the Top End").
Darwin Harbour Strategy 2020-2025 Darwin Harbour Regional Plan of Management (2003)	2021	Darwin Harbour Advisory Committee	The Darwin Harbour Advisory Committee (DHAC) was established in 2003. Its role is to provide advice to government through the Minister for the Environment. DHAC produced the first Darwin Harbour Strategy in 2010. A revised strategy was published in 2020 to guide sustainable management and planning in the region. Chair of DHAC, Professor Karen Gibb suggests: "Darwin Harbour is a thriving tropical harbour, which is highly valued by the community for its significant natural, cultural and social values. As a working harbour it supports an important industry hub and is the gateway of Northern Australia, which presents a diversity of economic opportunities." The values and goals espoused by the strategy are: • Foster partnerships: To protect and enhance Darwin Harbour through integrated management and in a partnership between government, industry and the community. • Protect and preserve: To protect and enhance the natural environment of Darwin Harbour.

Policy or strategy	Year	Released by	Relevant points
			• Celebrate connection: To protect and enhance the cultural values and heritage of Darwin Harbour. • Sustainable industry: To protect and enhance the economic value of Darwin Harbour in accordance with ecologically sustainable development principles. • Maintain our unique lifestyle: To protect and enhance social, recreational, lifestyle use and enjoyment of Darwin Harbour in an ecologically sustainable manner. DHAC in 2021 released its Integrated Report Card based on 12 values identified in consultation with stakeholders. Indicators for Indigenous values were food security, future generations and spiritual and sacred sites. A 2003 Darwin Harbour Regional Plan of Management by DHAC has valuable context and background to the committee's work, including a section on Larrakia perspectives.
Barkly Regional Deal	2018	Australian and NT Governments, Barkly Regional Council	The Barkly Regional Deal is a tripartite arrangement between the Australian Government, Northern Territory Government and Barkly Regional Council signed in December 2018. It is the first Regional Deal in Australia and is intended to get the three levels of government working together to address community priorities in the region, economic development and improve social conditions. A Governance Table was established to bring together Traditional Owners and community representatives of the 17 language groups across the Barkly, Aboriginal organisations, youth, business leaders and the non-government sector. The 10-year Barkly Regional Deal includes $78.4 million investment in 28 initiatives for three community priority areas – economic development, social development and culture and place-making. These include a regional workforce strategy, business hub, a mining and energy services hub, improved delivery of the Community Development Program (CDP) and $12.7M for student boarding accommodation. An element of the Barkly Deal includes participative approaches to community planning in Barkly communities, including Elliott.

3.6 Ethical standards

True North's research work is guided by our values and membership of several relevant professional associations that establish ethical standards for independent, impartial and rigorous research. These include the Environmental Institute of Australia and New Zealand (EIANZ); International Association for Impact Assessment (IAIA); International Association for Public Participation (IAP2); and the Research Society (formerly Australian Market and Social Research Society).

We observe the standards set out by the National Statement on Ethical Conduct in Human Research (National Health and Medical Research Council 2018) and Australia's Privacy Act 1988. This includes the protection of intellectual property, the ability for people to provide input confidentially if requested and protection of data gathered during our research.

We report on the limitations of our research at p.2 of this report.

4 Community and stakeholder engagement

4.1 Engagement guidelines

A requirement to consult is a key aspect of the statement of reasons and Terms of Reference for this study. The objects of the Northern Territory *Environment Protection Act 2019* (sections 3(d) and 3(e)) expressively:

- provide for "broad community involvement during the process of environmental impact assessment and environmental approval;
- recognise "the role that Aboriginal people have as stewards of their country as conferred under their traditions and recognised in law, and the importance of participation by Aboriginal people and communities in environmental decision making process".

The Northern Territory EPA's Stakeholder Engagement and Consultation Guidance for Proponents (updated January 2021) recognises that stakeholder consultation is an important component of social, cultural and health impact assessments, over and above formal opportunities for feedback on documents placed on public exhibition.

The guidance note stipulates that a purpose of impact assessment in the Northern Territory is to involve the community in planning for projects. This requires a proactive approach to early stakeholder engagement, in order to identify and address issues "before key decisions are made and when alternatives are still an option" (p.8)

"The NTEPA considers that both proponents and the community benefit from respectful decisions, deeper dialogue, and collaborative decisions that result from ongoing stakeholder engagement rather than being limited to specific consultation activities."

The guidance note recommends that proponents adopt the International Association for Public Participation (IAP2) core values as principles for best practice stakeholder engagement. These core values are shown in Figure 4-1 below.

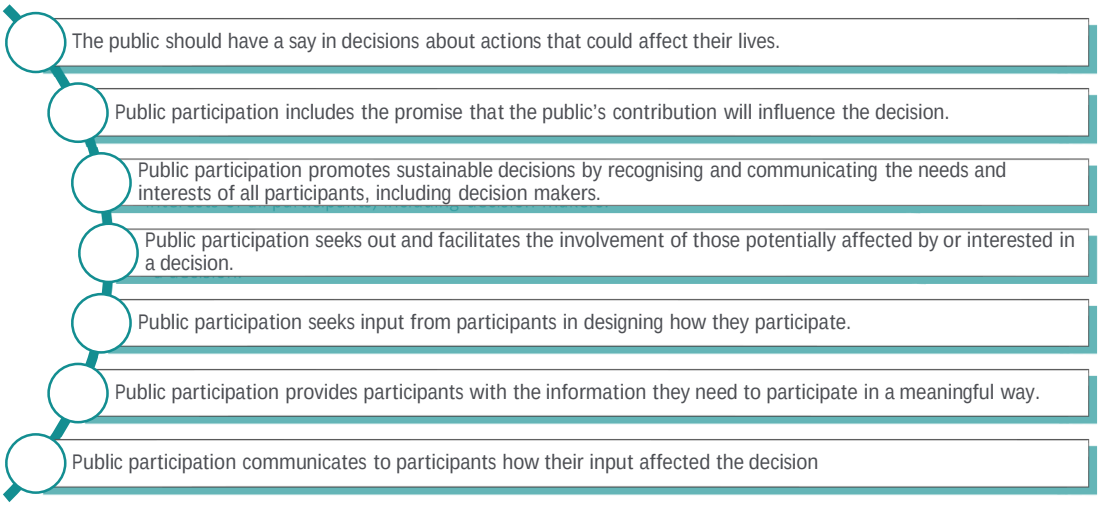

Figure 4-1: IAP2 Core values

4.2 Stakeholder engagement objectives

Early and meaningful engagement is an authentic process of involving people in solutions and decisions, listening to understand their perspectives, providing an honest account of people's input and taking seriously the lived experience of communities (Munday 2020). The objectives of consultation for the Environmental Impact Study (EIS) and Social Impact Assessment (SIA) were to:

- provide all community and other stakeholders with timely, accurate and relevant information
- tailor consultation methods and communication materials to the needs of diverse stakeholders
- inform scoping and project planning, through the life of the Project
- provide Sun Cable and regulators with confidence that people and communities' attitudes, beliefs, values and concerns are well-understood
- inform balanced decision-making by giving equal weight to community knowledge and technical studies
- provide feedback to stakeholders on how their input influenced regulatory and Project decisions.

The Northern Land Council has a statutory role to represent the interests of Traditional Owners and Native Title Holders, including the provision of free, prior and informed consent.

4.3 Key stakeholders

Figure 4-2 indicates the categories of stakeholders spoken to. More detail is contained in the consultation report at Appendix F.

Figure 4-2: Categories of stakeholders

4.4 Engagement approach

4.4.1 Methods

Methods used to provide information and seek feedback included:

- briefings and meetings with key stakeholders, community and industry groups to outline the project, respond to questions and listen to feedback, including Government Coordination meetings, Barkly Regional Deal workforce development committee (generally attended by both Sun Cable and True North)
- workshops with Northern Territory Government departments (Sun Cable)
- Sun Cable has worked with the NT Industry Capability Network (ICN) to provide information on the ICN Project Gateway site on the AAPowerLink Project and separate ancillary projects (a proposed manufacturing facility at East Arm and battery on East Arm)
- key informant interviews with specific stakeholders to elicit insights, local and specialist knowledge (generally True North and Mark Stoyles Consulting)
- interviews to inform development of the workforce development strategy and skills audit (Mark Stoyles Consulting)
- public information sessions, primarily designed to reach stakeholders who may have been unaware of the project (12 sessions between 22 September and 4 November at shopping centres and public places in the Greater Darwin Region, Katherine, Tennant Creek, Elliott and Marlinja which were advertised in local media, by email and the distribution of community posters)
- industry briefings (NT Chamber of Commerce, Manufacturers' Council and Energy Club)
- attendance at conferences, such as the First Nations Clean Energy Conference in Alice Springs in November 2021.

The consultation strategy envisaged briefings of all local governments along the route. However, local government elections were held in August 2021 and the Elliott Local Authority disbanded. Therefore, offers to brief councils and the Elliott Local Authority have been mostly postponed until early 2022. The City of Darwin was briefed in November. The Mayors (before and after the municipal elections) and CEO of Litchfield Council were briefed twice. Barkly Regional Council was briefed in February 2022 and the Regional Council's CEO, Mayor and Deputy Mayor and members of Elliott's disbanded Local Authority were briefed in October and November.

Wider briefings with businesses and renewable energy stakeholders were proposed for all regional locations in October and November. However, this was hampered by COVID-19 travel restrictions, several conferences in Darwin and Alice Springs and a busy consultation period on other policies and projects. The briefings will be scheduled progressively in 2022 as design and procurement planning progresses.

Other challenges were experienced with key stakeholders being unavailable to meet, the short notice of some meetings, the importance of respecting the role of the Northern Land Council in identifying and coordinating meetings with Native Title Holders, COVID-19 travel restrictions and reliance at times on third parties to communicate information on meetings.

4.4.2 Engagement materials

A range of tools and materials supported the consultation. Fact sheets and media releases were Consultation was supported by a fact sheet, presentation materials, maps, visual diagrams and frequently asked questions to ensure consistent messaging by all staff. Fact sheets and media releases were added to Sun Cable's website at www.suncable.sg. This material was revised in September 2021 in response to significant project changes. Tools and tactics included:

- a stakeholder database to keep all stakeholders informed of project developments, including media releases, information on the EIS variation and how to provide feedback
- a revised fact sheet available in hard copy, emailed to the stakeholder database and placed on Sun Cable's website (see attachment)
- PowerPoint presentations tailored to the needs of different stakeholders, including plain English and more visual presentations for Aboriginal audiences
- laminated maps and renders of the proposed power poles for public displays
- banners including graphics of the project, overhead cables and subsea cabling laying
- flyers to promote public displays distributed electronically, by hard copy, on social media and as newspaper advertisements (see attached examples)
- a poster with more visual explanations of the project.

4.4.3 Consultation with Aboriginal people

Sun Cable recognises the importance of proactive, respectful and inclusive consultation with Aboriginal people connected to the land and seas on which the Project will operate. The company has prioritised NLC-organised meetings with Native Title Holders and neighbouring estate groups ahead of public consultation. Dedicated consultation with Traditional Owners and Native Title Holders included:

- an estimated 33 days in the field with paid cultural monitors for ecological surveys and the cultural heritage surveys on Powell Creek, Gunn Point and the Litchfield utilities corridor
- Sun Cable meetings with the Northern Land Council (NLC), Central Land Council (CLC), Tiwi Land Council (TLC), Larrakia representative bodies and individuals and families with ties to affected areas
- dedicated meetings by the Northern Land Council (NLC) to inform Indigenous Land Use Agreement (ILUA) negotiations
- a site visit for Traditional Owners organised by the NLC and Sun Cable in April 2021 to discuss the final location and boundaries of the Solar Precinct footprint

- a briefing of the Mantiyupwi Clan Estate in Darwin and on the Tiwi Islands to discuss Tiwi cultural connections to the Gunn Point Peninsula and the subsea cable route
- lodgement of the AAPowerLink Project Authority Certificates with the Aboriginal Areas Protection Authority (AAPA) after extensive consultation and review (additional sacred sites clearances will be conducted by the NLC to satisfy ILUA requirements)
- site visits with family groups to view a Technology Research Station on Powell Creek Station, including work being done by local companies (this work was approved separately and is not covered by the EIS)
- ongoing meetings by Sun Cable's Aboriginal Affairs team with families and individuals).

4.4.4 Results of engagement

Some strong themes emerged from stakeholder and community consultation for the SIA and EIS, which are summarised below.

4.4.5 Key issues raised

Issues raised during consultation extended from direct feedback about Sun Cable's proposed activities to complaints about many existing systemic issues affecting people's daily lives:

- comments that the project will generate wealth for its owners and energy for Singapore, but people expect to see social and economic benefits for those in the project footprint which is occupied by some of Australia's most disadvantaged people
- expectations that Sun Cable's approach to community benefits would include energy solutions for communities, homelands and businesses in the Northern Territory – maybe in the shape of pilot projects – rather than exporting all the benefits of the project (Sun Cable explained the technical and financial constraints – see SIA for discussion of this issue)
- many stakeholders contrasted the many jobs available with the project, with high unemployment levels and poverty in the Barkly
- however, equally strong concerns were expressed regarding crippling skills shortages across all sectors and challenges in recruiting and retaining Aboriginal workers

- while the Northern Territory Government sees major projects as growing the Territory's population and employment levels, a key constraint was seen as chronic public, government and private housing shortages which may be exacerbated by the Project
- overcrowded public housing remains a key grievance and barrier to education and jobs
- general support for renewable energy as an emerging economic sector and for its potential to attract new industrial development to Darwin, while decarbonising existing industry and domestic networks
- opportunities for research and development in the Territory to build regional and industry expertise in renewable energy and intercontinental grid transmission systems
- challenges with industry participation on legacy projects, and expectations of benefits for the Territory and the regions
- cumulative impacts, with a number of major projects progressing in the Barkly and Katherine/Big Rivers regions on similar timelines
- community perspectives on how Sun Cable's AAPowerLink Project might leave a multi-generational legacy in the regions in which it operates
- concern about the extent of land clearing, with some willingness to accept this as long as benefits from the project are equitably distributed

A detailed summary of the feedback is outlined in the consultation report at Appendix F.

5 Community profiles: Social area of influence

The Australia-Asia PowerLink (AAPowerLink) Project will be potentially socially and economically transformative for the Northern Territory, enabling a 'green' manufacturing sector, providing hundreds of jobs across its 70-year lifespan and building human and business capacity. However, the Project is also a massive linear infrastructure project that will industrialise 12,000 hectares (the size of Darwin municipality) of a remote, sparsely populated landscape at one end and a rural-residential region facing development pressures at the other.

The sensitivity of these regions to disturbance of diverse social, cultural, economic and cultural values is likely to be varied, based on complex and varied histories, social pressures, aspirations and ability to absorb change. Some of the positive and negative effects of change may be obvious, immediate and readily managed. Others may be felt or perceived more as ripple effects, or indirect consequences of change with complex causal factors and diffuse solutions.

Sections 5 outlines key places and demographics in the AAPowerLink Project's immediate footprint and expanded social area of influence. Key areas are shown in Figure 5-1 (below).

Section 6 the provides baseline data and context for some of these communities in order to highlight strengths and vulnerabilities to social change processes that may be invoked by the Project.

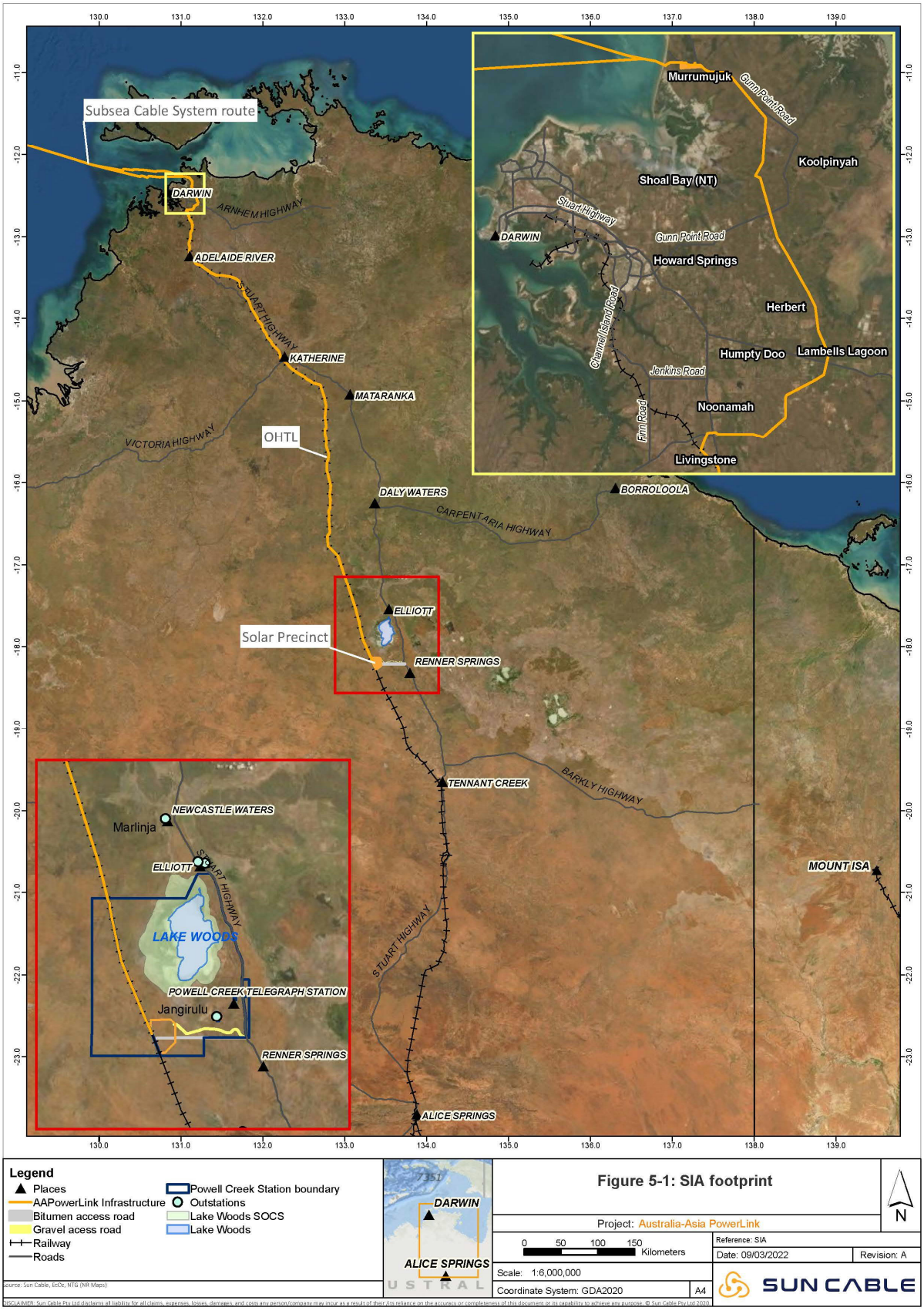

Figure 5-1: SIA study footprint

5.1 Social area of influence

Solar Precinct

The Solar Precinct is proposed for 12,000 hectares of land on Powell Creek Station, about 70 kilometres south-west of Elliott in Central Australia. The following table shows the distance of the nearby places from the Project site:

Table 5-1: Places closest to the Solar Precinct

Community/location	Distance from Solar Precinct
Jangirulu outstation	17 km north-east
Lake Woods	20 km north-east
Pamayu (Powell Creek) outstation	25 km north-east
Renner Springs Desert Inn	36 km east

Overhead transmission line

From Powell Creek, the overhead transmission line (OHTL) will follow the AustralAsia Railway corridor about 800 kilometres to Livingstone, south of Darwin, then travel through the Litchfield Municipality along a future utilities corridor to Murrumujuk, on the Gunn Point Peninsula. The OHTL will cross public roads and infrastructure, with no impact expected on ongoing use. The railway corridor passes through some smaller private land areas supporting horticulture, agriculture and rural living. At some points along the route, the OHTL travels close to rural housing, homesteads, towns, Aboriginal outstations and community infrastructure.

Darwin Converter Site and Cable Transition Facilities

The Darwin Converter Site and Cable Transition Facilities will be built near Murrumujuk on the Gunn Point Peninsula, connecting with a Subsea Cable System at Murrumujuk on Gunn Point Peninsula, a popular camping, fishing and recreational area.

Table 5-2: Places closest to Murrumujuk

Community/infrastructure/place of interest	Distance from converter site and cable transition facilities
Durduga Tree Point Aboriginal Community	5 km south
Gunn Point Beach access	directly north of site
Seafarms' proposed Sea Dragon aquaculture facility	directly west of site

Subsea Cable System

Subsea cables will extend from Gunn Point Beach at Murrumujuk all the way to Singapore. Only components of the Project that are on Australian land or within the Australian Exclusive Economic Zone (AEEZ) are assessed as part of this SIA.

5.2 Community profiles: Regional towns

The Project is located in a remote, sparsely populated part of the Northern Territory. It is likely to draw heavily on distant regional and external workforces, particularly during construction. As will be discussed, this has implications for many facets of project planning, including recruitment, transport and logistics and accommodation.

Tennant Creek, which services the vast Barkly region, is the closest town to the Powell Creek Solar Precinct. Distances from Tennant Creek to larger population centres are:

Table 5-3: Distance by road to relevant regional centres

Key regional centres by road	Distance from Powell Creek Precint
Kulumindini (Elliott) – closest town	128.7 km
Mount Isa (across the border in Queensland) – likely to be a source of workers	797 km
Katherine – likely to be a source of services, possibly workers	549.5 km
Alice Springs – likely to be a source of workers and supplies	693.4 km
Darwin – largely to be a source of services and workers	863.1 km
Borroloola (relevant because of connections with Garawa people living in the Barkly)	655.9 km

5.2.1 Greater Darwin

Greater Darwin comprises the three municipalities of Darwin, Palmerston and Litchfield. The Greater Darwin Area is home to 60 per cent of the Northern Territory's population, with 147,255 residents, about 11 per cent of whom identify as Aboriginal and Torres Strait Islander (ABS 2016 and 2019).

Between 2007 and 2017, the Greater Darwin population increased year on year, peaking at 4.27 per cent in 2013 as a result of the INPEX Ichthys LNG plant construction. However, the area was the only capital city to record a population decrease in the 2019-20 financial year, dropping by 180 people or 0.1 per cent (ABS 2021).

Greater Darwin has a young population, with a median age of 33 compared with 38 nationally. Close to half of Greater Darwin's population (43 per cent) is aged between 25 and 49 compared with about a third nationally (34.7 per cent). Similarly, the region has a lower proportion of older people compared with the rest of Australia. Residents aged over 50 account for 24.5 per cent of the population, compared with 34.1 per cent nationally.

Many of Greater Darwin's workers tend to be transient, relocating to the region for work, then leaving when major projects end. A Charles Darwin University study (Taylor & Tan 2020) found only 57 per cent of early career individuals planned to continue living in the Territory for the next two years. This retention rate rose across age groups to 82 per cent for people at

retirement age. When the highest level of education for respondents was considered, people holding trade certificates had the lowest intended two-year retention rates across all life stages, particularly in early career respondents (43 per cent) and pre-retiree stages (55 per cent). The study suggests "people working in trades are potentially more affected by broader economic conditions and may migrate more quickly to where work is available" (Taylor & Tan 2020).

ABS data suggests that the Greater Darwin Region experienced a net migration loss of 1864 internally in 2020 (not counting overseas migration), which is equivalent to 1.26 per cent of the population. Other Greater Capital City areas such as Sydney and Melbourne experienced an internal migration loss equivalent to 0.56 per cent and 0.18 per cent of the population respectively in the same period.

Generally, people residing in Greater Darwin have a lower level of educational attainment than the rest of Australia, with slightly fewer people having completed a Bachelor degree or above and fewer completing year 12. However, 19.3 per cent of people in Greater Darwin have obtained a Certificate III or IV compared with 15.7 per cent nationally.

Almost three-quarters (71.2 per cent) of Greater Darwin's working population is aged between 15 and 64 compared with 65.4 per cent nationally, aligning with the Territory's young population profile (ABS 2016). The highest industry of employment is public administration and safety (12.5 per cent) followed by construction (10.3 per cent) and accommodation and food services (9.3 per cent) (ABS 2017).

People living and working in Greater Darwin have a higher median income than the rest of Australia, sitting at $61,375 a year compared with $48,360. Greater Darwin has a higher proportion of mid to high income earners (people earning more than $1000 per week) than other capital cities and a lower proportion earning between $less than $1000 per week (.id Community/ABS 2016).

5.2.2 Palmerston

Palmerston is the third largest city in the Northern Territory and the fastest-growing municipality. Palmerston is a relatively new city, with residential development dating back to 1982. During the 1980s and 1990s the municipality experienced significant growth, with the population more than doubling between 1991 and 2001. Much of this growth was due to Defence personnel moving into the area (.id community, 2020). While growth rates have steadied, Palmerston recorded the strongest growth in the Territory in 2019-20 (up 1.9 per cent) (Department of Treasury and Finance, 2020).

Residential development in Palmerston continues, with the newest suburbs being Zuccoli, The Heights Durack and Mitchell Green. Population projections suggest Palmerston will grow at an annual rate of 2.4 per cent from 2016-36 (Department of Treasury and Finance, 2019).

Many Palmerston residents enjoy a high income ($2197 median weekly household income). However, the area has a higher rate of socioeconomic disadvantage than Darwin and Litchfield as ranked by the Australian Bureau of Statistics' Socio-Economic Indexes for Areas (ABS 2016).

More families live in Palmerston than in Darwin and Litchfield but the area also has the highest proportion of single parent families (ABS 2016).

The main employment sector is State Government and Administration (6.5 per cent) which is consistent with Darwin and Greater Darwin. A lower level of tertiary educational attainment is recorded in Palmerston which perhaps correlates with a higher proportion of technicians and trade workers than in Darwin (18.5 per cent compared with 14.9 per cent).

Aboriginal people comprise 11 per cent of Palmerston's population, with an unemployment rate of 12.4 per cent. However, participation rates (the proportion of a working-age people working or actively looking for work) for Aboriginal people in Palmerston and Litchfield are relatively low. This is likely to reflect disengaged youth and people on welfare benefits (the non-participation category includes retired persons, students, those taking care of children or other family members, and others who are neither working nor seeking work).

Palmerston has a relatively high rate of home ownership, compared with Darwin, with lower property prices, more young families and a median age of 30: considerably lower than the median age of 34 in Darwin and 37 in Litchfield (ABS 2016). Households in Palmerston tend to be larger, with an average of 2.9 people per household, compared with 2.7 in Greater Darwin. This may reflect the higher proportion of families living in Palmerston. The median monthly mortgage is also slightly higher than the Greater Darwin median, sitting at $2253 compared with $2200.

5.2.3 The Barkly Region

The Powell Creek Solar Precinct will be located in the Barkly region, the second largest local government area in Australia. Barkly Regional Council covers 323,514 square kilometres, the equivalent of the United Kingdom or New Zealand and 42 per cent larger than Victoria. The region includes many small communities across vast distances and is home to an estimated 7392 people, of whom 72 per cent are Aboriginal people from 16 language groups (Barkly Regional Deal 2019). Tennant Creek is the main regional service centre for the Barkly, which extends along the Barkly Highway to the Queensland border.

A large proportion of Barkly residents are young, with about 40 per cent aged 24 years and under, and about 7 per cent aged 65 or older (Northern Territory Government 2021). The region has experienced a 4.9 per cent decline in population over the past 10 years, there is high unemployment (24.9 per cent) and a lower proportion of working age residents with a Certificate III or higher (29.3 per cent), compared with the Northern Territory (47.5 per cent) and Australia (56.9 per cent). Youth unemployment in the Barkly is at 40.1 per cent (Barkly Regional Deal, 2019 based on ABS Regional Population Growth data updated in March 2019).

The Warumungu people have lived in the region surrounding Tennant Creek for thousands of years. Other Aboriginal groups moved into the area as they were displaced from pastoral properties across the region onto Aboriginal reserves and fringe camps. The Patta Wurumungu people hold Native Title for Tennant Creek and in 2008 signed an Indigenous Land Use Agreement that recognises the Patta Warumungu as Native Title Holders for about 27 square

kilometres of land. Native Title was surrendered in parts of the town to allow for future residential and commercial development (Planning Commission 2017).

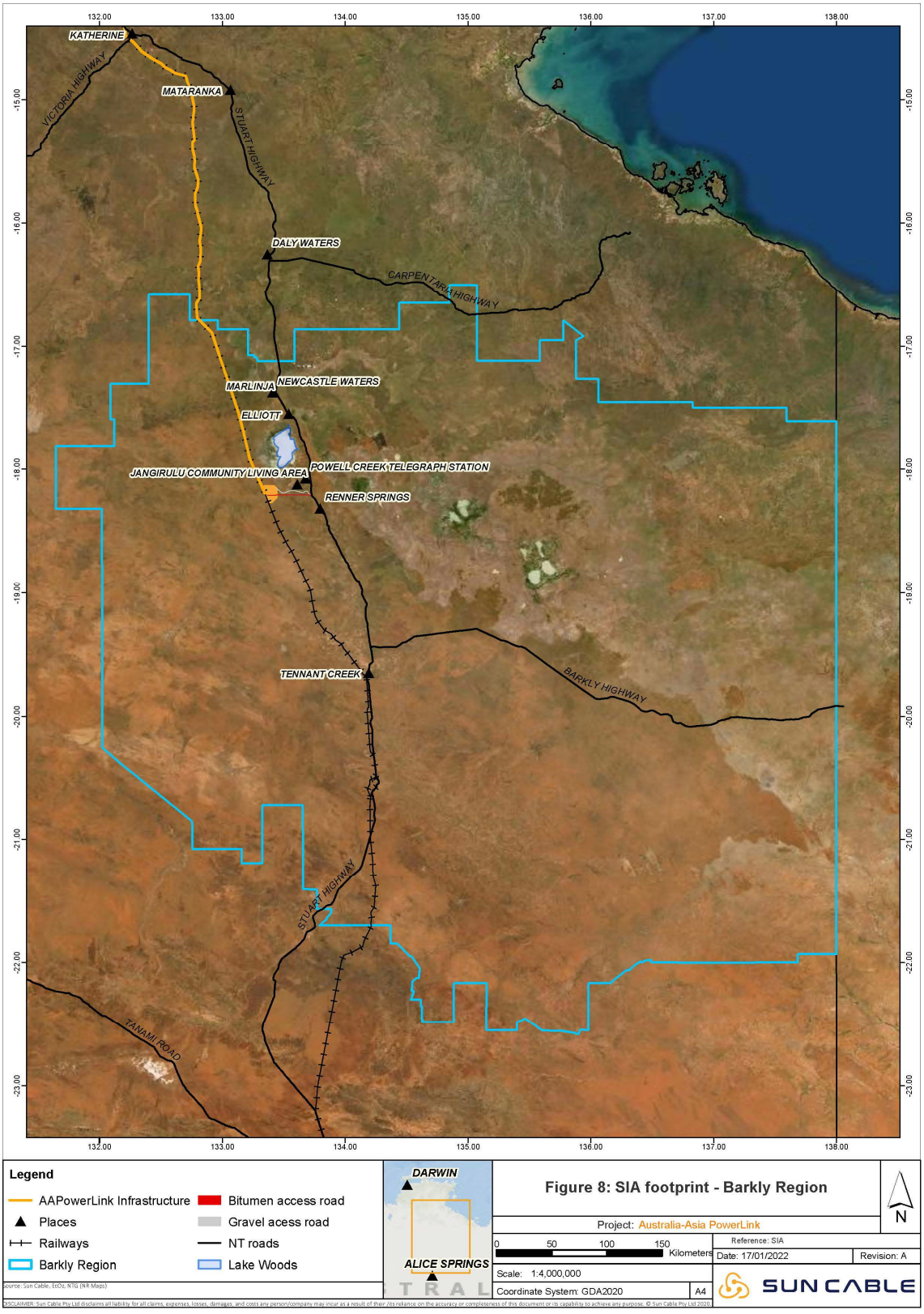

Figure 5-2: Barkly region

5.2.4 Tennant Creek

Tennant Creek was named in 1860 after John Tennant, a pastoralist from South Australia, by John McDouall Stuart, who had supported Stuart's transcontinental expeditions. In 1872, the Overland Telegraph Station was completed. An area surrounding the station was declared a government reserve, which precluded development, so Tennant Creek was established 11 kilometres to the south. The town was declared in 1934 and grew as a major centre for pastoral production and gold mining in the Barkly (Planning Commission 2017).

Tennant Creek is the fifth largest town in the Northern Territory and the main service centre in the Barkly region, which extends along the Barkly Highway to the Queensland border. The estimated residential population of Tennant Creek (SA2) in 2020 was 3302 (ABS 2021). In 2019, 69.3 per cent of Tennant Creek's population were aged between 15 and 64 years.

In 2016, Aboriginal people made up more than half of Tennant Creek's population (51.5 per cent). There has been a decline in net internal migration to Tennant Creek from 2017 to 2020, however the annual decline dropped from -47 to -5 from 2019 to 2020.

5.2.5 Kulumindini (Elliott)

Kulumindini, or Elliott, is in the Kuwarrangu ward of the Barkly Regional Council. It is the second largest urban area in the Barkly and a key administration centre. Dubbed 'the middle of everywhere' (Forrest & Forrest 2011), the town lies on the Stuart Highway halfway between Darwin and Alice Springs and halfway between the Western Australian and Queensland borders, on the edge of Newcastle Waters Station. Elliott is the closest town to the Solar Precinct.

> It is the country of the Jingili desert people with the Wambaya people to the east and south-east, the Yangman and Mangarrayi to the north; the Mudbura and Gurindji to the west and the Warlpiri, Warlmanpa and Warramungu to the south and south-west. These people all had traditional associations with the Jingili and ceremonial ties to the watered areas around Elliott. The lands around Elliott lie across the important Dreaming tracks of the Emu and the Sun, spirit ancestors who were travelling through country on their way to the southern parts of the Northern Territory. The rocks found in this area are amongst the oldest in central Australia, some over 1900 million years old (Barkly Regional Council website n.d.).

At the 2016 Census, Elliott had a population of 339, many of whom are former stockmen and their families living in town camps at either end of the town: Gurungu (North Camp) and Wilyuku (South Camp).

Interviewees described a decline in population and commercial activity in the town over the past few decades. The local caravan park, which in the 1990s hosted a number of permanent onsite vans, is now derelict and for sale.

> "Thirty years ago, in 1990, there was a population of 600. There were four main street businesses, groceries, 33 cabins/motel rooms, two builders, a painter, a motor mechanic and four rural contractors based here. A pub that opened 24 hours a day, seven days a week.

Now there is no accommodation and a pub that's never open." (Bob Bagnall, Chair, Local Authority).

Bob Bagnall describes the cattle yards next to North Gamp as a "hive of activity" in the late 1980s through to about 2000. During the Brucellosis and Tuberculosis Eradication Campaign (BTEC), Elliott was on the tick line, so cattle were being dipped and spelled at the cattle yards and shipped south. Cattle sales days could see an influx of up to 100 truck drivers, agents, buyers and sellers. A full-time caretaker lived at the yards, with many casual jobs for Aboriginal people. With the completion of BTEC and start of live cattle exports, activity at the yards came to a stop.

Elliott includes a Barkly Regional Council service centre and workshops providing services to Elliott and the Marlinja outstation on Newcastle Waters, as well as a sport and recreation centre, aged care, a safe house and a police station. There are two roadhouses providing fuel and stores. One is attached to the Midland Caravan Park (now for sale) and includes a post office. There is no commercial accommodation.

The town had its own Elliott District Community Government Council (EDCGC) from the 1980s until 2008, when Elliott was absorbed by Barkly Regional Council as part of the NT Government's local government reforms. The EDCGC had earlier absorbed the assets of the Gurungu Aboriginal Corporation, which went into administration in 2005.

Most of the dwellings in Elliott are rented (78.2 per cent), with only 15.4 per cent owned outright. Stakeholders interviewed for this study suggest a high level of overcrowding and high demand for public housing in the town and two town camps.

Figure 5-3, Figure 5-4, Figure 5-5: Elliott main street showing Puma service station and roadhouse; old Ampol station site; Elliott Hotel (closed).

5.2.6 Katherine

Katherine is the fourth largest town in the Northern Territory, has about 11,000 residents and provides services to communities from the Western Australia border to the Gulf of Carpentaria. The town is 320 kilometres south-east of Darwin at the junction of the Stuart Highway and the Victoria Highway and is regional headquarters for most government departments servicing the Katherine/Big Rivers region.

Katherine Town Council takes in Manbulloo, Florina, the Binjari and Rockhole communities. The town also hosts the headquarters of the Victoria Daly Regional Council (which extends from Katherine to the West Australian border, including Pine Creek, Timber Creek, Kalkarindji/Daguragu, Daly River and Yarralin) and the Roper Gulf Regional Council (which extends across 186,000 square kilometres from the north of Elliott to the Queensland border).

The main drivers of economic activity and jobs are Defence, mineral production and exploration (Deloitte 2017). Interviewees in Katherine suggested an abundance of projects and a shortage of housing and labour. Major projects include the expansion of Tindal Air Base, which has contributed to substantial population growth and economic activity since it opened in 1988, upgrades to the Bradshaw Field Training Area, a proposed cotton gin 20 kilometres north of the town, Seafarms' Sea Dragon prawn aquaculture project at Legune Station, the proposed Mount Todd Gold Mine, a flood mitigation program in Katherine East and a proposed $35 million logistics hub. Katherine businesses also expect to win work with onshore gas exploration and in the Beetaloo gas province.

The town has a modern hospital and air medical service, two high schools and five primary schools as well as the Katherine School of the Air. Council operates two large sport and recreation facilities, the Katherine Sportsgrounds and Aquatic Centre and the Katherine Showgrounds Complex. Katherine boasts a modern shopping complex, tourist information centre, retail area, a cinema, motels, hotels, library, restaurants and cafés (Katherine Town Council 2021).

5.2.7 Alice Springs

Alice Springs is the second largest town in the Northern Territory and is likely to be a source of workers and supplies for the AAPowerLink. In 2020, Alice Springs had an estimated residential population of 39,391, more than a third of whom were Aboriginal (36.2 per cent). The estimated resident Aboriginal population in 2016 was 16,998.

Alice Springs is the major economic, business and service hub for the Central Australia region, servicing a regional population of 41,000 and cross-border regions in South Australia, Western Australia and Queensland. The key industries of mining, tourism and primary industries are underpinned by government funding for regional service delivery and Defence (Department of the Chief Minister and Cabinet 2021).

Alice Springs' net internal migration has steadily declined from 2017 to 2020. From 2019 to 2020, 433 more people departed Alice Springs than arrived from within Australia. The years 2019 to 2020 saw a net overseas migration of 30, a significant drop from previous years. The

median age in Alice Springs in 2019 was 33.3 and 70.2 per cent of Alice Springs' population was of working age (between 15 and 64).

In 2016, 38.2 per cent of Alice Springs' population had completed Year 12 or equivalent. The unemployment rate in Alice Springs was 9.6 in 2016. Of those people in Alice Springs who were employed in 2016, 17.6 per cent worked in public administration and safety, 16.7 per cent in health care and social assistance and 10.6 in education and training (ABS 2016).

5.2.8 Mount Isa

Mount Isa is a major mining town and service centre in north-west Queensland in the centre of Queensland's desert region. In 2020, the town of Mount Isa (SA2) had an estimated population of 18,334. ABS data from the 2016 Census suggests Mount Isa had a high employment rate, at 94 per cent, and almost a third of households in Mount Isa earned an income of $2500 per week, with almost a third of employed residents working in the mining industry.

Mount Isa is a potential source of workers for the Project, as many workers in Mount Isa are transient, there has been a decline in the number of people employed in mining in recent years, and the type of work likely to be available aligns with Mount Isa's workforce capabilities. Between 2011 and 2016, the number of people employed in mining in Mt Isa, decreased by 457 (ABS 2016). In 2016, 22.2 per cent of workers in Mount Isa were technicians and trades workers, 15.8 per cent were machinery operators and drivers and 9.2 per cent were labourers (ABS 2016).

Mount Isa is just over 650 km from Tennant Creek and there is considerable mobility of people between the two towns.

In 2017, the Tennant Creek Mount Isa Cross-Border Commission was formed by the then Mayor of Tennant Creek Steve Edgington and the then Mayor of Mount Isa Joyce McCulloch in recognition of mutual economic interests in projects such as Jemena's Northern Gas Pipeline and a proposed Mount Isa to Tennant Creek Railway.

5.3 Community profiles: Solar precinct

5.3.1 Powell Creek station

The proposed Solar Precinct site is on Powell Creek Station, about 70 kilometres south-west of Elliott and 30 kilometres west of the Stuart Highway. Powell Creek is owned by Consolidated Pastoral Company and run in conjunction with Newcastle Waters Station. Just off the Stuart Highway is the heritage-listed Powell Creek Telegraph Station, built between 1875 and 1884.

Powell Creek Station is popular with local Aboriginal people for hunting. Lake Woods and the Longreach Conservation Area are to the north-east of the proposed Solar Precinct. Native title rights on Powell Creek Station were determined by the Federal Court in 2020 for six estate groups: the Bamayu (Wurwanawanji-Yarrayarra) estate group; the Bamayu (Titirlku) estate group; the Marlinja estate group; the Ngapa Jangirulu estate group; the Walanypirri estate group; and the Wilyuku estate group (Northern Land Council 2020). The Solar Precinct is on Warlmanpa Country (Earthsea 2021).

5.3.2 Renner Springs

Renner Springs, on the Stuart Highway south of Lake Woods and 36 kilometres from the solar precinct, promotes itself as 'The Heart of the Beef Country'. The Desert Inn roadhouse building is an old army hut relocated after World War II from the army's staging camp 50 kilometres away at Banka Banka Station, which dates from 1885. The property sits on four freehold titles and has potential for expanded accommodation or as a fuel and transport depot on the Stuart Highway.

The current owners, Christine and Alan Revell, in 2021 spent $500,000 on renovations to rooms, the dining area and swimming pool. Renner Springs is popular accommodation for road contractors, grey nomads and service providers to Elliott, 90 kilometres away.

About half the income of Renner Springs is from fuel sales, including 7000 litres a day of wholesale fuel to road trains 24 hours a day. Other services include:

- restaurant, bar and the 'only bakery within 1000 kilometres'
- auto accessories and shop
- 27 motel rooms, with 59 beds
- caravan park with 15 powered and 60 unpowered sites.

Figure 5-6: Renner Springs

5.3.3 Newcastle Waters Station

Newcastle Waters Station covers just over 10,000 square kilometres on open plains, flood country and timbered sandhills. The station can carry 65,700 head of cattle including 20,000 commercial brahman breeders. The homestead is three kilometres off the Stuart Highway. As of October 2021, the station had about 45 full-time staff and some extras for peak periods.

Newcastle Waters was one of the first cattle stations in the Territory, with the town of Newcastle Waters established at the junction of three great stock routes (Pearce 2016). Remnants of what has been described as a 'ghost town' at Newcastle Waters have been retained as a memorial to the life of the outback drovers. The preserved historic buildings include the former Aboriginal Inland Mission Church, Jones's Store, the Junction Hotel and a telephone repeater station.

The station and surrounding areas, including the Marlinja homelands community, experience periodic flooding from Newcastle Waters Creek that can isolate the homestead for weeks (interviews).

Figure 5-7: Newcastle Waters Station

Figure 5-8 and Figure 5-9: The historic Newcastle Waters, including the former Junction Hotel

5.3.4 Marlinja

Marlinja is a homeland 25 kilometres north of Elliott and three kilometres off the Stuart Highway. The homeland is an excision of the Newcastle Waters Cattle Station. Residents at a community meeting in November 2021 estimated that about 70 people, mostly from three families, live in the community. About 20 children attend the nearby school.

5.4 Community profiles – Overhead Transmission Line (OHTL)

5.4.1 Roper Gulf region

The OHTL runs through the Roper Gulf Regional Council's area of responsibility. Roper Gulf covers nearly 186,000 square kilometres, from just north of Elliott to between 200 and 1000 kilometres south-east of Darwin. In 2020, the ABS estimated the area's population at 7458.

The region is mainly rural with a number of small towns, Aboriginal communities and homelands. Most of the region's population (79.7 per cent) is Aboriginal, with 61.7 per cent of residents speaking an Aboriginal language at home.

The region had a moderately high unemployment rate in 2016, at 17.3 per cent. More than half of residents over the age of 15 (51.1 per cent) were not in the labour force in 2016 and fewer than a quarter of residents aged over 15 had completed Year 12 schooling (18.3 per cent).

Public administration and safety and education and training each employ 15.8 per cent of the region's population. This is followed by agriculture, forestry and fishing (11.4 per cent) and health care and social assistance (11.1 per cent). The main industries in the region are agriculture, mining and tourism (.id community 2021).

5.4.2 Birdum

Birdum was the railhead of the Darwin line from 1930 until World War II. A pub was established by Katherine's O'Shea family in 1930 as Birdum became a centre for cattle transport, drovers, train crews and the pilots of passengers of mail flights. In 1942 the pub was taken over by American troops as their headquarters before moving to the new railhead at Larrimah in 1944 (Pearce & Alford 2006).

5.4.3 Murranji Station

Murranji Station, a 447,500 hectare pastoral station south-west of Daly Waters, was purchased by Bunderra Cattle Company in 2020. The OHTL passes through Murranji Station and the Murranji Land Trust, just south of the Buchanan Highway.

5.4.4 Daly Waters

The historic town of Daly Waters has a population of 194, with a median age of 37. Daly Waters has a store, hotel, caravan park and airstrip (Roper Gulf Regional Council n.d.). It is known for its eccentric Daly Waters Hotel, established in the 1930s, and several historic sites such as Stuart's blazed tree and the old Daly Waters Aerodrome, built in 1927. The Hi-way Inn Hotel

and Caravan Park, on the intersection of the Stuart Highway and Carpentaria Highways, is the closest accommodation to proposed oil and gas development in the Beetaloo.

5.4.5 Larrimah

Larrimah, the wartime terminus of the North Australia Railway, means 'meeting place' in the local Aboriginal language (Pearce & Alford 2006). The town is part of Roper Gulf Regional Council and includes a hotel and café. In 1991, a local museum was set up in the old wartime repeater station. Larrimah is the site of an agribusiness precinct proposed by the Land Corporation and NT Farmers Association. The precinct of 5712 hectares, in the Big Rivers Region, was selected to extend the season for crops such as mangoes, citrus and melons.

5.4.6 Dunmarra

Dunmarra Wayside Inn is a roadhouse near the intersection of the Buchanan Highway, south of Daly Waters and 100 kilometres north of Elliott. It offers a caravan park and motel accommodation, restaurant, fuel, bar and swimming pool and caters to travellers between Darwin and Alice Springs.

5.4.7 Mataranka

About an hour south of Katherine, Mataranka has a population of 350 (ABS 2016), including 91 people living in Mulgan Camp. Almost one-third of the population is Aboriginal (29.5 per cent).

Municipal services are provided by Roper Gulf Regional Council, with a regional local authority. Mataranka has a health clinic, school, shops, supermarket, motel, caravan parks, airstrip, hotel, service station and police station. Nearby tourist attractions include the thermal Bitter Springs in Elsey National Park, a historic cemetery and buildings, camping, an annual rodeo and fishing competition (Roper Gulf Regional Council n.d.).

The Mataranka labour force of 125 in 2016 included 10 per cent unemployment. Top employers were local government administration (15.7 per cent), accommodation (11.2 per cent) and vegetable growing (10.1 per cent). Income is relatively low, with the median weekly personal income at $478 (ABS Census Quickstats 2016).

5.4.8 Victoria Daly region

The Victoria Daly Region, which includes Pine Creek, covers a vast distance of more than 167,000 square kilometres. The council's development goal for the region is a mature, diversified economy that will further enrich the municipality's quality of life, natural environment and diverse cultures with a growing commitment to sustainability and resilience to the peaks and troughs of economic cycles (Victoria Daly Council website 2018).

5.4.9 Pine Creek

Pine Creek, in the Big Rivers Region, is part of the Victoria Daly Regional Council, at the junction of the Stuart Highway and Kakadu Highway. It is two hours' drive south of Darwin and one hour north of Katherine. In 2016, Pine Creek had a population of 328, a quarter of whom (26.5 per cent) were Aboriginal (ABS 2016). Aboriginal language groups of the area are Myili, Jawoyn and Wagiman. There are several recorded Aboriginal sacred sites of Aboriginal quarries in the region (Victoria Daly Regional Council 2018).

The top industries of employment in Pine Creek are accommodation (14.4 per cent), cattle farming (11 per cent) and local government and administration (7.8 per cent), with unemployment at 20.4 per cent.

The Victoria Daly Regional Plan (2019) lists key challenges for Pine Creek as a lack of jobs, limited land for private housing and investment and a slowing economy impacting tourism.

5.4.10 Coomalie region

Coomalie is part of the greater Darwin Region, covering 2056 square kilometres, with an estimated population of 1319 residents (2016 Census). It includes the towns of Adelaide River and Batchelor. The industry base of the Coomalie Region has moved from a reliance on the pastoral and mining sectors to include tourism, education, horticulture and service industries. The Region is a significant tourist destination, "steeped in history from early Chinese market gardens, used as a base during the Second World War and mining" (Coomalie Community Government Council 2021).

The original inhabitants of the Coomalie Region were Kungarakany, Awara and Warai groups. The first European activity was recorded in 1860 when George Goyder's expedition surveyed the area.

5.4.11 Adelaide River

Adelaide River is a historic town in the Coomalie municipality, with a population of 353 (2016 Census). It is a popular tourist venue and government service centre. The Adelaide River Cemetery is the resting place of 63 civilians and 434 military personnel killed in the Top End during WWII, as well as 292 service personnel lost in Timor (Coomalie Community Government Council 2021).

The town has a remote health centre, a small primary school, a post office, police station and fire station and historic sites including the Adelaide River Railway Heritage Precinct. The Adelaide River Inn and Resort is a popular stopover for travellers along the Stuart Highway, with a caravan park, motel, bistro and service station.

5.4.12 Batchelor

Batchelor is gateway to Litchfield National Park and headquarters of the Coomalie Community Government Council. One-third of the population of 507 (36.3 per cent) is Aboriginal (ABS 2016). The town is home to Batchelor Institute of Indigenous Tertiary Education (BIITE) and ENI's Batchelor Solar Farm.

5.4.13 Manton Dam

Manton Dam was built to provide water supplies to the Darwin population, but was relegated to back-up status when Darwin River Dam became the main water supply for Darwin in 1972. Manton Dam is a popular recreational area for picnics, boating, jet-skiing and fishing. It is still regarded by the Power and Water Corporation as a back-up to Darwin's reticulated water supply, with controls over activities in its catchment.

5.4.14 Litchfield Council region

Litchfield Council covers the rural suburbs beyond Darwin and Palmerston, covering 3000 square kilometres from Gunn Point in the north to Darwin River about 60 kilometres south of Darwin. The Litchfield local government area accounts for 91.8 per cent of Greater Darwin's land, but only a small portion is residential. Litchfield takes in Middle Arm Peninsula, Southport, Weddell, Holtze, Howard Springs, McMinns Lagoon, Coolalinga, Girraween, Herbert, Lambells Lagoon, Freds Pass, Virginia, Bees Creek, Humpty Doo and Noonamah. The Litchfield Subregional Land Use Plan (2020), suggests that growth is most likely in the urban and peri-urban areas of Holtze, Weddell, Hughes, Murrumujuk, and the Noonamah area.

The Subregional Land Use Plan, updated in 2020, notes that Litchfield has relatively few residents but is heavily visited for recreational purposes by Darwin and rural residents. The fast-growing municipality had an estimated population of 25,566 in 2020 (ABS 2020), with the 2016 Census suggesting that 9.7 per cent were Aboriginal and Torres Strait Islanders (ABS 2016). The region's Aboriginal unemployment rate is about half that of the rest of Greater Darwin, sitting at 6.6 per cent. People in Litchfield are typically older (median age of 37) and 6.2 per cent cited Defence as their employer.

The municipality includes a range of rural residential, horticultural and agricultural activities, with rural residential blocks generally clustered around the four activity centres of Howard Springs, Humpty Doo, Berry Springs and Coolalinga (Planning Commission 2015). Litchfield residents value their rural lifestyle, many living on two acre blocks. Several residential developments, such as Noonamah Ridge, have been opposed as a threat to this lifestyle.

The municipality contains many scenic and conservation attractions, from Gunn Point beaches, popular with recreational fishers and campers, to the Berry Springs Nature Park, a significant tourism draw card.

The former INPEX workers' village at Howard Springs accommodated FIFO workers during construction of the Ichthys project's LNG plant at Bladin Point, on Middle Arm Peninsula. More recently, the Howard Springs accommodation facility has been used as the Centre for National Resilience, or quarantine facility, for the COVID-19 pandemic.

5.4.15 Acacia Hills

Acacia Hills is an outer rural locality of Darwin north of Manton Dam. It is 60 kilometres south of the Darwin CBD and part of the Litchfield local government area. The OHTL will run just west of Acacia Hills. At the 2016 Census, the population of Acacia Hills was recorded as 694 although that likely includes people on rural blocks in the surrounding areas (ABS 2016).

5.4.16 Livingstone

The OHTL route will deviate from the Stuart Highway corridor and travel through the rural locality of Livingstone before crossing Cox Peninsula Road and re-crossing the Stuart Highway north of Livingstone. Livingstone is a rural locality in the Litchfield municipality about 10 kilometres from Noonamah. An AACo meat processing facility in Livingstone closed in 2018. The Livingstone Recreation Reserve is set amongst 80 hectares of natural bush land, offering a range of rural facilities. The Livingstone Bush Fire Brigade and Litchfield Horse and Pony Club use the reserve, along with a hall, bistro, oval, playground and picnic area and other recreational facilities. The reserve is managed by a volunteer management committee (Litchfield Council 2021). At the 2016 Census, Livingstone had a population of 452 (ABS 2016).

5.4.17 Hughes and WWII Hughes Airfield

The OHTL next travels east through Hughes, north of the WWII Hughes Airfield. Hughes is an outer rural locality about 50 kilometres from Darwin. The Hughes airfield is a sealed runway constructed during WWII and has gun emplacements and remnant items in the bush around the site. There is no public access to the site. The Litchfield Subregional Land Use Plan identifies potential to direct subregional growth to undeveloped areas including Hughes.

5.4.18 Rural area around Noonamah

The OHTL will traverse the rural region, south and east of Noonamah, known for its iconic Noonamah Tavern and Rodeo and as a popular fuel stop for Stuart Highway traffic. Noonamah is a rural and rural residential area with surrounding agriculture. In 2016 the population of Noonamah was 319, 11 per cent of whom were Aboriginal (ABS 2016). The Darwin Regional Land Use Plan (2015) identifies interest from private land owners in providing a range of residential opportunities around Noonamah including urban lots, rural residential and rural lifestyle lots, eventually accommodating up to 45,000 residents.

5.4.19 Lloyd Creek and Wak Wak

Lloyd Creek is a rural locality south of Humpty Doo and east of Noonamah. The OHTL will run south and east of Lloyd Creek and north-east about 200 metres from Wak Wak, another rural locality south-east of Humpty Doo.

5.4.20 Noonamah Ridge Estate

The NTG utilities corridor in which the OHTL will be located will travel through sections of the proposed Noonamah Ridge estate east of Noonamah and Hughes. The proposed master planned estate covers 26 square kilometres extending from Townend Road to north of Elizabeth Valley Road (EcOz Environmental Services 2013). Developer Intrapac intends to provide a high

quality rural residential and lifestyle estate with a range of lot sizes and an emphasis on retaining rural character and amenity. The NT EPA decided the Project required an EIS and the draft EIS was available for public exhibition in 2015-16. After receiving the NT EPA assessment report in 2017, Intrapac Property has done further environmental work, applied for a rezoning in 2019 and was completing further specialist studies and preparing a master plan. If approved, the Project will be built over 30 years and provide up to 4200 residential lots, a new local town centre and associated services and infrastructure (Noonamah Ridge n.d.).

5.4.21 Lambells Lagoon

Lambells Lagoon is an outer rural suburb about 50 kilometres from Darwin with predominantly rural residential blocks with a population of 347 in 2016 (ABS 2016). The OHTL will run through the middle of a non-residential area west of Lambells Lagoon Road and the more populated rural area east of Wanderrie Road.

5.4.22 Herbert

The OHTL will run north from Lambells Lagoon, between Herbert and along the western perimeter of the Black Jungle Conservation Reserve. The line will travel 200 to 300 metres from the residential blocks on the eastern edge of Herbert. Herbert is a rural residential area near Humpty Doo. In 2016, the population of Herbert was 1730, with 550 houses. Almost 90 per cent of the labour force in Herbert was employed, either full-time or part-time, with fewer than 4 per cent unemployed (ABS 2016).

5.4.23 Koolpinyah/Station

Koolpinyah is a locality about 37 kilometres east of Darwin that consists of land bounded to the east by the Adelaide River and in part to the north by the Clarence Strait (Wikipedia 2021). It is named after Koolpinyah Station, a pastoral lease established in 1908 by Evan and Oscar Herbert, the sons of Charles Edward Herbert, a judge, a politician and a former Government Resident of the Northern Territory. The name is derived from "Gulpinyah", the Aboriginal name for a waterhole near the station's homestead (NT Place Names extract). The Herberts owned Koolpinyah Station until 1974. The station is now owned by Mr Ah Toy and includes the site of the proposed Noonamah Ridge Estate.

5.4.24 Extractives

The utilities corridor passes through the corridor goes through Extractive Mineral Permit 28393 and close to a number of other extractive permits. The Howard Springs sand extraction site has operated since 1990 with Boral starting its operations in 1994, about 25 kilometres east of Darwin on the Howard Sand Plains. It is accessed from Howard Springs via Gunn Point Road. In 2016 Boral Resources submitted a referral for expansion of its existing sand extraction area. In February 2021, DCT Australia announced it had purchased the quarry from Boral and will supply local Darwin construction companies and DCT's civil construction projects. The quarry supplies sands, gravel, rock aggregate, fill and topsoil.

5.4.25 Gunn Point Peninsula

The Gunn Point Peninsula is Larrakia country and a popular hunting area for Larrakia, Wulna and Tiwi people, all of whom maintain customary connections to the area. It is 327 square kilometres, 60 kilometres from Darwin CBD and 40 kilometres from Palmerston. Formerly part of Koolpinyah Station, about 90 per cent of Gunn Point Peninsula is held by the NT Land Corporation as a Crown Lease in Perpetuity.

The NT Land Corporation has allowed public access and encouraged responsible use of the Gunn Point Peninsula since it acquired the land in 1989. The Corporation aims to preserve the area's long-term potential for future tourism, residential and strategic economic activities including agricultural/horticultural purposes.

The Gunn Point Peninsula, and in particular Murrumujuk Beach, is a popular place to celebrate Territory Day, with visitors able to let fireworks off on Murrumujuk Beach in accordance with the Territory Day regulations.

Wildfires are common on Gunn Point Peninsula. The NT Land Corporation does weed control and controlled hazard reduction burning during the dry season. As it is regarded as a remote area, Bushfires NT responds to fires on Gunn Point only if lives are in danger.

Access to the Gunn Point Peninsula was enhanced with the $40 million realignment and sealing of Gunn Point Road by the Northern Territory Government in 2018, providing all-weather access to the proposed Project Sea Dragon hatchery and for tourism and recreational purposes.

5.4.26 Leaders Creek

Leaders Creek is north-east of the OHTL and Darwin Converter Site and Cable Transition Facilities on Gunn Point Peninsula. Access to Leaders Creek about 44 kilometres along Gunn Point Road. The freshwater creek provides the only reliable wet season swimming hole on the peninsula, while the creek crossing is used for overnight camping and as a picnic area (Calnan 2006). Leaders Creek Fishing Base is a tourism and recreational fishing business that offers accommodation, boat hire, a secure carpark and a kiosk. It is promoted as convenient to Darwin and ideal for fishing and mud crabbing. The Leaders Creek boat ramp provides access to the major recreational fishing locations of the Vernon Islands and the Adelaide River delta (Calnan 2006).

Saltwater Arm boat ramp

Another boat ramp popular with recreational fishers is the Saltwater Arm boat ramp, 17 kilometres off Gunn Point Road (Northern Territory Government 2021).

5.5 Community profiles - Darwin Converter Site and Cable Transition Facilities

5.5.1 Durduga/Tree Point Reserve

The Durduga Tree Point Aboriginal Association holds freehold land within the Tree Point Conservation Area. This land parcel hosts a small community of fewer than 15 dwellings that are occupied variously throughout the year. In 2016, the formal population of Durduga was fewer than five (Bushtel 2021).

5.5.2 Gunn Point Beach

The Darwin Converter Site and Cable Transition Facilities are planned for Murrumujuk, immediately south of the Gunn Point Beach access road. Gunn Point Beach is a popular recreation and camping area. Registered vehicles are permitted to drive onto the beach, with access from three designated tracks. However, there are substantial signs of erosion from 4WD tracks to the beach. Vehicles are not permitted to drive on the beach in Tree Point Conservation Reserve.

Figure 5-10: Camping at Gunn Point Beach

Figure 5-11: Erosion from 4WD tracks to Gunn Point Beach

Figure 5-12: Access road to Gunn Point Beach

5.5.3 Murrumujuk

The Cable Transition Facilities are proposed for Murrumujuk Drive, on the coast of Shoal Bay below Murrumujuk, an area provisionally set aside as a future residential area to support strategic industrial development of Gunn Point and Glyde Point. The land is zoned Future Development, with adjacent coastal land zoned for Conservation and Public Open Space.

Murrumujuk, which overlooks Shoal Bay, has been a component of various regional plans since 1984 when the locality was first identified as a potential rural centre. The Murrumujuk Land Use Concept Plan (Northern Territory Government 1990) set land aside for residential, commercial and community use, with Gunn Point Road intended to provide arterial road access. Subsequent plans identified the potential for major industrial development at nearby Glyde Point, one of the few sites in the region suitable for a deep water port.

The relative isolation of Murrumujuk, about 60 kilometres from the Darwin CBD and 40 kilometres from Palmerston, as well as the cost of supporting infrastructure, have precluded development to date. Murrumujuk Beach and adjacent areas are maintained as private land available for public use. The name Murrumujuk is of Aboriginal origin and relates to whale dreaming (Place Names Register n.d.).

5.5.4 Seafarm's proposed Sea Dragon aquaculture facility

Project Sea Dragon's stage 1 hatchery is proposed for an area next to the AAPowerLink Murrumujuk site. According to Seafarms' 2017 Notice of Intent, the hatchery will be used to breed spawn and rear larval prawns. It will use seawater sourced from offshore and piped to the hatchery via seawater intake pipelines. The pipes will be buried by horizontal directional drilling methods under the fore dune and beach as far as possible into the intertidal zone. Discharge water from the hatchery will be pumped into Shoal Bay about two kilometres offshore via a discharge pipeline.

Figure 5-13: Current access road (the proposed Converter Station will be to the left)

5.6 Community profiles – Subsea Cable System to AEEZ

The Project will involve construction and installation of a permanent Subsea Cable System from Murrumujuk on Gunn Point Peninsula, through Shoal Bay, Beagle Bay, Commonwealth waters, across the Bayu Undan pipeline and through the Oceanic Shoals Marine Park in Australian waters to the edge of the AEEZ in the Timor Sea (see Figure 2-6 above).

5.6.1 Darwin Port

The route of the subsea cable will take it through Darwin Harbour. Darwin Port is Australia's northern gateway for trade with Asia and beyond, and is a support hub for the offshore oil and gas fields in the region. The Darwin Port boundary extends from Gunn Point to Charles Point. Darwin Port Operations Pty Ltd is part of the Landbridge Group, a private Chinese company.

In 2019-20, the following vessel numbers entered Darwin Port (Darwin Port 2021):

- 1472 trading vessels
- 85 container and general cargo vessels
- 67 liquid bulk vessels
- 32 car carrier vessels
- 313 rig tender vessels
- 61 cruise ship vessel visits.

5.6.2 Shoal Bay

Shoal Bay is part of the Shoal Bay Coastal Reserve, established in 2000 to protect an area of swamps, mud-flats, tidal flats and rainforest. The Reserve protects large areas that are culturally significant for the Larrakia People. There are 1000-year old shell middens on higher ground near the swamps. The area is used by Darwin and surrounding residents for bird watching, wildlife watching, hunting and fishing (Northern Territory Government 2021).

The shallow bay is popular with recreational fishers and crabbers. A 2015 survey found that most recreational fishing in the Greater Darwin Area is in the Darwin Harbour region (40 per cent), followed by Bynoe Harbour (14 per cent) and Shoal Bay (6 per cent) (Department of Agriculture, Water and Environment n.d).

In 2014, Shoal Bay was the source of 45 per cent of the Darwin-based recreational crab catch, making it the single most important crabbing location for the NT's valuable recreational fishing sector. In 2014, the recreational crab harvest at Shoal Bay was estimated at 19,000 kilos for the year (AFANT 2021). The Amateur Fishermen's Association of the Northern Territory (AFANT) is seeking to have the Shoal Bay mud crab resource allocated to the recreational, fishing tourism and Aboriginal customary sectors and to implement an immediate ban on commercial crabbing in Shoal Bay (AFANT 2021).

The cable route avoids high value fishing and crabbing areas.

5.6.3 Beagle Gulf

Shoal Bay is part of the Beagle Gulf. The Gulf is the body of water between Darwin and Bathurst and Melville Islands and opens to the Timor Sea in the west. The Beagle Gulf forms the western approach to the Darwin Port, so a significant volume of shipping transits through the area to the offshore oil and gas fields in the Arafura and Timor seas and to Asia. Depths in the area range from five to more than 50 metres in deep channels (Australian Hydrographic Office 2021).

Four fish aggregating devices (engineered, artificial reefs) built on behalf of the NT Government, have been placed in the Beagle Gulf to support recreational fishing. The steel and concrete modules sit on the sea floor in four locations – between the North Gutter and Lee Point, one in the Dundee region and one between the Vernon Islands and Cape Hotham (NT Department of Industry, Tourism and Trade 2019).

In 2020, as part of Hydro Scheme 2020, part of the seafloor in the Beagle Gulf was surveyed to gain additional data on the seafloor and increase maritime safety in the area. The survey revealed four new unreported shipwrecks (Australian Hydrographic Office 2021).

5.6.4 Commercial fisheries

Commercial fisheries operate in waters likely to be traversed by the Subsea Cable System. The fishing areas permitted under the various licences cover vast distances but activity often targets specific sites. The commercial fisheries off the Northern Territory coast and in Commonwealth waters are managed by the Northern Territory and Australian Governments. More detailed information on commercial fisheries in the region is outlined in the Economic section.

5.6.5 Bayu Undan/Barossa gas pipeline

The cable route crosses the Bayu-Undan Gas Export Pipeline in the Timor Sea that transports gas from the Bayu-Undan gas field to the Darwin Liquefied Natural Gas plant (DLNG plant). Santos has taken over from ConocoPhillips as the operator of the pipeline on behalf of joint venture partners. The pipeline has operated since 2005, with gas production from the Bayu Undan gas field expected to be exhausted by about 2022.

Santos announced in March 2021 that it would proceed with its Barossa gas and condensate project off the Northern Territory coast, north of Darwin. The Barossa development will include a floating production, storage and offloading (FPSO) vessel, subsea production wells, supporting subsea infrastructure and a gas export pipeline tied into the existing Bayu-Undan to Darwin LNG pipeline. Santos will decommission part of the existing pipeline and feed a new supply of gas into the pipeline at the 380 kilometre point, south-west of Bathurst Island. The decommissioned part of the pipeline will remain in place (Santos 2019). First gas production from Barossa is expected in the first half of 2025 (Santos 2021).

5.6.6 North Australian Exercise Area (NAXA)

The North Australian Exercise Area (NAXA) is a maritime military zone administered by the Australian Defence Force (ADF). It extends west of Darwin into the Bonaparte Gulf. The area is used to conduct realistic at-sea exercises with naval and shore-based weapon firing training. (INPEX 2012). During live firing exercises, shipping traffic may be asked to alter course and navigate with additional caution (Australian Hydrographic Office 2018). Exercise Kakadu, hosted by the Royal Australian Navy and supported by the Royal Australian Air Force, is Australia's largest maritime exercise, held biannually in the NAXA. In 2018, 27 countries took part in the exercise with 23 naval vessels and a submarine (RAN 2018).

5.6.7 Oceanic Shoals Marine Park – Commonwealth

The Oceanic Shoals Marine Park is part of the Australian Marine Parks in the North Network, established in 2012 to protect the region's marine ecosystems and biodiversity. The park is in Commonwealth waters, along with seven other marine parks off the coast of the Northern Territory (Parks Australia 2018). The Oceanic Shoals Marine Park is west of the Tiwi Islands and about 150 kilometres north-west of Darwin. It covers more than 70 000 square kilometres and extends to the limit of Australia's Exclusive Economic Zone (AEEZ).

5.6.8 Australia's Exclusive Economic Zone (EEZ)

Australia's Exclusive Economic Zone (AEEZ) covers 10 million square kilometres around the Australian mainland and offshore territories. Australia has sovereign rights to the natural resources of the water column, seabed and subsoil in the AEEZ. Jurisdiction of the AEEZ covers artificial islands, installations and structures and other rights and duties (Geoscience Australia n.d.).

5.6.9 Maritime Boundary Treaty and Maritime Delimitation Treaty

In August 2019 the Maritime Boundary Treaty between Australia and the Democratic Republic of Timor-Leste came into force after it was signed in March 2018. The treaty sets out the permanent maritime boundaries between the two countries and a legal framework for development of oil and gas resources in the Timor Sea. The Treaty settled a long-running dispute between Australia and Timor-Leste and was an historic agreement for the two countries (Department of Foreign Affairs and Trade n.d.).

5.6.10 INPEX offshore spoil disposal ground

An offshore site 15-20 kilometres north of the mouth of Darwin Harbour has been used as a disposal area for material from INPEX's dredging operations in Darwin Harbour. This is 300 metres north of the route of the subsea cable.

6 People and communities

6.1 Overview

Sections 6 to 13 of the SIA predict and assess potential positive and negative impacts according to the dimensions described in Section 3.4 (Metholodogy). Section 6 builds on the community profiles from Section 5 to provide a baseline characterisation of the regions where project activities will occur. It outlines likely change processes and their consequences, then concludes with an assessment of the significance of these changes.

A key change process for communities would arise from the rapid in-migration of people seeking work or a fly-in fly out (FIFO) workforce interacting with the community. FIFO has been described as "work which is undertaken by long-distance commuting on a regular basis for an extended period at such a distance from the employee's home that they are not able to return to their permanent residents at the end of a shift" (House Standing Committee on Regional Australia 2013). An Australian Government Standing Committee examining the impact of FIFO workforces found they were necessary and appropriate for the labour-intensive construction stage of projects, but should not be used as the primary work practice where it undermines the feasibility of remote Australia. FIFO workforces tend to suit the lifestyles of young, single males who consequently lack commitment and identification with host communities, hence the benefits of separating external workers from existing communities. Additional implications of large FIFO workforces (men and women) include impacts on worker wellbeing as a result of being away from family and social support, loosened social ties, and increased substance abuse and fatigue-related accidents (CSIR 2016; Berger 1977; Kahn & O'Faircheallaigh; Carrington, Scott, McIntosh 2011, Brereton & Pattenden 2007).

Potential impacts under People and Communities would be invoked by noticeable effects on people's health, wellbeing and safety, which are essential for a good quality of life. Concepts such as community cohesion, vitality and wellbeing are intangible, complex and difficult to measure without detailed social research. In the case of the Sun Cable SIA, there are many factors beyond the AAPowerLink Project's control that may affect cohesion, vitality and wellbeing.

Key issues to emerge from stakeholder consultation were housing shortages, poverty and disadvantage and concerns at the level of alcohol-related crime in the Barkly in particular. These, then, are the key issues covered in the following section.[3]

[3] A 'community' is a grouping of people living in the same geographic area or bound by social and cultural ties and common interests. It is important to note that communities are rarely homogenous and are likely to contain groups and individuals with a variety of values, attitudes, beliefs and interests. Social research is needed to determine the strength and diversity of a community's social fabric, the extent to which values are shared or a source of conflict and how different community members may experience or perceive impacts. Vanclay et al. (2015) refer to 'communities of place' and 'communities of interest'. 'Affected communities' are those impacted by projects, which can extend to regional centres that are part of project supply chains.

Table 6-1: What is covered by People and Communities section

What is covered by People and Communities	What the Terms of Reference asked for
Health, wellbeing, safety, community cohesion, our sense of connectedness, ability to feel safe, shared values and capacity to absorb newcomers into the community.	• Key landowners, custodians, stakeholder communities and other persons with overlapping or intersecting interests; • Social values, as identified by stakeholders; • Demographics and changes to the population during construction and operations; • Social amenity and use of the proposal area and adjacent areas for other purposes, including residential, commercial, industrial, recreational/leisure, tourism and traditional land use; • Social integration of non-local construction personnel during construction; • Changes or restrictions to local traffic due to development of new roads and intersections and construction vehicles, resulting in delays or inconvenience to local communities and other road users; • Human exposure to electromagnetic fields, biting insects, ticks and mites.

6.2 People and communities – baseline data

6.2.1 Northern Territory population and trends

The Department of Treasury and Finance, in collaboration with the Demography and Growth Planning team of the Northern Institute of Charles Darwin University has developed projections for the Territory's resident population to the year 2046 and regional populations to the year 2036. The projections are based on the Australian Bureau of Statistics (ABS) 2016 Census.

The Territory's population is expected to grow from 245,678 in 2016 to 351,607 in 2046. The Aboriginal population is projected to grow from 74,546 to 104,387, a steady increase of 1.1 per cent, in the same period. The highest growth rate (4.3 per cent) is projected to be for Aboriginal people aged 65 and over. A decline in younger Aboriginal population segments reflects an overall out-migration to other States.

The highest expected growth is in Palmerston, which is projected to grow at 2.4 per cent annually between 2016 and 2035. The Barkly is the only region where the population is projected to decline: from 6153 in 2016 to 5884 in 2036 (a 0.2 per cent decline in the Aboriginal population and 0.3 per cent decline for the non-Aboriginal population). These projections do not incorporate the effects of future development, such as land releases or major projects.

6.2.2 Demography

The following table provides a demographic overview of the Barkly and Greater Darwin regions.

Table 6-2: Demographic overview

	Tennant Creek SA2	Elliott 2016 (Quickstats)	Barkly LGA	Greater Darwin SA4
Land area	4206.1 ha	299.6 ha	32,271,321.9 ha (2020)	316,390.6 ha
Estimated residential population 2020	3302	339 (2016)	7453 6655 in 2016	147,255 (136,828 in 2016 – 52.5% M, 47.5% F)
% working age (15-64) 2019	69.3%	59.2%	66.7%	71.2%
Unemployment rate 2016**	7.1%	35.2%	24.9%	4.1%
Aboriginal unemployment 2016) (IARE, IREG for Darwin)	17.5%	42.7%	39.2%	12.7%
Aboriginal not in the labour force (over 15) (IARE, IREG for Darwin)	60.5%	42.9%	52.9%	44.4%
Aboriginal youth unemployment rates				
Main sector of employment	Health care and social assistance (22%)	Community and personal service workers (27.8%) and labourers (26.7%)	Public admin & safety 17.6%	Public admin and safety 18.6%
Estimated Aboriginal and TSI 2016	2019	299 (87.2%)	4528 (68%)	17,465 (8.7%)
Median weekly household income 2016	$1432	$1433	$1323	$2183
Aged 15+ and achieved Certificate, Year 12 or above as highest level of educational attainment	53.3%	42.2%	32.7%	62.3%
Aged 15+ and Year 12 = highest level of educational attainment	30.8%	8.7%	8.8%	14.2%
Average household size 2016	2.7	4.1	4.4	2.7
Average per bedroom	1.3	1.3	1.6	1.1
Average monthly household mortgage 2016	$1225	Nil	$1155	$2200
Av monthly household rent	$833	$50 weekly	$541	$1835
Median age 2019	33	24	28	33
Born overseas 2016	416	Nil****	502	34,908
Number of local businesses 2019	188		206 (2020) 218 (2019)	10,773
People who need help with core activities 2016	4.1%		3.5%	2.9%

Source: ABS Quick Stats and ABS Regional data. Greater Darwin is Darwin, Palmerston, Litchfield
***Employment rates do not capture the 'disengaged'. See below for youth unemployment rates in the Barkly, which are much higher*
**** The disparity likely partially reflects in-migration to Darwin for jobs and outmigration from Elliott by those unable to find work*
***** 96.4% reported being born in Australia. There were no other responses for country of birth. Only 1.2% had parents who were born overseas and this was mainly England.*

6.2.3 Levels of disadvantage

A community's wellbeing is a key contextual factor that determines how change processes will disturb or enhance its social fabric. According to Hall et al (2020, p. 13):

> The social determinants of health in an Indigenous Australian context are more aligned with the holistic perspective of health traditionally held by Indigenous Australians, where health is viewed as the social, spiritual, emotional and cultural wellbeing of an individual.

The Barkly Region, which includes Tennant Creek and Elliott, has a population of about 7000 and exhibits high levels of disadvantage and poor levels of wellbeing on most determinants of health. In Tennant Creek. Many disengaged young people reside in Community Living Areas (town camps) identified as low socio-economic areas (BRADAAG 2020). The following information is based on data from a study by the Menzies Institute of Health Research (De Vencentiis et al., 2019):

- 51.3 per cent of Tennant Creek residents are Aboriginal, compared with 15 per cent in 1981 (Brady 1984), although the population size is roughly the same
- 32.7 per cent of Barkly families are single parent families
- 41.6 per cent of Barkly residents are aged 0-24 and 75.6 per cent of these people are Aboriginal.

Indicators of disadvantage in key areas

The extent of disadvantage is suggested in the following table, adapted from De Vencentiis et al. 2019.

Table 6-3: Indicators of disadvantage. Based on data in the Menzies Report, 'Story of our Children and Young People' (De Vencentiis et al. 2019).

	Australia	NT	Greater Darwin	Top End	East Arnhem	Big Rivers	Barkly	Central
Proportion of children aged 0-17 with notifications of child abuse or neglect	n/a	18.2%	11.6%	21.3%	16.8%	28.1%	41.4%	26.4%
Proportion of children 0-17 in out of home care	0.8%	1.7%	1.6%	0.9%	0.6%	2.1%	1.5%	2.1%
Rate of young people aged 18-24 (per 1000 population) who were victims of an offence against a person	Na	58.7	34.2	81.9	42.6	98.7	110.9	106.7
Annual rate (per 1000 population) of apprehensions of males 10-17 involved in crime	Na	128.0	62.0	76.0	108.5	229.4	475.8	257.1

	Australia	NT	Greater Darwin	Top End	East Arnhem	Big Rivers	Barkly	Central
Annual rate (per 1000 population) of apprehensions of females 10-17 involved in crime	Na	34.3	22.1	10.5	-	64.5	84.1	78.1
Proportion of children aged 15 and under in low-income households (ABS 2016)	19%	27.5%	15.7%	50.2%	39.9%	41.2%	51%	37.8%
Proportion of births to women aged under 20	2.2%	5.5%	2.5%	10.3%	14.5%	12.4%	16.8%	6.3%
Proportion of women who reported smoking during pregnancy	9.9%	20.1%	10.7%	44.2%	47%	39.7%	47.9%	21%
Proportion of babies exposed to alcohol in their first trimester of pregnancy	Na	4.4%	2.2	8.1%	5%	11.4%	20.8%	4.8%
Proportion of children who are regularly read to or encouraged to read at home	93.1%	79%	91.2%	44.8%	57%	56.5%	31.9%	75.5%
Proportion of students in NT Government schools with less than 80% school attendance	Na	37.9%	20.6%	71.5%	68.2%	62.4%	73%	52.3%
Proportion of students in Year 7 reaching the minimum national standard in literacy at NT Government schools	94.1%	69%	87.1%	31.9%	40.3%	42.7%	35%	52.8%
Proportion of Year 7 students reaching the minimum national standard in numeracy	95.6%	76.8%	91%	44%	56.5%	60.8%	68.9%	58.5%
Year 12 or equivalent completion	74%	49.3%	61.6%	24.8%	31%	32.1%	29.1%	37.3%
Unemployment among young people, aged 15-24 (excludes disengaged youth not actively looking for work) (ABS 2016)	12%	14.1%	9.6%	44.1%	27.8%	15.7%	37.4%	15.5%
Young people (18-24) enrolled to vote	89%	57.1%	63.1%	50.6%	44.5%	49.8%	46.5%	51.2%
SEIFA scores (ABS 2016)	1000	939	1039	646	723	801	679	893

Data drawn from a range of sources, generally covering the years 2017-19, including ABS Census of Housing and Population and Labour Force Survey, Territory Families, Australian Institute of Health and Welfare, Department of the Attorney-General and Justice, NT Department of Health, Australian Department of Education and Training, NT Department of Education, NAPLAN reports (see report for detail and qualifications). The Socio-Economic Indexes for Areas (SEIFA) provide an index of relative disadvantage. Areas with scores below 1000 indicate relative socioeconomic disadvantage)

6.2.4 Alcohol-related crime in the Barkly region

Alcohol abuse and alcohol-related crime is a key issue undermining community wellbeing in the Barkly. This and other social determinants of health[4] are likely to erode community vitality, or ability to take advantage of employment and other opportunities.

Manifestations of alcohol abuse include high levels of foetal alcohol spectrum disorders (FASD) affecting early childhood development, domestic violence, assaults and deterrence of tourists.

> "Crimes committed by young people can influence the sense of community that other young people feel with their peers, and can heavily impact the opportunities for future employment for young offenders" (De Vencentiis et al., 2019, p.34).

Tennant Creek has high rates of disengaged youth and youth crime. This includes night-time break-ins, arson, groups of youths wandering the streets at night, youths throwing stones at buses at night, repeated thefts and vandalism at tourist accommodation. The town made national headlines in 2018 over the rape of a two-year old girl, crime rates by young people, sexual assaults, alcohol abuse, domestic violence and alleged child protection failings (Toohey & Sorensen 2018).

Barkly Council and BRADAAG submissions to the NT Liquor Commission (2020) comment on issues with secondary supply of alcohol and 'grog running' from Mount Isa, Alice Springs, highway roadhouses and Katherine. Both comment on tourists being deterred by queues of people waiting to consume alcohol in main street hotels or buy takeaway alcohol.

The level of alcohol-related crime, in particular assaults, reached a peak in 2014 but dropped after a range of measures were introduced, including the banned drinkers' register in 2017 and further emergency measures in 2018 (Toohey & Sorensen, 2018). Emergency admissions to Tennant Creek hospital dropped by 29 per cent between 2016 and 2018 and alcohol related assaults dropped by 60 per cent (Tennant Creek Alcohol Reference Group 2019).

However, alcohol-related assaults and domestic violence have reportedly risen again as a result of COVID-19 measures, such as Job Keeper and Job Seeker payments, whereby "people on fixed and low incomes have received the windfall of a substantial increase in their disposable incomes" (Liquor Commission 2021, p.27). Community stakeholders, including Police, have expressed concern at the influx of people from nearby communities after royalty payments, which are spent on alcohol and consumer goods (Tremblay, Boyle & Munday 2020; Verdant Resources SIA; BRADAAG submission to Liquor Commission 2020).

Measures to address the high levels of alcohol abuse include Police Auxiliary Liquor Inspectors (PALIs) stationed outside takeaway bottle shops, controls over the sale of takeaway alcohol in

[4] The World Health Organisation (WHO) describes the social determinants of health as "the non-medical factors that influence life outcomes". These include income and social protection, education, unemployment, working life conditions, food insecurity, housing, early childhood development, social inclusion and access to quality and affordable health services). (www.who.int/health-topics/social-determinants-of-health)

Tennant Creek, Elliott and roadhouses by the NT Liquor Commission. The Tennant Creek Alcohol Harm Minimisation Plan 2019-2024, coordinated by a local Alcohol Reference Group (2020), targets both supply and demand reduction. An alcohol management plan for Elliott led to the introduction of permits in late 2021, that allowed people to drink a six-pack of beer at home (interviews). The 28 initiatives of the Barkly Regional Deal's 28 initiatives include $3 million towards crisis youth support.

However, the issues are likely to remain deep-seated and intractable. As far back as 1983, Tennant Creek Council was lobbying the NT Government to address alcohol abuse in the town. The resulting report by Maggie Brady (1984) described a culture of hard-drinking by both Aboriginal and non-Aboriginal residents, where "drinking and its associated conviviality is an integral part of maintaining human social relationships". The Barkly Regional Deal describes the period of 1986-1996 as the time of the 'grog wars'. The first Alcohol Management Plan was released in 2008 and an Alcohol Reference Group established in 2014. Several alcohol restricted areas were established by the Australian Government's 'Intervention' in 2012.

The Tennant Creek Alcohol Harm Minimisation Action Plan 2019-2024 comments that:

> "Harm from alcohol is a significant issue in Tennant Creek. This issue has immediate, medium and intergenerational effects. The effects are broad and impact the drinker, their family and wider community group. The broader community feels the impact in health, social and economic terms."

Some data that suggests the depth of the problem:

- Alcohol related assaults, which had dropped markedly since 2018, rose again by 53.01 per cent in the year to the end of November 2020, while domestic violence related assaults rose 31.88 per cent in the same period (NT Police 2020a)
- Alcohol related assaults increased by 37 per cent in the year from September 2019-2020 to September 2020-2021, and domestic violence related assaults rose by 34 per cent (NT Police 2020a)
- The Northern Territory has the highest per capita consumption of alcohol in Australia and the highest number of alcohol outlets (NT Police 2020b)
- Consumption per capital in Tennant Creek is twice the Territory average, which is "associated with an extraordinarily high level of alcohol-related harm" (NT Liquor Commission 2021)
- Alcohol was implicated in between 70 and 80 per cent of assaults reported to police in the Barkly over the past five years (Liquor Commission 2021)
- There are 10 retailers licensed to sell alcohol and three social clubs. Wholesale alcohol supply rose by 4 per cent from 2016 to 2017, while the estimated drinking-age population decreased by 1 per cent (Tennant Creek Alcohol Reference Group 2020)
- The proportion of children aged 0-17 in notifications with domestic violence recorded as a contributing factor was 19 per cent in Tennant Creek, the highest in the Territory
- The proportion of children aged 0-17, with notifications of child abuse or neglect was 41.4 per cent.

Data is not available at a more local level for Elliott.

Domestic violence

The Northern Territory has the highest victimisation rate for selected domestic and family violence-related offences in Australia. Northern Territory Police reports indicate there are 1600 victims per 100,000 people in the Territory, which is more than double the number in Western Australia. Aboriginal people in the Northern Territory are more likely to be hospitalised, murdered or have their children removed than non-Indigenous people (AIHW 2020). A chronic lack of long-term secure housing and crisis accommodation are significant barriers to women escaping violence in the Territory. Almost half (46 per cent) of people seeking assistance from homelessness services in the Territory report family and domestic violence as the reason, particularly affecting women (NT Shelter 2020).

6.2.5 Key community services in Tennant Creek

In many respects, Tennant Creek is a service town to the large Aboriginal population in Tennant Creek, its town camps and surrounding communities in the Barkly. Key Aboriginal organisations in town include Julalikari Council Aboriginal Corporation, the Patta Warumungu Aboriginal Corporation, Anyinginyi Aboriginal Health Corporation (see Section 7.2.2) and Papulu Apparr-kari Aboriginal Corporation (Language Centre) and Barkly Regional Arts (see Section 9).

Julalikari Council Aboriginal Corporation

Julalikari Council Aboriginal Corporation (JCAC) was established in 1974 as the Warumungu Papulu organisation and is now a large corporation representing 17 language groups, including Warumungu Traditional Owners in Tennant Creek and 16 other language groups across the Barkly. In conjunction with Indigenous Business Australia, Julalikari (a Warumungu word meaning ‘All of us, together’), has a major stake in the Tennant Creek IGA supermarket and BP Service Station. Sections of Julalikari include construction and housing, land management, the Karguru seedbank and nursery, the Nyinkka Nyunyu Art and Culture Centre, aged and disability care, the Marlungku-Kari Child Family Centre, youth and family services and a play group.

Figure 6-1: William Martin at the Karguru Nursery and First Nations Seed Bank

Current priorities are negotiating a Local Decision Making Agreement with the Northern Territory Government, building a portfolio of local businesses to enhance Aboriginal employment and training, becoming an accredited housing provider and enhancing the Nyinkka Nyunyu Art and Culture Centre (interviews).

Julalikari runs a night patrol, which focuses on the safety of the community, particularly children and vulnerable families, domestic violence and at risk people. In early 2021, a group of women including Julalikari Chair Linda Turner set up the Jurnkkurakurr Volunteers to patrol the streets of Tennant Creek at night in response to high levels of crime (including the burning down of the town's only supermarket) and young people wandering the streets at night.

Catholic Care

Catholic Care provides a wide range of services to Tennant Creek and Barkly communities, including Elliott. Services cover housing and tenancy support, money programs, relationship help, family and parenting support, early childhood and youth support, mental health and disability support and family violence programs.

Other groups providing support services include Tennant Creek Transport, Tennant Creek Women's Refuge, BRADAAG (Barkly Regional Drug Abuse Advisory Group) and St Vincent de Paul.

6.2.6 Community aspirations

Consultation for this SIA at times touched on community aspirations, but not in sufficient depth to provide reliable qualitative data. Some feedback is contained in the consultation report at Appendix F. Further consultation on community goals and aspirations will form part of the agreement-making process by the Northern Land Council and Sun Cable in 2022 and Barkly Regional Deal community planning. However, some indication of community aspirations was suggested by Menzies' consultation in 2018 in the Tennant Creek area, which suggested the 'Big Eight' community aspirations (De Vencentiis et al. 2019, p.23):

- children getting a quality education
- children are with their families and parents are supported to be involved and accountable for their children
- addressing problem drinking, particularly for parents
- ensuring all children and families have appropriate, stable housing
- the community coming together as one
- children have fun and safe activities to engage them after school hours
- stopping fighting and violence (among children and adults)
- living in a beautiful and clean town.

6.3 Key events or activities causing impacts

Key events or activities creating change processes that may lead to positive or negative impacts to communities include:

- mobilisation of workforce creating changes to demographic composition, and a visible presence of construction workers (a likely in-migration of mostly young, male workers during the construction period)
- accommodating a large workforce in a remote area, away from families
- potential return of local people to work on the Project, perhaps taking up accommodation or expecting to live with family
- agreement-making process causing tensions between those receiving benefits and those seen as missing out
- higher levels of disposable income, cash royalty payments or poor worker behaviour compounding issues with alcohol abuse and domestic violence
- project traffic using the Stuart Highway and Gunn Point Road.

6.4 Potential impacts

Table 6-4: Predicted potential impacts – People and Communities

Potential impacts – People and Communities	
Potential beneficial impacts	Potential detrimental impacts and residual ratings
PC-4: Enhanced community vitality through investment in social and community infrastructure and enhanced economic activity (noticeable)	PC-1: Reduced sense of public safety and wellbeing as a result of Project-induced substance abuse and alcohol related crime (medium)
PC-7: Enhanced public health, through higher wages and improved socioeconomic status, reduced substance abuse (barely perceptible)	PC-2: Reduced sense of wellbeing and safety from an influx of workers and project activities during construction and operations (medium)
	PC-3: Reduced community cohesion and resilience, through changed demographics, community conflict and jealousies over perceived distribution of benefits (medium)
	PC-5: Higher levels of road trauma on the Stuart Highway, Gunn Point Road and access routes (medium)
	PC-6: Reduced feelings of safety along the railway and high voltage transmission line corridor (low)
	PC-8: Reduced public health, though noise, dust, human exposure to electromagnetic fields, biting insects, waste and contamination (low)
	PC-9: Reduced mental health and wellbeing of workforce from loneliness or family pressures, increased drug and alcohol use, self-harm and suicide (medium).
	PC-10: Reduced welfare of girls and young women due to exploitation by workers, sexual liaisons, sexually transmitted diseases and unwanted pregnancies (low)
	PC-11: Deaths, injuries or disruptions to recreational traffic on the harbour during trenching of cables (low)

6.5 Impact assessment for people and communities

This section analyses the potential impact of a large industrial project operating in a sparsely populated remote area with high levels of disadvantage. While projects such as the AAPowerLink will inevitably expand opportunities for work and wealth, the ability of small, remote communities to take advantage of these opportunities and absorb change is influenced by factors such as resilience and vulnerability. It is important for proponents to understand this context in order to maximise benefits and be sensitive to existing stressors.

Our research suggests the Barkly is characterised by high levels of disadvantage, poor social determinants of health, a history of dispersal from traditional lands by settlement and existing strains on community cohesion. This compounds likely vulnerability to additional stressors and, as suggested by several stakeholders, increases expectations of benefits from the AAPowerLink Project to meet basic – let alone aspirational – needs.

The Greater Darwin Region, with its young, mobile and less disadvantaged population, is expected to have greater capacity to absorb change. However, the strong values and attachment to place of Darwin's rural and coastal areas will need to be acknowledged and protected.

The following section analyses each of the identified positive and negative impacts (see the Risk and Opportunities Matrix in the Social Impact Management Plan at Appendix J).

6.5.1 Reduced sense of public safety and wellbeing as a result of Project-induced substance abuse and alcohol related crime

Wellbeing includes our sense of connectedness, ability to live in harmony with each other, feel safe and be healthy (Munday 2020). There is evidence from both the baseline data presented above and from consultation for this SIA that public safety and alcohol-related crime are already troubling issues in the region, including domestic violence, disengaged youth, vandalism, assaults, a prevalence of chronic diseases, high rates of foetal alcohol syndrome disorders and high rates of drink-driving. Businesses cited the image of Tennant Creek as being a major factor deterring both tourists and prospective staff. Both Elliott and Tennant Creek have alcohol management plans, including limits on takeaway alcohol.

The Project could exacerbate the issue of substance abuse through poor worker behaviour while in transit or on days off, if there is 'grog-running' to or from the workers' accommodation village, or if higher disposable incomes and royalty payments are spent on alcohol (which stakeholders perceived as likely). Many stakeholders – Aboriginal and non-Aboriginal – expressed reservations about payments of cash royalties. Police advised that a strictly controlled 'wet mess' would be preferable as it would quarantine workers away from public venues and reduce incentives for grog-running.

Given community sensitivity to issues surrounding crime and alcohol abuse in the Barkly, its existing prevalence and potential for long-lasting detriment, this impact was rated as HIGH. While resolving social disadvantage is beyond Sun Cable's control, there are many ways in which Sun Cable's contractors can mitigate against exacerbating substance abuse, both in the Barkly and Greater Darwin area. These include strict controls over worker behaviour, on and off site; zero tolerance policies for drug and alcohol abuse in the workplace and drink-driving; a strictly controlled 'wet' mess; minimising cash payments; and ensuring adherence to local alcohol management plans (including restrictions on takeaway alcohol). With these mitigation strategies in place, we reduce the residual risk to MEDIUM. Given community sensitivity, it will be important to maintain close contact with NT Police and the community and be responsive to feedback on alcohol-related issues.

6.5.2 Reduced sense of wellbeing and safety from an influx of workers and project activities during construction and operations

While communities are rarely homogenous, the in-migration of project workforces (generally young males, wearing high-vis work clothing) can change a town's demographic composition, values and sense of wellbeing. This issue is particularly acute during the shorter-lived construction phase if workers are visible in the community after hours (as occurred with INPEX in Darwin) or behave poorly (as outlined in 6.5.1). However, the phenomenon can also occur with an influx of new families changing the town's demographic composition or prevailing values (such as farming communities in Queensland becoming coal-mining towns).

People living around Powell Creek have no experience of industrial development on this scale, the closest major project being Bootu Creek Mine which reportedly employed few local people. The advent of a solar precinct, potentially coinciding with significant traffic and project activities from onshore oil and gas developments in the Beetaloo, may industrialise landscapes currently valued for their cultural, recreational and biodiversity values - and challenge local people's sense of place and wellbeing.

Consolidated Pastoral would like to see worker behaviour on Powell Creek strictly controlled and workers not accessing station tracks and Lake Woods after hours, where they could disturb grazing activities or collide with station road trains and cattle.

While Tennant Creek evolved as a gold-mining town and exploration and building crews remain a familiar sight, Elliott comprises mainly Aboriginal families and service providers. Any increased population from workers and their families would need to be managed carefully to ensure they are absorbed without eroding community cohesion.

In the Greater Darwin Region, the visible presence of workers at Murrumujuk could be challenging to people who value Gunn Point Beach for camping, fishing and recreational purposes.

This potential impact was given a rating of HIGH due to the likely extent, scale, duration and sensitivity to change. With mitigation to lower the visibility and intrusive nature of construction activities, such as quarantining construction workers in an accommodation village at Powell Creek and maintaining strict codes of behaviour, the rating was reduced to MEDIUM.

6.5.3 Reduced community cohesion and resilience, through changed demographics, community conflict and jealousies over perceived distribution of benefits

The literature suggests that an influx of young, single males (typical of a construction workforce) can reduce community cohesion, sense of purpose, belonging, inclusion, social ties and level of participation in community activities (CSIR 2016; Carrington et al. 2011).

Volunteering in community activities, such as sports clubs, emergency services, service clubs community groups and tourism venues, can be reduced if workers are away from home while on shift or have looser social ties when moving into a new community. Interviewees cited a decline in community cohesion and volunteering in Tennant Creek in the past two or three

decades after mining and the local abattoir closed. Many long-term families were reported to have left town, being replaced by short-term government and service workers with weaker social ties to the town.

Community conflict may be sparked by agreement-making over benefits and local participation. This may provoke rumours and jealousies between those getting the benefits and those seen as missing out on royalties, jobs or other benefits. In the Barkly, this could compound existing complexities and frictions between families which were cited during consultation. In addition, major projects can spark conflict between opponents and supporters of projects. In Elliott, stakeholders mentioned residual tensions between both family groups and land councils over the failed Muckaty waste repository proposal and conflict over proposed onshore oil and gas exploration in the Beetaloo. There have been attempts by some Traditional Owners to break away from the Northern Land Council and its default prescribed body corporate (PBC) and establish their own independent PBC (see Holding Redlich submission of November 2020 to the Draft Terms of Reference on behalf of the Nurrdalinji Native Title Corporation, which covers an area to the north of the Solar Precinct).

Reduced community cohesion is less likely in the Greater Darwin Region, however there is potential for conflict over any perceived threats to the rural residential lifestyle already facing development pressures and fears of the AAPowerLink Project acting as a catalyst to industrial development on the Gunn Point Peninsula.

This potential impact was given a HIGH rating, largely because of the likely scale of change, the consequences of exacerbating existing community divisions and sensitivity to change. Mitigation and management measures would include workforce management and codes of behaviour (as above), good ongoing engagement to build trust and relationships and equitable distribution of benefits. Should this be achieved, the residual risk reduces to MEDIUM.

6.5.4 Enhanced community vitality through investment in social and community infrastructure, social enterprises, community activities

Community vitality is the competence of a community, the strength of its institutions, the agency or capacity of people to seize opportunities, their ability to collaborate to get things done, and the strength and equality of social and economic institutions. Communities such as Elliott and Tennant Creek have suffered a decline in community vitality over the past 30 years. In line with the decline of many regional communities, the towns have lost population, experienced a decline in volunteering and lost key economic sectors.

It is possible that Sun Cable's negotiated and community investment packages, in particular its Regional (Aboriginal) Legacy Strategy, may strengthen the community vitality of Barkly communities. Negotiated agreements and community benefits might incorporate local enterprises, social enterprises for the long-term unemployed or community infrastructure (such as sporting facilities, halls or childcare) that build community vitality.

Elliott in particular may benefit from increased economic activity, that could revive the town's commercial fortunes (see Section 5.2.5). This would require Sun Cable to collaborate with the town's leaders to ensure any social and economic investment is in line with community aspirations and at a pace that can be absorbed by the town's governance structures. Threats to success would include any undermining of the community's social fabric, loss of leaders with cultural authority, frictions over how change is implemented and a reduced cohort of non-Aboriginal residents who are strongly invested in the town's future and its institutions.

In Elliott, the potential to enhance community vitality could be transformational. For the Barkly more broadly, given the extent of the need, the likely incremental visibility of any contributions and potential difficulties differentiating Sun Cable's contributions from other activity in the Barkly, this opportunity was given an initial LOW rating. Longer-term, there is potential for this to become NOTICEABLE. Any contributions in the Greater Darwin Region are likely to be more diffuse, difficult to attribute to project activity and more difficult to measure.

6.5.5 Higher levels of road trauma on the Stuart Highway, Gunn Point Road and access routes

Mobilisation of the project will increase traffic from East Arm Port to Murrumujuk, along Gunn Point Road, and to Elliott, along the Stuart Highway. Road freight will include many slow-moving, oversized loads, including:

- six 300-tonne transformers, each about the size of a house
- about 150 oversize movements along Gunn Point Road to Murrumujuk
- about 400 over size movements along the Stuart Highway on double and triple road trains.

Workers will be either flown to the Solar Precinct or transferred by bus from 'park and ride' facilities to sites to reduce the number of private vehicles on the road and the risk of driver fatigue if workers commute to and from sites after shifts.

The Powell Creek Solar Precinct will require construction of a new intersection to facilitate vehicle turning movements to the site during establishment and construction of the precinct. The intersection is in a 130 km/h speed zone and will require turning lanes, deceleration and acceleration lanes and flag lighting (Byrne Consulting 2022 at Appendix K).

While the overall number of vehicles is not a substantial increase on current traffic counts (Byrne Consulting 2022), the consequences of any road trauma would be severe. Risks include interaction with self-drive tourists and caravans. On Gunn Point Peninsula, any industrial traffic would pass through built-up areas and mix with residential and recreational traffic. On the Stuart Highway, road trains and oversize freight will pass through the centre of Katherine and Mataranka. Other road users may become impatient in trying to overtake road trains or oversize loads.

Increased Project traffic may coincide with heightened activity in the Beetaloo oil and gas province, compounding road safety risks and reducing feelings of safety for other road users, including tourists.

Elliott Police report that traffic duties are a major component of their work, with drink driving, 'grog running' from Dunmarra 100 kilometres to the north of Elliott and single vehicle rollovers. They are concerned at any additional risks from the transport of chemicals or hazardous materials, which they are not equipped to respond to.

Pastoralists are concerned that private vehicles using tracks on Powell Creek Station could create safety risks for other users, such as collisions with cattle trucks or cattle. The Member for Barkly, Steve Edgington, mentioned that parts of the highway are in poor condition and have reduced speed limits.

Given the irreversible and extreme consequences of road trauma, this potential risk was given an initial rating of HIGH. With appropriate traffic management plans and scheduling, the residual risk reduces to MEDIUM. Mitigation measures would include organised worker transport to minimise individual trips and crashes from worker fatigue (Sun Cable plans to bus workers from 'park and ride' points), flying workers to the proposed airstrip near the Powell Creek site, use of railway transport for heavy equipment, worker and contractor codes of behaviour, fatigue management, avoiding peak hour traffic in built-up areas, traffic movement plans for transporting loads through towns and strict adherence to work health and safety plans for the transport of hazardous materials.

6.5.6 Reduced feelings of safety along the railway and high voltage transmission line corridor

The mobilisation of construction crews is likely to increase activity along the railway corridor, including the presence of workers in the corridor. An additional five or six trains a week may increase delays and potential risks at rail crossings. The level of activity is likely to be short-term and risks mitigated with appropriate controls, through communication with rail operators, strict adherence to work health and safety plans (including rail safety officers) and good communication with nearby residents and other road users. Therefore it is assigned a residual rating of LOW.

6.5.7 Enhanced public health, through higher wages and improved socioeconomic status, reduced substance abuse

Health is a "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (World Health Organisation). Indicators for the social determinants of health would suggest an overall poor health status for many Barkly families. Sun Cable's activities might include improved socioeconomic status for wage earners and improved health status through health promotion programs in the workplace and investment of community benefits in health services. However, the scale of issues to be addressed and challenges establishing measurable causal links suggest a residual rating for this potential opportunity of BARELY PERCEPTIBLE.

6.5.8 Reduced public health, though noise, dust, human exposure to electromagnetic fields, biting insects, waste and contamination

While these issues were required to be discussed by the Terms of Reference, they barely featured during consultation for the SIA, although questions were asked about the risks posed by electromagnetic fields (EMF). Noise and dust are dealt with as amenity issues under Living Environment below. The human health report (Chapter 15 of the EIS) reports on leading research that indicates that extremely low EMF frequency near HVDC power lines does not pose a risk to human health and this issue is best addressed through good communication. Workers face some health risks from mosquitoes and sandflies at the Darwin Converter Site, which should be covered by an appropriate work health and safety system that meets the requirements of the Northern Territory Government's medical entomology guidelines (see Chapter 15). Therefore, this potential risk has a residual rating of LOW.

6.5.9 Reduced mental health and wellbeing of workforce from loneliness or family

The literature would suggest that mental health is a key issue for FIFO workers living away from families, social support and a sense of belonging to a community. This can lead to family breakdown, substance abuse, suicide and fatigue-related injuries (Carrington et al. 2011; Brereton & Pattenden 2007). Several interviewees suggested mental health challenges may be compounded for Aboriginal workers due to cultural and family pressures, such as jealousy issues or worrying about how family are faring, particularly if workers feel isolated, lack confidence or are subject to racism in the workplace. A Department of Families interviewee commented that pre-existing personal and family pressures that might be masked in a general workplace could be exacerbated by the heat and remoteness of Powell Creek. Loneliness and long absences from family may result in self-harm, suicide or substance abuse.

The likelihood combined with the consequences of this risk would be severe, mainly during the construction phase, leading to an initial rating of HIGH. Mitigation measures, such as strong mentoring and support in the workplace and family friendly rostering (allowing local workers to go home at weekends) would reduce the rating. Cultural awareness training, codes of behaviour, zero tolerance for racism and culturally friendly workplaces (such as groups of workers from the same language groups) constitute the key mitigation strategies. If adopted, these strategies reduce the risk to MEDIUM.

6.5.10 Reduced welfare of girls and young women due to exploitation by workers, sexual liaisons, sexually transmitted diseases and unwanted pregnancies

Several inquiries into the social impacts of large resource projects in areas with vulnerable populations highlight the risk of short-term liaisons between male workers and local women or prostitution for drugs and alcohol. The consequences can be unwanted pregnancies, sexually transmitted diseases and jealousy issues (Kahn & O'Faircheallaigh 2010 for the Browse Basin; CSIR for potential development of the Karoo Basin in South Africa; the 1977 Mackenzie Valley inquiry by Justice Tom Berger in Canada). Experience with previous projects would suggest that communities often prefer workers to have no contact with local families to mitigate against jealousy issues and liaisons. Given the likely sensitivity to this issue and its enduring relevance for the Project, this potential risk was given an initial rating of MEDIUM. The risk would be

reduced to LOW with strongly enforced codes of behaviour for workers, good mentoring and support of workers and separation of workers' accommodation.

6.5.11 Deaths, injuries or disruptions to recreational traffic on the harbour during trenching of cables

Popular activities on Darwin Harbour include recreational fishing and boating. There have been previous incidents of recreational boats colliding with dredging equipment (eg during dredging for the INPEX LNG plant in 2011). The risk would be compounded at night, particularly if boat users are affected by alcohol. There is a risk of deaths or injuries from collisions between recreational boats and vessels trenching and laying cables in Darwin Harbour.

Given the consequences of such incidents but short duration of the exposure, this potential risk is given an initial rating of MEDIUM. The residual rating is reduced to LOW should appropriate mitigation be adopted. This would include communication with recreational fishers through AFANT, Leaders Creek and notices at boat ramps; Harbour Master's Notices to Mariners; and safety plans for cable-laying vessels, including visibility at night.

6.6 Mitigation and management

A summary of mitigation and management measures discussed above:

- adherence to Sun Cable policies, procedures and protocols and accountability for their enforcement
- on-site worker accommodation and separation of workers from nearby communities
- zero tolerance for discrimination, racism, sexism, harassment and bullying in the workplace
- strong mentoring and support in the workplace, including culturally safe and 'wrap around' support for workers interested in further training, education and upskilling
- particular sensitivity to gendered impacts, particularly for Aboriginal women both in the community and the workplace
- zero tolerance for drug and alcohol abuse
- minimise cash royalty payments (the NLC has hired community development staff for the AAPowerLink to work with communities to manage cash payments and support community-driven development)
- adherence to local alcohol management plans (and perhaps representation on local management committees)
- tightly controlled wet canteens at workers' accommodation
- equitable distribution of jobs and benefits
- traffic management plans that account for cumulative increased traffic and minimises workers commuting by road, fatigue management
- work health and safety plans covering railway corridors, road and marine activities
- culturally appropriate rosters and workplaces, limiting time away from families
- good communication with stakeholders over peak traffic activities on the road and trenching and cabling activities at sea.

7 Social infrastructure and services

7.1 Overview

Major projects can put pressure on social infrastructure if they lead to substantial demographic change, particularly if the pressure is sudden and short-lived. An influx of families or temporary construction workers may lead to increased demand for services such as housing, education, transport, policing and community infrastructure.

Cumulative industrial development can put pressure on the availability, quality and affordability of social infrastructure in the catchment area for workers, particularly given current pressures on the housing, rental and accommodation markets (REINT 2021).

The key potential impacts of the AAPowerLink Project on social infrastructure in the Barkly would be any demand for rental accommodation in Elliott or Tennant Creek and downward pressure on scarce social housing with any population increases. There is also potential to impact on short-term accommodation if contractors or workers book out hotels and motels. Given what appears to be a housing crisis – across the private and public sectors – this impact could be severe, with flow-on effects to quality of life and livelihoods in the Barkly and Katherine. Pressures in the Greater Darwin Area will depend on the extent to which Sun Cable is able to recruit local staff and whether FIFO accommodation is needed. This remains uncertain, with industry groups reporting skills shortages across all sectors. The Planning Commission is developing sub-regional land use plans and has published a social infrastructure needs analysis to cater for projected residential growth in Litchfield and Palmerston growth areas.

Key opportunities would be Sun Cable's benefits packages providing staff accommodation that could be left as a legacy to address housing shortages and potential investment in energy security for towns and homelands in the project's footprint. An issue arising from such investments would be the extent to which the private sector simply replaces government spending, resulting in no net benefit to communities. This is described in the literature as a 'retreat of the State' as service provider (Scambary 2013; Altman 2009; Proute Quick et al. 2016).

The focus of this section is on the Barkly Region, where the greatest scale of change and consequent pressures are likely to be felt. However, it will be important for Sun Cable's accommodation planning to take account of potential pressures on Palmerston and Litchfield. For the construction phase, this would apply whether or not the Project recruits large FIFO workforces needing short-term accommodation or seeks to attract families to settle in the Greater Darwin Region. While ancillary infrastructure, such as the proposed East Arm Manufacturing Facility, is not covered by this SIA it is a relevant factor in considering the cumulative implications of Sun Cable's labour force demands.

Table 7-1: What is covered by People and Communities section

What is covered by Social Infrastructure and Services	What the Terms of Reference asked for
The quality, accessibility and affordability of social infrastructure and services, such as housing, health, education, transport, emergency services, utilities.	Relevant accommodation type and quantity. Changes to population (local and NT), employment market and businesses and indirect impacts to housing market, community and social services, infrastructure and economy.

7.2 Social infrastructure and services – baseline data

7.2.1 Education

The schools in Tennant Creek and towns closest to Powell Creek are small, government-operated schools. Secondary school students living in remote Aboriginal communities in the Northern Territory have a number of schooling options once they reach Year 8. This can include staying in their community to continue their schooling, moving to a regional high school with access to residential facilities or moving to a boarding facility in Darwin, Alice Springs or interstate. Aboriginal Hotels Limited operates a Tennant Creek residential facility so secondary school students from remote communities can attend Tennant Creek High School.

Barkly region

School attendance for non-Aboriginal students in the Barkly Region for Term One of 2021 sat at 84 per cent, with 80 per cent attendance in the early and senior years and more than 87 per cent in the primary and middle years. In comparison, school attendance for Aboriginal students in the Barkly region was 47.3 per cent on average, with attendance in the senior years declining to 34.9 per cent (NT Department of Education 2021).

Tennant Creek

Tennant Creek Primary School offers education from transition to Year 6. In 2020, Tennant Creek Primary School had 396 students (NT Department of Education 2021).

Tennant Creek High School provides middle and senior years education for students from Year 7 to 12. In 2020, the school had 196 students enrolled, more than three quarters of whom (78 per cent) were Aboriginal. A total of 81 per cent of students at the school spoke a language other than English. Aboriginal students at Tennant Creek High School come from the urban and town camp areas of Tennant Creek as well as remote communities. Students can study a combination of school based subjects, Vocational Education and Training (VET) courses on site through Charles Darwin University and correspondence courses. School-based apprenticeships provide an additional pathway for senior students. The school employs 21 teachers and 13 non-teaching staff. In 2019, average attendance rates at the school were 62 per cent. Just 23 per cent of students at the school attended 90 per cent of the time (NT Department of Education 2021).

Newcastle Waters

Newcastle Waters school is a remote area preschool, primary school and middle school that offers education from transition through to year nine, mostly for residents of the nearby Marlinja Homeland. At the 2019 Census, there were 18 enrolments at the school (Northern Territory Government 2021). We were advised there were about 20 students in 2021.

Elliott

Elliott school has 74 students enrolled. As at October 2021, all but the principal's son were Aboriginal. Average attendance is about 67 per cent, with a peak of 80 per cent for the first time in late 2021. The school goes to Year 9, after which children go to boarding school. The high attendance rate was attributed by the principal to community support and a strong Remote School Attendance team ('yellow shirts').

Figure 7-1: Elliott school motto

7.2.2 Health

Health and medical facilities in the Barkly are small facilities that provide primary health care services. Central Australia Health Service provides primary care at the Elliott Community Health Centre.

We were unable to obtain official data on staffing levels and services, however media reports and the Member for Barkly in the latter part of 2021 suggested staff shortages and temporary closures of several clinics in the Barkly, including Epenarra. This likely reflects general recruitment challenges compounded by COVID-19 related pressures on health staffing.

Tennant Creek

Tennant Creek Hospital is a 20-bed hospital that serves the Barkly region. It assesses, diagnoses and treats short-term illnesses and injuries (NT Government website 2021). The hospital provides general health care and medical services; 24-hour accident and emergency; a 16-chair renal unit that provides a dialysis service to across the Barkly; antenatal care; allied health services; home and community care services; visiting specialists and community health services. As at December 2021, based on advice from the Nurses and Midwifery Federation, the Member for Barkly was reporting that Tennant Creek Hospital is at 'crisis point' and is missing eight full-time equivalent staff members.

Additional medical services include the Tennant Creek General Practice, Aero Medical Services and St John Ambulance. Tennant Creek General Practice is a health facility of the Royal Flying Doctor Service that provides primary health care services. Aero Medical Services coordinates medical air transport including hospital transfers, evacuations and retrievals. St John Ambulance provides local area transport for patients.

Anyinginyi Health Aboriginal Corporation

Anyinginyi Health Aboriginal Corporation (AHAC) provides primary health care services to more than 7500 Aboriginal people of Tennant Creek and the surrounding Barkly region, with a vision that Aboriginal people in the Barkly region enjoy 'equity in health status with that of other Australians'. AHAC adopts a community development approach, ensuring Aboriginal people have the right to affordable, accessible and appropriate health care. Services include health and allied health services to Tennant Creek and surrounding communities, Piliyintinji-Ki (Stronger Families, including social and wellbeing support) and public health services, with a focus on preventative programs such as sport and recreation, health promotion, a Foetal Alcohol Spectrum Disorders (FASD) program, Grow Well Program (focussed on mothers and babies) and programs to address smoking, trachoma and sexually transmitted disease (Anyinginyi Health Aboriginal Corporation, 2021). As at November 2021, there were 18 vacant advertised positions at the AHAC.

Palmerston/Litchfield

There are three regional health facilities in the region between Holtze and Elizabeth River (Planning Commission 2021):

- The Palmerston Regional Hospital, in Holtze, provides 116 hospital beds, emergency facilities and ancillary specialist day patient services, with room for expansion as a mixed-services health precinct
- Palmerston GP Super Clinic
- Danila Dilba Health Services, currently operating at 95 percent capacity.

7.2.3 Housing

Northern Territory

The Real Estate Institute of the NT (REINT 2021) reports a tight property market across the Territory with strong demand and high sales volumes. This is combined with a limited supply of rental properties, which is driving higher rents.

In the year to September 2021, residential building approvals in the Territory rose by 20 per cent to 743 approvals. The value of building approvals in the Territory rose by 18 per cent to $400 million, below the 10-year average of $518 million (Department of Treasury and Finance, 2021). By the end of 2021, the Master Builders Association of the NT was reporting a sharp decline in private construction approvals, with only 21 houses approved in December compared with 55 in December 2020. CEO David Malone attributed the decrease to the removal of incentives such as Homebuilder and BuildBonus.

Rental properties, including the private market and social housing, are the dominant tenure in the Northern Territory. Outright ownership is the least common tenure, at 15 per cent, which is about half of the national rate of 31 per cent. Public housing represents the majority of the housing stock in very remote communities (Northern Territory Department of Local Government, Housing and Community Development 2020b).

Housing affordability in the Northern Territory

According to the Northern Territory Government's submission on homelessness in the Northern Territory (2020b), the private rental market in urban and regional centres is largely unaffordable for low to moderate income households. Vacant rental properties, particularly in major urban centres (Darwin and Palmerston), are high priced and not affordable options for very low, low and moderate income households and families. The submission refers to the June 2018 Cost of Living Report by the NT Council of Social Services (NTCOSS) which found a lack of rental properties in the NT that could be considered affordable for households receiving income support payments.

Scarce affordable housing contributes to long waiting lists for public housing. At the time of the submission (2020), there were 4960 public housing dwellings in urban and regional centres and 3844 applicants on the waitlist for urban public housing. In June 2021, Darwin and Palmerston public housing waiting times varied from two to eight years depending on location and type of housing required.

Homelessness in the Northern Territory

The Northern Territory's population constitutes just one per cent of Australia's population, yet the NT accounts for 12 per cent of Australia's homelessness. Aboriginal people make up one-third of the Northern Territory's population, but comprise 88 per cent of the NT's homeless population (Department of Local Government, Housing and Community Development 2020a).

Data from the 2016 Census suggests the NT has 12 times the national rate of homelessness (599.4 and 49.8 per 10,000 persons, respectively). The primary causes are a shortage of affordable and appropriately sized dwellings, which contributes to the high rates of overcrowding found across the Territory (NTG submission, Inquiry into Homelessness 2021).

Indigenous Australians rely on public housing because individual land ownership in remote and very remote Australia is difficult to obtain. At the 2016 census, 57 percent of NT Aboriginal households were rented and 21 percent of these were public housing (AIHW, 2020). Indigenous people in remote and very remote areas were three times more likely to live in public housing when compared with Aboriginal households in non-remote areas (56 and 17 percent respectively) (AIHW 2020).

The Closing the Gap report (Department of Prime Minister and Cabinet 2019) identified housing affordability and supply as a crucial area for action. The 2019-20 Federal budget outlined $110 million for remote housing. The Australian Government announced its commitment to work with state and territory governments to deliver better housing for remote Aboriginal communities (Department of Prime Minister and Cabinet 2019).

Housing availability in Tennant Creek

Data from the 2016 Census suggests 878 private occupied dwellings and 371 unoccupied (29.7%) in Tennant Creek on Census night. Of the occupied dwellings:

- 632 (72%) were separate houses
- 45 (5.1%) were semi-detached or townhouses
- 161 (18.3%) were flats or apartments
- 36 (4.1%) were 'other', which includes caravans, cabins, improvised homes, or house/flat attached to a shop.

Data on tenure suggests far higher rates of rental properties than for the Northern Territory overall or for Australia:

- 122 (4.1%) owned outright
- 135 (15.6%) owned with a mortgage (compared with 34.5% for Australia)
- 552 (63.7%) rented (compared with 50.3% for the Territory and 30.9% for Australia).

The Tennant Creek property market experiences greater volatility than Alice Springs and Katherine due to less housing stock and lower sales volumes. Building approvals in Tennant Creek increased from 23 in 2018-19 to 36 in 2019-20, the highest number of approvals since 2013-14. Budget Papers suggest this reflects the improved outlook for mining, mineral and gas developments in the region, which is expected to increase demand for dwellings.

Real estate agents suggest a good supply of properties for sale but scarcity in the rental market. Interviewees commented that rents were high. An online search in January 2022 in Tennant Creek suggests there were:

- four properties available for rent on the private market - two units and two houses, one of the latter was also for sale (the three-bedroom houses were being offered at $430 and $490 rental per week).
- 32 houses for sale, priced from $199,000 to $590,000 with an average price of $334,000.

A land use plan discussion paper (Planning Commission 2017) identified land to the east, above Peko Road, as most suitable for residential expansion and land to the west of the town as most suitable for industrial expansion, including a potential multi-modal hub. The Commission suggested that future populations of 5000 and 8000 would trigger demand for an additional 495 and 1111 dwellings respectively. The Master Builders' Association of the Northern Territory suggests that commercial investors would need the confidence of a pipeline of projects to invest in residential sub-divisions, which would require a long lead-time for headworks.

The Kelly Well and Cabbage Gum aquifers that supply Tennant Creek were described by the Planning Commission in 2017 as a "high risk resource" (p.77) with no known alternative potable water source near Tennant Creek. Existing water infrastructure and waste water treatment ponds were regarded as sufficient for a population of 5000. Power capacity was described as limited, allowing for only minor growth with no planned upgrades.

Public Housing in Tennant Creek

The NT Government is the main provider of public housing in Tennant Creek, with more than 90 percent of clients identifying as Aboriginal - the highest rate in the NT. There is heavy demand and limited availability of public housing in Tennant Creek and Elliott.

High rates of overcrowding in Tennant Creek are more than three times the national rate (Barkly Regional Deal 2020). Causal factors include a shortfall in crisis accommodation, ageing and limited public housing stock, reduced housing affordability and increased public housing waiting lists (Nash & Memmott 2016). Most Aboriginal people in Tennant Creek are social housing tenants, most of them living in the nine community living areas (or town camps) of Kargaru, Tingkarli, Wuppa, Marla Marla, the Village, Village Camp, Munji-Marla, Ngalpa Ngalpa (Mulga), Sorry Camp and Hingstons Place (Planning Commission 2017). Tenants' housing choices are limited due to a scarcity of affordable rental properties. In 2016, Nash & Memmott reported that no new public housing had been built in Tennant Creek for 30 years, so the current stock was ageing and not adequately maintained.

Community living areas are connected to basic services (power, water, sewer), with a significant amount of land potentially available for development (Planning Commission 2017).

The general wait time for public housing in Tennant Creek is from six to eight years, or from two to six years for priority housing. At 30 June 2021, there were 230 people on the public housing wait list in Tennant Creek but only two vacant public houses available (Northern Territory Government 2021e).

In 2019, the Northern Territory Government produced a five-year housing strategy *A Home for all Territorians*. At the time, there were an estimated 11,247 public rental properties in the Northern Territory:

- 10,852 of them social housing (mostly public housing)
- 395 affordable rental properties.

The strategy estimated that between 8000 and 12,000 new homes will be needed across the Northern Territory by 2025. The Government in 2017 announced a 10-year $1.1 billion program to address 'critical overcrowding'. This was backed by an additional $550 million of Australian Government funding, with a Federal Closing the Gap target of 88 per cent of Indigenous Australians to be in appropriate (not overcrowded) housing by 2031.

By December 2021, the NT Government was being criticised for having spent only a quarter of the $1.1 billion funding after five years of its 10-year commitment (Parkinson, Morgan & Robinson 2021).

The past two years has seen a number of projects designed to boost public housing stock, including five affordable houses in Peko Road to be leased through Venture Housing, 14 new Government Employee Houses that saw the return of five houses to public housing stock and 13 new public houses in community living areas (including three delivered by Julalikari Council Aboriginal Corporation). The NT Budget Papers 2021-22 (2021) report that, since September 2016, the Territory Government has delivered 40 new homes and 85 Room to Breathe living spaces across the Barkly region under the remote housing investment package. In December 2021, the NT Government announced an investment of $21 million for affordable and social housing across the Territory (Gunner & Worden 2021). However, a constant theme in interviews for this SIA was that the need remains dire.

Anyingyini Health Aboriginal Corporation in Tennant Creek has a staff housing program to provide supported tenancies for employees and quarters for medical staff. Catholic Care and the Tennant Creek Women's Refuge provide crisis housing.

The housing crisis is compounded by other factors of Aboriginal disadvantage characterising communities in the region. Hall, Memmott et al. (2020) conducted a study of the relationship between remote housing, crowding and infectious disease, and found that crowding causes malfunctions in health hardware such as hot water systems, washing machines, toilets and kitchen facilities, which leads to difficulty performing healthy living practices.

Elliott

Stakeholders in Elliott complained of high levels of overcrowding and reported heavy demand for public housing in both the town and associated town camps. Except for one house in South Camp, there have been no new public (social) housing built here for 25 years (interviews). In September 2020, the Northern Territory Government announced 10 new two-bedroom Government Employee Housing homes had been built in Elliott, which should help free up public housing.

Housing availability in Katherine

Strong economic growth in Katherine has been accompanied by an accommodation crises, with long waiting lists for public housing. Interviewees referred to scarcity and high prices of private rental accommodation, forcing employers to put staff up in short-term accommodation. The town of 10,000 has a public housing waiting list of six to eight years, its rate of homelessness is 31 times the national average and double the rest of the Northern Territory, and an influx of workers with the $1.1 billion Tindal upgrade has 'squeezed the rental market' (Toomey 2021). Real estate agents report one rental home available for every 10 jobs on offer in Katherine and that housing shortages are hindering recruitment of medical staff and teachers (Toomey 2021).

Proposed commercial housing projects include the Casuarina Park development, which is being built in three stages. Sales for Stage 2 opened in November 2021. Planning is underway for a new $22 million neighbourhood centre in East Katherine.

Housing in Greater Darwin

The vacancy rate for dwellings in Greater Darwin in the September quarter 2021 was very low, at 1.9 per cent, while Darwin's rural area had a 0 percent vacancy in units. The median rent, in Greater Darwin, for a 3-bedroom house in the quarter to September 2021 increased by 6.4 percent to $589 per week and the median rent for a 2-bedroom unit increased by 3.7 percent to $423 per week (REINT 2021).

In the quarter to September 2021, the volume of properties sold in Greater Darwin increased by 37 per cent, with 331 properties sold in the quarter. Palmerston had an 86 per cent increase in unit sales for the quarter and a 4 per cent increase in the median price (Northern Territory Department of Treasury and Finance 2021).

The Darwin Regional Land Use Plan (2015) identifies parts of the 11 Mile and Greater Holtze for future urban development. As residential release areas such as Zuccoli, Muirhead and Durack Heights reach full build-out, the NTG is preparing to service land in the Holtze Urban Area plan for land release to meet near-term demand (Planning Commission 2021). Strategic land development plans include more than 5000 new residential lots to create two new suburbs at Holtze, next to Palmerston Regional Hospital, and Kowandi (a former Commonwealth Defence facility). Budget Papers show headworks due to start in late 2022-23 (Department of Treasury and Finance 2021). Private sector investment includes the Northcrest residential area.

At the end of 2021, the NT Planning Commission was consulting on a Holtze to Elizabeth River Subregional Land Use Plan that incorporates these areas as well as Virginia South-West, Archer and Mitchell West. A needs analysis for the plan cites growth estimates for Palmerston and the Holtze Elizabeth River Strategic Land Use Plan area. This could potentially see population growth of 37,000 to 57,000 new residents for Palmerston and far-term growth (by 2050) from 58,000 to 101,200 in the land use plan area. Drivers for growth include employment-generating projects such as the Gateway Shopping Centre and Palmerston Regional Hospital. This will likely reflect an increase in young couples without children in the 2021 Census data (Planning Commission 2021).

Short-term accommodation in the Barkly region

Short-term accommodation in the Barkly is limited. Informal discussion with hotel and motel providers suggests many were struggling to find staff, further reducing capacity for both rooms and food service.

Table 7-2: Short-term accommodation between Tennant Creek and Elliott

Accommodation	Capacity
Safari Lodge Motel	18 rooms, including executive suites
Eldorado Motor Inn	82 rooms
Bluestone Motor Inn	65 motel rooms
Goldfields Hotel Motel	24 rooms (currently on the market for $4M)
Desert Sands	Serviced apartments, limited information on website
Three Ways	Campground, motel rooms, cabins (25 km north of Tennant Creek)
Banka Banka	A range of accommodation, from unpowered sites to cabins and a three-bedroom cottage (152 km south of Elliott)
Renner Springs	27 ensuite motel rooms, 24-hour fuel, restaurant (recently refurbished), 90 km south of Elliott
Outback Caravan Park (Tennant)	Camps sites, cabins, deluxe two-bedroom cabins
Tennant Creek Caravan Park	Unpowered sites to cabins
Threeways Roadhouse	Caravan park and campground, including motel rooms and cabins (25 km north of Tennant Creek)
Further afield	Hi-Way Inn, Daly Waters Hotel (153 km north of Elliott) Devils Marbles Hotel (350 km south of Elliott) Dunmarra Wayside Inn (101 km north of Elliott) Barkly Homestead (Tablelands Highway)

Elliott

There is no commercial accommodation in Elliott. Visitors stay at the Renner Springs Desert Inn, 90 kilometres away. The Midlands Caravan Park is rundown and for sale, although the store, post office and fuel bowsers are operating. Northern Interests, which operates the Elliott Store and Puma service station, has plans to develop the old Ampol site, including accommodation, but the current status of these plans is uncertain (interviews). The Kulumindini Aboriginal Corporation is keen to develop commercial enterprises in Elliott, including accommodation.

7.2.4 Transport

The Solar Precinct is 30 kilometres west of the Stuart Highway and next to the Adelaide to Darwin railway line. The Solar Precinct and overhead transmission line (OHTL) follows the path of several earlier pioneering projects that were nation-building in their time:

- The Overland Telegraph Line was completed in 1872, with 15,000 poles across the continent joining up with a subsea cable that came onshore in Darwin in 1871 (150 years ago). The Powell Creek telegraph station, near the Solar Precinct, is a remnant of what was once a critical communications link between Adelaide with London.
- The Stuart Highway began as a supply track for the Overland Telegraph Line. It was upgraded during World War II to transport troops and maintain supply lines to the North. The final stretch - between Port August and Alice Springs - was sealed in 1987 as part of the Australian Bicentenary roadworks programme.
- The AustralAsia Railway: Construction of a transcontinental railway began at Port Augusta and Darwin (then called Palmerston) in 1878. The southern line reached Alice Springs in 1929. The northern line from Port Darwin reached Pine Creek in 1889, Katherine in 1926 and Birdum in 1929 but was closed in 1976. A new Tarcoola to Alice Springs standard gauge line opened in 1980 but the final stretch, between Alice Springs and Darwin, was not opened until 2004 (Munday 2000).
- The NT Government's vision of an 'electricity super highway' (Roadmap to Renewables 2017) (see policy context at 3.6).

Roads

The Stuart Highway is a major arterial highway, linking Darwin in the north to Adelaide, 3000 kilometres to the south, and the major regional centres of Katherine, Tennant Creek and Alice Springs in between.

The Barkly Highway runs east-west, connecting Tennant Creek and Barkly pastoral properties with Mount Isa in Queensland. The junction of the Barkly and the Stuart Highways is at Threeways, north of Tennant Creek.

The Carpentaria Highway, which heads east from the Hi-Way Inn Roadhouse 104 kilometres north of Elliott, is the key access road to the Gulf of Carpentaria town of Borroloola, Glencore's

McArthur River Mine and onshore oil and gas exploration in the Beetaloo Basin. A $150 million upgrade to the Carpentaria Highway was announced by the Australian and Northern Territory Governments in September 2021. The unsealed Buchanan Highway heads west from Dunmarra, 36 kilometres south of the Hi-Way Inn. A substantial increase in industrial traffic is likely on the Carpentaria and Stuart Highways from developments such as the Beetaloo and Tindal Air Base near Katherine.

Access to Gunn Point Peninsula from the Stuart Highway is via Howard Springs Road and Gunn Point Road. The Northern Territory Government in 2018 awarded three tenders worth $32.2 million to realign and upgrade Gunn Point Road. With growth, the reserve of Howard Springs Road will need widening to allow upgrading as the main road connection to Gunn Point Road. In future, a zoned arterial corridor from Temple Terrace to Holtze/Kowandi North will be reclassified as a main local road and become an integral part of the proposed Holtze/Howandi residential development. In the far term, it is proposed to realign the corridor for the future Glyde arterial along the northern boundary of the Greater Holzte area. If strategic industry is developed around a port at Glyde Point and town of Murrumujuk, a realigned arterial corridor from 11 Mile would pass by Robertson Barracks and the Darwin Correctional Centre for a main road, utilities and possibly rail connection between Palmerston and the Gunn Point Peninsula (Planning Commission 2021).

Rail

The AustralAsia Railway Corporation manages the concession deed for the Tarcoola to Darwin Railway on behalf of the Northern Territory and South Australian Governments. Intermodal freight services are operated by Aurizon, which in October 2021 purchased former rail operator OneRail. Sun Cable's overhead transmission line is within the railway corridor until Livingstone in the north.

OneRail transported 1.9 million tonnes of freight along the corridor in 2018-19 and again in 2019-20, with an average 12 freight trains a week. The Ghan passenger service operates between Adelaide and Darwin twice a week during the peak tourist season and once a week in the off-peak season.

Air

Interstate air services operate to Darwin and Alice Springs. Air North operates a 30-seat Embraer 120 aircraft three times a week on the 'Centre Run' from Darwin-Katherine-Tennant Creek and Alice Springs. Tennant Creek Airport can accommodate most commuter aircraft. It is not staffed but is open 24-hours a day for arrivals, departures and refuelling. Elliott has a 1000-metre bitumen public air strip. Most pastoral stations have private air strips. For example, Newcastle Waters maintains two light planes and two helicopters, described by the station manager as a strategic part of the business.

7.2.5 Policing and emergency services

Elliott Police patrol a vast region of 103,000 square kilometres up to Daly Waters and Dunmarra, 100 kilometres to the north, 100 kilometres south to Renner Springs and down the Buchanan Highway and Barkly Stock Route, where police visit cattle stations to do motor vehicle and firearm registrations. Elliott has five gazetted positions: A Remote Sergeant, two constables, an Aboriginal Community Police Officer and Aboriginal Liaison Officer (a local Traditional Owner and fourth generation Aboriginal police officer). The main police workload is traffic duties (including rollovers on the Stuart Highway) and domestic violence. While alcohol abuse is a key issue, police report little property crime, vandalism or graffiti (interviews).

Elliott has a small fire station and a Fire and Emergency Response Group (FERG), with five volunteers trained in road crash rescue, grass firefighting techniques, first aid and search and rescue. However, the station relies on Tennant Creek's two permanent firefighters to respond to major incidents requiring personal protective equipment, which would include any spills of chemicals or hazardous materials. Pastoralists tend to be self-sufficient in responding to grassfires, which are common in the region. Police report that nearby pastoral properties are well-managed and that police are rarely called to pastoral properties to deal with criminal matters (interviews).

7.3 Key events or activities

Key Project activities that could put pressure on social infrastructure and services includes:
recruitment of workers and families leads to population growth and demand for rental and private housing, schools and childcare

- local people returning to the region for work, adding to overcrowded social housing
- taking up short-term accommodation during construction
- increased industrial traffic on arterial and municipal roads
- use of local health facilities for worker health or emergency response
- increased demand for emergency services, including policing, response to fires, road trauma
- use of power, water, sewerage, telecommunications and waste facilities at project sites
- recruitment attracting workers from existing service providers.

7.4 Predicted impacts

Table 7-3: Potential impacts for Social Infrastructure and Services

Potential impacts – Social Infrastructure and Services	
Potential beneficial impacts	Potential detrimental impacts and residual ratings
SI-4: Improved transport infrastructure (noticeable)	SI-1: Reduced quality, affordability and availability of public and private accommodation, particularly in Tennant Creek, Elliott and Katherine as workers of families seek local housing (high)
SI-5: Enhanced access to schools and childcare (barely perceptible)	SI-2: Reduced affordability and access to health services (low)
SI-8: Improved access to utilities, such as power, water and telecommunications (noticeable)	SI-3: Reduced access, affordability or quality of transport infrastructure, including road and rail (low)
SI-9: Improved quality and range of community infrastructure due to Project investments (noticeable)	SI-6: Pressure on quality and availability of childcare and educational services in the Barkly (low)
	SI-7: Pressure on emergency services, necessitating increased staffing and enhanced infrastructure (low)
	SI-10: Reduced quality of municipal services in Elliott and Tennant Creek due to loss of staff, pressures on budget and staff time (medium).

7.5 Impact assessment for social infrastructure and services

7.5.1 Reduced quality, affordability and availability of public and private accommodation as workers of families seek local housing

Any demand for social housing, commercial rentals or purchases of property would stress already saturated housing markets in all regions (Darwin, Katherine, Alice Springs and the Barkly.) Housing and skills shortages - often interlinked – were two key issues raised during consultation for the SIA.

Longer-term, the AAPowerLink Project and other economic development in the Barkly and Litchfield Regions could act as a catalyst to private investment in commercial housing and short-term accommodation. There is a serious tension here between Government's desire for population growth and a scarcity of housing options to support it. David Malone, CEO of the Master Builders Association of the NT, suggests the issues will be difficult to resolve as the private sector needs the certainty of a pipeline of demand in order to invest in commercial housing projects. The Territory's economy tends to be project driven, which brings uncertainty. This uncertainty is compounded by long lead times for appropriate land release and headworks by Government.

Potential pressures on all types of accommodation could come from:

- workers or managers seeking to move their families to Tennant Creek, Elliott or Darwin during the construction phase (as happened with INPEX when many workers moved from the Howard Springs accommodation village into the community);
- this could include workers preferring to commute from regional towns to workers' accommodation villages on Powell Creek (and potentially Murrumujuk) rather than FIFO from further afield, especially if the COVID pandemic continues;
- accommodation camp capacity being exceeded at peak periods;
- short-term pressures on local accommodation from workers enroute to work sites from other regional centres or interstate, including sub-contractors' staff;
- mobile work camps and short-term accommodation along the railway corridor;
- the 'honey pot' effect of local people returning to the region for jobs or an influx of people from other regions seeking work;
- local contractors expanding their workforce to provide services to the Project;
- local workers wanting to invest their wages in purchasing or building new homes.

Katherine contractors report a heavy reliance on short-term accommodation, due to the scarcity and high cost of rental properties. In Tennant Creek and Elliott, a dearth of housing and high rents has created major barriers to recruitment and many unfilled vacancies. Jemena built an accommodation village on Phillip Creek Station to avoid saturating the local market during construction of the Northern Gas Pipeline in 2018 and purchased a six-bedroom house in Tennant Creek to accommodate external workers for maintenance and shut down events.

Housing scarcity and higher costs are particularly acute for social housing tenants, given public housing waiting lists of up to eight years. Overcrowded housing is a key barrier to Aboriginal worker recruitment and retention. Inflationary pressures or higher demand for private rentals can force low-income earners back into the public housing market, compounding shortfalls.

While the AAPowerLink plans a workers accommodation village at Powell Creek and mobile 'fly' camps during construction, these alone are unlikely to alleviate pressures. Rental stock is in high demand and short supply in all regional centres, inhibiting the relocation of staff and any business growth aspirations by local contractors. Some interviewees opted to buy rather than rent in both Katherine and Tennant Creek. However, this is unlikely to be a preferred option for the AAPowerLink workforce until the operational phase of the Project, assuming that staff are prepared to make a long-term commitment to the town. An increase in owner-occupied dwellings would also reduce rental stock, putting downward pressure on public housing. In Darwin, the Planning Commission is preparing sub-regional plans and social infrastructure needs analysis to cater for population growth around Palmerston and Litchfield. Given the uncertainty around population projections and sources of labour, which could include skilled migration, it is difficult to predict how the Project will impact on housing prices and availability in the Greater Darwin Area.

The severity of the problem, potential cumulative impacts from other investment attraction activities by government, the likelihood of the Project contributing directly and indirectly to housing scarcity, compounded by community sensitivity to the problem warrant the highest negative rating of CATASTROPHIC. Concerted actions may reduce the rating to HIGH, largely because of the scale of the project and the many factors remaining outside Sun Cable's control. These include:

- an accommodation plan covering all facets of AAPowerLink activities in the Northern Territory, taking account of likely sources of labour, demand for accommodation, gaps in the market and long lead-times needed for good planning;
- investing in new housing stock off-site, which could be leased to staff to alleviate local housing pressures;
- agreement-making to support locally-owned accommodation ventures;
- mandated use of the Powell Creek accommodation village by workers and sub-contractors except in exceptional circumstances (and when local providers indicate this will not displace other users);
- collaboration with other proponents on dedicated worker accommodation that could be left as a legacy for other purposes, such as tourism;
- if worker accommodation is needed in Greater Darwin, an ideal option would be the former INPEX workers' village at Howard Springs, which might be shared with other projects. However, this is unlikely to be feasible in the short-term given its use as a quarantine facility for the COVID-19 pandemic.

7.5.2 Reduced affordability and access to health services

Health services in the Barkly are reportedly operating at capacity and with reduced staff, particularly due to COVID travel restrictions and demands. While the Tennant Creek and Elliott health services operate from good facilities, staffing in the region is under strain and often dependent on agency and locum health staff from interstate. Interviewees suggested there would be minimal capacity to absorb increased demand, such as workforce health checks, attending to worker injuries or increased road trauma. The closest hospital to Murrumujuk is the new facility at Palmerston, about 52 kilometres away, which is reportedly suffering from staff shortages, compounded by demands on health staff from the COVID-19 pandemic.

The importance of access to health services suggests an initial risk rating of MEDIUM. However, this would be reduced to LOW if the AAPowerLink ensures self-sufficiency by providing its own first aid and medical facilities at Powell Creek and Murrumujuk (including a COVID plan).

7.5.3 Reduced access, affordability or quality of transport infrastructure, including road and rail

Deterioration or pressure on Barkly or Litchfield roads would be of concern to government, local government, tourism operators and pastoralists, who would expect AAPowerLink to fund any new or repairs to degraded facilities.

Transport of workers on commercial flights to Darwin or on regional flights could lead to higher prices or crowding out of other users, such as public servants and other service providers travelling between Katherine and Tennant Creek.

There were suggestions during consultation that the OHTL could pose a safety risk to helicopters and light planes operating on pastoral properties, however the Consolidated Pastoral Company felt this could be managed with good communication.

Measures proposed by AAPowerLink to reduce negative pressures on transport infrastructure include flying workers to the Solar Precinct on dedicated flights. The level of increased rail freight is unlikely to strain capacity, particularly the AAPowerLink will build its own siding at Powell Creek.

Given the importance of quality transport infrastructure, this risk was given an initial rating of MEDIUM, reduced to LOW with appropriate mitigation.

7.5.4 Improved transport infrastructure

Poor transport and logistics infrastructure is a key issue for remote communities, to access services and for cultural activities, such as hunting. If the AAPowerLink creates new access roads and improved transport infrastructure, locals may get the benefits, such as access to new hunting areas. However, this may simply offset areas lost to the Solar Precinct. On Gunn Point Peninsula, the Northern Territory Government in 2018 awarded $32.2 million to realign and upgrade Gunn Point Road, which has improved access for recreational fishermen. Further commercial activity may prompt completion of this road to Glyde Point.

Where a statutory road authority identifies that upgrades are required to a public road, this will result in a net benefit for the broader community and increase vehicle safety in the corresponding region. Other benefits may include increased regularity of commercial air services, opportunities for ancillary services and developments that support project needs and related employment opportunities.

The rating for this opportunity is BARELY PERCEPTIBLE. It could increase to NOTICEABLE, although tangible benefits would appear unlikely in the short-term.

7.5.5 Enhanced access to schools and childcare

AAPowerLink efforts to create pathways from education to jobs on the project might enhance school attendance. Existing schools appear to have the capacity to absorb additional students, although there would likely be staffing implications.

Access to childcare in Tennant Creek was raised in interviews as a constraint that particularly affects women. It is unlikely that AAPowerLink would be able to address this, except as a potential commercial opportunity or perhaps a small number childcare places at the worksite to support female workers. This is an issue best addressed either commercially or by government. Therefore an initial opportunity rating of BARELY PERCEPTIBLE remains.

7.5.6 Pressure on quality and availability of childcare and educational services in the Barkly

Higher demand may put pressure on local educational infrastructure and services. Access to childcare in the Barkly is already problematic. However, this pressure is unlikely to occur during construction and should be readily absorbed during operations in both Darwin. The initial and residual ratings for the risk are therefore LOW.

7.5.7 Pressure on emergency services, necessitating increased staffing and enhanced infrastructure

Given existing activity in the region, any additional workload is likely to be short-term. Any incidents at the Powell Creek site would necessitate a long response time from Elliott or Tennant Creek, taking emergency services away from other duties. AAPowerLink would therefore be expected to be self-sufficient and not put further strain on limited firefighting resources (two permanent staff in Tennant Creek, volunteers and pastoral workers).

Any additional demand for police services may require an upgraded police station in Elliott. The current station is a set of demountable building that are reportedly not fit-for-purpose. Other interviewees suggested the health clinic has limited spare capacity to provide health and ambulance services but may be able to triage aerial evacuations if required (the Department of Health has not responded to requests for data).

This potential risk was reduced from MEDIUM to a residual rating of LOW, provided AAPowerLink develops an effective emergency response plan and has an on-site response team.

7.5.8 Improved access to utilities, such as power, water and telecommunications

Power is seen as expensive and unreliable in remote Northern Territory areas, with many smaller communities depending on diesel generators. A study by Longden et al. (2022) found that nearly 91 per cent of 3300 households using 'pay as you go' metres had been disconnected from electricity during the 2018-19 financial year. About 74 per cent were disconnected more than 10 times. The study suggests that energy insecurity for Aboriginal people living in remote areas - mostly off-grid - is linked to poor health, heat-related mortality, food insecurity and not being able to operate essential medical equipment. Temperature extremes compound the risk

for vulnerable households, who typically live in poorer quality housing with less opportunity to invest in efficient technology.

Barkly Regional Council said one of its biggest operating costs is providing power to council facilities. Julalikari Council Aboriginal Corporation, which provides services to Tennant Creek and the Barkly, is prioritising solar rooftop systems on new houses. Original Power is a small community-focused organisation that aims to build the power of Aboriginal and Torres Strait Islander peoples through collective action. Its projects include rooftop solar in Tennant Creek and Marlinja and a micro-grid pilot at Borroloola.

As part of its Territory Economic Reconstruction framework, the NT Government aims to transition remote power for 72 communities' Indigenous Essential Services program to renewable-based energy systems by 2030. In April 2021, the NT Government invested $2 million towards the $59 million Solar Energy Transformation Program (SETuP), co-funded by the Australian Renewable Energy Agency (ARENA) that delivered 10 megawatts of solar generation to remote communities between 2017 and 2019.

While technical and cost barriers preclude AAPowerLink from providing electricity directly from the Solar Precinct to nearby towns and communities (which would require conversion from DC to AC), stakeholders suggested other ways that Sun Cable could contribute to energy security. This could be in the shape of community benefits or by harnessing Sun Cable's "brainpower and technological expertise" (comment in interview) to provide solutions to communities living in poverty (see Consultation Report at Appendix F).

Stakeholder suggestions included donating second-hand panels, co-investment in capacity-building projects and considering pilot plants near remote towns and communities. There is substantial solar research capacity in the Northern Territory: from Charles Darwin University to a cluster of solar research institutions in the former 'Solar City' of Alice Springs, including Ekistica, that specialise in the delivery of remote area infrastructure. The procurement of services from local solar companies and research institutions would contribute to the Territory's renewable capacity.

An Alice Springs Future Grid committee, led by the Intyalheme Centre for Future Energy, involves multiple organisations from across the Northern Territory and Australia. The aim of the $12.5 million collaborative project is to identify and overcome barriers to further renewable energy penetration in the Alice Springs electricity system.

Expectations that AAPowerLink could contribute to energy security and affordability in the Barkly was one of the most frequently raised issues during consultation, from the Barkly Mayor to Aboriginal service providers and submissions from environmental groups during exhibition of the Project's referral documents:

> "Aboriginal residents in nearby Marlinja, Elliott and Tennant Creek are experiencing devastatingly high summer temperatures, failed wet seasons, and are forced to live in housing that is not for these conditions due to decades of government neglect. The cost of electricity in particular is prohibitive in these communities." (ECNT submission to Draft Terms of Reference, 2021).

As outlined above in 7.1, a key issue is whether these expectations are realistic and the extent to which the AAPowerLink can and should provide services that are a government responsibility, resulting in no net gain to communities. The key benefits from the project may, rather, come from Sun Cable's support of technological advances in renewable energy generation. The company is investigating opportunities to support regional electricity initiatives for local towns and homelands including off-grid solar and battery systems. This includes evaluation of the Solar Energy Transformation Program (SETuP), delivered in the past by the Power and Water Corporation. Sun Cable has also committed to establish a NT Centre for Renewable Excellence and has commissioned services from Ekistica.

Any upgrade to telecommunications at the Solar Precinct could contribute to enhanced telecommunications in the area. Note that Renner Springs has only Optus access.

AAPowerLink's contribution to regional utilities is likely to be NOTICEABLE as part of a collaborative approach with government and research institutions to improve energy security in particular.

7.5.9 Improved quality and range of community infrastructure due to Project investments

Enhanced community infrastructure may be delivered as a result of agreement-making, community investments or co-investment with other parties. This is most likely to be beneficial longer-term, as part of Sun Cable's ongoing engagement or Regional (Aboriginal) Legacy Strategy, particularly infrastructure that supports sport and youth development.

This opportunity might be BARELY PERCEPTIBLE at first but, with consistent investment, would rise to a NOTICEABLE positive impact.

7.5.10 Reduced quality of municipal services in Elliott and Tennant Creek due to loss of staff, pressures on budget and staff time.

Recruitment at a time of labour shortages means workers are more likely to leave existing employers than unemployment queues, in search of new opportunities or higher wages. This includes government, local government and other service providers, many of whom are already struggling with hard-to-fill vacancies. Barkly Regional Council is one of the largest employers in the region. Staff shortages would impact on service delivery and entail the time and cost of backfilling positions.

This risk is one largely beyond AAPowerLink's control to mitigate, apart from collaborative approaches to recruitment and workforce development. Given existing workforce shortages, the risk is both likely and consequential therefore it has initial and residual risk ratings of MEDIUM

7.6 Mitigation and management

A summary of mitigation and management measures highlighted for social infrastructure and services is:

- prepare an accommodation plan covering all aspects of the project, from temporary construction workforces to long-term population growth;
- consider providing new housing stock which could be leased to workers or left as a community legacy (eg Territory Alliance workers' village left to the Mantiyupwi Clan Estate on the Tiwi Islands for tourist accommodation)
- minimise use of the private rental market to avoid putting pressure on scarce accommodation;
- ensure self-reliance for first aid, medical and emergency response teams;
- build access roads and avoid degradation of existing pastoral tracks and arterial roads;
- workforce planning to assess the childcare needs of permanent workers and how AAPowerLink might contribute;
- collaborate with other employers to minimise impact on their ability to offer services, recognising that this is an impact that will be difficult to mitigate

(See the SIMP at Appendix J for more detail).

8 Economies and jobs

8.1 Overview

The purpose of an economic impact assessment is to identify the positive and negative economic impacts of a project at a national, Territory, regional and local level. This includes the likely distribution of positive and negative impacts on local communities, with a particular focus on local employment and income effects and other local industry impacts, such as on local suppliers (Queensland Government 2017; NSW Government 2015).

The AAPowerLink will undoubtedly have substantial benefits, including jobs, local procurement, government revenue, economic diversification and contribution to government's economic and renewable energy agendas. A major source of reliable, affordable energy at commercial scale has enormous potential to create a more sustainable and diverse economy through decarbonisation of existing energy networks and attraction of industries associated with renewable energy such as hydrogen, green manufacturing and data centres. However, the economic impact assessment considers additional matters, such as the sustainability of economic benefits, their equitable distribution in local and regional economies, the extent to which economic benefits will leak to other jurisdictions, and potential unintended consequences for existing businesses and economic sectors. Prediction and analysis of the significance of impacts is necessarily tempered by context, including the capabilities and the capacity of existing businesses and labour markets to take advantage of opportunities offered by the Project.

A key potential social and economic benefit of the AAPowerLink Project is the employment of local people. The Local Workforce Strategy (attached to this SIA) outlines the types of construction jobs likely to be available to local workers. Despite high Aboriginal unemployment in the Barkly, there are significant barriers to both local employment and recruiting skilled workers to live and work in regional towns. The Local Workforce Strategy outlines ways in which these barriers might be overcome.

The topic of economies and jobs elicited by far the most prolific commentary during consultation, with valuable insights and local knowledge provided on potential opportunities, threats and lessons learned (see Consultation Report at Appendix F).

Table 8-1: What is covered by Economies and jobs

What is covered by Economies and jobs	What the Terms of Reference asked for
Jobs, economic opportunities and community development, including the employment and training of Aboriginal people, local procurement and equitable distribution of economic benefits and harms.	Workforce For each phase of the proposal: • estimated number of people to be employed • skills base required • likely sources (local, regional, overseas) • on-site facilities provided (including any accommodation) Business • existing and required local businesses necessary to supply chain, construction and operations • primary economic characteristics within the proposal area • primary employment source/s of townships/cities/communities within or in proximity to the proposal area • proximity to existing infrastructure and associated operators (eg rail, gas pipeline, cables) General • impacts to waste management facilities, particularly from disposal or recycling of solar panels and batteries during the life of the proposal and following decommissioning • potential future land use conflicts within the footprint, eg mineral and petroleum titles Economic and financial • economic assessment of the proposal's impact on the NT economy • details of the financial capacity to implement the proposal and the potential risks to Project implementation • total contribution to GTP and GSP over the economic life of the proposal • expected employment and availability of appropriately skilled labour during construction and operation phases of the project • potential adverse impacts to local and regional industries due to competition for limited labour resources • use of non-local workforce • estimated capital and annual operational expenditure • value of residual infrastructure at end-of-life of the proposal • impact on the local and NT energy market and energy prices • future NT government infrastructure within utility corridors, eg future electricity transmission.

8.2 Economies – baseline data

The following section provides a baseline description of the Northern Territory's economy, derived mainly from the Territory's 2021 Budget papers and Territory Economic Reconstruction Commission's (TERC) December 2020 Report.

The Northern Territory Government is aiming for a $40 billion economy by 2030 to drive growth and accelerate jobs and population growth (TERC 2020). The 2021 budget papers forecast a $1.4 billion deficit for the upcoming financial year, with the Territory's net debt expected to reach $9 billion in 2021-22. The deficit is expected to expand to $11.4 billion by the end of the forward estimates period in 2024-25, hence the Government's ambition to grow private sector investment and return the economy to a more sustainable footing.

The structure of the Territory's small open economy reflects its wealth of natural resources, strategic defence capabilities, tourism, and relatively large government and community services sector. In 2019-20, the Territory's Gross State Product (GSP) was $26.2 billion, an increase of 5.3 per cent from 2018-19. Budget papers note that, after a strong rebound in the domestic economy in 2020-21, economic growth is forecast to average 2.4 per cent a year to 2024-25, compared with average growth of 1.9 per cent in the five years to 2019-20. GSP is estimated to increase by 4.7 per cent in 2021-22 and State Final Demand by 4.2 per cent (this is based on projects that have reached Financial Investment Decision and does not factor in the AAPowerLink Project). Growth in 2019-2020 was supported by many NT and Australian Government COVID-19 stimulus measures, limited trading restrictions and low interest rates (Department of Treasury and Finance 2021).

Economic growth in 2021-22 and 2022-23 is forecast to moderate after two years of strong growth and as government stimulus measures are removed. Economic growth is expected to be driven by stronger private and public sector investment, such as the Barossa offshore gas project, new Charles Darwin University campus in the Darwin CBD, Darwin Ship Lift Project, defence-related works and significant investments in transport infrastructure (Department of Treasury and Finance 2021).

However, the Budget papers note that the Northern Territory economy remains heavily reliant on government and community services, which accounted for 23.8 per cent of the Territory's GSP and 42.3 per cent of employment in 2019-20, compared with 17.4 per cent and 28.8 per cent respectively nationally. The Territory's service industries, the third most important sector, account for 19.7 per cent of the Territory's output and 32.3 per cent of employment in 2019-20 compared with national contributions of 34.8 and 37.8 per cent respectively.

Table 8-2: Key economic sectors in the Northern Territory. Source NT Budget Papers: Industry Outlook. Note that ABS labour market statistics exclude defence personnel. The rise in mining and manufacturing economic outputs but decline in jobs reflects growing LNG exports.

	GSP			Employment		
Sector	Value $M 2020-21	Annual change %	Share of GSP %	Number	Change %	Share %
Mining and manufacturing	8503	31.9	31.6	6026	-12.6	4.6
Mining	7521	39.7	27.5	2213	-32.4	1.7
Manufacturing	982	-7.5	4.1	3813	5.4	2.9
Government and community services	6186	2.0	23.8	55,625	7.6	42.3
Service industries	5056	-5.8	19.7	42,578	-10.5	32.3
Defence	2244	7.0	8.8	5433	0.9	n.a
Construction	1466	-15.7	5.9	10,810	-2.9	8.2
Retail and wholesale trade	1112	-9.1	4.5	14,197	9.0	10.8
Tourism	852	-26.8	3.3	7300	-12.1	5.5
Agriculture, forestry, fishing	649	-5.9	2.5	2414	34.8	1.8

8.2.1 Economic sectors – Barkly region

Key economic sectors across the Barkly region are pastoral, tourism, Aboriginal arts and culture and mining, while economic activity and jobs are driven by government services, pastoral and mining-related activities (Deloitte 2017).

The Barkly and Tennant Creek pastoral district accounts for a substantial proportion of the Territory's total cattle industry exploration (Northern Territory Government 2021). A regional economic development strategy in 2014 reported the Barkly had more than 200,000 square kilometres of pastoral land covered by 25 leases, most of which were held by large pastoral companies. It accounts for about 30 per cent of the Territory's cattle production. Pastoralists suggested that (as of October 2021) the sector doing reasonably well, with high prices driven by a national shortage of cattle and reduced feed due to dry conditions. Good wet season rain was expected (and has since fallen).

Tennant Creek is envisaged as a mining and logistics services centre. Preliminary investigations are underway to understand the development requirements for a multimodal and agribusiness hub in Tennant Creek (NT Treasury and Finance 2021). Gold exploration and mining continue to play an important role in the regional economy, with companies like Emmerson Resources and Territory Resources focussing on gold and copper deposits. Also in the region is the Bootu Creek manganese mine (which appears to be halting production – see Section 12), the proposed Verdant Minerals phosphate mine, Arafura Resources' proposed rare earths mine at Aileron,

gold and copper exploration around Tennant Creek and Encounter Resources' copper exploration in the Ashburton Ranges, to the east of the proposed Solar Precinct.

8.2.2 Barkly Regional Deal

The Barkly Regional Deal, a 10-year $78.4 million investment by the Australian and Northern Territory Governments and Barkly Regional Council, aims to improve the productivity and liveability of the Barkly region by stimulating economic growth, improving social outcomes and supporting local Aboriginal leadership. The program is supported by a governance table, coordinated by a Backbone Team. A number of working groups include a Barkly Aboriginal Alliance, as well as economic, workforce development and measuring change working groups. The three priority areas are economic development, social development and culture and place-making. The most relevant of the 28 initiatives to the SIA include:

- a regional workforce strategy ($1M)
- youth infrastructure ($7.62 million)
- a Barkly business hub ($2.2 million, awarded to local company Harvey Developments in December 2021)
- ongoing new housing
- an economic growth strategy
- maximising Aboriginal employment
- improvements to the delivery of the Community Development Program (CDP), with a Remote Jobs Program to be trialled in the Barkly
- a multi-purpose accommodation facility ($.25 million)
- student boarding facility ($12.7 million)
- crisis youth support and accommodation ($3 million)
- a feasibility study for an arts centre in Elliott.

8.2.3 Main employers in the region

Key employment sectors in the Barkly Regional Council LGA are public administration and safety (17.6 per cent), health care and social assistance (17.3 per cent), education and training (13 per cent), agriculture, forestry and fishing (12.6 per cent) and retail trade at 7.6 per cent (ABS 2016).

The data for Tennant Creek is similar, with the Barkly Regional Deal (2020) reporting that the main employment sectors in Tennant Creek are health care and social assistance (24.5 per cent), public administration and safety (19.8 per cent) and education and training (11.3 per cent). In 2018, there were 2829 jobs in the Tennant Creek area.

The data indicates the main employers in the region are likely to be Northern Territory Government service providers in police, health, education and associated services and local government and associated services.

The Barkly Regional Council employs 246 people, more than half of whom (148) are Aboriginal. Of the Aboriginal employees, 54 are permanent full-time, 29 are part-time, 64 are casual and there is one apprentice (Barkly Regional Council 2020).

(See Section 6 for more detailed Tennant Creek, Elliott and Barkly demographic data.)

8.2.4 Tourism – Barkly region

A Tourism Research Australia profile for the Barkly region (2021) reported 51 tourism businesses in the Barkly in 2019, with 34 of them employing 1-19 people.

A Tourism NT Barkly Regional Report for 2017-19 reports that on average from 2017 to 2019, the Barkly region received 125,000 visitors who spent an estimated $84 million and stayed 325,000 nights in the region. In this reporting period, 14,000 visitors to the Barkly region were from overseas, 64,000 were from interstate and 47,000 were from within the NT.

Most intra-Territory visitors were in the Barkly region for business (24,000), 12,000 visitors were holidaying and the remainder were visiting friends and relatives or for another reason. Interstate travellers were predominantly holiday tourists (40,000) however 18,000 visited for business. Almost all international travellers went to the Barkly region for a holiday (13,000).

More than two thirds of the interstate tourists (68 per cent) were aged 55 and over while almost half of the international tourists (45 per cent) were aged between 15 and 29. Most of the visitors to the region travelled by car or campervan.

For the year ending June 2021, 67,000 visitors travelled to the Barkly region, a decline of 37 per cent on the 2019 figures. New South Wales, South Australia and Queensland represented the largest interstate holiday source markets for the NT in the year ending June 2021 (Northern Territory Department of Industry, Tourism and Trade 2021).

8.2.5 Land use

Solar Precinct

The main land use in the Barkly region is pastoral, however there has been a recent increase in mineral exploration and mining activity. The solar precinct is on a pastoral lease on Powell Creek Station, held by Consolidated Pastoral Company, which manages Newcastle Waters, Powell Creek and Dungowan pastoral leases. The solar precinct will operate under a lease arrangement with Consolidated Pastoral and an Indigenous Land Use Agreement (ILUA) being negotiated with the Native Title Holders through the NLC (see Cultural Identity).

The Beetaloo Sub-basin, just north of Elliott and about 250 kilometres north of Tennant Creek, is the Northern Territory's premier shale gas resource. There are many petroleum wells and gas discoveries, with exploration permits granted across the region and 20 exploration wells drilled in the sub-basin. Exploration activity is increasing (Northern Territory Government 2020b). The Amadeus gas pipeline runs generally parallel to the highway and railway line through the region to Darwin.

The land at Powell Creek is Warlmanpa Country and is used extensively by Aboriginal families from Elliott, Marlinja and surrounding homelands for hunting (see Cultural Identity).

Overhead Transmission Line

The OHTL mostly aligns with the Alice Springs to Darwin Railway Corridor under a lease and sub-lease arrangement over Crown Land and Aboriginal Freehold Land. AAPowerLink will operate the OHTL under an easement agreement with the AustralAsia Railway Corporation. The OHTL will divert away from the railway corridor in some areas to avoid towns. For the final 66 kilometres, it will follow a government utilities corridor from Livingstone to the Darwin Converter Site. Sections of the OHTL not in the railway corridor will be operated under lease and easement arrangements to be negotiated with the landholders and the NT Government.

The utilities corridor is identified in the Litchfield Subregional Land Use Plan (LSLUP 2020). The LSLUP), notes that the Litchfield region includes a range of rural residential, horticultural and agricultural activities.

The land uses in the Litchfield Subregional Land Use Plan close to the OHTL:

- rural area (as it crosses the Stuart highway towards the Arnhem Highway)
- rural activity centre (around Humpty Doo)
- open space/natural area (as it travels north to intersect with Gunn Point Road)
- mangrove/conservation (as it travels alongside Gunn Point Road)
- borders a horticulture and rural area
- urban/peri-urban (Murrumujuk).

Darwin Converter Site

The Darwin Converter Site and Cable Transition Facilities on Gunn Point are on undeveloped Crown Land, which is subject to a Crown Lease in Perpetuity in favour of the NT Land Corporation. The Darwin Converter Site is near the designated urban/peri-urban area of Murrumujuk. Gunn Point Peninsula is considered Larrakia country and a popular hunting area for Larrakia, Wulna and Tiwi people, all of whom maintain customary connections to the shared areas around Gunn Point.

The land is identified for Future Development (Zone FD) in the LSLUP and therefore suitable for the intended development, subject to consent.

The land to the west is approved for development of a prawn aquaculture facility as part of Project Sea Dragon owned by the Seafarms Group. Further west is Gunn Point Beach, a popular recreation and camping area. South of the site is part of the Tree Point Conservation Reserve. The Jampalampi Tiwi, through the Durduga Tree Point Aboriginal Association, have freehold tenure at Tree Point (Durduga), 2.5 kilometres south of the Cable Transition Facilities.

Figure 8-1: Land near the proposed Cable Transition Facilities

Subsea Cable System

The Subsea Cable System will be operated under easement and licence arrangements with the relevant government entities.

Commercial fisheries in the northern waters off the Northern Territory coast and in Commonwealth waters are managed by the Northern Territory and Australian governments. The Northern Territory commercial fishery is relatively small, with 200 commercial fishing licences, 190 registered fishing vessels and an average harvest of 5500 tonnes per year of marine life. There are 15 Northern Territory commercial wild harvest fisheries, incorporating inshore and offshore fisheries. Most fisheries span the entire coastline, although some are restricted to specific regions.

The following information on active commercial fishing operations in the Timor Sea was included in a fact sheet produced by ConocoPhillips (2017, p 3) on the Bayu Undan pipeline:

> The Timor Sea is an active commercial fishing area used by both Australian and Indonesian fishermen. There are seven main Australian commercial fisheries operating in the areas surrounding the pipeline in Commonwealth Waters including: Northern Prawn Fishery, Timor Reef Fishery, Northern Territory Demersal Fishery, Northern Territory Spanish Mackerel Fishery, Northern Territory Shark Fishery, Western Tuna and Billfish Fishery, and Southern Bluefin Tuna Fishery.

8.2.6 Employment

The Northern Territory labour force as of September 2021 comprised 129,977 employed persons. Seasonally adjusted residential employment in the NT decreased by 0.4 per cent. Full-time employment increased by 2.2 per cent while part-time employment decreased by 8 per cent. The Territory's seasonally adjusted unemployment rate increased from 3.4 per cent in August to 4.2 per cent in September 2021. The participation rate was 70.9 per cent compared with 64.5 per cent for Australia (Department of Treasury and Finance 2021).

Young people in the Northern Territory account for a lower share of the labour force than a decade ago (13.4 per cent in 2020-21 compared with 17.7% in 2010-11). This reflects both the gradual ageing of the population and a decline in the participation rate of younger workers. The decrease in labour force participation and increased prevalence of part-time work for younger Territorians is partly related to the downward trend in the number of 15 to 24-year olds who are employed and attending full-time education, with year-on-year declines (Australian Government 2021). An Australian Government Local Jobs Program for Darwin and Alice Springs (Australian Government 2021) comments that young Aboriginal people face additional obstacles in successfully transitioning into adulthood, such as the effect of inter-generational trauma, racism and prejudice and socioeconomic disadvantage.

Tennant Creek

In 2016, 1,245 people in Tennant Creek reported being in the labour force. Of these, 70.1 per cent were employed full-time, 15.6 per cent part-time and 7.1 per cent were unemployed. Of the Aboriginal people in the labour force in Tennant Creek, 277 reported being employed either full or part-time, while 65 were unemployed. A total of 40.9 per cent of Aboriginal people in Tennant Creek aged 20 to 24 had attained Year 12 or equivalent or Certificate III or above (ABS 2016).

The Barkly Regional Deal (2020) reports that the main industries of employment in Tennant Creek are health care and social assistance (24.5 per cent), public administration and safety (19.8 per cent) and education and training (11.3 per cent). In 2018, there were 2829 jobs in the Tennant Creek area.

Elliott

The Northern Territory Government and Council are the main employers in Elliott, offering mostly administration or labouring positions. Just over a third of Elliott's population reports being in the labour force (125 people). Of those, just over a third (35.2 per cent) report being unemployed (ABS Quick Stats).

Interviewees suggested high rates of disengagement. In October 2021 an estimated 124 people were registered with Centrelink, about 95 of whom were seeking work (others were on various welfare payments). However, an estimated 100 people were not registered, mostly young people, highlighting the limitations of official participation rates.

8.2.7 Workforce and skills shortages reports and policies

Skills shortages was a frequent theme of interviews for the SIA, with employers and industry groups reporting national, Territory-wide and regional shortages as a key barrier to business growth.

Research by the Institute for Sustainable Futures (Clean Energy Council 2020) suggested that, in 2019, 72 per cent of renewables jobs were in development, construction and installation. Based on a survey, the report found skills shortages in the categories of construction and operations managers; civil, electrical and grid engineers; quality, health, safety and environment managers; and electrical trades and technicians:

> "Across the sector, but especially in large-scale renewable energy, policy uncertainty, the project-based nature of construction and installation jobs, remote site locations, and salary competition with other industries are proving obstacles to attracting and retaining quality workers. Renewable energy developers face difficulties recruiting workers with relevant experience in certain activities, and existing training systems are not meeting industry needs." (p.27)

The Clean Energy Council report is based on scenarios developed by the Australian Energy Market Operator (AEMO). A 'step change' scenario (which assumes policy commitments towards Australian decarbonisation in line with the Paris Agreement) suggests that between 2019 and 2025, the clean energy sector workforce could grow from 25,000 (about 10,000 in small-scale rooftop solar) to 44,000 people. The research predicted that by 2035 about 70 per cent of direct jobs in clean energy generation and associated supply chains would be distributed across regional and rural Australia. As the industry matures, the strongest demand is expected to be for electricians (13.6%) and electrical trade assistants (6.1%).

Research for the Clean Energy Council report pre-dated the COVID-19 pandemic. In 2020-21, there was regular media coverage and several reports released highlighting the challenges as Australia plans for post-COVID economic recovery. For example:

Table 8-3: Recent reports on skills shortages

Report	Year	Released by	Relevant points
Infrastructure Market Capacity Report	2021	Infrastructure Australia	Skills shortages are prevalent across the infrastructure workforce and are expected to reach unprecedented levels, "well beyond the sector's ability to service them". Major public infrastructure activity is expected to double in the next three years, peaking at $52 billion in 2023, when it is predicted that the infrastructure workforce will be 48% short of demand, a deficit of 93,000 people. There are 182,000 people working in the infrastructure sector in Australia. Smaller jurisdictions face higher risks for workforce retention. In the Northern Territory, 30% of the infrastructure workforce is working on public infrastructure
The National Roadmap for Indigenous Skills, Jobs and Wealth Creation	2021	National Indigenous Australians Agency	The national roadmap is a collaborative effort between governments, business and industry, the non-government sector and Indigenous Australians. It aims to enable enhanced economic opportunities and outcomes for Aboriginal and Torres Strait Islander peoples. An action plans covers skills development, better jobs outcomes and growing Aboriginal businesses.
NT Business and Skilled Migration Strategy	2021	Northern Territory Government	Migration NT in the Department of Industry, Tourism and Trade (DITT) is consulting on a new skilled migration strategy for the Northern Territory. Increased international migration was recognised in the NT Government's Population Growth Strategy (2018-28) as vital to population growth in the NT.
Skills Priority List	2021	National Skills Commission	The National Skills Commission was established in July 2020 to provide expert advice on Australia's labour market and trends in workforce skills. Its latest skills priority list reveals that one in five occupations in Australia is suffering from skills shortages, particularly in regional areas. The biggest gaps are electricians, carpenters, chefs, fitters, machinery operators, drivers, managers and community and personal service workers.

Report	Year	Released by	Relevant points
Future Made in Australia Skills Plan	2021	Australian Opposition	Leader of the Opposition, Anthony Albanese, in December 2021 released a skills plan focussing on addressing skills shortages with 465,000 free TAFE places, a $50 million TAFE Technology Fund, a $100 million New Energy Apprenticeships program and 20,000 new university places. Albanese claims that: . reduced TAFE places mean 85,000 fewer apprenticeships and traineeships in Australia than in 2013 . one in four Australian businesses is experiencing critical skills shortages.
2021 Construction Northern Territory	2021	Industry Skills Advisory Council	The construction industry in the NT for the past decade has been among the top five contributors to the NT's Gross State Product and employment. Between 2010-2020, the industry employed on average 10.3% of the NT's workforce and accounted for 10% of GSP. However, this had declined to 8.2% and 5.9% respectively in 2020. Recent stimulus packages and an industry boom has "resulted in acute workforce shortages and retention issues" (p.6). Key sectors of the construction industry are building construction (19%), heavy and civil engineering construction (5%) and construction services (76%). Only a small proportion employ more than 20 people. About two-thirds of the construction workforce is found in Darwin and 85% of workers are male. In 2016, 6.4% of the NT's construction workforce was Aboriginal, the highest in Australia. The key reasons given by stakeholders for workforce shortages were people lacked the skills (17% agreement), experience (15%) or were reluctant to relocate to regional and remote areas (14%). Occupations in demand are extensive (p.17), including most trades, building certifiers, licensed builders, quantity surveyors, truck drivers, civil engineers, work health safety managers and a range of civil skills.

Key recent media comments on infrastructure shortages:

- Mineral Resources chief executive Chris Ellison told The Australian in November that big resources producers are struggling to find workers in the Pilbara region, with competition from the East Coast creating a greater skills shortage than during the mining boom a decade ago (Williams, 2021)
- Infrastructure Partnerships Australia (IPA) chief executive Adrian Dwyer estimates a labour shortfall of more than 40 per cent will hamstring record investment in public and private infrastructure, compounding fears that workforce shortages will delay projects and increase costs for taxpayers. The IPA predicts national infrastructure expenditure will peak at $19.4B in the third quarter of 2024 and has called on the Australian Government to introduce a specific class of skilled migration visas for infrastructure (Maddison 2021).
- Tourism Central Australia chief executive Danial Rochford in May said tourism and hospitality operators were struggling to keep up, with 500 job vacancies unfilled in Central Australia (Emeck 2021).

8.2.8 Likely jobs with AAPowerLink

About 1750 jobs are expected to be generated during the Project's construction stage, from 2024 to 2029, with 350 jobs during the operational stage, from 2026 to 2089. Most of these jobs are expected to be at the Powell Creek Solar Precinct, as illustrated in Figure 8-2 below:

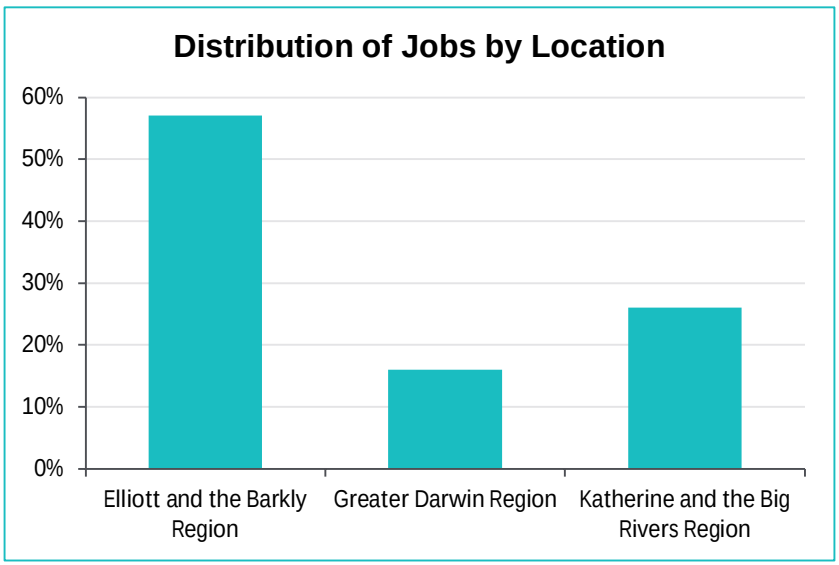

Figure 8-2: Distribution of jobs by site (source: Mark Stoyles Consulting)

Based on an analysis of AAPowerLink's construction workforce data (see attached Local Workforce Strategy for a detailed breakdown):

- 41 per cent of the construction workforce is likely to be machinery operators and drivers
- 36 per cent are likely to be technicians and trade workers
- 10 per cent are likely to be professionals
- 8 per cent are likely to be labourers
- 5 per cent are likely to be managers, clerical and administrative workers.

While AAPowerLink intends to source as many local workers as possible, local skills shortages would suggest many will be FIFO workers. AAPowerLink will establish an initial camp of about 200-250 rooms, then a workers' accommodation village with about 1000 rooms to cover the construction phase at Powell Creek.

8.2.9 Business counts

The Industry Capability Network (ICN) is a national organisation, with its NT office established in 1987. Its role is to work with procurement managers and project managers for major projects to identify suppliers capable of meeting project requirements, while opening up new opportunities to local suppliers. ICN developed and administers ICN Gateway, a major project portal designed to maximise the exposure of business opportunities and provide "full, fair and reasonable" opportunities, as defined by the Australian Industry Participation National Framework. The ICN Gateway currently has 4000 NT businesses listed and about 70,000 nationally. AAPowerLink has been listing packages of work for ancillary infrastructure and updates on Project Gateway at https://gateway.icn.org.au/project/4536/australia-asean-power-link-aapl

Sun Cable has engaged the ICN NT to conduct capability mapping of NT businesses against 145 scopes of work (see Appendix Y for the full report). This mapping was based on companies in ICN's database as of 6 December 2021. A high level summary of findings of the ICNT NT capability mapping:

- 1507 businesses were identified as having potential capability to fulfil one or more of the identified scopes
- 163 of the matched businesses identify as majority-owned Aboriginal businesses
- civil (231 businesses), construction (531), solar farm (826), fabrication (212) and electrical categories (442) were the categories with the highest capability
- Aboriginal-owned business enterprise capability was found across all categories to some degree, however construction, civil, professional services, and vehicles and industries were most common
- all categories had moderate to high capability across the Northern Territory
- 65 per cent of identified businesses are 'small', with a turnover of less than $10 million
- 24 per cent of identified businesses are 'large', with a turnover greater than $20 million.

While the majority of businesses are small (with turnover of less than $10 million a year), the Territory has several companies with experience of large, remote civil and construction projects. For example, ICN's mapping determined that:

- 67 per cent of civil companies were identified as small (turnover of less than $10 million), but 26 per cent were large (turnover of more than $20 million a year) and 12 per cent employed more than 200 people
- 72 per cent of construction companies were small, with 19 per cent categorised as large and 7 per cent employing more than 200 people
- 66 per cent of electrical companies were small, 25 per cent were large and 19 per cent employed more than 200 people.

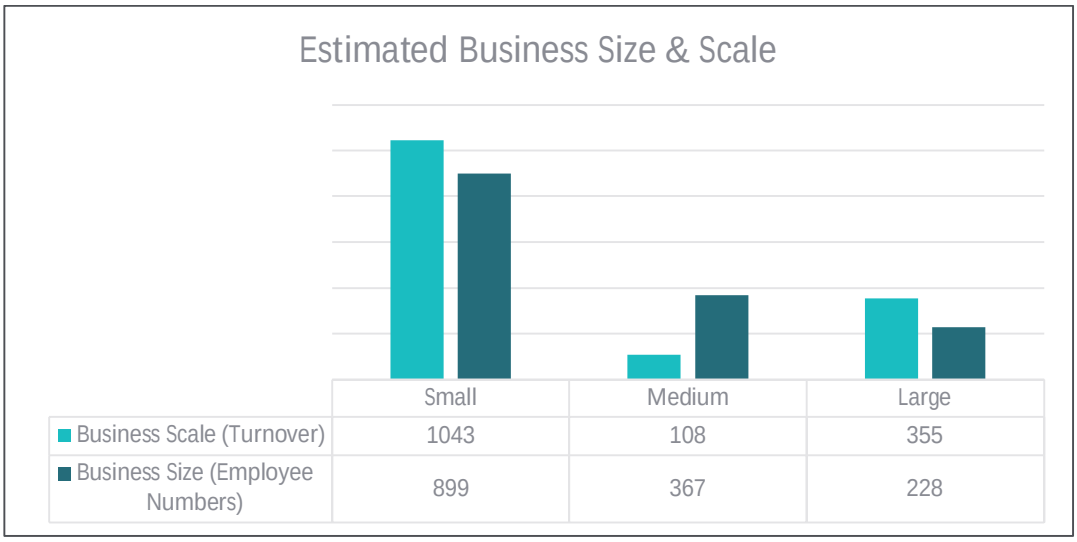

Figure 8-3: Estimated businesses and size (source ICN NT)

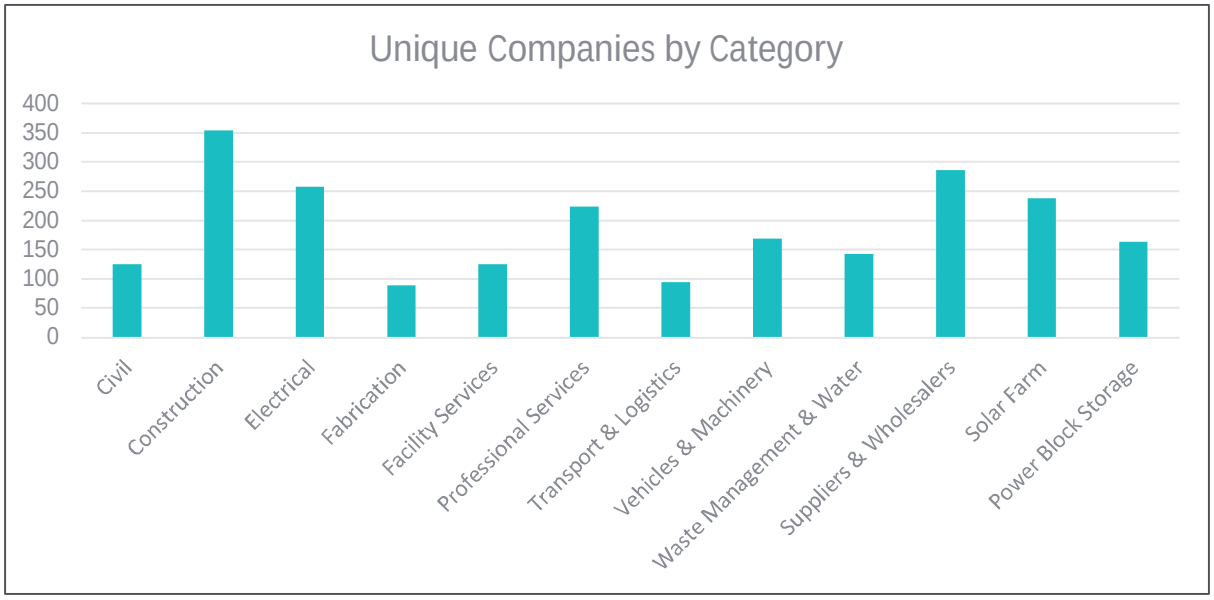

Figure 8-4: Unique companies by category (source ICN NT)

8.2.10 Project economics

PricewaterhouseCoopers Consulting (Australia) Pty Ltd (PwC) was engaged by Sun Cable to prepare economic modelling and present an analysis of the economic impacts of the AAPowerLink proposal in an *Economic impacts of the AAPowerLink to the NT and Australia* report (Appendix G). This report details the economic impacts (comprising both direct and indirect or flow-on benefits) of AAPowerLink on the national and Northern Territory economies, including impacts on:

- economic activity (GDP and GTP): a monetary measure of the value of all goods and services produced
- employment: the number of full-time equivalent (FTE) jobs
- household consumption: a monetary measure of the value of all goods and services purchased by households.

The economic impact of AAPowerLink was estimated by applying an economic impact assessment framework using Computable General Equilibrium (CGE) modelling. A base case (no AAPowerLink) and project case (AAPowerLink) were modelled from FY24 - FY69 and the difference reported as the net impact attributable to AAPowerLink. Key inputs including estimated capital costs, operating costs and the value of exports to Singapore were applied to the energy generation and transmission industries in the NT. Further details about the modelling and assumption are provides in the full report at Appendix G.

8.3 Key events or activities causing impacts

Key Project events and activities creating change processes with economic and employment implications include:

- tendering and procurement for goods and services
- agreement-making with Native Title Holders
- workforce development planning
- recruitment and training of local workforces
- mobilisation of workforces in Darwin and the Barkly.

8.4 Predicted impacts

Table 8-4: Potential impacts – Economies and jobs

Potential impacts – Economies and jobs	
Potential beneficial impacts	Potential detrimental impacts and residual ratings
EJ-1: Stronger Australian economy through contracts, stronger renewable energy (noticeable)	EJ-4: Frustration by businesses who fail to win tenders (medium)
EJ-2: Stronger and more diversified Territory economy by boosting manufacturing, industry, population, taxes (beneficial)	EJ-5: Businesses become overly dependent on the Project or renewables sector and over-invest due to unrealistic expectations of benefits during the construction phase (low)
EJ-3: Stronger and more sustainable regional economy through contracts, wages and economic diversification (transformational)	EJ-10: Failure to deliver on expectations of local jobs, due to lack of interest, skills shortages, poor work-readiness (medium)
EJ-6: Local businesses benefit from winning work and enhanced capabilities, including Aboriginal businesses and pastoralists (beneficial)	EJ-11: Reduced pastoral productivity around the Project site: grazing and mustering, through noise, dust, introduction of weeds, reduced access to bores and productive grazing land, erosion, leaving gates open (low)
EJ-7: Access to affordable, reliable power provides long-term social and economic benefits, sustains new economic sectors (transformational)	EJ-12: Reduced capabilities and productivity of other economic sectors because of loss of workers to AAPowerLink (medium)
EJ-8: Enhanced human capital and skills as a result of jobs and training over the lifetime of the Project (beneficial)	EJ-13: Crowding out or reduced productivity of other economic sectors, such as tourism, pastoral and horticulture (low)
EJ-9: Aboriginal jobs and training and legacy skills development as a result of the Project and community benefits package (transformational)	EJ-15: Inflationary effects on other businesses and economic sectors (low)
EJ-14: Enhanced labour force and skills from the relocation of spouses and partners of the construction workforce and management team (EJ-15)	

8.5 Impact assessment for economies and jobs

The AAPowerLink Poject offers substantial economic benefits for the Territory and Australia: from a visible economic stimulus during construction and operations to more enduring benefits such as population growth and economic diversification. As a utilities scale infrastructure project, the AAPowerLink Project becomes potentially transformational. Making available up to 800 MW of renewable electricity to Darwin could contribute to decarbonising existing networks and industry activity, attract industrial growth in sectors such as green manufacturing, hydrogen and data centres and reduce greenhouse gas emissions (see Section 10.5.4).

Strong NT Government and stakeholder support for the Project during stakeholder consultation for the EIS reflected the local, regional and Territory-wide social and economic benefits likely to be unlocked by the AAPowerLink by providing renewable energy to the Darwin region.

Across the spectrum of stakeholders, however, support was conditional on the extent of benefits retained in the Territory. President of the NT Chamber of Commerce, Karen Sheldon, has long experience in the Barkly. While enthusiastic about the project, she commented that gold mining has seen millions leave the region with nothing for the community but holes in the ground, a perspective echoed by stakeholders as diverse as the Warumungu Patta Group in Tennant Creek and the Environment Centre Northern Territory (ECNT):

> "ECNT's constituents have raised concerns that Sun Cable's project, despite its clear benefits in reducing global greenhouse gas emissions, may be just another extractive project in the Northern Territory that delivers benefits elsewhere" (submission to Terms of Reference, November 2020).

Support from the Arid Lands Environment Centre (ALEC) was equally conditional on the local distribution of economic benefits, including a more reliable Darwin-Katherine grid, potentially power to Tennant Creek, local manufacturing and the Project being incorporated into the NTG's electric 'super highway':

> "Too often large-scale developments in the resources and energy sector ignore the communities in which their projects are based. It is vital that local benefits in terms of jobs, investment and affordable energy are embedded into the project design, as well as ways the community can participate in the developmental process" (ALEC submission, November 2020).

For the NT Government and business community, tangible and enduring benefits must include local jobs and procurement, growing a renewable energy economy and skills development. Several stakeholders contrasted AAPowerLink's exports providing energy security to Singapore with the energy insecurity of many impoverished Aboriginal communities. As Tony Miles from Aninginyi Aboriginal Corporation explained, the image of Sun Cable will be influenced by the company's contribution to the lives of people living in poverty along the overhead transmission line route and by Sun Cable:

> "… being aware that this huge solar farm powering a super city thousands of miles away is almost science fiction. But all along that pathway are some of the most disadvantaged people in the world and those power cables… for the local person whose country it goes through, what is the image of Sun Cable? There is the big contrast between the super city, the science fiction and right in their pathway are Aboriginal people in terrible housing conditions who can't even get access to reliable power. You can see the image in your mind of what it looks like. A satirical cartoon of a township next to a super city all lit up."

The following section predicts and assesses the likely significance of potential positive and negative impacts of the AAPowerLink Project for economies and jobs, drawing on both quantitative data and qualitative stakeholder insights.

8.5.1 Stronger Australian economy through contracts, stronger renewable energy

At a national level, AAPowerLink supports key Australian Government economic goals, including a strong renewables sector, regional growth and a strong role for Indigenous Australians in economic growth. The Project aligns with many key strategies, including:

Australian Infrastructure Plan: The AAPowerLink Project provides a strategic fit with the 2021 *Australian Infrastructure Plan: A Roadmap for Infrastructure Reform*, including place-based outcomes for communities; sustainability and resilience; industry productivity and innovation; and an affordable transition to a net zero energy future.

Technology Investment Roadmap: The AAPowerLink aligns with this strategy to accelerate development and commercialisation of low emissions technologies.

Australia's Net Zero Emissions 2050: The AAPowerLink is a fit with this whole-of-economy plan to achieve net zero emissions by 2050 while preserving Australia's existing industry strengths, establishing Australia as a leader in low emissions technologies and positioning Australia's regions to prosper.

National Roadmap for Indigenous Skills, Jobs and Wealth Creation (National Indigenous Australians Agency): The AAPowerLink provides a mechanism for a long-term commitment to increasing economic opportunities for Indigenous Australians.

Nationally, the AAPowerLink is projected to increase GDP by $4 billion over the 46 years to FY69. While in some years there are negative impacts due to resources being diverted from other sectors, over the long-term, the project has a net positive impact on economic activity for the NT and Australia (Appendix G).

While the contribution of the Project is positive, the scale of change on a national scale was rated as BARELY PERCEPTIBLE based on construction activity being confined to the Northern Territory and all electricity being transmitted to Darwin or exported. This could increase to NOTICEABLE with expanded links to interstate energy grids in future.

8.5.2 Stronger and more diversified Territory economy by boosting manufacturing, industry, population, taxes

AAPowerLink provides a strategic fit with the Northern Territory Economic Reconstruction Commission (TERC) report (2020). This strategy is for a post-COVID economic recovery that would see the NT economy grow from $23 billion to $40 billion by 2030. The TERC forecast a shortfall of this target by about $5 billion. The AAPowerLink provides an opportunity to address this gap by providing utility-scale renewable electricity. The strategy also outlined the need for a "dramatically expanded role for renewables" alongside renewable exports, the creation of low emissions manufacturing and green hydrogen industries. By making available affordable, clean and stable electricity, the AAPowerLink can potentially support the NT's competitiveness in attracting growth industries such as green hydrogen, data centres and critical minerals processes (see Strategic Context at Section 3.6).

The PwC economic impacts modelling indicates a net positive impact on the Northern Territory economy, including stimulating economic activity, increasing employment and consumption of goods and services. Increased employment and project expenditure will drive growth in NT household consumption by up to $15 billion across the project lifespan. This equates to an average of $1.3 billion a year during the construction phase and an average of $190 million a year during the operation phase.

The PwC economic analysis suggests the impact of AAPowerLink initially will be observed through additional construction activity in the NT. These direct economic impacts will flow from capital expenditure (CAPEX) estimated at exceeding $30 billion and a concentration of employment at the Powell Creek Solar Precinct. Second round or flow-on effects occur as the supply chain of the energy industry is stimulated and as business and consumer demand is encouraged in the economy. AAPowerLink will create opportunities for businesses and suppliers and stimulate innovation and investment in Australia, especially the NT. The following are key findings from the report:

AAPowerLink Project will stimulate economic activity and raise aggregate demand in the NT economy. Real Gross Territory Product (GTP) and Gross Domestic Product (GDP) is projected to increase by $20.6 billion and $4 billion respectively, from FY24 to FY69 (Appendix G).

PwC economic impact modelling suggests that in FY28 (a representative year of the construction phase), the AAPowerLink has the potential to cause between 2-21 per cent reduction in economic activity in the NT sectors of Tourism, Manufacturing and Agriculture, Forestry and Fishing as employment transfers to the Construction and Utilities industries. Despite this redistribution of activity, the project is still a net benefit to Australia, increasing average annual employment by 1100 jobs (direct and indirect) nationally, and increasing economic activity by $24.6 billion (undiscounted) from FY22-69.

During FY48 (a representative year of the operations phase), modelling shows adverse economic impacts are negligible for all NT industries, and widespread positive economic activity is expected across most industries.

Sun Cable is preparing a Territory Benefit Plan and Regional (Aboriginal) Legacy Strategy with the aim of maximising local participation and benefits to the Territory (see Section 8.6).

The scale and duration of benefits are likely to be high, both because of the 70-year project life, breadth of energy-enabled development, tangible contribution to the NT's budgetary position and alignment with investment and population growth objectives. However, strong outcomes may depend on securing offtake agreements in the NT, which are being negotiated throughout 2022. Given a level of uncertainty and the many factors beyond Sun Cable's control, this opportunity is given a rating of NOTICEABLE, with the potential to be BENEFICIAL.

8.5.3 Stronger and more sustainable regional economy (longer-term) through contracts, wages and economic diversification

From a corporate perspective, local economic participation is seen as one means of maintaining a social licence to operate – or community acceptance - by giving communities a stake in economic development. From a community perspective, the participation of local businesses ensures benefits flow into communities. However, as Esteves and Barclay (2011) suggest, the extent to which local communities actually benefit will depend on their capacity to supply goods and services, the extent to which there is a local multiplier effect and the ability of communities to adapt to the inevitable changes that accompany large developments.

Maximising local participation, including agreements with Aboriginal businesses, may require partnerships with governments and support institutions. Proactive procurement may include higher preference ratings for local businesses, unbundling large contracts to create opportunities for smaller suppliers, requiring non-local suppliers to sub-contract or joint venture with local suppliers, investing in supplier development programs, mapping capabilities to determine which businesses would most benefit from opportunities and good engagement to build a supportive and sustainable business environment (Esteves & Barclay 2011).

The Project is likely to contribute to Barkly region economic development initiatives, particularly through workforce development and proactive procurement policies that build human capital and Aboriginal service and supply opportunities. Consultation suggested key success factors include an investment in understanding local business capacity, providing mentoring and support, good communication of opportunities, flexible tendering to suit local capacity, working with the ICN and industry bodies and holding Tier One and Two contractors accountable for local participation commitments by Sun Cable.

A key issue raised during stakeholder interviews is the 'boom and bust' nature of major projects. The need for large workforces and budgetary and timeline expediency mean legacy social and economic benefits might be bypassed by the 'sugar hits' of construction activity. Sustainability, or enduring benefits, is more likely to evolve incrementally as the project moves into its operational phase or provides businesses with the certainty to invest in growth.

Many business opportunities, particularly at a local scale in the Barkly, might be individually small but collectively substantial and should be based on local 'buy in'. Stakeholders suggested that emergent interest in Aboriginal economic development and services may grow from community development programs or Aboriginal enterprises providing services such as transport, labour hire, accommodation, catering and cleaning, art and furnishings, serviced offices, rangers and land management services, seed banks and waste management. A pipeline of projects would give businesses the confidence to invest in workforce development and equipment, guided by coherent planning frameworks such as the Barkly Regional Deal, which is factoring in other renewable projects, mines and onshore oil and gas.

Negotiated agreements that focus on enterprise development rather than cash payments have the potential to contribute to Aboriginal social and economic benefits in Tennant Creek, Elliott and the wider Barkly Region.

The scale and duration of change may be minimal initially. Longer-term, however, the operational phase of the Project provides boundless opportunities for intergenerational benefits, particularly when considered in conjunction with other projects planned for the Barkly. Therefore, this opportunity is assigned an initial rating of BENEFICIAL, rising to TRANSFORMATIONAL if opportunities are both made available and taken up. The availability of renewable energy for other projects in the Darwin region would enhance their viability, adding to sustainable regional economic development. Shared commercial opportunities with other development in the region would deliver cumulative benefits.

Strategies to achieve transformational change include proactive and capacity-building regional procurement, workforce development that strengthens regional skills (see attached), taking advantage of government support programs, having a strong local presence to build relationships with local businesses, collaboration with the Northern Territory Government to achieve its renewable energy goals and compliance with local participation goals outlined in Sun Cable's Territory Benefit Plan. Ongoing monitoring should include reporting on outcomes.

8.5.4 Frustration by businesses who fail to win tenders

Businesses may fail to win tenders because they are poorly prepared, cannot meet standards, cannot compete on price with larger interstate companies, are unaware of pending opportunities or perceive bias in the awarding or tenders.

There are high expectations of the Project, but also some cynicism by businesses based on negative experiences with other projects. Stakeholders cited examples of Tier One and Two contractors favouring existing supply relationships, not meeting commitments or not taking the time to understand the capacity and experience of local businesses, often operating in remote and harsh environments.

It was suggested that some local businesses may have the capabilities but not necessarily the capacity to deliver, may have no desire to grow or may not be able to meet the standards required of large projects.

In Katherine, stakeholders advised that local businesses were fully committed with the many projects on the drawing board and limited capacity to take on more work.

Based on comments from SIA interviews, this risk is assigned an initial rating of HIGH based on the likelihood of an expectations gap and potential risk to Sun Cable's reputation. This reduces to MEDIUM with appropriate mitigation.

Strategies to reduce the risk include: good communication with businesses and industry groups, including the Chamber of Commerce; ICN to provide accurate intelligence on local capabilities; accountability for local participation commitments in the Territory Benefit Plan and proactive planning to package tenders in a way that suits local capability.

8.5.5 Businesses become overly dependent on the Project or renewables sector and over-invest due to unrealistic expectations of benefits during the construction phase

Linked to the above risk is over-enthusiasm by businesses who invest in business growth or equipment in anticipation of opportunities that may or may not materialise, which can lead to insolvency, negative sentiment towards the project and reduced economic vitality from business failures. The literature provides examples from the rapid expansion of coal seam gas development in Queensland, where businesses invested in accommodation and housing near the end of the development cycle. There is sensitivity to the issue in Darwin, due to the scale of INPEX's Ichthys LNG project and rhetoric about the 'INPEX cliff' as construction activity declined, with a consequent decline in the fortunes of some local businesses.

The risk is likely to be most acute during the short-term construction phase. The long-term nature of the AAPowerLink Project and potential pipeline of work from other projects may help mitigate against this, as well as careful procurement to ensure businesses have the appropriate financials and business plans to make sound investment decisions. This would reduce an initial risk rating of MEDIUM to LOW.

8.5.6 Local businesses benefit from winning work and enhanced capabilities, including Aboriginal businesses and pastoralists

As outlined above, local industry participation will be a key expectation of government and regional business groups in both Darwin and the Barkly. Benefits from winning contracts, particularly those that provide long-term certainty, include business and workforce development, including critical mass to support local trade training. There is potential to build local Aboriginal enterprises to provide services and supplies.

Feedback from industry groups and ICN's capability mapping would suggest that the Territory has many companies with the civil and construction experience likely to be needed by the AAPowerLink Project. Some local companies already provide services to regional mining and pastoral companies, such as civil work, camp management and catering and retail services.

Industry groups such as the Northern Territory Chamber of Commerce are generally supportive of the project but want to see tangible benefits. For the Chamber, value for the Territory means the capacity to grow, including through skilled migration, rather than reliance on FIFO workforces.

The Northern Territory Chamber of Commerce and ICN suggested that Sun Cable will need to communicate opportunities well in advance so businesses have time to prepare.

> "Given there is still some uncertainty about the project proceeding, business needs to have confidence before they invest. It's a brave business that would invest in something before it occurs," says Chamber CEO Greg Ireland.

CEO of the Territory's Industry Capability Network (ICN) Kevin Peters concurred, commenting that interstate companies are often dismissive of local capabilities, have centralised procurement offices and use existing contractors without making the effort to understand local capabilities. It was important to be transparent and communicate with businesses so they are aware of opportunities and start planning, he suggested.

Other measures to maximise benefits include partnering with government programs, mentoring and business support, fostering joint ventures, capability mapping, having a local office, not imposing unrealistic targets, offering good terms of payment, respecting local experience and knowledge and proactive packaging of tenders to suit local capacities.

The manager of the Battery Hill Visitor Information Centre suggested there may be opportunities to provide niche tourism experiences for Project workers on their days off, such as independently run trips to historic mine sites or plans by Nyinkka Nyunyu to offer cultural tours based on a bush food experience. Karguru, part of Julalikari Council Aboriginal Corporation (JCAC), runs a seed bank and biodiversity register. It has partnered with the Juno training centre on a Food Ladder project, provides bush foods to local cafes, runs cultural tours and is providing plants to local landscaping and streetscaping projects.

The Renner Springs Desert Inn has potential to provide both accommodation and services such as catering, fuel and lay-down areas to store equipment in transit.

Julalikari Council Aboriginal Corporation runs a construction business, part-owns the local supermarket, and is looking to purchase more local businesses. The Chair of Julalikari, Linda Turner, stressed the importance of AAPowerLink 'buying local' and providing sufficient notice of procurement and training needs.

Several Aboriginal stakeholders commented that, rather than ex gratia cash payments, they wanted to see benefits payments invested in local trusts or corporations. The focus should be on economic development and community-owned ventures in Elliott, including accommodation, a community-owned store, an art gallery, tourism ventures and a local ranger group.

Many Aboriginal businesses want to remain small, to look after family and benefit from business hubs that can provide back office support, mentoring, bookkeeping, access to business growth advice, governance systems and support preparing tenders. The proposed Barkly Business Hub is being set up as part of the Barkly Regional Deal to provide a one-stop-shop to start ups or support existing businesses.

> "A lot of Aboriginal people want to start businesses. But at the grassroots, people just don't know what they don't know. The average person on the street doesn't know how to register a company, how to set up a governance structure. They need help managing invoices, doing their BAS… They need to be properly supported… at the grassroots level … walking side by side with them for the next five years… or you are setting people up to fail." (Steve Edgington, Member for Barkly).

The ICN has developed an online Aboriginal business locator, supported by the Power and Water Corporation. However, some Aboriginal groups commented on previous commitments to Aboriginal participation not being met. The Larrakia Development Corporation expects to see a genuine commitment to award contracts to Aboriginal corporations and compliance with commitments. Larrakia Nation Aboriginal Corporation wants to ensure obligations to Aboriginal participation cascade from primary contractors to ensure lower tier contractors are held accountable.

The opportunity for local business growth was given an initial rating of NOTICEABLE, rising the BENEFICIAL as the direct and indirect opportunities materialise, both directly with the Project and other economic development.

8.5.7 Access to affordable, reliable power provides long-term social and economic benefits in the Territory, sustains new economic sectors

As well as direct benefits, access to reliable, affordable power is likely to enable other projects and build new economic sectors. Consultation revealed high expectations of renewable energy delivering government's commitment to net zero emissions by 2050, while maintaining household, community and industry access to reliable, affordable energy. There was strong interest in how the Project would contribute to the reliability and security of the Darwin-Katherine Integrated Grid. Many stakeholders wanted to ensure that benefits for the Territory were commensurate with the undoubted contribution to Singapore's energy security.

The aim of the AAPowerLink is to provide dispatchable electricity at materially lower wholesale prices than the current average cost of gas-based electricity in the NT. Clean renewable electricity produced by the Project can reduce carbon emissions and contribute to net zero emissions targets under the Northern Territory's Climate Change Policy. AAPowerLink can improve the NT's competitiveness in attracting growth industries (such as green hydrogen, data centres and critical minerals process) by making available clean, renewable energy.

PwC's economic impact assessment (Appendix G) suggests AAPowerLink can provide stable renewable energy by providing 24/7 firmed (guaranteeing supply from other sources) renewable electricity and the proposed 36 gigawatt-hour (GWh) battery. AAPowerLink can also support a significant Australian export industry to Asia by meeting up to 15 per cent of Singapore's electricity needs.

This opportunity was given a rating of BENEFICIAL rising to TRANSFORMATIONAL, based on the potential extent, duration and scale of change to the Territory's fiscal position and government's strong policy commitment to investment attraction and renewable energy.

8.5.8 Enhanced human capital and skills as a result of jobs and training over the lifetime of the project

Economic impact modelling by PwC (Appendix G) predicts the average annual increase in employment in the NT will be more than 1200 jobs (FTE including direct and indirect jobs) from FY24-FY69, with an average of about 6800 (FTE, direct and indirect jobs) created during the construction phase alone.

There will be acute sensitivity to delivering local jobs and training outcomes given the Barkly's high levels of disadvantage and unemployment. Interviewees commented on the lack of longevity from Jemena's Northern Gas Pipeline Project, despite intense training activities.

Significant immediate benefits are unlikely, given the current skills shortages and recruitment challenges. However, skills shortages present an opportunity to deliver longer-term capacity-building by growing a skilled labour force, in turn contributing to business and population growth in Greater Darwin and the Barkly.

Enabling policies and activities include the Barkly Regional Deal's Jobs Strategy, many positive educational and business development activities and strong interest by Aboriginal groups in the Barkly and Darwin in contracts and business development.

Based on the likelihood, scale and longevity of opportunities, this is given an initial rating of NOTICEABLE. Intensive efforts will be need to turn opportunity into reality, which would increase the rating to BENEFICIAL.

8.5.9 Aboriginal jobs and training and legacy skills development as a result of the Project and community benefits package

The potential for transformational skills development of Aboriginal people and pathways from disadvantage to jobs and ultimately management positions is the greatest potential benefit of the Project but the most challenging to achieve. How to maximise the opportunities was a key focus of stakeholder feedback and is also addressed in the Local Workforce Strategy (attached to this SIA).

There is an enormous gap between chronic and often multi-generational unemployment and realising community and government aspirations to grow the Aboriginal workforce. Yet aspirations for real jobs were frequently expressed by Aboriginal people during consultation, particularly by community leaders wanting a better future for their youth.

Many non-Aboriginal residents of the Territory's regional towns are transient, have weak ties to their place of work and leave at the end of a job. Aboriginal people retain strong ties to country and family so are less likely to travel too far from kin and country when jobs are scarce. The Project creates a range of opportunities for local Traditional Owners and neighbouring groups to earn a living on their own country and build skills that can be applied to other projects.

Jobs may be created directly with construction contractors, indirectly throughout the supply chain, or as part of negotiated benefits agreements, such as community development and enterprises providing services to AAPowerLink. Stakeholders suggested a high level of interest in jobs on country, such as ranger groups, seed banks, investment in language and cultural services as well as civil work and trades. “Land management is the easiest job to get people into. We can offer conservation land management at June. Trade training centres offer trades. We could make fences for Sun Cable. Year 12s are doing Cert II in agriculture, helping with fencing, putting in water supplies, controlling weeds, looking after vegetation.” (Andrew Oliver, Juno Training Centre)

Figure 8-5: Juno Centre Tennant Creek

The greatest benefits are likely to accrue incrementally and will require initial small steps, mentoring and support, with the intergenerational aspect of the 70-year project seen as an opportunity to build an enduring legacy.

Stakeholders suggested the best employment outcomes will come from flexibility, strong mentoring, working with families and supporting businesses with a good track record of employing Aboriginal people, including Aboriginal businesses. For example, Aboriginal-owned PPP Contracting in Elliott was cited as “having a knack” for employing and retaining Aboriginal staff.

This opportunity is assigned an initial rating of NOTICEABLE, given that immediate gains are likely to be of short duration and scale. This would increase to TRANSFORMATIONAL should real multi-generational outcomes be achieved at an extent and scale commensurate with the opportunity. The gap between ratings reflects the breadth of the challenge (outlined in more detail in the Consultation Report at Appendix F and the Local Workforce Strategy).

Enhancement strategies include local participation plans and the good will, trust and relationships to deliver on commitments. Negotiated benefits such as Indigenous Land Use Agreements will need to be supported by a Local Workforce Strategy, mentoring and strong liaison in the field. Sun Cable’s Regional (Aboriginal) Legacy Strategy and Territory Benefit Plan outline a number of commitments for which Sun Cable will need to be held accountable.

8.5.10 Failure to deliver on expectations of local jobs, due to lack of interest, skills shortages, poor work-readiness

As with business expectations of contracts, there are likely to be unrealistic expectations of jobs, due to a lack of work-ready staff, limited understanding of what jobs entail and the many cultural and social barriers to work.

A study commissioned by Rio Tinto of its Pilbara region mining operations (Parmenter & Barnes 2021), found that workers' experiences in their first year was critical to retention. The key factors important to the retention of Aboriginal employees were:

- a culturally competent non-Indigenous workforce (the ability of individuals to work effectively in cross-cultural situations), including supervisors having an understanding and respect for the distinct cultural and historical backgrounds of workers
- culturally appropriate support mechanisms, including a positive 'on-boarding' experience to help new recruits settle into their roles and work environment and the comfort of fellow Indigenous workers
- access to professional development, with 79 per cent of Indigenous employees occupying entry-level positions and reporting that limited development opportunities were a key reason for leaving.

Stakeholders suggested barriers in the Barkly include a lack of incentive to work, peer group pressure and family and cultural pressures. Systemic barriers include overcrowded housing, poor literacy and numeracy, multi-generational unemployment, high drop-out rates from education and substance abuse. Other deterrents include a lack of transport, not wanting to commute to work, attendance at football carnivals and racism in the workplace.

> "If anyone in Tennant Creek wants work, there is work. If they want work, they are already working. It's about people who have never worked, and picking them up" (comment in stakeholder briefing).

It will be important to work collaboratively with service providers, communities and families to enhance good outcomes, create realistic expectations and find community-driven solutions Suggestions from stakeholders included:

- ensuring long lead times to get people work-ready
- flexible work arrangements, such as starting with a few hours a week to build skills and confidence
- culturally appropriate rosters (such as weekends with families, provision for cultural obligations)
- working with families to help them envisage what jobs are like
- a zero tolerance of racism, to provide comfortable workplaces
- careers advisers in schools
- more vocational and trade training, starting in schools
- on-the-job learning
- an online jobs portal and skills passport

- boarding schools closer to home
- helping to manage families issues, such as money management
- social enterprises to provide entry level jobs for the long-term unemployed (but high costs and drop-out rates need to be factored in).

The potential failure to deliver on expectations of jobs is considered a HIGH risk, which may reduce to MEDIUM with strong mentoring and support and implementation of AAPowerLink's Local Workforce Strategy.

8.5.11 Reduced pastoral productivity around Project site: grazing and mustering, through noise, dust, introduction of weeds, reduced access to bores and productive grazing land, erosion, leaving gates open

The Solar Precinct is on a working pastoral property in an area previously used for grazing cattle, while the railway corridor passes through many pastoral properties. Pastoralists will be sensitive to disruption from the Project.

Consolidated Pastoral suggests key risks include the introduction of 'seeds and weeds', any disruption to grazing and mustering from project activities, degradation or disruption to access tracks, any disruptions to mustering and project vehicles leaving formal access routes.

Newcastle Waters works with the NT Cattlemen's Association's Real Jobs Program and employs some Aboriginal staff from Elliott and Marlinja, but recruits most staff from interstate and doesn't expect to lose pastoral workers to the Project.

This risk was given an initial rating of MEDIUM. However, given that disruption should be short-term, of limited extent and easily mitigated, the residual rating is LOW.

Mitigation strategies include agreed communication protocols, codes of behaviour for workers, weed management (see Appendix Q) and responsiveness to any issues raised by pastoralists.

8.5.12 Reduced capabilities and productivity of other economic sectors through loss of workers to AAPowerLink

It is already hard to recruit to positions. Many businesses in the Barkly reported a reliance on FIFO and locum workers (including for management and administration positions), casual backpacker workforces and the Pacific Australia Labour Mobility (PALM) scheme. Many are struggling with the loss of these sources of workers and uncertain of the post-COVID environment.

There is likely to be competition for scarce workers given Barkly Regional Deal initiatives, local roads, oil and gas and potentially mining, particularly at the construction stage. Scarcity is likely to be compounded by national skills shortages and difficulties recruiting people to the Barkly (see 8.2.7 above). Workforce pressures can lead to inflationary pressures and reduce the capacity of existing businesses to provide services.

There will be sensitivity to this issue given the survival of businesses is contingent on reliable, suitably skilled workforces. The risk is therefore given a rating of HIGH, particularly during construction. This risk may reduce to MEDIUM longer-term as opportunities in the Greater Darwin Area and Barkly attract new workforces and a pool of Aboriginal workers develops.

A key mitigation strategy proposed by the Local Workforce Strategy (attached to this SIA) is for AAPowerLink to support local businesses to build their workforce capacity to participate in the AAPowerLink project, rather than compete with them for scarce workers.

Other mitigation strategies include working with other major economic infrastructure project proponents and the Barkly Regional Deal, to support a collaborative approach to workforce planning, recruitment and retention at the regional level across a pipeline of likely projects. Additional strategies include the next stage of workforce development planning and collaboration with bodies such as the Industry Skills Advisory Council of the NT to identify competencies, skills shortages and solutions.

8.5.13 Crowding out or reduced productivity of other economic sectors, such as tourism, pastoral and horticulture

In addition to labour market pressures, the Barkly is likely to be particularly sensitive to any impacts on the productivity of existing economic sectors. Productivity and livelihoods can be reduced through land use conflicts, particularly if there is progressive industrial development in the Barkly from agribusiness, mining, onshore oil and gas development and other renewable energy projects (dealt with in Section 13).

The project may cause detriment to existing local businesses, including loss of staff to better paid project positions, workers taking up flights and short-term accommodation, inflationary pressures or bringing large companies to the Barkly to compete with existing businesses.

Local business would benefit from contractors and workers using local accommodation, such as in Tennant Creek or at Renner Springs. However, the relatively limited supply of accommodation means capacity would be easily saturated, displacing both tourism and other workers.

The pressures would be more readily absorbed in Darwin, however, large numbers of FIFO workers at peak construction can put pressure on the cost of accommodation as well as intrastate and interstate flights.

This risk is assigned an initial rating of MEDIUM which would be reduced to LOW with appropriate mitigation strategies, such as accommodation and logistics planning to reduce disruption.

8.5.14 Enhanced labour force and skills from the relocation of spouses and partners of construction workforce and management team

A common theme in SIA interviews was that many people filling positions in the Barkly and Greater Darwin area have come to the Northern Territory as spouses or partners of other workers, including skilled migrants settling in regional areas. Thus, the relocation of families would likely address other skills shortages. As outlined above, however, a major barrier to population growth is housing scarcity.

This opportunity is given an initial rating of BARELY PERCEPTIBLE, which could rise to NOTICEABLE given collaboration with government campaigns to recruit families to the Territory and overcome barriers to their relocation.

8.5.15 Inflationary effects on other businesses and economic sectors

Inflationary effects are most likely at the construction phase of projects, where scarcity can drive up wages and the cost of goods. The Individual contribution of the Project may be less significant than cumulative impacts from the range of projects proposed for the Greater Darwin and Barkly Regions.

Such impacts are likely to be of short duration but consequential for local businesses, therefore this risk is assigned a MEDIUM rating. This would reduce to LOW with appropriate mitigation measures, such as working with the ICN, Barkly Regional Deal and NT Government to collaboratively plan for development pressures.

8.6 Mitigation and management

Four key over-arching approaches will help maximise economic and workforce opportunities arising from the AAPowerLink Project and minimise detrimental impacts on existing businesses and workforces. These will be refined in discussion with affected communities and key stakeholders over 2022 to ensure community involvement in decision-making:

- A Local Workforce Strategy (attached), which outlines pathways to skills development and jobs, a skills matching exercise and suggested collaboration with training providers closer to the start of construction
- Territory Benefit Plan covering the procurement of goods and services, employment and training, Aboriginal participation, strategic industry and economic opportunities
- Regional (Aboriginal) Legacy Strategy, which includes:
  - good engagement and input to decision-making (see Section 12)
  - culturally appropriate training and employment programs
  - growing Aboriginal businesses
  - community benefit funds and support for Aboriginal organisations and not-for-profits
- Indigenous Land Use Agreements and voluntary engagement agreements with Traditional Owners and Native Title Holders.

Specific ideas raised by stakeholders include:

- collaboration with ICN's Project Gateway to communicate and manage works packages
- good communication with industry groups and regional businesses to provide early information on opportunities, standards and procedures for tendering
- collaboration with the Barkly Regional Deal's economic and workforce development groups and other proponents in the Barkly and Greater Darwin Regions
- proactive packaging of tenders to suit local and regional capacity
- binding and enforceable commitments on Tier One and Two contractors to ensure workforce and procurement procedures align with Sun Cable's commitments
- reporting against key indicators such as the value of works packages and number and proportion awarded locally and to Aboriginal enterprises
- collaboration and co-investment in the Territory's renewable energy research and development capacity
- collaboration with industry and government skills development and recruitment planning and policies
- support and mentoring for small businesses
- worker codes of behaviour to ensure culturally safe workplaces
- management plans to reduce productivity threats to pastoralists, such as traffic and weeds management, accommodation and logistics planning (see Section 7)
- community investment that improves the liveability of regional towns.

9 Cultural identity

9.1 Overview

Cultural identity includes the arts and culture of the many heterogeneous communities in the footprint of the AAPowerLink Project. This includes Aboriginal culture, language, lore and law. However, the main purpose of this section is to examine how AAPowerLink might lead to largely unintended and intangible impacts on the enduring cultural connections of Aboriginal people to their land and seas.

Objects of the *Environment Protection Act (NT) 2019* include:

> 3(e) to recognise the role that Aboriginal people have as stewards of their country as conferred under their traditions and recognised in law, and the importance of participation by Aboriginal people and communities in environmental decision-making processes.

A key limitation of this section is the impediments to consultation with Aboriginal people specifically for the SIA as highlighted in Section 4 (above). However, the Heritage Impact Assessments, at Appendices T1 to T3), provide a comprehensive assessment of cultural heritage impacts as well as insights into Traditional Owners' enduring knowledge of and connection to their country. Substantial ongoing consultation is planned, both through the Northern Land Council (NLC) and to support Sun Cable's Regional (Aboriginal) Legacy Strategy.

Table 9-1: What is covered by Cultural Identity

What is covered by Cultural Identity	What the Terms of Reference asked for
Covers connections to country, cultural authority and respect for Aboriginal worldviews and cultural values. Cultural identity can be affected by reduced access to land and traditional livelihoods, damage to sacred or important cultural sites, threats to traditional leadership or dilution of shared values. This dimension also covers the shared culture and values of communities.	Culture and heritage Sacred sites and cultural and historical heritage may be impacted during construction of the proposed action. The significance of impacts is currently uncertain. • Key landowners, custodians, stakeholder, communities and other persons with overlapping or intersecting interests • Change or permanent land use restrictions • Direct and indirect disturbance to traditional and/or contemporary Aboriginal values, uses of land (eg hunting and ceremonial use) • Tangible and intangible impacts on cultural values and landscape due to cultural connection to country and potential disturbance to flora and fauna, ecosystems, landscapes and landforms from construction, operation or maintenance

9.2 Cultural identity – baseline data

Despite the effects of colonial settlement, dispossession, poverty, clashes over land and dispersal of Aboriginal people across the Territory, cultural identity remains strong, based on enduring connections to family and country. In many cases, cultural identity has been strengthened by recognition of land rights, reconciliation and treaty discussions, a strong Aboriginal visual and performing arts sector and growing involvement in land management, such as ranger groups.

For example, when Native Title rights were recognised for Banka Banka, Helen Springs and Powell Creek as part of a Consent Determination by the Federal Court of Australia in October 2020, Powell Creek Native Title Holder Mary Noonan commented:

> "This ceremony today links up our ancestors, the current generation and future generations. We'll remember this day in history. I've got tears in my eyes. I just cry because of my old people they didn't live to see this, the recognition today is just amazing." (NLC 2020)

The Papulu Apparr-Kari Aboriginal Corporation (Language Centre) has a strong presence throughout the Barkly, including Elliott, and has worked on several projects to revive language and traditional ecological knowledge, including dictionaries and books in collaboration with elders. This includes the co-production of a book on biocultural and language knowledge of the Jingili and Mudburra people regarding plants and animals in the region around Elliott and Marlinja by Traditional Owners, linguists and a biologist in 2015 (Raymond et al., 2015, p. 12).

> Jingili country runs through what is now called Beetaloo Station and also includes parts of OT Downs Station and Newcastle Waters Station. It extends roughly from the town of Daly Waters in the north to Powell Creek in the south. It includes most of the drainage of Newcastle Creek, Longreach Waterhole, Lake Woods and Elliott.
>
> Mudburra country occupies a large area to the north-west of Elliott. It runs just to the west of the Stuart Highway, starting near Daly Waters in the north and stretching just south of Elliott. It includes the Murranji Aboriginal Land Trust, the Murranji outstation and stock route, and the Buchanan Highway in the north. Mudburra country includes a length of the dry, open country which is the northern part of the Tanami Desert.
>
> The majority of Jingili (people who speak Jingulu) and Mudburra people have lived for the last few generations in and around the town of Elliott, including Marlinja and Newcastle Waters, and on Beetaloo, Murranji and Ucharonidge stations. Jingulu and Mudburra people now live throughout the central Northern Territory from Tennant Creek to Katherine (p.12).
>
> For the past one to two hundred years, the Jingili have lived with speakers of Mudburra who moved into the area from further west, sharing customs and ceremonies. Most, but not all, Jingulu speakers can also speak the local dialect of Mudburra (p.26).

The book contains rich descriptions of plants and animals in the region, cultural knowledge associated with them – including hand signs for plants and animals - and their use for food, tools, medicines, art and stories of the seasons.

The Solar Precinct is on Warlmanpa Country, about 70 kilometres south-west of Elliott. The Heritage Impact Assessment describes knowledge shared by five Traditional Owners who were part of the cultural heritage survey team. As noted by Earthsea (2021, p.68) Warlmanpa Country as a whole should be considered a significant cultural landscape, given its spiritual importance to Warlmanpa and other Aboriginal people who have had a long history with the region. The Heritage Impact Assessment (Earthsea 2021, p.20) reports comments by Traditional Owners that the Solar Precinct contains and number of dry claypans and drainage depressions, which would hold water after heavy rain, including subsurface water. Given the ephemeral nature of water resources within the Precinct, Traditional Owners indicated the area would traditionally have been considered a high-risk environment to traverse except after heavy rain. To avoid repetition, and to respect the context in which knowledge was shared with Earthsea, this section of the SIA should be read in conjunction with the Heritage Impact Assessment at Appendix V.

The Project footprint from Powell Creek to Murrumujuk and Shoal Bay out to the Timor Sea passes through a range of tenures including Native Title determinations, land under Native Title claim and Aboriginal Land Trusts. The Overhead Transmission Line crosses Larrakia country to Murrumujuk on Gunn Point Peninsula, which is a region of cultural, social and historical significance to Aboriginal groups including Larrakia, Tiwi and Wulna people of the Adelaide River floodplains. These groups maintain important customary ties to Murrumujuk and use the area for hunting, gathering and recreational uses (Earthsea 2022).

9.3 Key events or activities causing impacts

Project activities or events that could lead to changes that may impact on cultural identity.

- land clearing, access roads and other ground-disturbing activity damaging sacred sites, heritage or culturally significant sites and landscapes and seascapes
- employment in a predominantly non-Aboriginal workforce
- living away from family reducing the ability to meet cultural obligations
- reduced access to country important to sustenance and cultural identity
- reduced access to sites that are important to for cultural activities and passing on knowledge
- increased access to heritage and cultural sites by outsiders as a result of improved roads and workers living at the Solar Precinct.

9.4 Predicted impacts

Table 9-2: Potential impacts – Cultural Identity

Potential impacts – Cultural Identity	
Potential beneficial impacts	Potential detrimental impacts and residual ratings
CI-4: Enhanced cultural identity by using ranger groups and cultural services (beneficial)	CI-1: Loss of cultural heritage due to damage or reduced access, including fears and anxieties of damage to sites or custodians' responsibilities (high)
	CI-2: Reduced values, cultural and spiritual connections to land and seas through reduced access or physical changes (medium)
	CI-3: Reduced ability to engage in traditional hunting, fishing, camping, foraging, gathering art materials, bush medicines or other livelihood activities (low)
	CI-5: Reduced ability to pass on culture, traditional knowledge, undermining of cultural authority due to loss of cultural heritage or access (low)
	CI-6: Loss or damage to declared or valued European heritage sites disturbed by Project activities (low)

9.5 Impact assessment for cultural identity

9.5.1 Loss of cultural heritage due to damage or reduced access, including fears and anxieties of damage to sites or custodians' responsibilities

Loss of sacred or culturally significant sites is a sensitive issue for Traditional Owners in the entire Project footprint, with fears expressed in several meetings about damage to sacred sites. Any damage would be permanent and deeply felt, as occurred at the nearby Bootu Creek Mine (OM Manganese was fined $150,000 in 2013 for desecrating the Two Women Sitting Down sacred site, part of which collapsed into a pit).

While sacred sites and registered heritage sites have legislative protections, many other cultural and historic sites remain significant because of their ties to the past or enduring culture of affected groups.

Cultural sites are often associated with surface water features such as creeks and waterholes which sustained life. Associated dreaming stories were a way of passing on social, cultural and ecological knowledge essential to the survival of Aboriginal people in a harsh environment over thousands of years.

There are many Larrakia and Tiwi cultural sites around Darwin Harbour and on Gunn Point Peninsula, including Tiwi burial sites in dunes along the foreshore and throughout the peninsula. During consultation, Tiwi people asked about potential damage from seismic tests or trenching for the subsea cable to underwater culturally significant sites as well as submerged landscapes, as well as to dreaming sites on the neighbouring Vernon Islands.

Given the sensitivity and irreversibility of lost or damaged sacred or culturally important sites, this risk is assigned an initial rating of CATASTROPHIC. The most important mitigation strategies are cultural heritage management plans (covered in the separate Heritage Impact Assessment), working with custodians, obtaining Aboriginal Areas Protection Authority Certificates and conditions in negotiated Indigenous Land Use Agreements (ILUAs) on cultural protections. AAPowerLink has already reconfigured aspects of the project's footprint in discussion with Traditional Owners to avoid sensitive areas. Strict adherence to management plans would reduce the risk rating to HIGH. Further mitigation would include cultural awareness training, cultural monitors for any ground-disturbing work, cultural protocols and visible signage for any restricted works areas.

9.5.2 Reduced values, cultural and spiritual connections to land and seas through reduced access or physical changes

Cultural values go beyond archaeological and heritage protection and include intangible cultural values and connection to country, as told through Dreaming stories, dance and art. Culturally valued species may be different to scientifically valued or threatened species. Their loss may reduce the ability to hunt for goanna or gather medicinal plants.

Larrakia and Tiwi people maintain strong cultural values to Darwin Harbour and its surrounds. The Darwin Harbour Strategy (2003, p.5) notes that:

> Larrakia people maintain an innate connection to the land and sea in the region. Cultural, spiritual and heritage sites of significance are located throughout the region where traditional harvesting remains an important practice to the Larrakia people.
>
> Larrakia people continue in their traditional use of natural resources in the Darwin Harbour region. In the recent past, Larrakia enjoyed everyday consumption of the bountiful food resources from the land and sea; bush tucker and medicine could be found everywhere, such as mangrove worms (*Darla*), long bums (*Danijarra*), fish, mud crabs, ducks, magpie geese (*Gakingga*), wallabies, possums, goannas and turtle eggs.

The Wulna people have strong connections to the Black Jungle Conservation Reserve on Gunn Point Peninsula. As noted by the Adelaide River Conservation Reserves Joint Management Plan (Parks and Wildlife 2004, p.1):

> The wetlands and associated landscapes include sites and landscapes of ritual, mythological and spiritual significance to Wulna Traditional Owners, and they have long been a source of abundant traditional foods, medicines and other resources for them.
>
> … The Reserves are living cultural landscapes which include sacred sites and dreaming trails that cross the broader Adelaide River area linking places and people. Aboriginal archaeological sites, mainly shell middens, are also located in the Reserves. These sites and the associated knowledge and traditions, demonstrate the long and significant connection Traditional Owners have with this area.

Cultural values could be affected by land clearing, changed land use and reduced access to areas of cultural importance, such as dreaming tracks, ceremonial places, campgrounds and travel routes that may not be covered by legislative protections. The Heritage Impact Assessment suggests activities that could impact on cultural heritage include substantial ground-disturbing activities, roadworks, environmental drainage works and ongoing maintenance over 70 years (see Earthsea, 2021, p.48).

This risk is given an initial rating of HIGH given the sensitivity of Traditional Owners to loss of cultural values, reducing to MEDIUM with respect, understanding of the potential risk and good management. Some impact is unavoidable, however the current Solar Precinct alignment was agreed by Senior Traditional Owners as offering the least impact to culturally important areas. AAPowerLink has agreed to realign some access corridors to avoid cultural heritage features (Earthsea, 2021).

Further mitigation measures would include cultural awareness training and inductions of staff, respect for cultural values and traditional knowledges, cultural monitors and culturally appropriate engagement throughout the project.

9.5.3 Reduced ability to engage in traditional hunting, fishing, camping, foraging, gathering art materials, bush medicines or other livelihood activities

Project activities and reduced access may have a negative impact on livelihoods and cultural activities such as fishing, camping, foraging, gathering art materials or bush medicines.

Hunting for goanna, kangaroo and other species is a common and important activity for Barkly Traditional Owners who would be concerned if access to country, in particular hunting areas, was reduced, both during construction and operations. The abundance of species could be affected by improved access roads bringing people into the area, by workers (including Aboriginal workers living in the accommodation village) using the chance to go hunting after work, disturbance of habitat or as a result of dust from project activity. This issue was a concern raised during consultation.

For Larrakia and Tiwi people, impacts on fishing and foraging around Darwin Harbour is considered unlikely due to the limited scale of marine activities, particularly with the relocation of parts of the project from Middle Arm to Murrumujuk (see Chapter 10 on Marine Ecosystems).

This risk is given a MEDIUM rating, reducing to LOW if the mitigation strategies outlined above are adhered to.

9.5.4 Enhanced cultural identity through support of ranger groups and cultural services

Contracted services to AAPowerLink may provide the added bonus of working on country, while enhancing cultural values. In the Barkly, this could include land management and rehabilitation or opportunities for enterprises such as passing on biocultural knowledge, seed collection, nurseries and landscaping. Larrakia and Tiwi people have strong land and sea ranger groups. Interviewees suggested that land management jobs were the easiest to fill (see 8.5.9), while

Traditional Owners expressed pride in jobs that allowed them to work on country. These services could evolve from community development projects or local enterprise development, with more flexible working hours more likely to match cultural obligations. Longer-term, land management may provide commercial and training opportunities. An additional advantage is that land and sea management jobs are equally attractive to men and women.

The Papulu Apparr-kari Aboriginal Corporation (Language Centre) has been working with Jingili and Mudburra people to capture biocultural knowledge held by elders. Initiatives under Sun Cable's ongoing engagement and Regional (Aboriginal) Legacy Strategy may strengthen culture, such as working with the multimedia centre at Elliott school on communication materials for the project, cultural training, interpreter services or Sun Cable's investment in community organisations.

This opportunity was given an initial rating of NOTICEABLE which could rise to BENEFICIAL with proactive efforts to invest in cultural services and involve ranger groups in land management, environmental services and rehabilitation, in turn contributing to the retention of biocultural knowledge for future generations.

9.5.5 Reduced ability to pass on culture, traditional knowledge, undermining of cultural authority due to loss of cultural heritage or access

Cultural ties can be threatened in many ways, including the need to adapt to a new workplace culture, less time for family and ceremony, reduced ability to pass on cultural knowledge and new forms of governance and leadership undermining elders' cultural authority.

This risk is linked to those outlined above, occurring through reduced access, having to adjust to a new dominant culture in the education system and workplace and reduced time for cultural obligations.

It is assigned an initial and residual risk rating of LOW, mainly because many other factors will likely contribute to the loss of cultural knowledge. Sun Cable has committed to the use of intergenerational cultural monitors. Other mitigation strategies would include cultural awareness training and discussion with communities on potential programs to support the retention of cultural knowledge. These activities could be sponsored by Sun Cable as part of its Remote (Aboriginal) Legacy Strategy.

9.5.6 Loss or damage to declared or valued European heritage sites disturbed by Project activities

The Solar Precinct and transport route follow the path taken by early settlement and transport, so reflects substantial European heritage: the Overland Telegraph line and telegraph stations, early stock routes, the Stuart Highway, World War II logistics, the route of the Old Ghan and new AustralAsia Railway and Amadeus gas pipeline. There are old homesteads and remnants of early settlement near the Solar Precinct, including the heritage-listed Powell Creek telegraph station and the 'ghost town' at Newcastle Waters (see Section 4.3 of Earthsea's Heritage Impact Assessment for valuable historical background). In the Top End, heritage sites identified by Earthsea include World War II airfields and an 1887 high level railway bridge.

Stakeholders suggested that heritage sites could be negatively impacted by increased visitor activity, accidental damage during ground disturbing work or vandalism by workers. The former Powell Creek Telegraph Station has both European and Aboriginal heritage significance, having served as an important rations station and refuge for Aboriginal people displaced by mining and pastoral activity in the Tanami. This issue is also covered in the Heritage Impact Assessment.

For the SIA, the initial risk rating is MEDIUM reduced to LOW with appropriate mitigation and management, including a cultural heritage management plan to be developed in 2022 as part of the EIS Supplement (see Earthsea 2021), high awareness of the significance of heritage and historic sites and codes of behaviour for workers. There may be opportunities to sponsor heritage restoration projects, although the Consolidated Pastoral Company cautioned that this should be in consultation with land owners.

9.6 Mitigation and management

The most relevant mitigation measures in this section are contained at Section 8.3 of the Heritage Impact Assessment, including cultural heritage management plans (CHMPs), the importance of Authority Certificates under the *Northern Territory Aboriginal Sacred Sites Act 1989 (NT),* access protocols for Traditional Owners and cultural awareness training during workforce inductions (see Appendices 8 and 16).

In determining the Solar Precinct footprint, Sun Cable took advice from Traditional Owners and reconfigured proposed boundaries to ensure activities have the least possible impact.

Sun Cable is preparing a Regional (Aboriginal) Legacy Strategy that covers a benefits sharing approach. The strategy includes several measures under 'cultural recognition', including:

- a Reconciliation Action Plan, with the guiding principles of respect, trust and transparency
- funding to support connection to country programs
- acknowledging neighbouring clan groups who may not have Native Title rights to the Powell Creek site
- a commitment to cultural inductions for all staff entering the project area and cultural awareness training for all Territory Project staff
- voluntary land use agreements (negotiated through land councils) and a Larrakia Engagement Agreement.

10 Healthy country

10.1 Overview

While other sections of the Environmental Impact Assessment (EIS) cover potential impacts on biodiversity and environmental protection and conservation, this section of the SIA looks at the issue from the perspective of how people value and use healthy country and seas. This is sometimes described as nature's contribution to people or ecosystem services: the contribution of the living natural environment to the basic needs of humans for fresh air, food and water as well as resource-based livelihoods and quality of life issues such as recreation, art and sense of place (Diaz et al., 2018). It is people's reactions to loss of the living natural environment, and iconic or totemic species, that often generates opposition to projects. For example, the cultural values of Lake Woods and nearby outstations - such as Jangirulu, about 20 kilometres east of the Solar Precinct - contribute to the strength of culture and ability to pass on knowledge and continue important cultural activities for the Jingili, Mudburra and Warlmanpa people. In rural residential areas, it is the large rural blocks, landscapes, lower density living and natural environment that are integral to fiercely held values. Values influence the way that people perceive and judge reality, truth and knowledge in ways that may differ from mainstream science (Pascual et al. 2017).

Table 10-1: What is covered by Healthy Country

What is covered by Healthy Country	What the Terms of Reference asked for
Healthy land and seas covers values associated with the use and enjoyment of the natural environment. This is sometimes described as socioecological systems or 'ecosystem services', which are the commercial, cultural, recreational and aesthetic benefits, goods and services we derive from the use of our land, clean air and water.	• Adaptation for climate change in design proposal and options • Alternatives for land use after closure, including the biological, cultural, economic and social viability of options, including disposal of solar panels • Marine environmental quality: any temporary impacts to fishing, recreation, industry use of the harbour during construction • Direct and indirect impacts to recreational and commercial areas and industries include Lake Woods, Gunn Point Peninsula and offshore areas (eg fisheries)

10.2 Healthy country – baseline data

The project footprint passes near a number of conservation areas valued by stakeholder groups, including Aboriginal people. Some of these sites are described below.

10.2.1 Powell Creek Solar Precinct

Lake Woods, Longreach Waterhole and Newcastle Creek

Lake Woods, 220 kilometres north of Tennant Creek, is the largest freshwater lake in the Northern Territory. Lake Woods is west of the Stuart Highway and about seven kilometres south of Elliott. It includes the lower reaches of Newcastle Creek, including two near-permanent waterholes (Longreach and South Newcastle), and a delta of distributary channels. Surface inflows are variable, with occasional major floods (including in 1993, 2001, 2006 and 2016). Longreach Waterhole is fenced and maintained by Newcastle Waters on behalf of Parks and Wildlife.

> When conditions are suitable, the lake supports more than 100,000 waterbirds including internationally significant numbers of Plumed Whistling Duck. The shrubland and wooded habitats provide breeding sites for several colonies of waterbird species, including egrets, cormorants and spoonbills. Large numbers of shorebirds also use the lake for migration stopover, and the near permanent waterholes in Newcastle Creek are an important refuge for many species during the dry season (Raymond et al., 2015, p.15).

Lake Woods and Newcastle Waters Creek featured in a campaign by local Aboriginal people against hydraulic fracturing, because of fears of contaminated waters running into the lake. Traditional owner Ray Dixon told environmental campaigner Lauren Mellor (2019):

> The survival of our people and our culture relies on keeping that water healthy. We may not have much in the way of legal protections, but my people cherish this country, it's like a diamond to them. We'll do whatever it takes to protect it.

Longreach Waterhole is a conservation area and popular spot with local people for camping, fishing and swimming (Raymond et al., 2015). Raymond Dixon's submission to the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory (2019), stated:

> Our songlines are carried through the underground and surface waterways. Our songlines are *ngurramarla* which means it carries the spirits of our old people to be passed on through the generations. This is a cycle that keeps alive…We have to maintain the health of the waterways. That water is alive through the song line. If that water isn't there the songlines will die too…

Mr Dixon said Aboriginal people share skin names with all the birds in the area that give them their place in country. Lake Woods is a significant feature for the Warlmanpa, Mudburra, Jingili and other groups who visited the site seasonally for ceremony, resources and trading (Earthsea 2021)

10.2.2 Transmission line

Yinberrie Hills

The Yinberrie Hills area is about 40 kilometres north of Katherine and is a key site in northern Australia for the nationally endangered Gouldian Finch. Yinberrie Hills is a national Site of Conservation Significance.

The Jawoyn Aboriginal Corporation and the NT Parks and Wildlife Service conduct annual fire management and pig control programs in the area and Parks and Wildlife conduct annual surveys of the Gouldian Finch populations around waterholes in the hills (Pavey 2009).

Arnhem Plateau Sandstone Shrubland Complex

The Arnhem Plateau Sandstone Shrubland Complex is an ecological community of national conservation significance comprising mostly native shrubs, grasses and animals living in rock country. It is a vital habitat to a large number of plants and animals and is protected under the *Environment Protection and Biodiversity Conservation Act (Cwlth) 1999* (EPBC Act). The area extends through the central top end region of the Northern Territory, with some of the ecologically significant species marked as likely to occur in locations between Pine Creek and Mataranka (Australian Government 2011).

Black Jungle Conservation Reserve

The OHTL will run alongside the western perimeter of the Black Jungle Conservation Reserve and cross through the south-western corner of the reserve. The Black Jungle Conservation Reserve is part of the Adelaide River Coastal Flood plain system and jointly managed by the Northern Territory Government and the Traditional Owners, the Wulna people. Access to the area is restricted except by permit for research or collection of crocodile eggs (Northern Territory Government 2014). The Adelaide River Coastal Floodplains are considered to be of national and international significance (Department of Lands, Planning and the Environment 2015).

The OHTL runs north through areas designated in the Litchfield Subregional Land Use Plan 2016 (2020) as open space/natural area and through a mangrove/conservation area before intersecting with Gunn Point Road.

Shoal Bay Coastal Reserve

The OHTL will run parallel to Gunn Point Road along the eastern edge of Shoal Bay Coastal Reserve and north-west towards Murrumujuk. The Shoal Bay Coastal Reserve protects a large coastal area bordered by Gunn Point Road, including large areas that are culturally significant for the Larrakia people as well as important wildlife habitats. There are 1000-year old shell middens on higher ground near the swamps. The area is used by Darwin and surrounding residents for bird watching, wildlife watching, hunting (magpie geese and waterfowl) and fishing (Northern Territory Government 2021).

Howard Swamp and Shoal Bay Coastal Reserve make up half of the hunting reserves available for waterfowl and pig hunting permit holders (Northern Territory Planning Commission 2020).

10.2.3 Gunn Point Peninsula

Tree Point Conservation Reserve

A Northern Territory Parks and Wildlife fact sheet on Tree Point Conservation Reserve (2020) provides the following description of the reserve:

> Tree Point Conservation Area protects a coastal strip of Shoal Bay on the Tree Point Peninsula and a large mangrove habitat with a tidal creek, which runs towards the Shoal Bay Coastal Reserve. The area is fringed by coastal vine thicket and a swampy floodplain, which hosts a number of bird species at various times of the year.

The OHTL doesn't travel through or near the reserve, but the Darwin Converter Site and Cable Transition Facilities will be to the north-east. Some stakeholders expressed sensitivity to any intrusion into the area by project activity and workers.

Figure 10-1: Tree Point Conservation Area

10.2.4 Darwin Harbour/Offshore

Oceanic Shoals Marine Park – Commonwealth

The Oceanic Shoals Marine Park is part of the Australian Marine Parks in the North Network, established in 2012 to protect the region's marine ecosystems and biodiversity. It is in Commonwealth waters, along with seven other marine parks off the coast of the Northern Territory (Parks Australia 2018). The Oceanic Shoals Marine Park is west of the Tiwi Islands and about 150 kilometres north-west of Darwin. The park covers more than 70,000 square kilometres and extends to the limit of Australia's exclusive economic zone.

The Marine Park was proclaimed under the *EPBC Act* on 14 December 2013 and renamed Oceanic Shoals Marine Park in October 2017. It is the largest marine park in the North Network, the network of marine parks off the coast of Queensland and the Northern Territory. Water depths vary from 15 to 500 metres. Commercial fishing and mining are key activities in the park (Parks Australia 2018). It has no international or national heritage listings. The marine park supports rich fish life and habitats and has various zones:

- national park (small section north-east of Bathurst Island)
- habitat protection (in the zone directly east and north-east of Bathurst Island)
- multiple use (south-western section and north-eastern section)
- special purpose -trawl (central section, east of the national park and habitat protection zones) (Parks Australia 2018).

Each of the zones has specific rules around different activities including for commercial fishing activity, commercial shipping, pearling, tourism, mining and numerous other activities (Parks Australia 2021)

10.2.5 Aboriginal Ranger programs

Larrakia Rangers

The Larrakia Ranger program is an initiative of the Larrakia Nation Aboriginal Corporation. Larrakia Rangers work on Larrakia land and sea country in the Greater Darwin region, Cox Peninsula and Adelaide River. The Larrakia Rangers' commercial work includes weed and erosion control, revegetation, fencing, signage and boardwalks, crocodile monitoring, fish surveys and water quality sampling ties (Larrakia Nation n.d.).

Larrakia Rangers also work on priority projects at sites with cultural and natural heritage significance to local Aboriginal people, including an ongoing weed clearance and revegetation project at Tree Point, various ranger activities at Tree Point and clean-ups at Gunn Point Beach. Rangers take monthly air samples from the Northern Territory Baseline Atmosphere Pollution Station at Gunn Point, as part of a collaboration with CSIRO (Ashton 2019).

Tiwi Rangers

The Tiwi Marine Ranger Program was established in 2001 as the first Aboriginal Marine Ranger Program in the Northern Territory. Traditional Owners wanted a more active role in sea country management due to concerns about illegal fishing, the arrival of foreign vessels and management of significant marine and seabird habitats. The Tiwi Marine Rangers work in conjunction with the Northern Territory Government and Australian Government on areas such as coastal surveillance. Their activities include coastal surveillance patrols, marine debris surveys and other activities along the coastal areas. In 2019, the Tiwi secured funding for an Indigenous Protected Area (IPA) covering 750,000 hectares of the Tiwi Islands, including the Vernon Islands.

In April 2021 the Australian Government announced a $100 million initiative to protect Australia's oceans. This includes $11.6 million over two years from 2021 to 2022 to incorporate Sea Country in Indigenous Protected Areas in nine locations. (Australian Government 2021).

10.3 Key events or activities causing impacts

The key activities that could impact on healthy land and seas include:

- mobilisation of a large workforce
- clearing of land for the Solar Precinct, OHTL on the utilities corridor and for the Murrumujuk site
- construction activities, including use of access roads and traffic in remote areas and marine activities such as seismic testing and cable-laying
- changes to surface or groundwater that sustains species, including demands for potable water or dust management
- continued presence of people and industrial activities in relatively isolated areas
- requirement for land management, rehabilitation and environmental services
- production of waste.

10.4 Predicted impacts

Table 10-2: Potential impacts – Healthy Country

Potential impacts – Healthy Country	
Potential beneficial impacts	Potential detrimental impacts and residual ratings
HC-5: Contribution to the Territory and global reduction in greenhouse gas emissions (transformational)	HC-1: Degraded biodiversity and habitat in the Project footprint (medium)
HC-6: Enhanced opportunities to care for country (noticeable)	HC-2: Damage to features with cultural significance, such as waterholes, access to groundwater for livelihoods, or loss of water-dependent species (low)
	HC-3: Reduced recreational fishing and shellfish due to poor fish health (low)
	HC-4: Contribution to greenhouse gas emissions from large-scale land clearing (low)

10.5 Impact assessment for healthy country

10.5.1 Degraded biodiversity and habitat in the Project footprint

Land clearing at the Solar Precinct will impact on more than 12,000 hectares of land, which could impact on species valued by Aboriginal and non-Aboriginal people for food, cultural and recreational purposes. The importance of spending time on country was raised in several meetings. Traditional owners referred to looking after country for their children and future generations. Some people asked what would happen to the wildlife at Powell Creek, nearby hunting areas or Lake Woods. As a former resident of Elliott commented:

> "West of Lake Woods is a popular hunting area. Lake Woods is a significant bird rookery when there is water in the lake, particularly pelicans. It's like stepping into a David Attenborough Show, there are thousands of birds on the turkey's nest dam.
>
> "There's goanna on the red soil and cattle grazing and kangaroos on the black soil, also echidnas and bush turkeys."

Environmental groups expressed concern at the level of land-clearing and its implications, particularly when taking account of other large land clearing applications on nearby stations and the potential cumulative impacts of future projects.

NT Field and Game raised concerns that the Project may cause bird strike (on the overhead transmission line) and disrupt the magpie geese hunting season. Bart Irwin commented that magpie geese, brolga, jabiru and pelican fly between water courses along the utilities corridor. Magpie geese gather around mango farms on either side of the Arnhem Highway, with a major flyway from Quambi Lagoon (a waterfowl hunting area) on Koolpinyah station to the Howard River flood plain. Ecological studies suggest this is unlikely (see Chapter 5 on Terrestrial Ecosystems).

Other comments suggested that the introduction of 'seeds and weeds' needed to be managed while improved access to sites, through better roads, could compound biodiversity degradation. Stakeholders commented that upgrading Gunn Point Road by the Northern Territory Government in 2018 had increased visitors to the informal camping area at Gunn Point Beach, where significant erosion is visible on access tracks (see Figure 5-11 above).

Ecological studies for the EIS (see Chapter 5 on Terrestrial Ecosystems) suggest that no threatened species will be displaced by project activities and that bird strike is unlikely. A Weed Management Plan can be found at Appendix Q.

Although the overall level of land clearing is small in the context of the Territory's land mass, this risk was rated as HIGH based on the scale of change, impact of land clearing and community sensitivity to impacts. This may reduce to MEDIUM based on avoidance of the habitats of valued species and reassurance of the implications of Project activities. Mitigation may include limiting impacts to the Project footprint, such as controlling worker behaviour outside construction areas.

10.5.2 Damage to features with cultural significance, such as waterholes, access to groundwater for livelihoods, or loss of water-dependent species

Groundwater features often have cultural significance. These could be affected by the Project's need for potable water, if roads disturb water courses or if workers trespass on important sites while off work. As noted by Earthsea (2021), water features often have strong cultural significance because they sustained Aboriginal people living in remote areas.

Technical studies for the EIS suggest that relatively small amounts of bore water are likely to be used at the Solar Precinct and Murrumujuk, therefore water abstraction will be relatively insignificant, with no impact on surface water flows. The ephemeral Lake Woods is 10 kilometres away and the Solar Precinct is mostly outside the modelled extent of floods. The closest groundwater dependent ecosystems are at Bull Creek, crossed by a gravel access road. The closest existing groundwater extraction to the Solar Precinct site is 100 kilometres away at Elliott for potable use. Extraction of groundwater at cattle bores is not measured. There are no known major water users at Murrumujuk and no ground water dependent ecosystems (see Chapter 6 on Hydrological Process). Mobile work camps will be self-supporting in terms of water, power, sewerage and waste management. It is planned to truck in water or extract water from station bores, under agreement with licensed landowners.

This risk was assigned a MEDIUM risk, reducing to LOW with appropriate environmental management plans and water monitoring.

10.5.3 Reduced quality of marine biodiversity, including iconic species, shellfish and fish.

The risk to marine biodiversity been lessened by the change of project location, with fewer impacts predicted off Gunn Point than had been considered likely in the near-shore area off Middle Arm. Trenching and cable-laying through Shoal Bay is planned to avoid high value fishing areas and mangroves. Modelling suggests any sediment plumes from trenching and cabling short be localised and short-term (see Appendix R Marine Modelling and Appendix S Marine Environmental Quality Report).

Given the importance of amateur fishing in the Darwin region and importance of fishing and shellfish to Aboriginal people, there would be sensitivity to any loss. However, these issues were not raised as a major concern in interviews and marine studies suggest limited likely impact (see Marine Environmental Quality and Ecology at Chapters 9 and 10). Therefore, this risk has a residual rating of LOW.

10.5.4 Contribution to greenhouse gas emissions from large-scale land clearing

Several stakeholders expressed concern at the level of land-clearing proposed for the Solar Precinct, both for the potential loss of species and contribution to greenhouse gases, which is a growing societal concern. Environmental groups were prepared to trade off concerns about these negative impacts for demonstrated benefits of renewable energy, including tangible benefits for nearby Aboriginal people (see Section 8.5).

The Greenhouse Gas Abatement Plan (Xodus at Appendix H) suggests that most project-related emissions will be generated by sea transport and loss of soil carbon from land use change over the life of the Project. Of the 4 MT of carbon emissions likely over 70 years, modelling predicts that:

- 32 per cent of greenhouse gases would come from marine vessels
- 28 per cent from the decomposition of organic debris and loss of soil carbon over 70 years due to land use change
- 17 per cent from air and land travel
- 9 per cent from plant and equipment for earthworks, construction and maintenance
- 7 per cent from logistics
- 4 per cent from power generation
- 3 per cent from vegetation clearing (Xodus, 2021, p. 21).

Given the extent, duration, scale of change and societal sensitivity to greenhouse gas emissions, this risk was given an initial rating of MEDIUM, which might reduce to LOW given the net positive effects of the project and measures described below.

10.5.5 Contribution to the Territory and global reduction in greenhouse gas emissions

Despite reservations about land clearing, there was strong philosophical support from many stakeholders for the Project's contribution to reducing the Northern Territory's carbon footprint and exports reducing greenhouse gas emissions in the Asia Pacific Region. The Project was seen as contributing to the Northern Territory Government's renewable energy and economic development policies (see Section 3.6.2).

A Greenhouse Gas Abatement Plan (Xodus 2021) was prepared to meet the requirements of the EIS and the Northern Territory Government's Large Emitters Policy. Xodus finds the Project is net carbon positive, with net avoided emissions in the Northern Territory of 110 MT over the life of the project, including decommissioning. Project activities are likely to emit 4.4 MT and avoid 115 MT from electricity and power generation. By way of context, greenhouse gas emissions in the Territory in 2019-20 amounted to 20.7 MT, with about 1.4 MT emitted from public electricity generation (Appendix H).

The Xodus report finds that the Project will supply about 10 per cent of the Territory's total energy needs when fully operational and represents an opportunity for a 10 per cent reduction in the Territory's emissions. This includes supplying about 30 per cent (35,000 GWh over the life of the facility) of the Darwin-Katherine Integrated System electricity requirements from renewable sources and supplying seven times that amount of energy (250,000 GWh over the life of the facility) to industrial customers in the NT once fully operational (see Appendix H).

In addition, the Project will lead to Singapore avoiding 370 MT of carbon dioxide emissions from fossil fuel power generation.

Given the extent, duration and scale of these benefits and strong support for renewable energy, this benefit was assigned an initial rating of HIGH, increasing to TRANSFORMATIONAL if stakeholders perceive project greenhouse gas emission targets met.

Mitigation strategies suggested by Xodus (Appendix H) include exploring carbon reduction technology solutions for marine vessels, electric and hybrid vehicles, plant and equipment; pursuing power purchase agreements with electricity users using fossil fuel power generation in the NT and Singapore; reducing clearing to as low as reasonably practical during construction; and landscaping that maximises vegetation cover to help reduce soil carbon loss over the project's life.

10.5.6 Enhanced opportunities to care for country

As outlined above, Aboriginal people retain an enduring interest in caring for their land and seas. Opportunities arising from the project include land management, ranger groups and commercial services with landscaping, rehabilitation, ecological surveys, offset programs (such as seed gathering) and ongoing environmental monitoring on Powell Creek and at Murrumujuk. Realising these opportunities would have many social, economic, cultural and ecological benefits, would create jobs and provide training opportunities.

There are already strong Larrakia and Tiwi Ranger groups. During consultation for this SIA, Aboriginal people around Elliott expressed an aspiration to set up a local ranger group. The Karguru First Nations Seed Bank and Nursery, run by Julalikari, saw commercial opportunities in working with Elliott women to re-establish the former nursery in Elliott. Women spoke of planting trees in the town. The Juno Centre in Tennant Creek has been providing young people with training in land management and fencing.

In the Top End, Larrakia and Tiwi people shared a strong interest in opportunities for ranger groups and better land management on Gunn Point Peninsula. Sun Cable's support for ranger groups was seen as potentially helping to combat anti-social behaviour, littering and the intrusion of recreational vehicles into conservation areas. The example was given of a shell midden being used as a motorbike ramp, with suggestions that Sun Cable could help fund fencing, signage and land management in the area.

Given an initial rating of BARELY PERCEPTIBLE, the opportunity would increase substantially to BENEFICIAL should there be evidence of commercial opportunities and expanded ranger group activity.

Figure 10-2: Litter at Gunn Point Beach (users are asked not to leave rubbish

10.6 Mitigation and management

Key mitigation and management strategies suggested for this section would include suggestions from the Greenhouse Gas Abatement Plan (Appendix H) to further reduce Project emissions, including:

- seeking ways to reduce transport emissions, such as energy storage solutions for marine vessels, electric and hybrid vehicles, plant and equipment
- pursue power purchase agreement with electricity users relying on fossil fuel power generation in the NT and Singapore
- seeking other opportunities that align with both AAPowerLink Project commercial drivers and the Territory and Australia's net zero emission targets, such as supplying industrial electricity users
- vegetation and landscaping studies to maximise vegetation cover on cleared areas that reduce soil carbon loss over the life of the Project
- reviewing construction methods to reduce clearing to as low as reasonably practical
- a revegetation plan to rehabilitate the cleared land at the end of the life of the Project.

Other mitigation strategies:

- environmental management plans that incorporate biocultural knowledge
- commercial opportunities for ranger and land management groups
- rehabilitation and environmental monitoring programs that provide such opportunities
- communication back to stakeholders on issues raised, including bird strike risks
- potential investments that improve the health of country, such as support for ranger group activities.

11 Living environment

11.1 Overview

Living environment covers impacts on community amenity or 'pleasantness of a place' (Oxford English Dictionary). Our living environment, or surrounds, is precious to our quality of life and may be disturbed by industrial activity, including noise, dust, smells, traffic congestion, pollution and destruction of landscapes.

Impacts on the amenity of nearby pastoral properties, towns and outstations did not emerge as a substantial issue from consultation, apart from concerns about reduced recreational access. However a watching brief should be maintained on these 'nuisance' impacts to ensure quick responses to any detriment and emerging issues.

Table 11-1: What is covered by Living Environment

What is covered by Healthy Country	What the Terms of Reference asked for
Our living environment incorporates what is often described as a 'surroundings' and includes the community's experience or perceptions of factors that cause annoyance or disturbance to the amenity of places where people and families live, work and play. This includes disturbance from industrial noise, dust, lights, heat, vibrations, traffic congestion, destruction of landscapes or pollution that detracts from the quality of our environs. Technical studies might assess the likelihood and consequences of impacts on receptors. A social perspective explores who these 'receptors' might be, their values and their sensitivity to disturbance.	• Any temporary impacts to fishing, recreational and industry use of the harbour during construction. • Social amenity and use of the proposal area and adjacent areas for other purposes, including residential, commercial, industrial, recreational/leisure, tourism and traditional land use • Changes or restrictions to local traffic due to development of new roads and intersections and construction vehicles resulting in delays or inconvenience to local communities and other road users • Visual impact of infrastructure • Impacts to amenity, eg noise and dust

11.2 Living environment – baseline data

The living environment covered by this SIA includes areas where people live, work or visit for recreational purposes, or the surrounds of residential and recreational areas. At Powell Creek, this would include the Newcastle Waters homestead, 10 kilometres from the Solar Precinct, and outstations near access roads, such as Jangirulu outstation, 17 kilometres from the precinct. The social area of influence covers all towns, properties, businesses and homelands along the OHTL route to Murrumujuk. In general terms, most of these areas are sparsely populated, remote or rural.

11.3 Key events or activities causing impacts

The key events that could impact on the amenity of people, families and communities would start with mobilisation of workers, land clearing and industrial activities across the landscape including:

- land clearing and earthworks
- transport and logistics
- construction
- permanent changes to landscapes.

11.4 Predicted impacts

Table 11-2: Potential impacts – Living Environment

Potential impacts – Living Environment	
Potential beneficial impacts	Potential detrimental impacts and residual ratings
	LI-1: Reduced access to recreational activities (low)
	LI-2: Reduced amenity and disturbance from dust, noise, light, heat, emissions and other pollution (low)
	LI-3: Reduced amenity from congestion and traffic delays with Project traffic (low)
	LI-4: Reduced aesthetic values of the landscape (medium)
	LI-5: Reduced sense of place through industrialisation of the landscape and changed land use (medium)

11.5 Impact assessment for living environment

11.5.1 Reduced access to recreational activities

Recreational values can be negatively affected if industrial activity, including the presence of workers (on days off) makes other users feel less safe or free to use public places. At the Solar Precinct, control of worker behaviour will be important to maintain the natural and recreational values of the area, including tourism and bird watching at Lake Woods. In Darwin, road access to Gunn Point Beach will not be disturbed. Recreational values could be impacted by exclusion zones during trenching and short-term disturbance to Gunn Point Beach. However, access to the beach will be retained throughout construction.

In general, responses to stakeholder feedback has informed avoidance of likely impacts and the move from Middle Arm to Murrumujuk avoids high value fishing activities. The Regional (Aboriginal) Legacy Strategy outlines measures to ensure local Aboriginal people retain access to hunting areas around the Powell Creek site.

This risk is assigned an initial rating of MEDIUM reducing to LOW, with appropriate management plans and ongoing stakeholder consultation.

11.5.2 Reduced amenity and disturbance to people and fauna from dust, noise, light, heat emissions and other pollution

Construction noise will be some distance from pastoral homesteads or living areas, although noise may disturb nearby animals. At Murrumujuk, construction noise will be some distance from residential areas but may disturb nearby camping sites, particularly at night.

Given the large area of land to be cleared, dust may affect residential areas or pastoral activities, including dust from traffic on the two access roads. The Barkly can be windy, with roads turning to bulldust during drought. Dust may also impact on nearby hunting and grazing country if it smothers plant life or affects groundwater. The Air Quality Impact Assessment (Air Environmental Consulting 2021 at Appendix U) found the impacts of dust and diesel exhaust (including nitrogen) were not expected to cause adverse impacts at the Solar Precinct, on the OHTL route or at Murrumujuk, given low levels and distance from sensitive receptors. Separation distances would be incorporated in the Project's Construction Environmental Management Plan to ensure compliance with air quality criteria. Impacts on air quality, including dust, were not raised during consultation but should be monitored during construction. Once construction is complete, Sun Cable plans to plant species under the solar panels that will reduce dust and soil carbon emissions.

Light pollution is likely to be minimal given the distance from residential areas, however lights may cause disturbance along the overhead transmission line and utilities corridor and on Gunn Point Beach users during construction. Lights would be more visible at night and out of keeping with the current amenity of Powell Creek and Murrumujuk, given the limited industrial activity in either region.

One pastoralist expressed concern at possible raised temperatures at nearby properties from the solar panels, known as the 'heat island' effect. Studies for the EIS would suggest this is highly unlikely (see Terrestrial Ecosystems at Chapter 5). Research (Barron-Gafford et al. 2016) has found that temperatures over a photovoltaic plant may be 2.5 degrees higher during days and 3-4 degrees at night, compared to surrounding land. This research suggests that the reach of any 'heat island' effect is too small to affect local homes. Sun Cable is investigating strategies to lower the temperatures emitted by panels, including vegetation trials in its Technology Research Park.

Given the likely short duration of most impacts during construction and distance from residential areas, the collective initial and residual risk rating for these amenity impacts is LOW. Mitigation may include the use of screens and limiting intrusive night-time work and dust suppression activities, particularly once construction is complete and cleared areas are rehabilitated.

11.5.3 Reduced amenity from congestion and traffic delays with Project traffic

AAPowerLink plans to transport a substantial amount of materials and solar arrays by rail. However, there will be substantial industrial traffic on the Stuart Highway during construction, including slow-moving transport transporting oversize freight such as transformers, 2600 poles and heavy equipment. These vehicles will pass through the towns of Katherine and Mataranka to lay down areas for the OHTL and the Solar Precinct. This is likely to create congestion and traffic delays, particularly at 'pinch points', hilly areas, navigating under power lines and two-lane sections of the highway.

Industrial traffic from East Arm Port to the Stuart Highway and along Howard Springs Road and Gunn Peninsula Road is likely to create temporary congestion, slower travelling times and potentially annoyance to recreational traffic. Gunn Point Road passes through rural residential areas with people commuting to schools and work.

As outlined in Section 6.6, there are likely to be cumulative impacts with other industrial traffic, such as onshore oil and gas development in the Beetaloo.

While the extent, duration and scale of change are relatively low, the Stuart Highway is the only north-south highway for both road freight, tourism and general traffic so increased industrial traffic will be unavoidable. Similarly, Gunn Point Road is the only access route to Murrumujuk, it passes through residential areas and is popular with recreational fishers, which would heighten sensitivity to congestion. Therefore, this risk attracts an initial rating of MEDIUM, which might be reduced to LOW with a good traffic management plan and use of rail and air transport as much as possible.

The Traffic Impact Statement (Byrne Consulting 2022 at Appendix K) suggests mitigation strategies such as logistics scheduling, maximising use of rail freight, avoiding peak hour traffic in built-up areas and working closely with the Department of Infrastructure, Planning and Logistics. Detailed traffic management plans will be required for oversize and overmass loads under the *Motor Vehicles Act.*

11.5.4 Reduced aesthetic values of the landscape

The scale of clearing and changed land use could be of concern to Native Title Holders and other visitors to the Powell Creek area. The Solar Precinct is will not be visible to road traffic but will be visible to passengers on the *Ghan*.

Several stakeholders raised concerns at the visual impact of the overhead transmission lines and 2400 steel poles, asking why they couldn't be undergrounded (for both safety and aesthetic reasons). The 48-58-metre poles are at least twice the height of existing power lines.

Given the enduring nature, scale of change and difficulty minimising visual impacts, this risk has an initial and residual rating of MEDIUM.

Figure 11-1: Render of poles along Gunn Point Road

11.5.5 Reduced sense of place through industrialisation of the landscape and changed land use

Some stakeholders raised concern about the industrialisation of landscapes, progressive development on Gunn Point Peninsula and the scale of development in Darwin Harbour.

The construction phase would bring a large workforce to a remote, sparsely populated region and industrial activity and changed land use to relatively undisturbed landscapes.

While not overly concerned about the AAPowerLink Project, the Consolidated Pastoral Company did raise the implications of changed land use, particularly if there are further projects in an area that is predominantly pastoral. Changed land use could be detrimental to the pastoral way of life and values.

Groups such as the Environment Centre Northern Territory (ECNT) and Planning Action Group (PLan) were concerned that development at Murrumujuk and along the utilities corridor could expedite industrial development on the Gunn Point Peninsula, which they have long opposed.

Given the permanency of this impact, the scale of change from current amenity and sensitivity of existing residents to changed land use, this risk attracts an initial rating of HIGH. Mitigation is largely outside AAPowerLink's control, particularly given the impacts of cumulative development in both regions, but the rating might reduce to MEDIUM through management strategies such as landscaping or offsetting impacts.

11.6 Mitigation and management

A summary of mitigation and management measures for impacts on people's amenity includes:

- good ongoing engagement and communication
- grievance procedures to ensure any detriment can be raised and, if possible, addressed
- construction environmental management plans, including dust suppression and revegetation
- traffic management plan
- controls over hours of work near residential areas.

12 Strong Voice

Having a strong voice means being given the time, opportunity and resources to have real input to decision-making on policies and projects that affect the lives, lifestyles and livelihoods of people, families and communities. For Aboriginal people, it incorporates the concept of Free, Prior and Informed Consent (United Nations 2007) to activities on their traditional lands and seas, recognition of traditional governance structures and enjoyment of statutory rights.

The concept of free, prior and informed consent (FPIC) is considered particularly important for vulnerable and disadvantaged communities, recognising unequal power relationships and greater vulnerability to impacts:

- free: no coercion, harassment or retribution
- prior: before any activity starts
- informed: full disclosure
- consent: that communities have a real choice (Vanclay et al. 2015).

12.1 Overview

Table 12-1: What is covered by Strong Voice

What is covered by Strong Voice	What the Terms of Reference asked for
A strong voice means having influence over decisions and contributing to our own governance. Communities may feel ineffectual if their voice is not heard.	• Engagement in line with the NTEPA Guidance Note for Proponents (2021) and objects of the *Environment Protection Act* (2019) • SIMP to include a stakeholder engagement plan and communication strategy, including for decommissioning and closure

12.2 Strong voice – baseline data

12.2.1 Many language groups and governance structures

A complexity of the AAPowerLink Project is the number of groups affected by project decisions and activities, including the primary project site at Powell Creek, linear infrastructure crossing the Territory from Powell Creek to Murrumujuk on the Gunn Point Peninsula, the Darwin Converter Site, subsea cable. Sun Cable is also developing ancillary infrastructure at East Arm and Middle Arm although these are not covered by the EIS.

An estimated 33 Aboriginal language groups have cultural connections to this extended footprint (Sun Cable Regional (Aboriginal) Legacy Strategy). The voices of many of these groups have become fragmented or disempowered through local government reforms in the Territory, changes of government policy and poor engagement by previous project proponents.

Existing governance structures in the Barkly include the Barkly Regional Council and Local Authorities in places such as Elliott. The Barkly Regional Deal has a Governance Table that reflects the three levels of government (Australian, Northern Territory and Barkly Regional Council), cultural authority and local business groups and service providers. Working groups include an Aboriginal Alliance and economic and workforce development groups. Julalikari Council Aboriginal Corporation, which represents language groups across the Barkly, is negotiating a Local Decision-Making Framework with the Northern Territory Government. The Northern Land Council, Central Land Council and Warumungu Patta Group have offices in Tennant Creek, while the Northern Territory Government runs a Government Coordination Committee. Several stakeholders commented on the importance of working with existing governance structures rather than creating new ones.

12.2.2 Role of Land Councils

The Northern Territory land councils are Commonwealth statutory bodies operating under the *Aboriginal Land Rights Act 1976.* They are the native title representative bodies under the *Native Title Act 1993.*

Land councils negotiate agreements with companies on behalf of traditional owners to "protect interests in Aboriginal land. Agreements, which can be in the form of an Indigenous Land Use Agreement, include compensation payments, employment, training, sacred site protection, environmental protection and cultural awareness" (Central Land Council, 2014).

The Central Land Council has a policy of encouraging native title holders to invest royalties from mining projects in community development programs and has encouraged the growth of ranger groups, so Aboriginal people can get natural land management jobs on their own country.

12.3 Key events or activities causing impacts

Events which could lead to impacts include:

- consultation during project planning and regulatory approval stages
- agreement-making and investment of benefits
- ongoing engagement strategies and governance over the Project's 70-year life, including for closure and rehabilitation.

12.4 Predicted impacts

Table 12-2: Potential impacts – Strong Voice

Potential impacts – Strong Voice	
Potential beneficial impacts	Potential detrimental impacts and residual ratings
SV-1: Enhanced agency in project planning and empowered decision-making (noticeable)	SV-2: Disempowerment of Aboriginal and other community groups who feel they have not been afforded an influential voice in decision-making (medium)
	SV-3: Reduced enjoyment of human rights, in particular the right of vulnerable Aboriginal people and communities to Free Prior and Informed Consent, gendered impacts, breaches of labour laws, racism in the workplace (low)

12.5 Impact assessment for strong voice

12.5.1 Enhanced agency through project planning and empowered decision-making

Opportunities from the Project might include enhanced agency in decision-making, influential input into project planning and empowered decision-making over benefits sharing.

There are plans in Elliott to expand the activities of the Kulumindini Aboriginal Corporation to invest the benefits of agreement-making and economic development in the region for the benefit of local Aboriginal families. Local artists have called for a proper arts centre in the town to provide access to visitors and tourists.

Stakeholders commented that projects often made tokenistic or even patronising efforts to invest in communities. Royalties were seen by some as another form of welfare. For benefits to be sustainable, or enduring, they have to be driven by their beneficiaries. This extends from jobs on country to aligning benefits with communities' hopes and aspirations.

As former NLC Regional Manager Rick Fletcher put it, this means tapping into where the energy is in communities. Aboriginal people will value benefits they have contributed to "through the sweat of their brow" and then work to create their own prosperity. The keys to success include respecting the people with cultural authority, building trust and relationships, proper governance structures, and giving people the time to organise themselves rather than creating pressure for quick results.

Should Sun Cable's ongoing engagement strategy and Regional (Aboriginal) Legacy Strategy be implemented as intended, opportunities for a stronger voice, agency in decision-making and empowered local governance would be NOTICEABLE.

12.5.2 Disempowerment of Aboriginal and other community groups who feel they have not been afforded an influential voice in decision-making

Having a strong voice implies having influence on decision-making. Some negative feedback was received about consultation for the EIS. This was due to delays with the start of engagement, changes in site selection for the Solar Precinct (which appear to have been poorly communicated to Traditional Owners of the first site) and relocation of key parts of the project to Murrumujuk. Some traditional owners felt they hadn't been consulted and challenged the NLC's role in identifying the right people (see Consultation Report at Appendix F).

Some stakeholders warned that consultation might be skewed by the views of strong families and suggested it was important to reach all families affected by the project. Others commented that project proponents had made promises over the years which hadn't been kept. Some criticised onshore oil and gas companies for not having a permanent presence in the region. It was suggested that AAPowerLink should have local offices and staff.

Sun Cable is developing a Regional (Aboriginal) Legacy Strategy which has as its first pillar the importance of engagement and informed decision-making. The objective of this pillar is to ensure meaningful engagement and the chance for affected communities to contribute to decisions over the Project's 70-year lifespan.

Given the sensitivity of this issue and likely ongoing concerns, this risk is given an initial rating of HIGH, perhaps reducing to MEDIUM. Good mitigation includes ongoing engagement that builds relationships and trust and ensures all Aboriginal individuals, families and organisations are able to raise issues. Other management strategies include implementation of the Aboriginal Legacy Strategy, good liaison with the Northern Land Council and Sun Cable's ongoing engagement and communication.

12.5.3 Reduced enjoyment of human rights, in particular the right of vulnerable Aboriginal people and communities to Free Prior and Informed Consent, gendered impacts, breaches of labour laws, racism in the workplace

International covenants and International Finance Corporation (IFC) performance guidelines place a growing emphasis on human rights. Breaches for the AAPowerLink Project are likely to be inadvertent, such as gendered impacts (jobs go to men, women bear the brunt of having to look after families, women are at greater risk of workplace bullying and sexual harassment) or racism and bullying in the workplace (both overt and unintended). Racism is both a welfare issue (covered as a mental health issue above) and a breach of human rights.

A particularly important right is genuine Free, Prior and Informed Consent (FPIC), which is a statutory responsibility of the Territory's land councils. FPIC goes well beyond traditional consultation in that it requires giving people the time and necessary resources to consider the implications of a project and respond (O'Faircheallaigh 2009).

While this risk attracts an initial and residual rating of LOW, the importance of FPIC in particular was raised during consultation and in submissions to the Draft Terms of Reference for the EIS. Mitigation includes appropriate workplace protocols and management plans and continued close liaison with land councils and Aboriginal organisations.

12.6 Mitigation and management

Suggested mitigation and management strategies are outlined in Sun Cable's Territory Benefit Plan, Regional (Aboriginal) Legacy Strategy and ongoing engagement and communication strategy. These include:

- community input to benefit-sharing agreements
- working closely with land councils and Aboriginal groups to ensure free, prior and informed consent (FPIC)
- place-based engagement methods for the life of the project
- active listening and honest responses to questions
- ensuring feedback to communities on issues raised
- a Reconciliation Action Plan developed in conjunction with Aboriginal stakeholders
- Land Use Agreements for the Solar Precinct and Transmission Corridor
- a Larrakia Engagement Agreement
- workplace management plans that encourage and support diversity.

Overall, it will be important for Sun Cable to maintain a whole-of-life-cycle approach to engagement, monitoring, reporting and adapting to emerging issues. It is recommended that data is gathered against key indicators for the life of the Project to inform reporting on the success of those issues of most concern to the community. This would include:

- number and value of local tenders awarded
- number and source of construction and operational workers and their retention rates
- number and retention rates of Aboriginal workers
- data on skills development
- accommodation strategy data, including use of local rental and short-term accommodation or any contributions to housing stock
- grievance procedures, complaints made and how they were resolved
- value of community investments

Ongoing governance and reporting should be determined in collaboration with affected communities and should respect existing governance structures.

13 Cumulative

13.1 Overview

Cumulative impacts are the successive, incremental impacts of a number of projects that may be individually inconsequential. They can occur concurrently or sequentially and may be either beneficial and detrimental. Most will be influenced by other policies and projects and thus outside Sun Cable's control. However, to the extent that these impacts are foreseeable, Sun Cable may be able to find collaborative solutions to mitigating negative impacts and enhancing opportunities.

With the government's focus on investment attraction, a large number of potential projects are proposed for the Greater Darwin region, Katherine and Big Rivers and across the Barkly and Beetaloo.

Cumulative consequences of multiple developments include changes in the dominant land use and lifestyles of regions, industrial development of relatively remote and intact landscapes, the movement of people and consequent pressures on the labour market, social infrastructure and changed demographics.

Individual and cumulative development could exacerbate community divisions between those who benefit and those who are most exposed to negative impacts, including the distribution of negotiated benefits agreements and philosophical opposition to land clearing and extractive industries.

Other cumulative impacts include consultation fatigue, pressures on Traditional Owners and pastoralists' time negotiating with multiple proponents and an acceleration of all social change processes.

Table 13-1: What is covered by Cumulative Impacts

What is covered by Cumulative impacts	What the Terms of Reference asked for
The incremental effects of multiple projects affecting a social area of influence simultaneously or accumulating over time or the compounding (positive and negative) effects of diffuse sources of change, whether policies, programs or projects.	• The assessment of each aspect (of the SIA) should consider cumulative impacts and the reversibility of potential impacts.

13.2 Cumulative impacts – baseline data

Other potential development in the Barkly Region includes:

- Barkly Regional Deal has 28 social and economic initiatives, including a Barkly Business Hub; new housing, an economic growth strategy, a Barkly mining and energy services hub, youth and justice infrastructure and a regional workforce strategy (see 8.2.2).
- A Strategic Regional Environment and Baseline Assessment (SREBA) is under way for proposed onshore gas development in the Beetaloo Basin, as part of the recommendations of the Independent Inquiry into Hydraulic Fracturing in the Northern Territory (2018) including a social, cultural and economic study. The Australian Government has prioritised the Beetaloo for development and commissioned several studies on maximising the economic benefits of development.
- Origin and Santos, have been drilling on granted exploration permits in the Beetaloo north-east of Elliott.
- Empire Energy has exploration permits 167, 168 and 198 to the north-west of the AAPowerLink footprint in the Beetaloo Basin, between Elliott and Katherine. Permit 169 extends south of Elliott, across AAPowerLink's proposed footprint, then to the east of the Stuart Highway. Empire Energy purchased Pangaea's Beetaloo interests in August 2021.
- The CSIRO is planning a study into the social licence to operate of large renewable projects in Australia, including the AAPowerLink.
- Proposed Tennant Creek to Darwin gas pipeline: in 2020 the Northern Territory Government awarded a $327,000 contract to CNC Project Management to conduct a prefeasibility study to identify a preferred 1000-kilometre infrastructure corridor from Tennant Creek to Darwin to include multiple high-pressure pipelines, electrical transmission lines and other services including water, electrical and communications. Maps of a proposed route show this pipeline following a similar route to the AAPowerLink transmission line (DIPL 2021). The proposal has attracted criticism from environmental groups, while Traditional Owners have complained at the lack of consultation.
- Jemena, which built the 622 kilometre Tennant Creek to Mount Isa gas pipeline, in November 2020 announced plans for a $5 billion expansion, including expansion of the Northern Gas Pipeline and a potential pipeline from the Beetaloo to Darwin. Jemena is owned by China's State Grid Corporation and Singapore Power.
- Territory Gas Australia Ltd (Brisbane-based Williams Group) in 2011 made 11 applications for onshore exploration permits under the NT *Petroleum Act*, including on land proposed for the AAPowerLink. These were advertised in 2013 but no tenure has been granted
- Elliott copper project: BHP announced in May 2021 that it was spending $22 million to become the majority shareholder in a gold and copper tenement on the Stuart Highway, along the Ashburton Ranges, being explored by Encounter Resources. This project runs parallel with AAPowerLink's proposed footprint. Encounter and its fully owned subsidiary Baudin Resources, also have the Jessica tenement, granted in August 2020 east of Tennant Creek.

- Bootu Creek Mine: 107 kilometres north of Tennant Creek, in 2020 resumed mining operations after a fatality at the Tourag Pit in August 2019. The mine was placed into care and maintenance between December 2016 and 2017 due to a fall in commodity prices, with the loss of about 140 jobs. The company's website (sighted in December 2021) suggests that mining has now ceased and OM Manganese is focussed on processing stockpiles.
- Verdant Resources: Verdant has environmental approvals for a proposed phosphate project on Ammaroo Station, near Ampilatawatja, on the Sandover Highway, south-east of Ali Curung.
- Fortune Agribusiness: Fortune Agribusiness is proposing a 3500-hectare irrigated horticultural development on Singleton Station, near Ali Curung, 120 kilometres south of Tennant Creek. The project has attracted controversy because of its requested 40,000 ML/year water allocation. The development is proposed to take place in four stages over eight years. The station would access the existing Tennant Creek to Ali Curung power network. Fortune Agribusiness expects to employ more than 110 permanent and 1350 seasonal staff, with annual operating expenditure of $A110 million. Supporting infrastructure requirements include a new community, including housing and community facilities, to accommodate the project's workforce. It plans to install a new solar array to provide a more reliable power supply and telecommunications systems.
- Hydrogen trial in Tennant Creek: A joint venture of Australian companies Axcentium and Ahurei is trialling its off-grid hydrogen technology, Aqua AeremTM, which captures water from the atmosphere in arid environments. After a 12-week trial in Tennant Creek, the $15 billion project has been renamed Desert Bloom Hydrogen and in December was awarded Major Project Status by the Northern Territory Government. It is backed by Sanguine Impact Investment, which has committed $1 billion for the initial stages of the project. A government media release suggests that, at peak construction, the project will create 1000 jobs, with 100 construction jobs for the first phase and 120 operational jobs. The project is now seeking suitable land in Central Australia to harness solar energy (Gunner & Lawler 2021). The current interest in renewable energy may prompt other projects in the Barkly.
- Project Sea Dragon: On Gunn Point Peninsula, Project Sea Dragon proposes a prawn hatchery on Crown land next to the Darwin Converter Station site (see Section 5.5.4).

13.3 Key events or activities causing impacts

- mobilisation of workforces for multiple projects in the Barkly and/or Greater Darwin
- land clearing
- procurement and logistics
- recruitment of a skilled workforce
- consultation for multiple projects
- investment of negotiated benefits.

13.4 Predicted impacts

Table 13-2: Potential impacts – Cumulative

Potential impacts – Cumulative	
Potential beneficial impacts	Potential detrimental impacts and residual ratings
CU-3: Cumulative opportunities to invest benefits and build capacity from multiple projects (beneficial)	CU-1: Reduced social, cultural, recreational and ecological values of the harbour (low)
CU-4: Cumulative opportunities for development of human capital and business capacity (noticeable)	CU-2: Cumulative impacts of industrialisation with onshore oil and gas developments, pipelines, agribusiness, renewable energy, mining and associated infrastructure (high)
	8-5: Communities and stakeholders become reluctant to engage due to consultation fatigue (medium)

13.5 Cumulative impact assessment

13.5.1 Reduced social, cultural, recreational and ecological values of the harbour due to large-scale changes

In Darwin, there is sensitivity to cumulative impacts on the harbour's diverse values from progressive industrial development and population pressures over the past 20 years. The harbour is integral to the Territory's unique lifestyle. Industrial development touches strongly held values so there is high sensitivity to disturbance.

Changes to the Project footprint mean direct disturbance should be localised, short-term and easily remediated and Project activity has moved from the greater harbour area. However, the AAPowerLink Project may be seen as contributing to cumulative industrial development around Darwin Harbour. Other development includes manufacturing on Middle Arm Peninsula and additional gas pipelines in the harbour, such as for the Barossa Project. The Project may be seen as enabling cumulative industrial development, for example should offtake agreements be signed with Middle Arm LNG companies and manufacturers.

The initial risk rating of MEDIUM is reduced to LOW.

13.5.2 Cumulative impacts of industrialisation, with onshore oil and gas developments, pipelines, agribusiness, renewable energy, mining and associated infrastructure

In the Barkly, cumulative impacts could include a gradual ecological or socio-ecological degradation of a region that changes the character and values of a place or region. This is particularly relevant when a number of industrial activities are in the pipeline in areas with little experience of industrial development and major projects (eg mining, hydraulic fracturing, horticultural expansion, renewables). Other impacts could include competition for skilled labour, cumulative pressures on accommodation and community resistance to changed land use.

In Tennant Creek, cumulative impacts could come from many Barkly Regional Deal initiatives and recent government announcements about enhanced road infrastructure to support onshore gas exploration. This would compound pressures listed in previous sections, such as the recruitment and training of workers, particularly if there is inadequate planning for population growth and land use changes.

Along the railway corridor, cumulative uses should be absorbed as there is limited additional disturbance.

On Gunn Point Peninsula, the overhead transmission line in the government utilities corridor will contribute to a greater scale of change as the AAPowerLink will be the first user of the corridor.

At Murrumujuk, there are concerns that the AAPowerLink and Seafarms' Project Sea Dragon will expedite industrial development of the Gunn Point Peninsula and the proposed township of Murrumujuk. On the one hand, this would meet NTG economic and population growth objectives and longstanding land use planning obectives. On the other, development was described by some stakeholders as a threat to tightly held rural and environmental values. Much development in the rural area has been heavily contested, reflecting tensions between economic development and rural lifestyle values. Previous opposition to industrial development on Gunn Point Peninsula and Glyde Point led to the Labor Government opting to develop Middle Arm for gas-based development.

This risk is assigned an initial and residual risk rating of HIGH, given that changes from multiple projects are inevitable, there is community sensitivity to the scale of change and this impact is beyond AAPowerLink's control to mitigate apart from collaboration with regional economic development planning.

13.5.3 Cumulative opportunities to invest benefits and build capacity from multiple Projects

The Australian and NT Governments have a focus on maximising the benefits of economic development in the Barkly and Beetaloo, including regional approaches to investing benefits, systems and infrastructure that diversify the economy and increase local business capacity, local decision-making and workforce development (Tremblay, Boyle & Munday 2020).

There will be many opportunities for regional capacity-building and investments by traditional owners, including community benefits and community development programs and a pipeline of workforce development and training opportunities. The capacity to realise these opportunities may grow incrementally.

The initial risk rating for this impact is NOTICEABLE, which increases to BENEFICIAL through good engagement, collaboration with regional strategies such as the Barkly Regional Deal, co-investment strategies and community-led design of benefits.

13.5.4 Cumulative opportunities for building and human capital and business capacity

As outlined in Section 8, the short-term nature of many projects creates a 'boom bust' phenomenon of short-term benefits. A pipeline of projects across the region builds critical mass and provides business with greater confidence to invest in business growth and development of skills that are transferrable between industry sectors. This, in turn, is likely to foster more collaborative approaches and deliver a sustained, or enduring legacy. It would increase the chances of continued employment and skills development for local workers, including the chance to complete apprenticeships. This could be BENEFICIAL. However, given the uncertainty about timing, potential to actualise these benefits and potential for countervailing forces to undermine the opportunity (such as competition for labour), the opportunity is assigned a NOTICEABLE rating. The key enhancement strategy would be collaborative regional planning approaches, co-investment strategies with governments and collaboration between industry sectors.

13.5.5 Communities and stakeholders become reluctant to engage due to consultation fatigue

Consultation of itself can be an impact, by making demands on people's time and energies. Community leaders, pastoralists and industry associations have many competing priorities. Consultation fatigue is the result not just of repeated consultation but also poor consultation, including where people feel their views were ignored.

Consultation with pastoralists and Aboriginal groups in the Barkly has included the Inquiry into Hydraulic Fracturing in the Northern Territory, SREBA for the Beetaloo, individual oil and gas projects, mining and agricultural projects, government policies and projects, Barkly Regional Deal planning and now for the AAPowerLink Project.

Disengagement may be compounded by a lack of trust in private or regulatory institutions or perceived power imbalances. There was some evidence of this during consultation for the AAPowerLink Project. Generally, however, stakeholders welcomed the chance to find out more about the Project and there was strong interest in jobs, business opportunities and benefits. Some stakeholders commented on previous proponents not keeping commitments made during consultation.

Given the frequency with which this issue was raised, it is given a HIGH initial rating, reducing to MEDIUM on the assumption that Sun Cable will adopt best practice engagement to build ongoing trust and relationships, as outlined in its Regional (Aboriginal) Legacy Strategy.

13.6 Mitigation and Management

Given the diffuse responsibility for cumulative impacts, the most appropriate mitigation and enhancement strategies will lie in collaborative planning with other proponents, regional industry groups and governance structures, such as the Barkly Regional Deal. This might cover shared solutions to accommodation and addressing skills shortages, common user infrastructure and community planning for the investment of benefits from various projects.

14 Summary

This SIA has provided an overview of the Australia-Asia PowerLink Project, engagement and social research methodology, baseline data on affected communities, prediction and assessment of potential impacts and advice on how positive and negative impacts might be managed and monitored.

The AAPowerLink is a pioneering project that should contribute to legacy benefits for the Barkly, Greater Darwin and the Northern Territory, in particular economic benefits from local procurement, jobs and renewable energy as an economic enabler for other sectors.

Potentially transformational positive impacts identified were: more sustainable regional economies by boosting manufacturing, industry, population growth and taxes; the social and economic benefits to the NT from access to affordable, reliable power; Aboriginal jobs and legacy skills development; and the Project's contribution to reducing Territory and global greenhouse gas emissions.

The highest rated potential negative impacts identified were: reduced affordability and availability of public and private housing; a loss of cultural heritage should sites be damaged or access reduced; and the cumulative impacts of industrial development in the Barkly and on Gunn Point.

Some of these impacts are largely beyond AAPowerLink's ability to mitigate or enhance but nonetheless provide important contextual information for consideration in project planning, benefits negotiations and understanding community expectations or a large project, operating in an area of high socioeconomic disadvantage.

Realising Sun Cable's intended legacy will require strong communication, continued community engagement and good will that goes beyond statutory requirements in the AAPowerLink's area of operations. This is addressed in the Social Impact Management Plan (Appendix J), as well as a Territory Benefits Plan and Regional (Aboriginal) Legacy Strategy being developed as a separate exercise by Sun Cable.

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16 Attachment (Local Workforce Strategy)

Australia-Asia PowerLink (AAPowerLink) Project

LOCAL WORKFORCE STRATEGY

Mark Stoyles
Mark Stoyles Consulting

February 2022

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Section One - Introduction

Background

This strategy was prepared by Mark Stoyles Consulting. It describes labour force capacity and the opportunities for Sun Cable's Australia-Asia PowerLink (AAPowerLink) Project to maximise local benefits for the Northern Territory economy.

This strategy will be used to help finalise Sun Cable's commitments under the Northern Territory Government's Territory Benefit Policy (Northern Territory Government 2019). This Policy requires Sun Cable to develop a plan that will detail specific actions for contributing to creating and sustaining a strong, vibrant economy in the Northern Territory, throughout and beyond the AAPowerLink Project's lifespan.

Through the local workforce strategy, key recommendations will be proposed to deliver local benefit outcomes for Territorians in the AAPowerLink Project. This will be achieved by addressing labour force skills and qualification gaps to attract and retain local workers, including specific benefits for Aboriginal employment. For the purpose of this strategy, the local labour force comprises all people who are employed, and those currently unemployed but who are actively seeking and capable of starting work.

The key findings and recommendations of this strategy build on an analysis of Australian Bureau of Statistics (ABS) 2016 Census data (ABS 2017) and the outcomes of extensive consultation with government departments, schools, Charles Darwin University, employment services providers, local businesses, industry bodies and residents. A full list of the stakeholders consulted is at Attachment A.

Sun Cable AAPowerLink Project

Overview of the Project

Sun Cable is an Australian-founded world-leading renewable energy company, established in 2018. AAPowerLink is Sun Cable's flagship project. This Project features a high-capacity solar storage and transmission system that will transmit renewable electricity from the Barkly region of the Northern Territory to Darwin and Singapore markets. The Project comprises six components:

- Powell Creek Solar Precinct (the Solar Precinct). About 70 kilometres south-west of Elliott, this precinct will capture the sun's energy through multiple large-scale solar and storage fields, located on 12,000 ha of land. The precinct will house various energy storage systems, converters, transmission lines, workforce accommodation, offices, carparks, access roads, an airfield, rail siding, fencing and other supporting infrastructure.
- Overhead Transmission Line (OHTL). The OHTL will generally follow the footprint of the Alice Springs to Darwin Railway Corridor, transmitting electricity approximately 800 kilometres along a High Voltage Direct Current line from the Solar Precinct to Livingstone in the north, where it diverts to follow a Northern Territory Government designated utilities corridor to Murrumujuk on Gunn Point Peninsula, 60 kilometres north-east of Darwin. The OHTL will comprise mostly

steel monopoles between 44 to 56 metres high, contained within a 60-metre wide easement within a permanently cleared four-metre wide access track.

- Darwin Converter Site. The overhead transmission line will terminate at the Darwin Converter Site. This site converts electricity from High Voltage Direct Current (HVDC) to High Voltage Alternating Current (HVAC) for local electricity networks, before being converted back to HVDC to export to Singapore. This site will be the junction point between the onshore and offshore power networks and will enable connection to the local Darwin electrical network. The Darwin Converter Site will include up to four voltage source converters, a battery energy storage system, substation and switchyard, an operations and maintenance facility and ancillary infrastructure including parking, laydown, warehousing, offices, a communications tower and ablutions. The facilities will be in a fenced compound with lighting and surveillance.
- Cable Transition Facilities. The cable transition facilities at Murrumujuk will comprise three separate components to transfer power from onshore to offshore: an underground cable corridor, Land-Sea Joint Station and Shore Crossing Site. Power leaving the Darwin converter site enroute to Singapore will be transferred by underground cables to the Land-Sea Joint Station via an underground cable corridor approximately 2.7 kilometres long and 70 metres wide. The Land-Sea Joint Station will be a fenced two-hectare site, about 300 metres inland from the beach near the junction of the access tracks to the Gunn Point Beach and Tree Point Conservation Reserve. The shore crossing site will consist of cables to be laid in temporary trenches approximately two metres wide and up to two metres deep, running from the Land-Sea Joint Station across the shoreline and out to the low water mark. After construction, the land surface and seafloor will be reinstated, with the disturbed areas revegetated.
- Subsea Cable System. A HVDC subsea cable system, comprising three cables, will be installed to transfer electricity over 4,200 kilometres from Darwin to Singapore.

The Project will be constructed at a cost of more than $30 billion. Construction is scheduled to begin in 2024, with the Project ready for operations from 2026.

Ancillary Infrastructure

In addition to the AAPowerLink Project, two other projects have been approved through separate statutory processes. These include a battery facility on the Middle Arm Peninsula near Darwin, and a Solar Array Assembly Facility near the railway line in the East Arm Business Park. While these projects will support the AAPowerLink Project, they are not part of its capital expenditure and therefore fall outside the scope of this local workforce strategy.

Section Two - Workforce Opportunities

Indicative Job Numbers

Sun Cable will facilitate local workforce opportunities at all of the AAPowerLink Project's Northern Territory components. Sun Cable estimates that up to 1,750 direct jobs will be generated during the Project's construction from 2024 to 2029. The operational workforce is estimated to require 350 direct jobs, from 2026 to 2089.

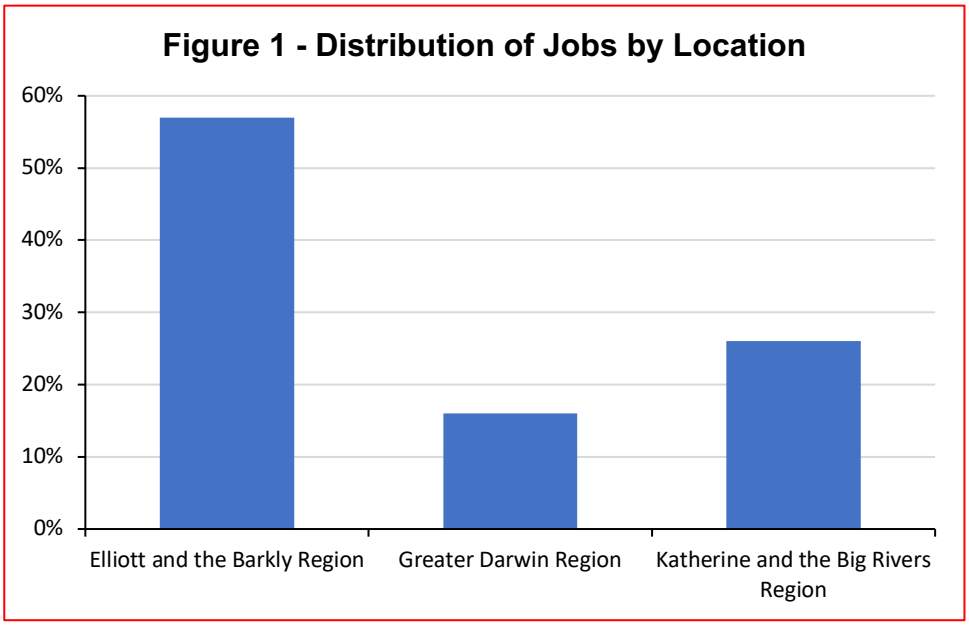
Table 1 shows the likely spread of construction jobs across the AAPowerLink Project's Northern Territory components. This table will be updated with data for the operational workforce, once the scoping work is completed on peak job numbers and their expected demand across the various components.

Table 1

Components	**Jobs**	**Proportion**
Powell Creek Solar Precinct	1,000	57%
Darwin Converter Site and Cable Transition Facilities	230	13%
Overhead Transmission Line	460	26%
Subsea Cable	60	3%
Totals	**1,750**	**100%**

Distribution of Jobs by Location

Figure 1 maps the likely distribution of construction jobs across the geographic locations making up the Project's Northern Territory footprint.



This figure shows that the largest concentration of jobs is in Elliott and the Barkly region, where the Powell Creek Solar Precinct is located. Katherine and the Big Rivers region is the next largest concentration, with the installation of the Overhead Transmission Line along the rail corridor. Greater Darwin region has the least concentration of jobs, with the Converter Site and Cable Transition Facilities.

Distribution of Jobs by Occupation

Attachment B provides a broad overview of the occupations and skills required for constructing the various components of the AAPowerLink Project. The peak numbers for constructing each component (excluding the Subsea Cable Landing Site) were calculated based on the following timelines:

- 4.5 indicative years to construct the Powell Creek Solar Precinct;
- 2.5 indicative years to construct the Darwin Converter Site and Cable Transition Facilities at Murrumujuk; and
- 2.5 indicative years to construct the Overhead Transmission Line.

Figure 2 categorises the combined construction workforce for these components under the eight major groups of the Australian and New Zealand Standard Classification of Occupations (ANZSCO). ANZSCO is the skills-based classification system, developed and used by the Australian Bureau of Statistics and Stats NZ, to categorise all occupations and jobs in the Australian and New Zealand labour markets (ABS 2019). A description of ANZSCO's classification groups is provided in Attachment C.

Figure 2 - Occupation Profile

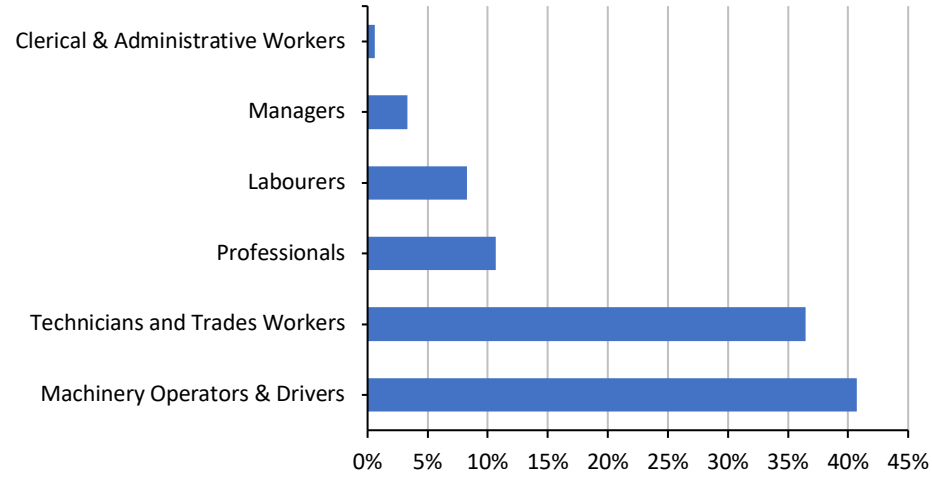


Figure 2 shows that Machinery Operators and Drivers, Technicians and Trade Workers make up the bulk of occupations to be filled during the AAPowerLink Project's construction phase, at 41% and 36% respectively of the total workforce. This is followed by Professionals and Labourers at 11% and 8%. Managers make up 3% of the total workforce, while Clerical and Administrative Workers make up just 1%.

Distribution of Jobs by Skills

Table 2 assigns ANZSCO's skill levels classification to the major occupation groups making up the AAPowerLink Project's construction workforce at Attachment B. ANZSCO defines skill levels by the range and complexity of tasks performed in a particular occupation. The greater the range and complexity of tasks, the greater the skill level for that occupation.

ANZSCO assigns occupations to one of five skill levels (ABS 2006, pp. 7-8). In determining the skill level of each occupation, ANZSCO seeks advice from employers, industry training bodies, professional organisations and others, to ensure that the determinations made are as accurate and meaningful as possible. A description of the five skill levels is at Attachment C. These skill levels are defined in terms of the formal education and training, previous experience and on-the-job training required for each occupation.

Table 2

Clerical & Administrative Workers	Skill Level 2 - Associate degree, advanced diploma or diploma, or at least three years of relevant experience. Skill Level 3 - AQF Certificate III including at least two years on-the-job training, AQF Certificate IV, or at least three years of relevant experience. Skill Level 4 - AQF Certificate II or III, or at least one year of relevant experience. Skill Level 5 – AQF Certificate I, or compulsory secondary education. Note – In some instances relevant experience and/or on-the-job training may be required in addition to the formal qualification. In the case of some Skill Level 5 occupations, a short period of on-the-job training may be required in addition to, or instead of, the formal qualification.
Managers	Skill Level 1 – Most occupations in this category have a skill level commensurate with a Bachelor degree or higher qualification. At least five years of relevant experience may substitute for the formal qualification. Note – In some instances relevant experience and/or on-the-job training may be required in addition to the formal qualification.
Labourers	Skill Level 4 – AQF Certificate II or III, or at least one year of relevant experience. Skill Level 5 – AQF Certificate I, or compulsory secondary education. Note – In some instances relevant experience and/or on-the-job training may be required in addition to, or instead of, the formal qualification.
Professionals	Skill Level 1 – Bachelor degree or higher qualification, or at least five years of relevant experience.

	Skill Level 2 - Associate degree, advanced diploma or diploma, or at least three years of relevant experience.
Technicians & Trade Workers	Skill Level 2 - Associate degree, advanced diploma or diploma, or at least three years of relevant experience. Skill Level 3 – AQF Certificate III including at least two years on-the-job training, AQF Certificate IV, or at least three years of relevant experience. Note: In some instances trade licensing, relevant experiences and/or on-the-job training may be required in addition to formal qualifications.
Machinery Operators & Drivers	Skill Level 4 – Australian Qualification Framework (AQF) Certificate II or III Note – Licensing requirements may apply to operate certain machines, including the requirements of the National Drivers Licensing Scheme.

Figure 3 describes the likely demand for skilled construction jobs across the AAPowerLink Project's components in the Northern Territory, applying ANZSCO's occupation skill levels classification in Table 2. Generally, skill levels 1-3 denote higher skilled jobs, while skill levels 4-5 denote lower skilled jobs. This graph also shows the proportions of the construction jobs in Attachment B that are considered suitable for local recruitment.

Figure 3 - Demand for Skilled Jobs

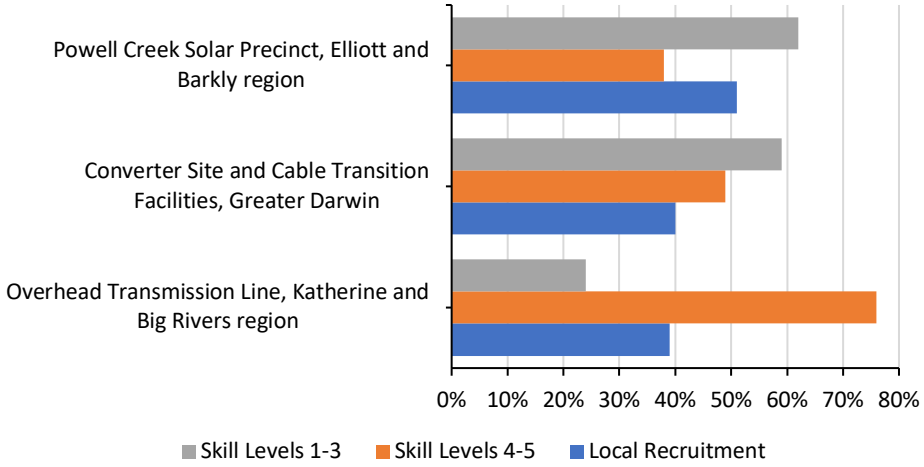


Figure 3 shows demand for skilled jobs across AAPowerLink Project's three components varies considerably. The Powell Creek Solar Precinct in the Barkly region, for example, has a higher demand for skilled construction jobs, compared to lower skilled jobs. This site also offers the greatest opportunities for locally recruited workers.

The likely demand for high and lower skilled construction jobs is more evenly spread with the construction of the Converter Site and Cable Transition Facilities in the

Greater Darwin region. There are fewer opportunities offered for locally recruited workers at this site. By comparison, the Katherine Big Rivers region has significantly higher demand for lower-skilled construction jobs with the installation of the Overhead Transmission Line. The Katherine and Big Rivers region offers similar opportunities for locally recruited workers as Greater Darwin.

Section Three - Regional Context

This section describes the Northern Territory's population and labour force, based on a review of ABS 2016 census data (ABS 2017). The extent to which the Northern Territory's regional populations have the requisite skills, knowledge and work-readiness to meet Sun Cable's workforce requirements will be discussed.

Regional demographics

Sun Cable's AAPowerLink Project local workforce catchment includes the township of Elliott (including Marlinja) and Tennant Creek in the Barkly region, Katherine and Big Rivers region (incorporating the local government areas), and the Greater Darwin region (incorporating the Litchfield, Palmerston and City of Darwin local government areas).

In the 2016 ABS census a total of:

- 164,383 people identified one of these population centres as their usual place of residence;
- 109,474 people, or just over 65%, reported being of working age, 15 to 64 years;
- 81,261 people, or nearly 50%, reported being in the labour force.

Figure 4 breaks down these figures for the three regional centres making up Sun Cable's local workforce catchment. This graph shows that between 90% and 92% of the total population, working aged people and the labour force resided in the Greater Darwin region. Katherine and the Big Rivers region was the next largest, with 6% each for the total population and working aged people, and 5% for those in the labour force. Tennant Creek and the Barkly region reported just 4% each for the total population and working aged people, and 3% for those in the labour force.

Figure 4 - Regional Demographics

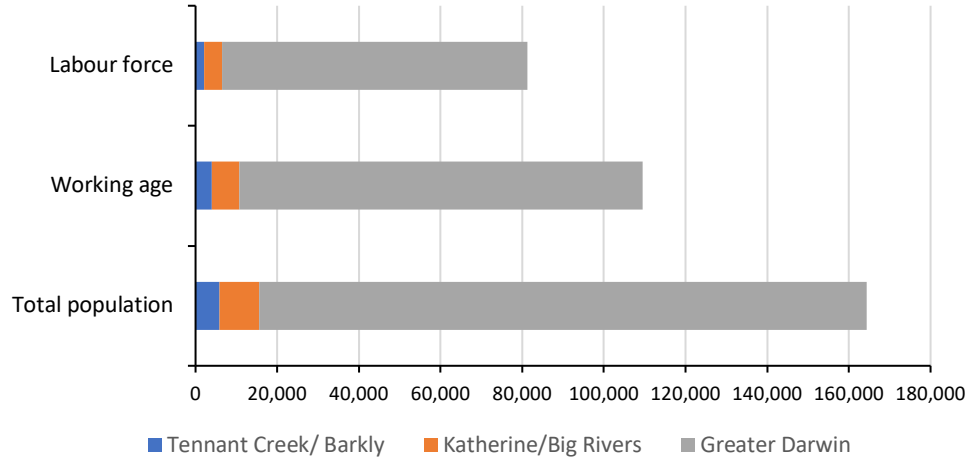


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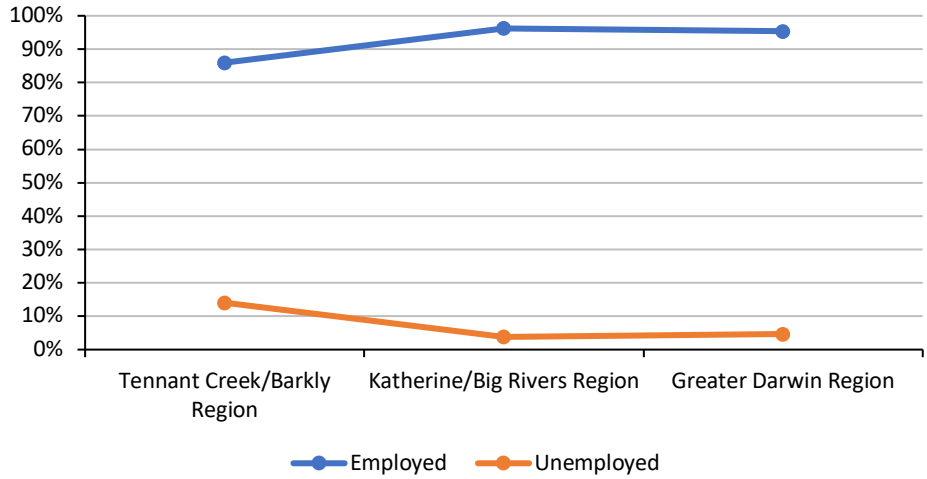
Figure 5 provides a breakdown of the proportion of people in Sun Cable's local workforce catchment, who reported being in the labour force in the week before Census night as either employed or unemployed. The ABS defines the labour force as including people who are undertaking paid or unpaid work, in a full or part-time job, or unemployed and actively looking for work. This graph shows that people reporting as being unemployed was substantially higher for Tennant Creek and the Barkly region at 14%, compared to Katherine and the Big Rivers region and Greater Darwin at 4% and 5% respectively.

Figure 5 - Employment



Population characteristics

Figure 6 describes the breakdown of males, females, Aboriginal and/or Torres Strait Islander people living within Sun Cable's local workforce catchment. This graph shows that, while there is a small variation between males and females across the regional centres, the proportion of Aboriginal and/or Torres Strait Islander people varies

significantly. Just under 65% of Tennant Creek and the Barkly region's population is Aboriginal and/or Torres Strait Islander, compared to 22% for Katherine and the Big Rivers region and just 9% for Greater Darwin.

Figure 6 - Gender and Aboriginal and/or Torres Strait Islander residents

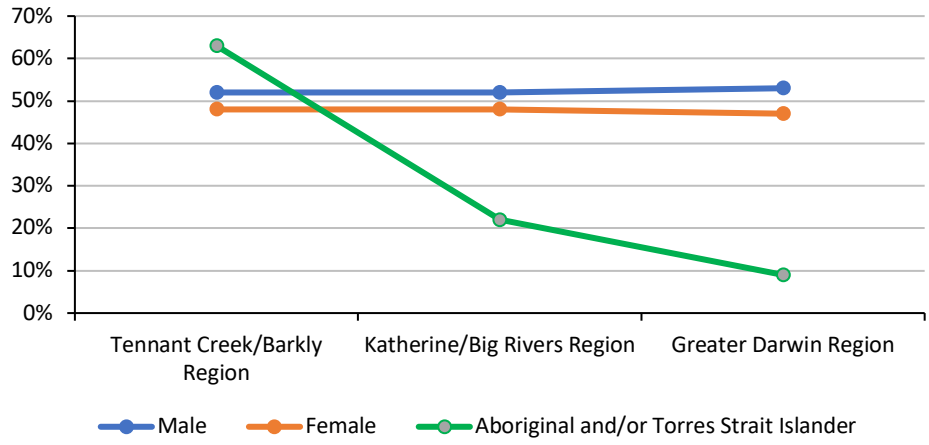
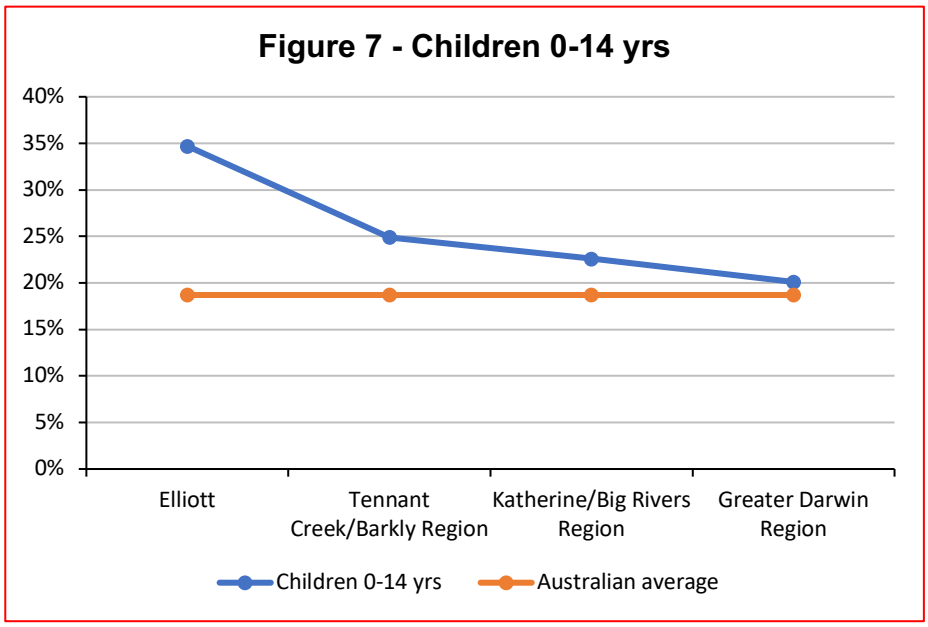


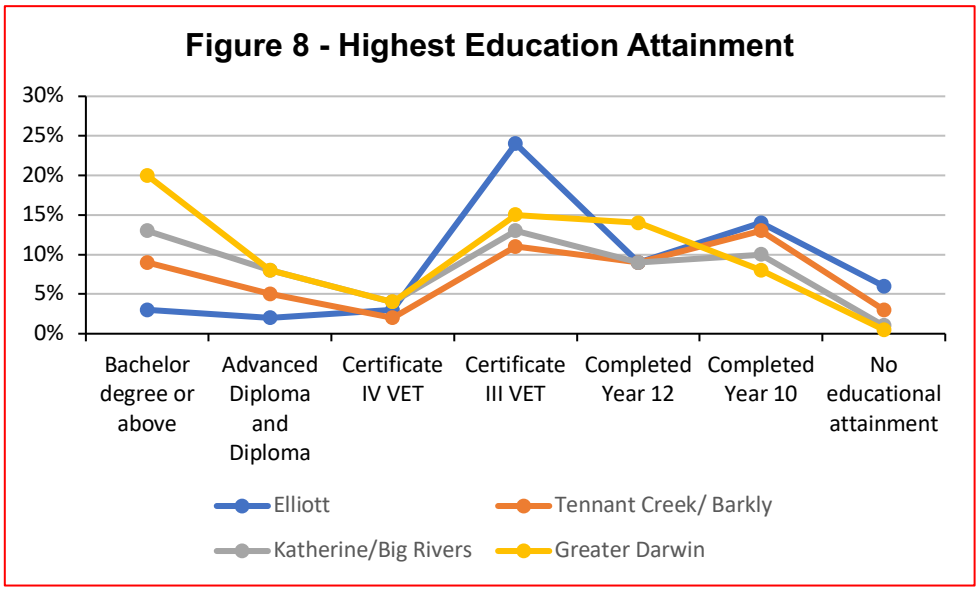
Figure 7 compares the proportion of children 0-14 years in the three regions of Sun Cable's local workforce catchment. This graph shows the proportion of children 14 years and younger in Elliott is 10 percentage points higher than Tennant Creek and the Barkly region, and 15 percentage points higher than Greater Darwin. Both Elliott and the Tennant Creek and Barkly region have high proportions of children in this age group, compared to the other regions of Sun Cable's workforce catchment. This should provide a significant cohort of prospective jobseekers, who could support Sun Cable's efforts to grow a future local labour market for the AAPowerLink Project. Sun Cable's success in this area will depend on these children remaining in the region and completing their secondary education in Tennant Creek.



Education

Figure 8 maps the level of highest education attained by people 15 years and older in the three regional centres of Sun Cable's local workforce catchment. This graph, shows:

- Greater Darwin has the highest proportion of residents with a Bachelor degree or above. It is equal with Katherine and the Big Rivers region for having the highest proportion of residents with an advanced diploma and diploma.
- Elliott has the highest proportion of residents who have a certificate III vocational education and training (VET) qualification.
- Significantly smaller proportions of people across the three regional centres reported having a certificate IV VET qualification.
- For all centres except Greater Darwin, more residents had completed Year 10 than Year 12 secondary schooling. This situation is the reverse for Greater Darwin, where significantly more people had completed Year 12.
- Elliott had the highest proportion of residents with no educational attainment, with Greater Darwin and Katherine and the Big Rivers region having the lowest proportion of just 1%.



Discussion

The number and type of jobs to be filled directly by Sun Cable, and through its supply chain, will fluctuate over time. The AAPowerLink Project is expected to have a 70-year lifespan, with construction to start in 2024 and operations commencing in 2026. Depending on the stage of the Project along this lifespan, its workforce size and composition will vary substantially.

Higher-skilled occupations

Given Greater Darwin's high concentration of residents, people of working age and those in the labour force, Sun Cable could potentially absorb a larger proportion of its local workforce from this region. In addition, both the Greater Darwin, Katherine and the Big Rivers regions have very low unemployment rates and significantly higher proportions of residents holding a Bachelor degree or above, advanced diploma and diploma. Taking this profile into account, Sun Cable could prioritise the recruitment of higher-skilled workers from these regional centres, targeting traditional trades, non-trades, managerial and tertiary qualified roles.

To capitalise on these opportunities, specific actions will be included in the local workforce strategy to promote Sun Cable's AAPowerLink Project to people who are work-ready and have the pre-requisite qualifications and experience to fill higher skilled jobs. Incentives could be considered to encourage residents from the Greater Darwin, Katherine and Big Rivers regions to work at the Powell Creek Solar Precinct, where it is expected there will be strong demand for skilled workers. Workers would be transported to and from site and use the onsite accommodation facilities at Powell Creek during their shifts.

Training and recruitment pathways for the unemployed

The Elliott township reported the highest level of unemployment of the four locations making up Sun Cable's local workforce catchment. It also has the highest proportion of residents with no educational attainment. While having the largest proportion of

people with a Certificate III VET qualification (suggesting a level of vocational training for this community), Elliott has the lowest proportions of people holding a Bachelor degree or above, advanced diploma and diploma. A similar pattern is noted for Tennant Creek and the Barkly region.

Given this demographic profile it is expected Elliott, Tennant Creek and the Barkly region will have much less capacity than Greater Darwin, Katherine and the Big Rivers region to meet local workforce requirements without significant investment from Sun Cable. The higher proportions of people identified as unemployed in Elliott, and to a lesser degree in Tennant Creek and the Barkly region, suggests a greater emphasis will be required in Sun Cable's local workforce strategy to provide training and recruitment pathways for this cohort of residents.

Increasing workforce diversity

The relative proportion of males and females are equally spread across the three regional centres making up Sun Cable's local workforce catchment. To ensure equal opportunities for males and females to participate in the AAPowerLink Project, appropriate diversity initiatives should be included in Sun Cable's local workforce strategy. These initiatives will focus on supporting more women to enter traditional trade roles that are generally dominated by males, as well as continue to promote other flexible workforce entry points in the Project. The strategy should also identify actions to encourage and support young women at secondary school to pursue career opportunities at Sun Cable, as well as ensure the AAPowerLink Project's workplaces are culturally safe, inclusive and respectful, particularly for Aboriginal women.

Aboriginal and/or Torres Strait Islander employment opportunities

Tennant Creek and the Barkly region reported the highest proportion of Aboriginal and/or Torres Strait Islander residents of the three regions making up Sun Cable's local workforce catchment. Whilst Sun Cable is committed to supporting Aboriginal and/or Torres Strait Islander workforce participation across all AAPowerLink Project components, in line with its Territory Benefit Plan, its efforts to maximise local workforce participation for this cohort should preference Elliott, Marlinja, Tennant Creek and the Barkly region in the first instance, given the numbers of people living in these locations.

Investing in young people as a future cohort of workers

While significant proportions of children 0-14 years are reported in all three regional centres of Sun Cable's local workforce catchment, the proportion of children in Elliott was the highest at 16 percentage points above the national average, and Tennant Creek and the Barkly region at 6 percentage points above. The proportions of children 0-14 years for Katherine and the Big Rivers region and Greater Darwin broadly aligned with the national average.

The number of children in Elliott, Tennant Creek and the Barkly region represents a significant future pipeline of secondary school students who could accrue generational benefits from Sun Cable's local workforce strategy over the AAPowerLink Project's 70 year lifespan. To capitalise on the generational opportunities presented by this

demographic, specific actions should be included in the local workforce strategy to engage and work with secondary schools.

A range of initiatives should be considered, that can be co-designed and implemented with schools, including making greater use of the Tennant Creek Juno Training Centre and other school based training facilities across the AAPowerLink Project's workforce catchment. These initiatives would include developing a suite of VET courses, work exposure and work experience activities, career information and education programs that can potentially be sponsored by Sun Cable. Sun Cable could also work with schools and universities to sponsor Internships, Cadetships and Graduate programs, to engage students looking to pursue career pathways to tertiary qualified jobs.

While noting the challenges of high drop-out rates and poor student attendance and participation in a number of schools within the AAPowerLink workforce catchment, the above courses and activities could provide a positive incentive for these secondary students. Actions could be considered for the Local Workforce Strategy to specifically engage at-risk students from as early as Year 10, through supportive training programs and career pathways that could eventually lead to employment in the Sun Cable project.

Section Four Stakeholder Consultation

The development of this workforce strategy is informed by a series of stakeholder consultations held in Tennant Creek, Elliott and Powell Creek, Katherine and Darwin between June and November 2021. These consultations comprised a mixture of in person and small group meetings. Due to the impact of COVID, a number of meetings were held as teleconference calls. The full list of stakeholders consulted is at Attachment A.

The consultation sought stakeholder views on the workforce readiness of residents living in these population centres to take up local employment opportunities in the AAPowerLink Project. It also explored the range of government funded employment services, strategic coordination and planning initiatives that could assist Sun Cable's implementation of its local workforce strategy. This section discusses the outcomes of this consultation, summarised under the following themes.

Labour Market Readiness

The stakeholder consultation shared a range of views about the local labour market capacity to fill jobs in the AAPowerLink Project.

Unemployment rates

While unemployment rates are key indicators of spare capacity in the labour market (Reserve Bank of Australia webpage), the level of skills training and work-readiness of local unemployed people will determine their potential "fit" as a source of labour for the AAPowerLink Project. The consultation raised a number of factors that could impact on the availability and capacity of local unemployed people to work in this Project.

The point was made that there are significant numbers of unemployed Aboriginal people, particularly in the Tennant Creek and Barkly region, who are not considered to be work-ready. Intergenerational unemployment, low literacy and numeracy skills, high rates of young people not completing their schooling, drug and alcohol issues and dysfunctional family relationships were all raised in the consultation as key factors impacting on the work-readiness of some unemployed groups.

Some of the businesses consulted reported increased complexities associated with employing Aboriginal people when meeting Indigenous targets tied to government contracts. Issues such as alcohol, family expectations, workers not regularly turning up to work and managing cultural obligations in the workplace, were identified as significant constraints adding to the costs of employing Aboriginal staff.

Commencing workers part-time and building up their hours as their work capacity increases, were identified by business and employment services providers as effective strategies for successfully managing an Aboriginal workforce. Other stakeholders also suggested role sharing, where two or more workers would occupy the one full-time equivalent (FTE) job.

Eight employment services providers were consulted across the Tennant Creek and Barkly region, Katherine and Big Rivers region and Greater Darwin. These government-funded services offer skills training and employment pathways to local unemployed

people. Their caseloads range from 800 to just over 1,000 jobseekers, depending on where the service is located. Providers reported having significant numbers of Aboriginal and Torres Strait Islander jobseekers, with a high proportion of jobseekers being long-term unemployed.

The employment services providers consulted reported relatively low proportions of their caseloads being work-ready, estimating between 10% and 30%. Work-readiness was generally defined by these services as jobseekers being engaged and regularly turning up for training and other activities, with at least an 85% attendance rate.

Service providers variously reported working with employers and industry to tailor their training and supports, and offered pre-employment training and post-placement mentoring support to increase the work-readiness of their jobseekers. All providers reported delivering Australian Qualifications Framework (AQF) certificate courses and, where possible, contextualising their training to articulate employment pathways to jobs identified by employers.

Attracting workers already in employment

In addition to the spare capacity potentially available from the local unemployed, today's modern labour market also provides Sun Cable with opportunities to recruit local employed workers with transferable skills to work in the AAPowerLink Project. There are also opportunities to draw on local labour market capacity through targeting part-time workers who are currently underemployed (Reserve Bank of Australia webpage).

A recurring theme from the consultation was the challenge of being able to attract skilled workers to live and work in the regional towns within Sun Cable's workforce catchment. This was due to severe housing shortages, schooling, lifestyle and liveability factors that make these towns less desirable locations for people to live. Stakeholders also referred to difficulties attracting people to towns such as Tennant Creek, which is seen as having an image problem with high-crime, public disorder and social dysfunction.

Stakeholders stressed the importance of working with other major project proponents in the regional centres making up Sun Cable's workforce catchment, to address common workforce challenges and enhance these centres as destinations of choice for workers. It was suggested a range of community investment initiatives could be considered to increase housing stock, childcare, education and recreational facilities, and decrease the impact of local crime, in making these destinations more appealing for future workers to settle.

The consultation identified a number of existing strategic initiatives aimed at growing regional economies, supporting local employment and driving investment decisions that will generate jobs. These include two working groups in Tennant Creek established under the Barkly Regional Deal, focused on increasing local employment and business opportunities (Barkly Regional Deal Backbone webpage). It also includes a proposal discussed in the consultation for Northern Territory Government to establish a stakeholder forum in Katherine. The proposed forum would facilitate a collaborative approach between project proponents to identify and address local workforce attraction, recruitment and retention issues.

To improve the work-readiness of employed people in the local labour markets as potential recruitment sources for the AAPowerLink Project, the consultation highlighted research by the Industry Skills Advisory Council NT (ISACNT). This organisation is identifying the skill attributes of related occupations and is analysing ABS data to determine the degree of skills portability between these occupations that could be used to recruit to local jobs that prove difficult to fill.

The Northern Territory Chamber of Commerce referred to its involvement in the campaign "Living it up in the Region". This campaign focuses on improving the liveability, attractiveness and access to amenities within major regional towns of the Northern Territory. The Chamber of Commerce expressed strong interest in working with Sun Cable and other major project proponents, to leverage the momentum and benefits flowing from this campaign to increase the Northern Territory's regional populations and businesses.

Supply-chain indirect workforce

A final avenue of local recruitment suggested in the consultation involved Sun Cable developing the AAPowerLink Project's indirect workforce, by supporting local business participation in the AAPowerLink Project's supply chain. The consultation discussed a range of integrated programs that could be developed in this area.

The example was given of Ventia's joint venture with Actemium, to provide maintenance services to the INPEX operated onshore processing facilities near Darwin. Known as TRACE, this joint venture has provided six apprenticeship opportunities every year since its inception three years ago, making it the Northern Territory's primary employer of apprentices (Ventia webpage). It was suggested similar opportunities could be encouraged by Sun Cable involving local businesses participating in its supply chain. These opportunities were identified as one means of increasing local indirect jobs, by extending the skills base of the workforces of local businesses in AAPowerLink Project's supply chain through offering more traineeships and apprenticeships.

The consultation heard from local businesses who said they were interested to participate in the AAPowerLink Project's supply chain; however businesses identified a number of constraints to recruiting workforces with sufficient skills to accept these opportunities. These businesses called for better access to local accredited training for apprentices. They also suggested longer lead times to tender for projects, to be able to develop workforce capacity. These businesses emphasised the importance of having a capable skilled workforce to be able to successfully compete locally for contracts in the AAPowerLink Project, rather than these contracts being filled by businesses from outside the region.

Intergenerational Workforce Opportunities

A range of suggestions were shared in the consultation on ways to capitalise on the intergenerational opportunities for developing a long-term skilled local workforce for the AAPowerLink Project.

Partnership with schools

The consultation discussed several ways Sun Cable could work with Tennant Creek, Katherine and Darwin secondary schools, through the Tennant Creek Juno Training Centre, Charles Darwin University (CDU) rural campus at Katherine, and the Palmerston Youth Skills Centre. The consultation also discussed plans to establish a pilot careers hub at Tennant Creek High School.

It was suggested a range of shared initiatives could be implemented to build secondary school student's interest, knowledge and understanding of the various job and career opportunities available through the AAPowerLink Project. The consultation canvassed opportunities for Sun Cable to collaborate with the Palmerston Youth Skills Centre, to develop contextualised programs that provide at-risk young people with training pathways to jobs.

Partnerships with universities, industry and schools

The consultation heard from stakeholders on the role and importance of universities for delivering VET certificate and tertiary education courses that can prepare prospective local jobseekers for higher-skilled jobs in the AAPowerLink Project. The consultation discussed how universities can deliver training targeted to both school-aged young people and adults, that combines VET with tertiary education to deliver higher-skills training in science, technology, engineering and mathematics (STEM).

Stakeholders discussed the importance of partnerships between industry, schools and tertiary education providers, to engage secondary students to consider STEM careers. The example was given of the Northern Territory STEM program, the sySTEMic Collaboration, involving students from Humpty Doo's Taminmin College. This program provided students with hands-on industry experience in a curriculum that featured two immersive site visits, a problem-solving day, and excursions to a mine site, a defence barracks and a university campus (Engineers Australia webpage).

The consultation discussed the potential role of CDU's Katherine campus to support the delivery of training and education programs aimed at higher-skilled jobs in the AAPowerLink Project. This campus sits under the College of Engineering, IT and Environment (Charles Darwin University webpage). This College has a strong focus on furthering scientific, engineering and technological learning, that could be applied to delivering flexible teaching, research and vocational training at the Katherine campus, or remotely through outreach programs.

Discussion

The stakeholder consultation provided useful insights into the challenges and opportunities within local labour markets to fill jobs in the AAPowerLink Project.

Targeting entry level jobs to the local unemployed

Unemployment rates are an indicator of spare workforce capacity in the labour force. Given the high rates of unemployment in the Tennant Creek/Barkly region (and to a lesser extent the Katherine/Big Rivers region and Greater Darwin), it can be expected that a number of positions within the AAPowerLink Project could be filled by local

unemployed people. Stakeholders suggested, however, that the work-readiness of the local unemployed is relatively low. With this in mind, Sun Cable may decide to target lower-skilled positions, as entry level jobs that could realistically be taken up by unemployed people.

From the list provided in Attachment B, it is estimated that just over 45% of the jobs making up the AAPowerLink Project's 1,750 construction workforce would be suitable for local recruitment. As shown in Figure 3, 51% of these jobs are likely to be in the Tennant Creek and Barkly region (with the construction of the Powell Creek Solar Precinct), 39% in Katherine and the Big Rivers region (with the installation of the Overhead Transmission Line), and 40% in Greater Darwin region (with the construction of the Converter Site and Cable Transition Facilities at Murrumujuk). Of these jobs, around 60% could be considered lower-skilled entry level positions. These involve occupations at the lower end of ANZSCO's skill levels, and comprise mainly labourers, machinery operators and drivers, clerical and administrative workers.

The employment services providers consulted were generally considered to be high performing. They should therefore be effective partners to work with Sun Cable in co-designing and delivering skills training and work-readiness programs that build the capacity of local unemployed people to meet AAPowerLink Project's entry level workforce requirements. Picking up on comments made by the businesses consulted, it is further suggested that part-time positions be offered initially through these programs, with the hours increased as people's capacity to work longer hours increases. All employment services providers consulted offer post-placement mentoring, to help unemployed people remain in their jobs and build workplace capacity.

Targeting higher-skilled candidates from Darwin, Katherine and through the indirect along the supply chain

The stakeholder consultation indicated there is potential capacity amongst people already employed to fill local jobs in the AAPowerLink Project. However, as highlighted by a number of stakeholders, Sun Cable's ability to attract these workers to the regional centres where they are needed will be significantly hampered by poor housing, educational opportunities and generally poor liveability factors.

ABS data discussed earlier in this report showed that Greater Darwin and the Katherine/ Big Rivers region have the highest proportion of people who identified as being in the workforce and holding a Bachelor degree or above, advanced diploma or diploma. Of the proportion of construction jobs identified earlier as being suitable for local recruitment, around 40% of these could be considered higher-skilled jobs. These would involve technicians, trades workers, managers and supervisors, with the occupation skill levels at the upper end of ANZSCO's classifications.

Sun Cable may wish to test the flexibility of the labour supply in the Greater Darwin and Katherine/Big Rivers regions. To do this Sun Cable could work with a suitably qualified organisation to advise on the transferability of the skills base of employed workers within these labour catchments, to determine their suitability to fill higher-skilled jobs in the AAPowerLink Project. Local workers from these regions would be transported to and from site and use the temporary accommodation facilities at the

Powell Creek Solar Precinct, to avoid exacerbating housing and social pressures in Tennant Creek. The installation of the Overhead Transmission Line would use temporary worker camps along the route.

The consultation confirmed local business interest in participating in the AAPowerLink Project's supply chain. Local workforce participation in indirect jobs associated with this Project could be facilitated by Sun Cable by supporting businesses to build their workforce capacity to compete for and win local procurement contracts.

Development of a medium to long term local workforce

Schools consulted expressed a strong interest in working with Sun Cable to help develop a medium to long-term skilled workforce that could support the AAPowerLink Project. These stakeholders suggested a range of career education, vocational training courses, work immersion and work experience programs that could be tailored to identified skill occupations and training pathways linked to the Project. The consultation also heard from stakeholders on the opportunities available through universities, for preparing prospective local jobseekers to fill higher-skilled jobs in both the direct and indirect workforces associated with the AAPowerLink Project.

Capitalising on these partnership opportunities, Sun Cable may choose to work with schools and universities to co-design a suite of vocational education and training courses, work exposure activities, and tailored careers information delivered through the Tennant Creek pilot careers hub. These programs could be co-sponsored by Sun Cable, to offer multiple and targeted career pathways for developing a future talent pipeline of students finishing school, transitioning into further training or university and eventually gaining employment on the Project. Sun Cable could also work with schools and universities to sponsor Internships and cadetships, with the option to progress into graduate programs catering to students selecting career pathways to tertiary qualified jobs.

Sun Cable may consider designing and delivering training programs with schools that specifically target at-risk students who have poor school attendance and participation rates. A focus of the Tennant Creek Juno Training Centre is to provide alternative education pathways for these at-risk students. This would offer a good synergy for any training initiatives developed by Sun Cable for this student cohort. The Palmerston Youth Skills Centre also provides a purpose-built state-of-the-art facility, offering flexible training to secondary students and youth who have disengaged, or are at risk of disengaging, from their schooling.

Section Five Strategic Recommendations

This section outlines key strategic recommendations to guide Sun Cable in implementing a local workforce strategy for the AAPowerLink Project. These recommendations cover both the construction and operations phase of the Project. Actions to give effect to these recommendations are also proposed for Sun Cable's consideration, together with the partner organisations who could assist with implementing the strategy.

Construction Workforce – 2024 to 2029

Recommendation One

That Sun Cable identifies the entry-level and higher-skilled construction jobs for the AAPowerLink Project that offer greatest potential for maximising local labour force participation.

Actions

To implement this recommendation the following actions are proposed.

1. Confirming the number of work hours and people needed by position classification for the construction workforces of the following components of the AAPowerLink Project:
    - Powell Creek Solar Precinct
    - Overhead Transmission Line
    - Darwin Converter Site and Cable Transition Facilities.
2. Preparing an indicative list of local job opportunities broken down by position classification, hours of work and location. This list should include jobs that can be filled directly by Sun Cable and through the local workforce recruitment provisions in contracts to be awarded through the supply chain.
    - The list would identify the skillsets and minimum qualifications (including personal capabilities and prior work experience) needed to fill these jobs.
    - The list will inform the training matrix to be developed under Recommendation Two, and the labour force capacity building and recruitment activities under Recommendation Three.
3. Identifying additional job opportunities in dedicated roles for cultural awareness training, land management (vegetation clearing, weed control) environmental management and cultural heritage protection, which could be filled by locally engaged Aboriginal people and Traditional Owners. These job opportunities should eventually transition into ongoing operational roles in the AAPowerLink Project.

Timeline

The indicative jobs list should be finalised by the second half of 2022.

Partner organisations

Industry Skills Advisory Council Northern Territory (ISACNT), Northern Territory Department of Industry, Tourism and Trade (DITT), National Indigenous Australians Agency (NIAA), government-funded Employment Services Providers, Barkly Regional Deal Backbone team.

Recommendation Two

That Sun Cable completes a training matrix to confirm the available skills, competencies and qualifications in the local labour force mapped against the indicative jobs list developed in Recommendation One. This matrix should allow Sun Cable to determine labour force capacity, and the skill gaps and training required, to provide pathways for local people to the entry level and higher skilled positions identified in the jobs list.

Actions

To implement this recommendation the following actions are proposed.

1. Developing a Scope of Services and appointing a third party contractor through an Expression of Interest (EOI) process. This contractor would undertake detailed labour market analyses of the geographic catchments of the AAPowerLink Project's components.
    - These analyses should determine the potential pool of available labour in these markets who have the requisite skills and expertise, may require minimal upskilling, or would need significant training and development, to fill entry level and higher-skilled jobs in the AAPowerLink Project.
    - Sun Cable should consider partnering with an independent peak organisation, (such as ISACNT, Chamber of Commerce Northern Territory or similar body), for industry skills capacity and capability advice to complete the training matrix.
2. Running information sessions with government-funded employment services providers and registered training organisations (RTOs), to gauge their interest and capacity to deliver accredited and non-accredited training for the positions identified in the training matrix.
    - Consideration should be given to the current experiences, track record and success of these organisations in delivering training within the geographic catchments of the AAPowerLink Project's components, and to Indigenous jobseekers and other priority groups (such as women, younger and older people).

Timeline

The training matrix should be completed by the first half of 2023. This would allow the remainder of 2023 and the first half of 2024 to complete the required training, and commence recruitment of local workers ready to start work in the AAPowerLink Project by the second half of 2024.

Partner organisations

Government-funded Employment Services Providers, RTOs, Julalikari Council Aboriginal Corporation, Charles Darwin University (CDU) Katherine and Alice Springs campuses, DITT, NIAA, Barkly Regional Deal Backbone team, Chamber of Commerce NT and ISACNT.

Recommendation Three

That Sun Cable builds local labour force capacity and fills jobs in the AAPowerLink Project construction workforce, in accordance with the indicative jobs list from Recommendation One and the training matrix from Recommendation Two.

Actions

To implement this recommendation the following actions are proposed.

1. Designing a Scope of Services and appointing a third party contractor through an EOI process. This contractor would work with employment services providers and RTOs to increase local visibility of available jobs, (both entry level and higher-skilled), and coordinate training packages to develop a pipeline of job-ready candidates to fill these jobs.
    - Where providers are funded by government, Sun Cable should not expect to subsidise their training. Commercial arrangements should be formalised with other providers, as required, prior to any training commencing.
    - Sun Cable should review the skills and job-readiness of candidates completing the training and independently fill the available jobs through competitive recruitment processes. The training packages should include guidance for local people on how to apply for jobs in the AAPowerLink Project. This training should also provide assistance with gathering work documents such as birth certificates, licences and tickets.
    - The contractor should work with Aboriginal and Traditional Owner groups, employment services providers and RTOs to source local candidates, and design and deliver tailored training programs and recruitment pathways to fill the dedicated roles from the indicative jobs list for local Aboriginal people and Traditional Owners.
2. Including local recruitment provisions in all procurement contracts to be awarded to businesses via Sun Cable's supply chain, to maximise local employment outcomes in the indirect workforce associated with the AAPowerLink Project.
    - To build the local workforce capacity of these businesses, the contractor should work with government and community organisations to identify training and recruitment pathways for

local candidates into direct jobs with suppliers and through apprenticeship and traineeship programs.

- Opportunities for shared hosting arrangements between suppliers, working with peak organisations such as Group Training NT, and sourcing funds from relevant government programs should be pursued by the contractor to help deliver a target number of apprentice/traineeship positions each year.

3. Designing a Scope of Services and appointing a third party contractor through an EOI process, to establish a web-based software recruitment and database facility. This facility will manage Sun Cable's processes for hiring all candidates coming through the above training, those competing for the dedicated jobs for Aboriginal people and Traditional Owners, and candidates independently seeking jobs in the AAPowerLink construction workforce.
    - This facility should offer a web-based portal for candidates to search and view current employment opportunities and apply for jobs within Sun Cable. It should also have a tracking system and data storage and retrieval capabilities, to manage pre-employment activities such as medicals, prerequisite training and verifying qualifications.
4. Designing and implementing a communication strategy to support the local promotion of jobs through the above web-based portal.
    - This strategy should include messaging on Sun Cable's commitments to preferencing local workers in the AAPowerLink Project from local, regional and Territory-wide labour force catchments.
    - The strategy should also include the dissemination of job alerts via local media and through organisations such as the employment services providers, RTOs, government and community organisations, university/schools and the Barkly Business Hub.
    - Specific information should be available in the communication strategy, and disseminated via Sun Cable's ICN Gateway webpage, to inform businesses lodging EOIs of Sun Cable's expectations and how it will enforce the local workforce recruitment provisions in the supply contracts to be awarded through the AAPowerLink Project.

Timeline

All training should be finalised and the recruitment of local workers commenced by the first half of 2024, to align with the roll-out of construction jobs and Sun Cable's capacity to place successful candidates in work. Timing of the training and recruitment of local workers by suppliers will be aligned with the awarding and commencement of their contracts.

Partner organisations

Government-funded Employment Services Providers, RTOs, Julalikari Council Aboriginal Corporation, Charles Darwin University (CDU) Katherine and Alice Springs campuses, ISACNT, DITT, Group Training NT, Barkly Regional Deal Backbone Team, Barkly Business Hub, Industry Capability Network Northern Territory (ICN NT), local direct suppliers.

Recommendation Four

That Sun Cable develops policies, protocols and procedures to establish and maintain inclusive work practices at the AAPowerLink Project components.

Actions

To implement this recommendation the following actions are proposed.

1. Engaging senior executives, managers, staff and HR practitioners to develop governance and oversight arrangements, policies, procedures and educational materials that can promote the benefits of diversity and support culturally safe, inclusive and respectful workplaces.
    - These measures should include welcome packs and project orientation programs for newly-hired staff.
    - The measures should also consider establishing a Diversity and Inclusion Council, championed by executive management and providing broad representation of workers from across the organisation and from diverse backgrounds and perspectives. The Council should sponsor leadership and education events and provide general oversight of workplace diversity and inclusion initiatives.
2. Establishing and communicating zero tolerance policies to handle incidences of racism, sexism and homophobia in the workplace as these arise.
3. Developing a Reconciliation Action Plan, to articulate Sun Cable's commitments and actions to engage with and create meaningful opportunities for Aboriginal and Torres Strait Islander people to participate in the AAPowerLink Project.
    - The Reconciliation Action Plan should include a "Welcome to Country" as part of all induction and project orientation programs for newly hired staff.
    - The Plan should also include workshops, information and resources to educate the construction and operational workforce on aspects of local cultural heritage within the catchments of the AAPowerLink Project's components. This should involve the sharing of languages, stories, artifacts, history and knowledge of country, delivered by Traditional Owners and qualified local Aboriginal people.

4. Generating dashboards and reports that can be shared online using interactive data visualisation software (such as Microsoft BI). These updates would monitor progress and measure the impact and outcomes of Sun Cable's workplace diversity and inclusion policies, programs and initiatives.

Timeline

Policies, procedures, education and communication materials should be finalised during 2023 and be in place by the first half of 2024, to align with the commencement of the AAPowerLink Project's construction workforce. These resources will be reviewed and refreshed annually and updated ahead of the commencement of the Project's operations workforce in 2026.

The establishment of a Diversity and Inclusion Council and completion of the Reconciliation Action Plan should occur during 2024, once the construction workforce is in place. These initiatives will be reviewed and updated during 2026, to coincide with the commencement of operations workforce.

Progress and monitoring reports should be generated annually and disseminated online to all staff. An evaluation of the diversity and inclusion initiatives should take place every four years, and ahead of the commencement of the operations phase in 2026. Initiatives will be refreshed, and new initiatives considered, depending on the outcomes of the rolling cycle of evaluations.

Partner organisations

Internal stakeholders, internal HR practitioners, Reconciliation Australia, Diversity Australia, Northern and Central Land Councils, NIAA, Julalikari Council Aboriginal Corporation, Patta Aboriginal Association, Jawoyn Association Aboriginal Corporation, Kalano Community Association, Larrakia Nation Aboriginal Corporation, Larrakia Development Corporation.

Operations Workforce – 2026 to 2089

Recommendation Five

That Sun Cable sets medium to long-term human resource objectives, and adopts a strategic approach to building local labour force capacity to service the AAPowerLink Project's ongoing operational workforce.

Actions

To implement this recommendation the following actions are proposed.

1. Designing a Scope of Services and appointing a third party contractor through an EOI process, to complete a Human Resource (HR) Strategic Plan. This contractor will report to an internal working group within Sun Cable to complete the following tasks:
    - map fluctuations in the likely composition and demand for direct and indirect jobs in the AAPowerLink Project workforce at key stages throughout the operations phase;
    - assess and update the current capacity, availability and demand for local labour within the geographic catchments of the AAPowerLink Project's components and identify potential competitors for this labour from other project proponents;
    - formulate strategic initiatives, objectives, timeframes and outcomes to build local labour force capacity and meet the ongoing demand for operational jobs;
    - establish benchmarks, data collection, monitoring and reporting mechanisms, to track progress with implementing the strategic plan and to measure its impact and outcomes.
2. Employing a Workforce Coordinator to implement the HR Strategic Plan. This worker will collaborate with employment services providers, RTOs, employment and recruitment agencies, tertiary education institutions, government departments and community organisations to deliver on the Plan's strategic initiatives, objectives and timeframes. The Plan should:
    - provide multiple entry points to the operational workforce, to support local people to backfill existing vacancies and recruit to new roles as these come available in the AAPowerLink Project;
    - incrementally build local labour market capacity through a range of targeted training and recruitment initiatives. Using the existing network of providers, these initiatives should establish a pipeline of prospective applicants to gradually increase the proportion of local labour employed in unskilled, semi-skilled, higher-skilled and credentialed jobs;
    - offer diverse employment pathways, catering for people who are unemployed as well as those in work and looking to move to Sun

Cable. Initiatives targeting key segments of the labour force (such as women, young and older people, Aboriginal and Torres Strait Islander people) should also be included, together with tailored training and recruitment pathways aimed at increasing their workforce participation levels; and

- include a range of initiatives to support local people who were employed in the construction phase and demonstrate capacity and commitment to transition to full time, ongoing jobs in the operations phase. To achieve this, apprenticeship, traineeship and cadetship programs should be considered as employment pathways to these jobs. Other accredited, non-accredited training and short courses should also be used to upskill workers and prepare them for operational roles. Locally engaged Aboriginal people and Traditional Owners who occupied dedicated jobs in the AAPowerLink Project's construction phase, should be included as part of the transitioning of jobs to ongoing roles in the operations phase.

3. Complementing the HR Strategic Plan with a strong emphasis on providing pre and post-placement mentoring and wraparound support to attract, develop and assist disadvantaged local candidates with complex needs to achieve sustainable employment in the AAPowerLink Project. Opportunities should be considered for Sun Cable to partner with local Aboriginal Traditional Owner organisations and other advocacy groups in the design and delivery of this mentoring program.

Timeline

The HR Strategic Plan should be completed by the end of 2025. The Workforce Coordinator should be appointed by the first half of 2025 and be ready to start implementing the HR Strategic Plan from the middle of 2026.

Partner organisations

DITT, NIAA, government-funded Employment Services Providers, employment and recruitment agencies, RTOs, schools and tertiary education institutions, Julalikari Council Aboriginal Corporation, Patta Aboriginal Association, Jawoyn Association Aboriginal Corporation, Kalano Community Association, Larrakia Nation Aboriginal Corporation and Larrakia Development Corporation.

Recommendation Six

That Sun Cable co-designs and implements vocational training, workplace immersion and work experience programs with secondary schools and universities, including the pilot careers hub in Tennant Creek, to achieve inter-generational local workforce opportunities from the AAPowerLink Project.

Actions

To implement this recommendation the following actions are proposed.

1. The Workforce Coordinator collaborating with schools, to engage secondary students from Year 10 onwards in VET qualifications, skillsets and short courses that can be completed over their senior years and tailored to trades and tertiary qualified jobs in the AAPowerLink Project.
    - A suite of VET courses and work activities should be developed with schools and co-sponsored by Sun Cable, to offer multiple career pathways and increase the future talent pipeline of students finishing school and transitioning into the AAPowerLink Project
    - Supportive training courses and programs should be designed with schools, the Tennant Creek Juno Training Centre and Palmerston Youth Skills Centre, to increase participation from at-risk students in AAPowerLink Project's training and job opportunities.
    - All courses and activities should be supplemented by online learning materials, information and case studies, to allow students to explore and learn at their own pace about the various career opportunities available in the AAPowerLink Project.
2. Helping schools and RTOs to contextualise course contents, training materials and delivery methods, work immersion and work experience activities, to ensure they are interactive, engaging and meaningful for students.
    - Training, assessment materials and learning resources should be tailored to meet the needs of students whose first language is not English, give emphasis to Indigenous languages and cultures, and provide additional support for students with disabilities and those with low language, literacy and numeracy skills.
    - To encourage student participation, program champions selected from Sun Cable's executive leadership team should be involved in promoting the opportunities and benefits of the training and workplace activities to students and schools.
3. The Workforce Coordinator promoting post-school employment pathways for students to technicians and trades workers in the AAPowerLink Project, through school-based apprenticeships that can transition into a full apprenticeship beyond school. Opportunities should also be considered for Sun Cable to sponsor Internships, Cadetships, and Graduate programs for students choosing career pathways to tertiary qualified jobs.
    - To ensure equitable and unbiased decision making, Sun Cable should establish an independent, merit-based and transparent review and assessment process to select successful student candidates to fill these opportunities.

Timeline

Sun Cable should engage with schools, NT Department of Education and the Palmerston Youth Skills Centre by the second half of 2024. This would allow sufficient

time to co-design training materials and resources and enrol students in pilot courses and activities that can run over two years of their senior schooling and allow them to graduate by the commencement of the operational workforce in 2026. The parameters, guidelines, review and assessment processes for awarding school-based (and full) apprentice/traineeships, internships, cadetships, and graduate opportunities should be finalised by the first half of 2026, with student applications being received and assessed from the second half of 2026, in line with the AAPowerLink Project's operational workforce commencing.

Partner organisations

Northern Territory secondary schools in the Tennant Creek/Barkly, Katherine/Big Rivers and Greater Darwin regions, Tennant Creek Juno Training Centre, Palmerston Youth Skills Centre, Northern Territory Department of Education, CDU and other universities, participating businesses along the AAPowerLink Project supply chain.

ATTACHMENT A

Stakeholder List

Tennant Creek

Andrew Oliver	Tennant Creek High School Juno Centre
Rob Duncan	Dept. Industry Tourism and Trade
Grant Butler	Dept. Industry Tourism and Trade
Harry Abrahams	National Indigenous Australians Agency
Carol Hermans	RN Employment Services Pty Ltd
Mandy Brown	RN Employment Services Pty Ltd
Benjamin Campion	Barkly Regional Deal Backbone Team
Mel Hargreaves	Saltbush Social Enterprise Pty Ltd
Jay Walker	CDU Alice Springs Campus
Jim Phillips	Phillips Earthmoving
Elizabeth Phillips	Phillips Earthmoving
Paul and Gail Bishop	NBL Hire
Nicolas Civitarese	T&J Contractors
Alana Civitarese	T&J Contractors
Elysha Kassman	T&J Contractors
Darrin Whatley	Darrin's Rubbish Removal
Mark Flanagan	TSS Security Service

Katherine

Brad Carruthers	The Kalano Community Association
Chris Hayward	RISE Ventures
Tara Granzien	RISE Ventures
Alison Haines	CDU Katherine Campus
Nick Lovering	Principal Katherine High School
Larni Montgomery	NT Education Registered Training Org.
Colin Abbott	Chamber of Commerce NT, Katherine
Scott Hutchison	Dept. Industry Tourism and Trade
Casey Greentree	National Indigenous Australians Agency

Darwin

Leanne Thackery	Palmerston Youth Skills Centre
Nicolette Grace	Salvation Army Employment Plus
Zoltan Smyth	WISE Employment
Krystal Jencik	MAX Employment Services

Alicia Boyle	Charles Darwin University
Stephen Goodall	Chamber of Commerce NT
Debbie Paylor	Industry Skills Advisory Council NT
Karen Sheldon	Saltbush Social Enterprises
Nicole Shackcloth	Saltbush Social Enterprises
Stevie Greenwood	Saltbush Social Enterprises

ATTACHMENT B

Skilled Position	Level of Qualification	Prop % of Work Force	ANZSCO Occupation Classification
Solar Precinct			
Civil and structural workers, engineers - Design	Levels 1 and 2	1%	Professionals
Civil engineers _ Project Engineers	Levels 1 and 2	1%	Professionals
Plant and machine operators, bulldozers, graders, excavators	Level 4 plus licensing requirements	3%	Machinery Operators and Drivers
Heavy vehicle operators (Transport to Powell Creek)	Level 4 plus licensing requirements	6%	Machinery Operators and Drivers
General labourers	Levels 4 and 5	7%	Labourer
Surveyors	Levels 1 and 2	1%	Professionals
HSE, safety, environmental, compliance officers	Levels 2 and 3, plus trade licences	2%	Technicians and Trades Workers
Project managers/Package Managers	Levels 2 and 3, plus trade licences	2%	Technicians and Trades Workers
Construction/area managers	Levels 2 and 3, plus trade licences	2%	Technicians and Trades Workers
Excavation teams	Levels 2 and 3, plus trade licences		Technicians and Trades Workers
Logistics teams/drivers - forklift operators, cranes, heavy vehicles	Level 4 plus licensing requirements	7%	Machinery Operators and Drivers
Passenger transport drivers - bus, coach, minivan	Level 4 plus licensing requirements	1%	Machinery Operators and Drivers
Bulk water transport	Level 4 plus licensing requirements	3%	Machinery Operators and Drivers
Bulk fuel transport	Level 4 plus licensing requirements	3%	Machinery Operators and Drivers
Solar deployment	Levels 2 and 3, plus trade licences	7%	Technicians and Trades Workers
Forklift telehandler operators	Level 4 plus licensing requirements	3%	Machinery Operators and Drivers
DC-side cabling installers	Levels 2 and 3, plus trade licences	3%	Technicians and Trades Workers
Energy storage deployment (transformer, PCS, Switchgear)	Levels 2 and 3, plus trade licences	6%	Technicians and Trades Workers
Electricians/Electrical contractors	Levels 2 and 3, plus trade licences	7%	Technicians and Trades Workers
Electrical engineers (commissioning)	Levels 1 and 2	3%	Professionals
Crane operators including EWPs	Levels 2 and 3, plus trade licences	3%	Technicians and Trades Workers
OEM commissioning contractors	Levels 1 and 2	3%	Professionals

Control systems engineers	Levels 1 and 2	2%	Professionals
Energy storage safety/compliance officers	Levels 1 and 2	2%	Professionals
Distribution and transmission at Solar precinct (33kV + 400kV)	Levels 2 and 3, plus trade licences	4%	Technicians and Trades Workers
Electrical engineers	Levels 1 and 2	1%	Professionals
General labourers	Levels 4 and 5	3%	Labourer
OHTL installation crews - linesmen, electricians	Levels 2 and 3, plus trade licences	3%	Technicians and Trades Workers
Crane operators/Materials handling	Levels 2 and 3, plus trade licences	2%	Technicians and Trades Workers
Cable logistics crews	Levels 2 and 3, plus trade licences	2%	Technicians and Trades Workers
Switchgear OEM compliance	Levels 2 and 3, plus trade licences	1%	Technicians and Trades Workers
Transformer OEM compliance	Levels 2 and 3, plus trade licences	1%	Technicians and Trades Workers
Safety/compliance officers	Levels 2 and 3, plus trade licences	1%	Technicians and Trades Workers
HSE, safety, environmental, compliance officers	Levels 2 and 3, plus trade licences	1%	Technicians and Trades Workers
Commissioning engineers	Levels 1 and 2	1%	Professionals
	Sub-Total	100%	
Logistics (including camp workers)			
Storemen and warehouse operators	Levels 2 and 3, plus trade licences	5%	Technicians and Trades Workers
Forklift and crane operators	Level 4 plus licensing requirements	36%	Machinery Operators and Drivers
Transport supervisors and schedulers	Level 1	7%	Manager
Medium and heavy vehicle operators	Level 4 plus licensing requirements	24%	Machinery Operators and Drivers
Rail safety compliance and protection officers	Levels 2 and 3, plus trade licences	5%	Technicians and Trades Workers
Rail intermodal operators	Levels 2 and 3, plus trade licences	24%	Technicians and Trades Workers
	Sub-Total	100%	
Passenger transport			
Personnel transfers - airfield and construction camp	Level 4 plus licensing requirements		Machinery Operators and Drivers
Pick-up/transfers - Elliott township and airfield	Level 4 plus licensing requirements	14%	Machinery Operators and Drivers
Pick-up/ transfers - Powell Creek airfield and construction camp	Level 4 plus licensing requirements	14%	Machinery Operators and Drivers
Onsite passenger transport	Level 4 plus licensing requirements		Machinery Operators and Drivers
Intra-site personnel movements	Level 4 plus licensing requirements	71%	Machinery Operators and Drivers
	Sub-Total	100%	

Onsite transport and logistics operations			
Heavy vehicle transport delivering materials and equipment	Levels 2 and 3, plus trade licences	38%	Technicians and Trades Workers
Operation of MHE and forklifts	Level 4 plus licensing requirements	38%	Machinery Operators and Drivers
Logistics operations within the Powell Creek	Levels 2 and 3, plus trade licences	25%	Technicians and Trades Workers
	Sub-Total	100%	
Powell Creek Solar Precinct facilities management and services (camp)			
Laundry and cleaning	Levels 2 and 3, plus trade licences	22%	Technicians and Trades Workers
Kitchen and canteen staff	Levels 2 and 3, plus trade licences	14%	Technicians and Trades Workers
Security	Levels 2 and 3, plus trade licences	14%	Technicians and Trades Workers
Grounds maintenance	Levels 2 and 3, plus trade licences	14%	Technicians and Trades Workers
General facilities maintenance	Levels 2 and 3, plus trade licences	14%	Technicians and Trades Workers
Passenger transport	Level 4 plus licensing requirements		Machinery Operators and Drivers
Office management, administration	Levels 2-5	7%	Clerical & Administrative Workers
Waste management	Levels 2 and 3, plus trade licences	7%	Technicians and Trades Workers
Bulk water cartage	Level 4 plus licensing requirements	7%	Machinery Operators and Drivers
	Sub-Total	100%	
Overhead Transmission (OHTL)			
Vegetation clearing - plant, grader operators	Level 4 plus licensing requirements	7%	Machinery Operators and Drivers
Drilling and piling	Level 4 plus licensing requirements	4%	Machinery Operators and Drivers
Pole installation	Level 4 plus licensing requirements	9%	Machinery Operators and Drivers
Cable installation	Level 4 plus licensing requirements	17%	Machinery Operators and Drivers
Logistics - based in Darwin Logistics Hub and some on-site	Level 1	11%	Manager
Electrical engineers	Levels 1 and 2	3%	Professionals
General labourers	Levels 4 and 5	7%	Labourer
MV/HV electricians/contractors	Levels 2 and 3, plus trade licences	5%	Technicians and Trades Workers
Heavy vehicle operators	Level 4 plus licensing requirements	22%	Machinery Operators and Drivers
Crane and forklift operators	Level 4 plus licensing requirements	11%	Machinery Operators and Drivers
Safety/compliance officers	Levels 2 and 3, plus trade licences	3%	Technicians and Trades Workers
Commissioning engineers	Levels 1 and 2	3%	Professionals

	Sub-Total	100%	
Voltage Source Converters (VSC) - Murrumujuk			
Cable landing site	Levels 2 and 3, plus trade licences	9%	Technicians and Trades Workers
Civil + structural engineering	Levels 1 and 2	13%	Professionals
Logistics - Darwin Logistics Hub and some on-site	Level 4 plus licensing requirements	9%	Machinery Operators and Drivers
Electrical engineers	Levels 1 and 2	5%	Professionals
Interface engineers	Levels 1 and 2	5%	Professionals
General labourers	Levels 4 and 5	18%	Labourer
MV/HV electricians/contractors	Levels 2 and 3, plus trade licences	18%	Technicians and Trades Workers
Heavy vehicle operators	Level 4 plus licensing requirements	13%	Machinery Operators and Drivers
Crane operators	Level 4 plus licensing requirements	9%	Machinery Operators and Drivers
	Sub-Total	100%	

ATTACHMENT C

ANZSCO Major Occupation Groups

Machinery Operators and Drivers are defined by ANZSCO workers who operate machines, plant, vehicles and other equipment to perform a range of agricultural, manufacturing and construction functions, move materials, and transport passengers and freight. The AAPowerLink Project's construction workforce has identified heavy vehicle, grader, crane and forklift operators and transport drivers for passenger pickups and transfers as broadly fitting this classification.

Technicians and Trade Workers are defined by ANSCO who perform a variety of skilled tasks, applying broad or in-depth technical, trade or industry specific knowledge, often in support of scientific, engineering, building and manufacturing activities. The AAPowerLink Project's construction workforce has identified a wide range of occupations that fit this category. These include electricians and electrical contractors; compliance officers; store and warehouse workers; cable landing and logistics workers; kitchen, laundry, security, grounds and facilities maintenance staff.

Professionals are defined by ANZSCO as workers who perform analytical, conceptual and creative tasks through applying theoretical knowledge and experiences. The AAPowerLink Project's construction workforce has identified a number of civil, structural and electrical engineering positions that broadly fit this category.

Labourers are defined by ANZSCO as workers who perform a variety of routine and repetitive physical tasks using hand and power tools, and machines either as an individual or as part of a team assisting more skilled workers. The AAPowerLink Project's construction workforce includes a broad range of general, construction, civil and environmental labourer positions aligned to this category.

Managers are defined by ANZSCO as workers who plan, organise, direct, control and review the day-to-day operations and major functions of commercial, industrial and government organisations. The AAPowerLink Project's construction workforce has identified transport supervisors, project, package and logistics managers as who broadly fitting this category.

Clerical and Administrative Workers represent the smallest proportion of occupations making up the AAPowerLink Project's construction workforce. ANZSCO defines Clerical and Administrative Workers as providing a variety of organisational, information and data management support services to managers, professionals and organisations.

ANZSCO Skill Levels

The five skill levels in ANZSCO are defined in terms of formal education and training, previous experience and on-the-job training. The determination of boundaries between skill levels is based on the following definitions.

SKILL LEVEL 1

Occupations at Skill Level 1 have a level of skill commensurate with a bachelor degree or higher qualification. At least five years of relevant experience may substitute for the formal qualification. In some instances relevant experience and/or on-the-job-training may be required in addition to the formal qualification.

SKILL LEVEL 2

Occupations at Skill Level 2 have a level of skill commensurate with one of the following:
•NZ Register Diploma or
•AQF Associate Degree, Advanced Diploma or Diploma.

At least three years of relevant experience may substitute for the formal qualifications listed above. In some instances relevant experience and/or on-the-job-training may be required in addition to the formal qualification.

SKILL LEVEL 3

Occupations at Skill Level 3 have a level of skill commensurate with one of the following:
•NZ Register Level 4 qualification
•AQF Certificate IV or
•AQF Certificate III including at least two years of on-the job training.

At least three years of relevant experience may substitute for the formal qualifications listed above. In some instances relevant experience and/or on-the-job-training may be required in addition to the formal qualification.

SKILL LEVEL 4

Occupations at Skill Level 4 have a level of skill commensurate with one of the following:
•NZ Register Level 2 or 3 qualification or
•AQF Certificate II or III.

At least one year of relevant experience may substitute for the formal qualifications listed above. In some instances relevant experience may be required in addition to the formal qualification.

SKILL LEVEL 5

Occupations at Skill Level 5 have a level of skill commensurate with one of the following:
•NZ Register Level 1 qualification
•AQF Certificate I or
•compulsory secondary education.

For some occupations a short period of on-the-job training may be required in addition to or instead of the formal qualification.

In some instances, no formal qualification or on-the-job training may be required.

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