

Terms of Reference for an EIS

Australia-ASEAN Power-Link

Sun Cable Pty Ltd

Barkly to Darwin Regions; ~~Darwin Harbour~~

January August 2021

Further information and guidance on the environmental impact assessment process is available on the NT EPA website at: www.ntepa.nt.gov.au

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1. Introduction

1.1. Overview

The Australia-ASEAN Power-Link (the proposal) proposed by Sun Cable Pty Ltd (the proponent) is being assessed by the Northern Territory Environment Protection Authority (NT EPA) under the *Environment Protection Act 2019* (EP Act) at the level of an environmental impact statement (EIS).

These terms of reference (TOR) set out the matters relating to the environment that are to be addressed in the draft EIS for this proposal. The draft EIS must also address all requirements in the NT EPA's *Preparing an environmental impact statement – Environmental impact assessment guidance for proponents*.

1.2. Background

A proponent initiated EIS referral was submitted to the NT EPA on 7 October 2020 for consideration under the EP Act. The proposal is to establish a large-scale solar farm in the Northern Territory with power exported to Darwin and then by subsea cable to Singapore. The proposal is described in the referral at: (<https://ntepa.nt.gov.au/your-business/public-registers/environmental-impact-assessments-register/assessments-in-progress-register/australia-asean-power-link-project>).

A 'notice of significant variation' was submitted to the NT EPA on 4 August 2021. Sun Cable propose to relocate the Darwin facilities component of the proposal including the Cable Transition Facilities, Darwin Converter Site and a segment of the Subsea Cable Corridor and Overhead Transmission Lines due to various constraints. The facilities will be relocated from the originally proposed location on Middle Arm Peninsula and Channel Island in Darwin Harbour, to Murrumujuk, 31km north-east of Darwin. The variation to the proposal is described in the referral at: [insert link](#).

The NT EPA decided that an EIS was required on 12 January 2021. The notice and statement of reasons for the decision are on the [NT EPA website](#).

1.3. Assessment under accredited assessment process

The proposal was referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The delegate of the Australian Government Minister for the Environment decided under section 75 of the EPBC Act that the proposed action is a controlled action and, as such, requires assessment and an approval decision due to the potential for a significant impact on matters of national environmental significance (MNES) protected under Part 3 of the EPBC Act.

The proposal is being assessed under an accredited assessment process (in accordance with section 87(4) of the EPBC Act as referenced in section 45 of the EP Act). These TOR have been prepared to meet the requirements of both government jurisdictions.

1.4. Assessment timeline

Table 1 Indicative assessment timeline for the Proposal

Key assessment milestones	Proposed / Completion date
Acceptance of proponent initiated EIS referral	16 October 2020
Referral consultation period including draft Terms of Reference	27 November 2020
Decision on accepted referral	12 January 2021
Terms of Reference approved	19 January 2021
<u>Notice of Significant Variation submitted</u>	<u>Insert date</u>
<u>Acceptance of notice</u>	<u>Insert date</u>
<u>Consultation period including amendments to draft Terms of Reference</u>	<u>Insert date</u>
<u>Decision on accepted notice</u>	<u>Insert date</u>
<u>Terms of Reference approved</u>	<u>Insert date</u>
Draft EIS submitted to the NT EPA	May-December 2021
Public and government authority consultation period	May to July 2021
Direction to prepare Supplement issued	August 2021
Supplement submitted	October 2021
Public and government authority consultation period	October 2021
Assessment report provided to Minister	December 2021
NT Minister's approval decision	February 2022
Commonwealth Minister's approval decision	March 2022

2. Matters to be addressed in the draft EIS

2.1. Summary

A summary of the draft EIS is required as part of the EIS documentation. The summary should be written as a stand-alone document, able to be provided on request to interested parties who may not wish to read the full EIS.

The summary should provide the following at a minimum:

- a clear and concise overview of the proposal, including key components and activities, lifespan, closure outcomes and intended future use of the site
- an explanation of the approvals process and function of the EIS
- a summary of the site selection process and alternatives considered
- an overview of the existing environment including location of the nearest sensitive receptors

- a summary of the environmental impacts of the proposal
- summary of measures to avoid, mitigate and, if applicable, offset potential impacts of the proposal.

2.2. Proposal description

2.2.1. Overview

Provide a clear description of the proposal and the full scope of works for which approval is sought. The proposal description should include:

- a summary table listing the key physical components of the proposal
- maps, figures, images, diagrams and flow charts
- any variations or modifications to the proposal since the referral information was submitted
- where there is uncertainty in the detailed design, footprint, capacity or life of the proposal, the approach to resolving this uncertainty should be clearly explained and the maximum extent for each parameter provided.

2.2.2. Proponent

Provide background to the proponent, including information on the environmental history of the proponent and its compliance with state/territory and Commonwealth environmental approval conditions. Outline any partnerships with other organisations or industries as part of the proposal.

2.2.3. Objectives of the proposal

State the rationale and justification for the proposal, considering social, economic and other environmental benefits and costs to the NT, in particular to local and regional communities, during the life of the proposal.

List the key objectives of the proposal and include a description of how the proposal meets these objectives.

The proponent should demonstrate in the draft EIS how the objectives of a proposal address the specific requirements of sections 42 and 43 of the EP Act.

2.2.4. Statutory framework

The EIS must provide information on the statutory framework including a description of any permits, consents, or other approvals that will be required from Northern Territory or Commonwealth agencies and/or authorities. While the proposal components within Singaporean and Indonesian jurisdictions are outside of the scope of the EIS, summarise the assessment and approval processes for these components.

2.2.5. Construction and operation

Provide a detailed description of all construction and operational aspects of the proposal as outlined in Table 2.

Table 2 Minimum information requirements for the proposal description

Topic	Required information
Site layout maps	<p>The description of the proposal must include, but not be limited to, detailed maps and graphic illustrations of:</p> <ul style="list-style-type: none"> • the location and dimensions of existing disturbance, infrastructure, roads/tracks and natural and modified landforms (including a depiction of these overlaid on aerial photos or high-resolution satellite imagery) within the proposal area • the location and approximate dimensions of areas to be disturbed, structures to be built or repurposed, including (where applicable): <ul style="list-style-type: none"> ○ all areas to be cleared¹ or disturbed ○ solar farm and electrical infrastructure, including cables ○ access roads, rail, airstrip and service infrastructure ○ water storage, stormwater and drainage infrastructure ○ buildings, structures and laydown areas ○ borrow areas ○ hazardous waste storage areas ○ other significant infrastructure. • the proposal layout in relation to environmental values and existing infrastructure (e.g. roads, cables, shipping channels, railway and pipelines). <p>The boundaries of the proposal area in relation to any overlapping or adjacent licenses and permits (mineral, petroleum or other); and any other interests in land including native title (claims or determined), Aboriginal freehold land, and pastoral land.</p>
Design	<p>Describe design options considered, including alternative configurations of the solar farm, reasons for selection of preferred design options, and how the proposed design avoids and/or mitigates environmental constraints and potential impacts and risks to the surrounding environment.</p> <p>Outline any site/route selection processes that have been undertaken, any alternatives considered, and justify why the proposed site/route was selected. Outline and justify any trade-offs in the site/route selection. Site/route selection should consider the potential for disruption or damage to existing infrastructure, particularly where design of the proposal intends to share existing corridors.</p> <p>Describe how the proposal has been designed, or allows for, adaptation to a changing climate e.g. capacity and efficiency of water facilities to allow for potential increase in evaporation and/or large rainfall events.</p>
Construction	<p>Describe all elements of the construction phase including:</p> <ul style="list-style-type: none"> • construction methods and any limitations of these in the area of the proposal. Where multiple alternatives exist, the choice of the preferred option(s) should be clearly explained and a comparison provided against other options in terms of potential environmental impacts • equipment and machinery required • construction materials required – major types, quantities, qualities, sources, storage requirements and potential hazards • available and potential sources of fill / borrow material • an overview of water quality of any controlled discharge (including targets in accordance with

¹ In accordance with the NT Land Clearing Guidelines and/or requirements under the NT Planning Scheme.

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Topic	Required information
	<p>ANZG (2018) or otherwise), location of the discharge point/s, and schedule for the discharge</p> <ul style="list-style-type: none"> • timeframes • any new ancillary infrastructure and upgrades required to service the proposal, including supply of electricity, road access and rail sidings • water requirements and sources (include a water balance) • waste classification and management, including drill muds from horizontal directional drilling (HDD) • controls to prevent creation of biting insects habitat • applicable legislation, guidelines and standards • details of how the proponent intends to address terrestrial and marine environmental management during construction, including: <ul style="list-style-type: none"> ○ erosion and sediment control ○ water capture, use and management including stormwater drainage ○ biosecurity measures to address weeds, feral animals and other pests ○ controls to avoid spills/discharges from vessels to marine environment ○ waste management ○ air quality management ○ maintenance of components and servicing of infrastructure ○ noise and vibration management (onshore and offshore, including noise from drilling activities, and underwater noise).
Operation	<p>Describe all onshore and offshore elements of the proposed operation including:</p> <ul style="list-style-type: none"> • environmental management of all aspects of the proposed operation with detailed maps, diagrams and facility design specifications and standards where relevant, including: <ul style="list-style-type: none"> ○ erosion and sediment control ○ water requirements and sources (provide a water balance) ○ water management including stormwater drainage biosecurity measures ○ waste management, including disposal/recycling of expended solar panels and batteries, and containment and disposal of contaminated wastewater and solids with details of pits, bunds, treatment and recycling ○ weed management ○ air quality management, including containment of dust ○ ongoing maintenance of onshore and offshore components and servicing of infrastructure ○ noise and vibration management (onshore and offshore) ○ applicable legislation, guidelines, and standards. • any feasible operation alternatives including alternatives for land management at the solar farm precinct (e.g. inclusion of grazing). Where multiple alternatives exist, the choice of the preferred option(s) should be clearly explained, and a comparison provided against other options in terms of potential environmental impacts.
Transport and traffic	<p>Describe traffic and transport activities during construction and operation, including but not limited to:</p>

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Topic	Required information
	<ul style="list-style-type: none"> proposed transport methods including rail, marine vessel and road freight forecast vehicle/vessel movements including type, size, volume and frequency of movements details on access, routes, vehicle/vessel types, volumes of traffic details of rail use and proposed rail siding.
Energy	Provide relevant information with respect to energy during construction and operation, including but not limited to: <ul style="list-style-type: none"> energy requirements and sources consideration of renewable sources of energy and justification of selected options estimate of the greenhouse gases emissions and savings measures to maximise energy efficiency and avoid and/or reduce greenhouse gas emissions consistent with the NT Government's target of achieving net zero greenhouse gas emissions by 2050 (DENR 2020).
Workforce	Provide a summary for each phase of the proposal, of the: <ul style="list-style-type: none"> estimated number of people to be employed skills base required likely sources (local, regional, overseas) on-site facilities provided (including any accommodation).

2.2.6. Rehabilitation and closure

This section should outline the planned rehabilitation and decommissioning of infrastructure and establish decommissioning objectives and goals. It should include:

- an overview of the pre-proposal environment and land use
- proposal lifespan
- procedures for decommissioning and rehabilitation planning including stakeholder engagement
- the biological, cultural, economic and social viability of options for decommissioning, removal and disposal of infrastructure and components, including implications of solar panels' disposal at the end of the proposal's life
- proposed rehabilitation measures including rehabilitation objectives and completion criteria, and proposed monitoring
- the proposed land use after closure (including alternatives).

3. Information requirements for environmental factors

The NT EPA identified 12 key environmental factors that could be significantly impacted by the proposal (Table 3). These have been selected from the *NT EPA Environmental factors and objectives – Environmental impact assessment guidance*.

Table 3 Preliminary environmental factors that must be considered in the draft EIS

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THEME	FACTOR	ENVIRONMENTAL OBJECTIVE
LAND	Terrestrial environmental quality	Protect the quality and integrity of land and soils so that environmental values are supported and maintained.
	Terrestrial ecosystems	Protect terrestrial habitats to maintain environmental values including biodiversity, ecological integrity and ecological functioning.
WATER	Hydrological processes	Protect the hydrological regimes of groundwater and surface water so that environmental values including ecological health, land uses and the welfare and amenity of people are maintained.
	Inland water environmental quality	Protect the quality of groundwater and surface water so that environmental values including ecological health, land uses and the welfare and amenity of people are maintained.
	Aquatic ecosystems	Protect aquatic habitats to maintain environmental values including biodiversity, ecological integrity and ecological functioning.
SEA	Marine environmental quality	Protect the quality and productivity of water, sediment and biota so that environmental values are maintained.
	Marine ecosystems	Protect marine habitats to maintain environmental values including biodiversity, ecological integrity and ecological functioning.
AIR	Air quality	Protect air quality and minimise emissions and their impact so that environmental values are maintained.
	Atmospheric processes	Minimise greenhouse gas emissions so as to contribute to the NT Government's target of achieving net zero greenhouse gas emissions by 2050.
PEOPLE	Community and economy	Enhance communities and the economy for the welfare, amenity and benefit of current and future generations of Territorians
	Culture and heritage	Protect sacred sites, culture and heritage.
	Human health	Protect the health of the Northern Territory population.

The draft EIS for the proposal should address how each of the above factors may be impacted by the relevant component of the proposal. While it is for the NT EPA to decide whether potential impacts are significant, the draft EIS should consider the significance of the identified potential impacts with reference to section 11 of the EP Act and [significant impact guidelines](#) for MNES.

A proposal footprint (direct disturbance) and area of influence (indirect disturbance) are to be established to identify the aspects of the environment (under each environmental factor) and the specific environmental values that could be impacted by implementation of the proposal. Consideration should

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be given to impacts associated with normal operations, abnormal operations, unplanned shutdowns of part or all of the proposal, and emergency shutdowns of part or all of the proposal.

For each of the key environmental factors listed in Table 3, the draft EIS is to provide an assessment of how the NT EPA's environmental objective would be met, as outlined in the NT EPA's *Preparing an environmental impact statement – Environmental impact assessment guidance for proponents* and detailed below.

If additional potential environmental impacts are identified through the environmental impact assessment process, they must also be included in the draft EIS, even if this requires addressing additional environmental factors not specified in Table 3.

The following sections and tables outline the information to be addressed for each environmental factor. The below information requirements should be addressed in an appropriate format within the draft EIS, with technical assessment reports appended to the EIS as applicable.

3.1. Terrestrial environmental quality

Table 4: Minimum information required for assessment of Terrestrial environmental quality

Aspect	Specific information required
NT EPA objective: Protect the quality and integrity of land and soils so that environmental values are supported and maintained.	
Environmental values	<ul style="list-style-type: none"> • Describe the soil/sediment characteristics of the area of influence for the proposal with consideration of the following aspects as appropriate: <ul style="list-style-type: none"> ○ the presence of contamination and/or acid sulfate soils ○ physical and chemical properties of the soil (including erosivity, fertility) ○ existing erosion and other disturbances. • Provide detailed maps to support these descriptions. • Provide results and interpretation of any geotechnical and soil investigations and surveys of the area of influence and an assessment of the suitability of sites for each relevant proposal component.
Potential impacts and risks	<p>Describe potential impacts to the NT EPA's environmental objective associated with the proposed construction and operation activities and development, including:</p> <ul style="list-style-type: none"> • direct disturbance of landforms and soils from earthworks during construction • indirect disturbance from project construction, such as erosion/topsoil migration • direct disturbance to the tidal zone as a result of construction of the land sea joint/shore crossing and potential for disturbance to associated ecological and hydrological values during project construction and operation • leaks of hazardous materials from batteries, transformers or other infrastructure installed at the solar farm precinct and Darwin VSC, or from vehicles • contamination of soils due to the disturbance of acid sulfate soils. <p>Determine the areas that could feasibly experience those impacts. Classify the areas as:</p> <ul style="list-style-type: none"> • proposal footprint – or direct disturbance footprint. These are the areas of proposed infrastructure, vegetation clearing and direct use. • area of influence – or indirect disturbance footprint. These are surrounding areas that may be indirectly affected by proposed activities, for example via the release of

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Aspect	Specific information required
	<p>contaminants (air, water, land), changes to land, water etc.</p> <p>Provide an assessment of potential impacts, benefits and risks to terrestrial environmental quality utilising outcomes of investigations and other relevant information. As a minimum, the assessment should take into consideration:</p> <ul style="list-style-type: none"> • scope, methods, equipment, timing and frequency • potential contaminants/pollutants including breakdown products • cumulative impacts with other industries or proposals • reversibility of potential impacts. <p>The assessment must identify potential impacts and risks to terrestrial environmental quality and quantify their significance. Consideration should be given to any policies, procedures and plans relevant to environmental values within the proposal footprint and area of influence.</p>
Avoidance, mitigation and management	<p>Outline the measures for avoiding, mitigating, or offsetting impacts identified above, with consideration of section 26 (Environmental decision making hierarchy) and section 27 (Waste management hierarchy) of the EP Act. Also include here measures to enhance or restore environmental quality.</p> <p>These should address at a minimum:</p> <ul style="list-style-type: none"> • facility design and layout • erosion and sediment control • stormwater • acid sulfate soil management (if present) • emergency/hazard/spill response management • end-of-life solar panel and battery management • compliance with any statutory or policy basis for the proposed measures. <p>Discuss adaptation to a changing climate including design and resultant viability of the proposal, with reference to the NT policy <i>Northern Territory Climate Change Response: Towards 2050</i> (DENR 2020) and Climate Change in the Northern Territory: State of the science and climate change impacts (NESP ESCC Hub 2020).</p> <p>All mitigation measures should be substantiated and in accordance with best practice, including advice from relevant NTG advisory agencies.</p>
Monitoring and reporting	<p>Outline proposed monitoring and reporting activities related to potential impacts and risks, and mitigation and management measures. The proposed monitoring and reporting should specify which project phase it relates to, i.e. construction or operations.</p> <p>All monitoring activities should be substantiated and in accordance with best practice including advice from relevant NTG advisory agencies.</p>
Residual impact	<p>Assess the significance of any residual impact or risk of the Proposal to identified values.</p>
Offsets	<p>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</p>

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Aspect	Specific information required
	the NT Offset Framework ² (as published) and the EPBC Act environmental offsets policy ³ .

² NT Offset Framework is available at: <https://depws.nt.gov.au/environment-information/northern-territory-offsets-framework/northern-territory-offsets-framework>

³ The EPBC Act environmental offsets policy is available at:
<http://www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy>

3.2. Terrestrial ecosystems

Table 5: Minimum information required for assessment of Terrestrial ecosystems

Aspect	Specific information required
NT EPA objective: Protect terrestrial habitats to maintain environmental values including biodiversity, ecological integrity and ecological functioning.	
Environmental values	<p>Describe the terrestrial ecosystems of the proposal footprint and area of influence with detail on vegetation communities (vegetation mapping to at least NVIS level 4 or higher for key infrastructure precincts), flora species and fauna species, detailing communities and species of regional and national significance, and pest and exotic species.</p> <p>The known, likely and potential presence of threatened ecological communities and species (identified in preliminary terrestrial ecology studies for the proposal and Protected Matters Search Tool (PMST) as target species) under the EPBC Act must be described, including but not limited to:</p> <p>Plants</p> <ul style="list-style-type: none"> • <i>Acacia praetermissa</i> • <i>Atalaya brevialata</i> • <i>Goodenia quadrifida</i> • <i>Helicteres macrothrix</i> • <i>Stylidium ensatum</i> • <i>Typhonium taylori</i> • <i>Xylopia monosperma</i> • Arnhem Plateau Sandstone Shrubland Complex threatened ecological community <p>Mammals</p> <ul style="list-style-type: none"> • Fawn Antechinus <i>Antechinus bellus</i> • Northern Quoll <i>Dasyurus hallucatus</i> • Arnhem Leaf-nosed Bat <i>Hipposideros inornatus</i> • Ghost Bat <i>Macroderma gigas</i> • Black-footed Tree-Rat <i>Mesembriomys gouldii gouldii</i> • Narbarlek <i>Petrogale concinna canescens</i> • Northern Brush-tailed Phascogale <i>Phascogale pirata</i> • Water Mouse <i>Xeromys myoides</i> <p>Birds</p> <ul style="list-style-type: none"> • Painted honeyeater <i>Grantiella picta</i> • Princess parrot <i>Polytelis alexandrae</i> • Greater bilby <i>Macrotis lagotis</i> • Night parrot <i>Pezoporus occidentalis</i> • Brush-tailed mulgara <i>Dasyercus blythi</i> • Gouldian Finch <i>Erythrura gouldiae</i> • Grey Falcon <i>Falco hypoleucos</i> • White-throated Grasswren <i>Amytornis woodwardi</i> • Masked Owl <i>Tyto novaehollandiae kimberli</i> • Red Goshawk <i>Erythrotriorchis radiatus</i> • Partridge Pigeon <i>Geophaps smithii smithii</i> • Crested Shrike-tit <i>Falcunculus frontatus whitei</i> • Bare-rumped Sheath-tail Bat <i>Saccolaimus saccolaimus nudicluniatu</i> • Far Eastern Curlew — <i>Numenius madagascariensis</i> • Lesser Sand Plover — <i>Charadrius mongolus</i> • Bar-tailed Godwit — <i>Limosa lapponica</i> • Red Knot <i>Calidris canutus</i> • Great Knot — <i>Calidris tenuirostris</i>

Commented [KW1]: Note: Only species highlighted in yellow have been added. The other tracked changes are made for ease of reading and cross-referencing in the EIS - we have reformatted the species lists into groups, ordered alphabetically and included both common and scientific names

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Aspect	Specific information required
	<ul style="list-style-type: none"> • Greater Sand Plover <i>Charadrius leschenaultii</i> • Curlew Sandpiper <i>Calidris ferruginea</i> <p>Reptiles</p> <ul style="list-style-type: none"> • Arnhem Land Egernia <i>Bellatorias obiri</i> • Plains Death Adder <i>Acanthopis hawkei</i> <p>Migratory Species (in addition to threatened species already listed above)</p> <ul style="list-style-type: none"> • <i>Actitis hypoleucos</i> • <i>Anous stolidus</i> • <i>Apus pacificus</i> • <i>Arenaria interpres</i> • <i>Calidris acuminata</i> • <i>Calidris alba</i> • <i>Calidris melanotos</i> • <i>Calidris ruficollis</i> • <i>Calidris subminuta</i> • <i>Calonectris leucomelas</i> • <i>Cecropis daurica</i> • <i>Charadrius dubius</i> • <i>Charadrius veredus</i> • <i>Cuculus optatus</i> • <i>Fregata ariel</i> • <i>Fregata minor</i> • <i>Gallinago megala</i> • <i>Gallinago stenura</i> • <i>Glareola maldivarum</i> • <i>Hirundo rustica</i> • <i>Limicola falcinellus</i> • <i>Limnodromus semipalmatus</i> • <i>Limosa lapponica</i> • <i>Limosa limosa</i> • <i>Motacilla cinerea</i> • <i>Motacilla flava</i> • <i>Numenius minutus</i> • <i>Numenius phaeopus</i> • <i>Pandion haliaetus</i> • <i>Phaethon lepturus</i> • <i>Pluvialis fulva</i> • <i>Pluvialis squatarola</i> • <i>Rhipidura rufifrons</i> • <i>Sula leucogaster</i> • <i>Sula sula</i> • <i>Tringa brevipes</i> • <i>Tringa glareola</i> • <i>Tringa incana</i> • <i>Tringa nebularia</i> • <i>Tringa stagnatilis</i> • <i>Xenus cinereus</i> <p>The known and potential presence of species (identified as target species in preliminary terrestrial ecology studies for the proposal and the Notice of Significant Variation) under the <i>Territory Parks and Wildlife Conservation Act 1976</i> (TPWC Act) must be described, including but not limited to:</p> <p>Plants</p> <ul style="list-style-type: none"> • <i>Acacia praetermissa</i>

Commented [KW2]: This list has been moved under the EPBC Act heading because they are listed migratory species. This list was previously included under the TPWC Act heading.

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Aspect	Specific information required
	<ul style="list-style-type: none"> • <i>Cleome insolata</i> • <i>Cycas armstrongii</i> • <i>Helicteres macrothrix</i> • <i>Luisia corrugata</i> • <i>Ptychosperma macarthurii</i> • <i>Styloidium ensatum</i> • <i>Typhonium praetermissum</i> • <i>Typhonium taylori</i> • <i>Utricularia dunstaniae</i> • <i>Utricularia singeriana</i> <p>Reptiles</p> <ul style="list-style-type: none"> • <i>Yellow-spotted Monitor Varanus panoptes</i> <p>Amphibians</p> <ul style="list-style-type: none"> • <i>Howard River Toadlet Uperoleia daviesae</i> <p>The likely occurrence of listed migratory species associated with Lake Woods must be described.</p> <p><u>The likely occurrence of listed migratory shorebird species associated with Gunn Point Beach must be described.</u></p> <p>Existing condition of habitat and vegetation communities should also be described along with any existing threatening processes.</p> <p>Provide detailed maps to support the above descriptions.</p> <p>Provide results and interpretation of any terrestrial ecology surveys of the area of influence.</p>
Potential impacts and risks	<p>Describe potential impacts to the NT EPA's environmental objective associated with the proposed construction and operation activities and development, including:</p> <ul style="list-style-type: none"> • direct loss of flora/ecological communities from vegetation clearing and ongoing maintenance (e.g. fire and vegetation management) including significant and sensitive habitats and potential habitats for threatened species listed under TPWC Act and EPBC Act. Provide an overview of the extent (ha) of the loss in table and map format • indirect disturbance or degradation of flora and vegetation, possibly resulting in a long-term decline or loss over time, for example from erosion, dust, weeds/pathogens, shading from solar panels, disturbance of acid sulfate soils, etc. • introduction or increase of weed and pest species due to construction, operation or maintenance activities • changes in bushfire risk (fire frequency and intensity) due to vegetation clearing and weeds • direct disturbance of fauna and fauna habitat as a result of clearing • indirect impacts to fauna habitat due to changes to water quality, introduction or spread of weed or pathogens or pest species, fragmentation and edge effects • indirect impacts to fauna as a result of reduced habitat availability or fragmentation • direct impacts to fauna as a result of collision with overhead transmission lines • direct impacts to fauna as a result of collision with vehicles or equipment, including solar panels • changes to fauna behaviours as a result of noise or lighting from proposal areas, including potential glare from solar panels or the 'lake effect' (solar farm mistaken for a water body)

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Aspect	Specific information required
	<p>Determine the areas that could feasibly experience those impacts. Classify the areas as:</p> <ul style="list-style-type: none"> • proposal footprint – or direct disturbance footprint (proposal footprint). These are the areas of proposed infrastructure, vegetation clearing and direct use • area of influence – or indirect disturbance footprint. These are surrounding areas that may be indirectly affected by proposed activities, for example via the release of contaminants (air, water, land), changes to land, water etc. <p>Provide an assessment of potential impacts, benefits and risks to terrestrial ecosystems utilising outcomes of investigations and other relevant information. As a minimum, the assessment should take into consideration:</p> <ul style="list-style-type: none"> • methods, equipment, timing and frequency • potential contaminants/pollutants.
<p>Avoidance, mitigation and management</p>	<p>Outline the measures for avoiding, mitigating, or offsetting impacts identified above, with consideration of sections 26 (Environmental decision-making hierarchy) and section 27 (Waste management hierarchy) of the EP Act. Also include here measures to enhance or restore environmental quality.</p> <p>These should address at a minimum:</p> <ul style="list-style-type: none"> • Facility design and layout. • Clearing of native vegetation. • Fauna relocation and management. • Pest/weed/pathogen control and management. • Compliance with any statutory or policy basis for the proposed measures. <p>Discuss adaptation to a changing climate including design and resultant viability of the proposal.</p> <p>All mitigation measures should be substantiated and in accordance with best practice, including advice from relevant NTG advisory agencies. All clearing of native vegetation should comply with the NT Land clearing Guidelines (DENR 2019).</p>
<p>Monitoring and reporting</p>	<p>Outline proposed monitoring and reporting activities related to potential impacts and risks and mitigation and management measures to terrestrial ecosystems. The proposed monitoring and reporting should specify which project phase it relates to, i.e. construction or operations.</p> <p>All monitoring activities should be substantiated and in accordance with best practice advice from relevant NTG advisory agencies.</p>
<p>Residual impact</p>	<p>Assess the significance of any residual impact or risk of the proposal to identified values.</p>
<p>Offsets</p>	<p>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.</p>

3.3. Hydrological processes

Table 6: Minimum information required for assessment of Hydrological processes

Aspect	Specific information required
<p>NT EPA objective: Protect the hydrological regimes of groundwater and surface water so that environmental values including ecological health, land uses and the welfare and amenity of people are maintained.</p>	
<p>Environmental values</p>	<p>Describe the following:</p> <ul style="list-style-type: none"> • climate and meteorological conditions of the proposal's area of influence with reference to hydrological regimes, the frequency and severity of extreme weather conditions, such as storms and cyclones • surface water catchment systems of the proposal's area of influence including detail on any waterways of significance, drainage patterns, flow variations and flooding • groundwater systems of relevant proposal areas • any relevant water control districts and water allocation plans • declared beneficial uses, existing users, water quality objectives and environmental values of water resources in proposal's area of influence <p>Provide detailed maps to support the above descriptions.</p> <p>Provide results and interpretation of any hydrological and hydrogeological surveys of the area of influence.</p>
<p>Potential impacts and risks</p>	<p>Describe potential impacts to the NT EPA's environmental objective associated with the proposed construction and operation activities and development, including:</p> <ul style="list-style-type: none"> • changes to the natural catchment and surface and groundwater hydrology, for example from the creation of hardstand surfaces and other infrastructure through construction and operation of the proposal • localised erosion from ground disturbance and surface water flowchanges • groundwater use (including impacts to other groundwater users) <p>Determine the proposal footprint and influence that could feasibly experience those impacts.</p> <p>Provide an assessment of potential impacts, benefits and risks to hydrological processes utilising outcomes of investigations and other relevant information. As a minimum, the assessment should take into consideration:</p> <ul style="list-style-type: none"> • methods, equipment, timing and frequency • cumulative impacts with other industries or proposals • environmental management requirements associated with seasonal weather, extreme weather conditions such as storms and cyclones for the 2, 10 and 100 year average recurrence interval events • reversibility of potential impacts <p>The assessment must take into account all construction and operation activities of the proposal.</p> <p>The assessment must identify potential impacts and risks to hydrological processes and quantify their significance:</p> <ul style="list-style-type: none"> • against relevant guideline thresholds • on the beneficial uses, water quality objectives and identified environmental

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Aspect	Specific information required
	values including groundwater dependent ecosystems and existing ground and surface water users.
Avoidance, mitigation and management	<p>Outline the measures for avoiding, mitigating, or offsetting impacts identified above, with consideration of sections 26 (Environmental decision making hierarchy) and section 27 (Waste management hierarchy) of the EP Act. Also include here measures to enhance or restore environmental quality. These should address at a minimum:</p> <ul style="list-style-type: none"> • facility design and layout • water management and efficiency, including stormwater and wastewater management • water efficiency • waste management including a detailed description of management methods for all types of wastes • geomorphic stability • erosion and sediment control • compliance with any statutory or policy basis for the proposed measures <p>Discuss adaptation to a changing climate including design and resultant viability of the proposal.</p> <p>All mitigation measures should be substantiated and in accordance with best practice, including advice from relevant NTG advisory agencies.</p>
Monitoring and reporting	<p>Outline proposed monitoring and reporting activities related to potential impacts and risks and mitigation and management measures to hydrological processes.</p> <p>The proposed monitoring and reporting should specify which project phase it relates to, i.e. construction or operations.</p> <p>All monitoring activities should be substantiated and in accordance with best practice advice from relevant NTG advisory agencies.</p>
Residual impact	Assess the significance of any residual impact or risk of the proposal to identified values.
Offsets	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.

3.4. Inland water environmental quality

Table 7: Minimum information required for assessment of Inland water environmental quality

Aspect	Specific information required
NT EPA objective: Protect the quality of groundwater and surface water so that environmental values including ecological health, land uses and the welfare and amenity of people are maintained.	
Environmental values	<p>Describe the water quality (chemical, physical and biological) of surface water and groundwater in the proposal's area of influence.</p> <p>Provide detailed maps to support the above descriptions.</p> <p>Provide results and interpretation of any hydrological and hydrogeological surveys of the</p>

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Aspect	Specific information required
	area of influence.
Potential impacts and risks	<p>Describe potential impacts to the NT EPA's environmental objective associated with the proposed construction and operation activities and development, including:</p> <ul style="list-style-type: none"> • localised erosion from ground disturbance and surface water flow changes • groundwater treatment • contamination from hazardous materials. <p>Determine the proposal footprint and area of influence that could feasibly experience those impacts.</p> <p>Provide an assessment of potential impacts, benefits and risks to inland water environmental quality utilising outcomes of investigations and/or other relevant information. As a minimum, the assessment should take into consideration:</p> <ul style="list-style-type: none"> • methods, equipment, timing and frequency • potential contaminants/pollutants • cumulative impacts with other industries or proposals. • environmental management requirements associated with seasonal weather, extreme weather conditions such as storms and cyclones for the 2, 10 and 100 year average recurrence interval events • the physical and chemical characteristics, volume, timing and location of any discharges • the reversibility of potential impacts. <p>The assessment must take into account all construction and operation activities of the proposal.</p> <p>The assessment must identify potential impacts and risks to inland water environmental quality and quantify their significance:</p> <ul style="list-style-type: none"> • against relevant guideline thresholds including ANZG 2018 • on the beneficial uses, water quality objectives and identified environmental values.
Avoidance, mitigation and management	<p>Outline the measures for avoiding, mitigating, or offsetting impacts identified above, with consideration of sections 26 (Environmental decision making hierarchy) and section 27 (Waste management hierarchy) of the EP Act. Also include here measures to enhance or restore environmental quality.</p> <p>These should address at a minimum:</p> <ul style="list-style-type: none"> • facility design and layout • water management and efficiency, including stormwater and wastewater management • waste management including a detailed description of management methods for all types of wastes, including end-of-life panels and batteries • erosion and sediment control • compliance with any statutory or policy basis for the proposed measures. <p>Discuss adaptation to a changing climate including design and resultant viability of the proposal.</p>

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Aspect	Specific information required
	All mitigation measures should be substantiated and in accordance with best practice, including advice from relevant NTG advisory agencies.
Monitoring and reporting	Outline proposed monitoring and reporting activities related to potential impacts, risks, mitigation and management measures. The proposed monitoring and reporting should specify which proposal phase it relates to, i.e. construction or operations. All monitoring activities should be substantiated and in accordance with best practice advice from relevant NTG advisory agencies.
Residual impact	Assess the significance of any residual impact or risk of the proposal to identified values.
Offsets	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.

3.5. Aquatic ecosystems

Table 8: Minimum information required for assessment of Aquatic ecosystems.

Aspect	Specific information required
NT EPA objective: Protect aquatic habitats to maintain environmental values including biodiversity, ecological integrity and ecological functioning.	
Environmental values	Describe the aquatic ecosystems and groundwater dependent ecosystems in the proposal's area of influence, including a description of Lake Woods and its values. Provide detailed maps to support the above descriptions. Provide results and interpretation of any aquatic ecology surveys of the area of influence.
Potential impacts and risks	Describe potential impacts to the NT EPA's environmental objective associated with the proposed construction and operation activities and development, including: <ul style="list-style-type: none"> direct and indirect disturbance to waterways and/or wetlands and associated ecological and hydrological values during proposal construction and operation, including: <ul style="list-style-type: none"> trenching on the Middle Arm peninsula (if applicable) construction of OHTL towers <u>and other infrastructure</u>, where in proximity to waterways/wetlands, e.g. sedimentation, erosion, uncontrolled runoff heat island effects from the solar farm precinct, particularly on the values of Lake Woods. Determine the proposal footprint and area of influence that could feasibly experience those impacts. Provide an assessment of potential impacts, benefits and risks to aquatic ecosystems utilising outcomes of investigations and/or other relevant information. As a minimum, the assessment should take into consideration:

Commented [KW3]: This has been added to account for assessment of impacts to the swamp located within the Darwin Converter Station site, but outside the direct disturbance footprint.

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Aspect	Specific information required
	<ul style="list-style-type: none"> methods, equipment, timing and frequency cumulative impacts with other industries or proposals the reversibility of potential impacts. <p>The assessment must take into account all construction and operation activities of the proposal.</p> <p>The assessment must identify potential impacts and risks to aquatic ecosystems and quantify their significance:</p> <ul style="list-style-type: none"> against relevant guideline thresholds on the beneficial uses, water quality objectives and identified environmental values including groundwater dependent ecosystems and existing ground and surface water users.
Avoidance, mitigation and management	<p>Outline the measures for avoiding, mitigating, or offsetting impacts identified above, with consideration of sections 26 (Environmental decision-making hierarchy) and section 27 (Waste management hierarchy) of the EP Act. Also include here measures to enhance or restore environmental quality.</p> <p>These should address at a minimum:</p> <ul style="list-style-type: none"> facility design and layout erosion and sediment control compliance with any statutory or policy basis for the proposed measures. <p>Discuss adaptation to a changing climate including design and resultant viability of the proposal.</p> <p>All mitigation measures should be substantiated and in accordance with best practice, including advice from relevant NTG advisory agencies.</p>
Monitoring and reporting	<p>Outline proposed monitoring and reporting activities related to potential impacts and risks and mitigation and management measures to aquatic ecology.</p> <p>The proposed monitoring and reporting should specify which project phase it relates to, i.e. construction or operations.</p> <p>All monitoring activities should be substantiated and in accordance with best practice advice from relevant NTG advisory agencies.</p>
Residual impact	<p>Assess the significance of any residual impact or risk of the proposal to identified values.</p>
Offsets	<p>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.</p>

3.6. Marine environmental quality

Table 9: Minimum information required for assessment of Marine environmental quality.

Aspect	Specific information required
<p>NT EPA objective: Protect the quality and productivity of water, sediment and biota so that environmental values are maintained.</p>	

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Aspect	Specific information required
Environmental values	<p>Describe the water quality (chemical, physical and biological) and sediment characteristics of the marine environment in the proposal's area of influence.</p> <p>Describe water quality objectives and declared beneficial uses.</p> <p>Provide results and interpretation on any marine investigations undertaken</p> <p>Descriptions and interpretation of the environmental values should take into consideration the range of seasonal variation within the proposal footprint and area of influence.</p>
Potential impacts and risks	<p>Describe potential impacts to the NT EPA's environmental objective associated with the proposed construction and operation activities and development, including:</p> <ul style="list-style-type: none"> • temporary impacts to fishing (commercial, recreational, charter, etc...), recreation, industry use of the harbourthe marine environment during construction • installation of subsea cables causing increased sedimentation in water column, negatively impacting upon harbour-water quality and aquaticmarine environments • voltage source converter and land-sea joint station development and the potential to produce site run- off, with impacts on water quality in the adjacent harbourmarine waters • spills of hazardous materials • acid sulfate soils • all direct impacts to seabed from cable laying, anchors, HDD at shore crossing, trenching and rock armouring. <p>Determine the proposal footprint and area of influence that could feasibly experience those impacts.</p> <p>Provide an assessment of potential impacts, benefits and risks to marine environmental quality utilising outcomes of investigations and/or other relevant information. As a minimum, the assessment should take into consideration:</p> <ul style="list-style-type: none"> • methods, equipment, timing and frequency • the likely scale of disturbance • water management, including stormwater and wastewater management • erosion and sediment control • cumulative impacts with other industries or proposals • reversibility of impacts. <p>The assessment must take into account all construction and operation activities of the proposal.</p> <p>The assessment must identify potential impacts and risks to marine environmental quality and quantify their significance:</p> <ul style="list-style-type: none"> • against relevant guideline thresholds. • on the beneficial uses, water quality objectives and identified environmental values.
Avoidance, mitigation and management	<p>Outline the measures for avoiding, mitigating, or offsetting impacts identified above, with consideration of sections 26 (Environmental decision making hierarchy) and section 27 (Waste management hierarchy) of the EP Act. Also include here measures to enhance or restore environmental quality.</p> <p>These should address at a minimum:</p>

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Aspect	Specific information required
	<ul style="list-style-type: none"> • facility design and layout • construction/installation methods • erosion and sediment control • marine water management, including ballast water management and marine pest control • potential acid sulfate soil management • spill response • compliance with any statutory or policy basis for the proposed measures. <p>Discuss adaptation to a changing climate including design and resultant viability of the proposal.</p> <p>All mitigation measures should be substantiated and in accordance with best practice, including advice from relevant NTG advisory agencies.</p>
Monitoring and reporting	<p>Outline proposed monitoring and reporting activities related to potential impacts and risks, and mitigation and management measures.</p> <p>The proposed monitoring and reporting should specify which project phase it relates to, i.e. construction or operations.</p> <p>All monitoring activities should be substantiated and in accordance with best practice advice from relevant NTG advisory agencies.</p>
Residual impact	<p>Assess the significance of any residual impact or risk of the proposal to identified values.</p>
Offsets	<p>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.</p>

3.7. Marine ecosystems

Table 10: Minimum information required for assessment of Marine ecosystems.

Aspect	Specific information required
<p>NT EPA objective: Protect marine habitats to maintain environmental values including biodiversity, ecological integrity and ecological functioning.</p>	
<p>Environmental values</p>	<ul style="list-style-type: none"> • Provide maps and interpretation of regional bathymetry, geology, geomorphology, sediments and seabed features at the local-scale for the area of influence within NT and Commonwealth waters. • Provide results and interpretation of any marine investigations undertaken in the area of influence to inform the EIS. • Describe the oceanic processes within <u>Darwin Harbour</u> <u>the near shore</u> and <u>the offshore</u> proposal area, such as local and regional tides, as well as seasonal current patterns and wavemagnitudes. • Describe the marine ecosystems values of the proposal's area of influence, including but not restricted to benthic communities dominated by mangroves, seagrass, macro algae, corals, filter feeders, mixed communities and bare substrates. • Describe any listed or threatened marine species within the proposal's area of influence and the Commonwealth Marine Area, and the habitats they rely on, including (but not limited to) the following list derived from the results of the PMST search: <ul style="list-style-type: none"> ○ All relevant cetaceans ○ Dugong (<i>Dugong dugon</i>) ○ Green turtle (<i>Chelonia mydas</i>) ○ Leatherback turtle (<i>Dermochelys coriacea</i>) ○ Loggerhead turtle (<i>Caretta caretta</i>) ○ Flatback turtle (<i>Natator depressus</i>) ○ Olive Ridley Turtle (<i>Lepidochelys olivacea</i>) ○ Saltwater crocodile (<i>Crocodylus porosus</i>) ○ Whale shark (<i>Rincodon typus</i>) ○ <i>Pristis pristis</i> ○ <i>Pristis zijsron</i> ○ <i>Pristis clavata</i>. <p>Describe the existing health/condition/amenity of marine ecosystems in the proposal's area of influence, with reference to threatening processes (e.g. pest species, habitat degradation), noise and vibration, and sedimentation.</p>
<p>Potential impacts and risks</p>	<p>Describe potential impacts to the NT EPA's environmental objective associated with the proposed construction and operation activities and development, including:</p> <ul style="list-style-type: none"> • indirect impacts to fauna habitat (feeding, nursery, epibenthic, infauna, pelagic, water column etc.) due to changes to marine environment, introduction or spread of contaminants or pest species • direct impacts to fauna as a result of collision with vessels or survey and/or construction equipment • changes to marine fauna behaviours as a result of electric and magnetic fields

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Aspect	Specific information required
	<p>(EMF), noise, thermal emissions or lighting from proposal areas</p> <ul style="list-style-type: none"> • direct disturbance/loss to benthic habitats from survey activities, cable laying (including anchoring, vessel maneuvers and trenching if required) and HDD for subsea cable installation • indirect disturbances to benthic habitats – sedimentation/erosion from surface runoff. <p>Determine the proposal footprint and area of influence that could feasibly experience those impacts.</p> <p>Provide an assessment of potential impacts, benefits and risks to marine ecosystems utilising outcomes of investigations and/or other relevant information. As a minimum, the assessment should take into consideration:</p> <ul style="list-style-type: none"> • methods, equipment, timing and frequency • the likely scale, extent of disturbance • cumulative impacts with other industries or proposals • environmental management requirements associated with seasonal weather, extreme weather conditions such as storms and cyclones for the 2, 10, and 100 year average recurrence interval events • reversibility of impacts. <p>The assessment must identify potential impacts and risks to marine ecosystems and quantify their significance:</p> <ul style="list-style-type: none"> • against relevant guideline thresholds • on the beneficial uses, water quality objectives and identified environmental values.
<p>Avoidance, mitigation and management</p>	<p>Outline the measures for avoiding, mitigating, or offsetting impacts identified above, with consideration of sections 26 (Environmental decision-making hierarchy) and section 27 (Waste management hierarchy) of the EP Act. Also include here measures to enhance or restore environmental quality.</p> <p>These should address at a minimum:</p> <ul style="list-style-type: none"> • facility design and layout • construction/installation methods, such as: <ul style="list-style-type: none"> ○ erosion and sediment control ○ potential acid sulfate soil management ○ marine water and sediment management, including ballast water management and marine pest control • compliance with any statutory or policy basis for the proposed measures. <p>Discuss adaptation to a changing climate including design and resultant viability of the proposal.</p> <p>All mitigation measures should be substantiated and in accordance with best practice, including advice from relevant NTG advisory agencies.</p>
<p>Monitoring and reporting</p>	<p>Outline proposed monitoring and reporting activities related to potential impacts and risks, and mitigation and management measures.</p> <p>The proposed monitoring and reporting should specify which project phase it relates to, i.e. construction or operations.</p>

Aspect	Specific information required
	All monitoring activities should be substantiated and in accordance with best practice advice from relevant NTG advisory agencies.
Residual impact	Assess the significance of any residual impact or risk of the proposal to identified values.
Offsets	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/or EPBC Act environmental offsets policy.

3.8. Air quality

Table 11: Minimum information required for assessment of Air quality.

Aspect	Specific information required
NT EPA objective: Protect air quality and minimise emissions and their impact so that environmental values are maintained.	
Environmental values	<ul style="list-style-type: none"> Describe the sensitive receivers within and in proximity to the proposal area. Describe the existing air quality environment. Describe any sources of emissions which could impact on air quality. Provide maps to support descriptions as appropriate.
Potential impacts and risks	<p>Describe potential impacts to the NT EPA's environmental objective associated with the proposed construction and operation activities and development, including reduction in local air quality due to the emission of dust and/or diesel exhaust during construction and/or operation of the proposal.</p> <p>Determine the proposal footprint and area of influence that could feasibly experience those impacts.</p> <p>Provide an assessment of potential impacts, benefits and risks to air quality utilising outcomes of investigations and/or other relevant information. As a minimum, the assessment should take into consideration:</p> <ul style="list-style-type: none"> methods, equipment, timing and frequency the likely source, scale and extent of emissions nature of sensitive receptors cumulative impacts with other industries or proposals reversibility of potential impacts. <p>The assessment must identify potential impacts and risks to air quality and quantify their significance:</p> <ul style="list-style-type: none"> against relevant guideline thresholds on identified environmental values.

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Aspect	Specific information required
Avoidance, mitigation and management	<p>Outline the measures for avoiding, mitigating, or offsetting impacts identified above, with consideration of sections 26 (Environmental decision making hierarchy) and section 27 (Waste management hierarchy) of the EP Act. Also include here measures to enhance or restore environmental quality.</p> <p>These should address at a minimum:</p> <ul style="list-style-type: none"> • facility design and layout • construction methods • emission suppression or management measures • compliance with any statutory or policy basis for the proposed measures. <p>All mitigation measures should be substantiated and in accordance with best practice, including advice from relevant NTG advisory agencies.</p>
Monitoring and reporting	<p>Outline any proposed monitoring and reporting activities related to potential impacts and risks, and mitigation and management measures.</p> <p>The proposed monitoring and reporting should specify which project phase it relates to, i.e. construction or operations.</p> <p>All monitoring activities should be substantiated and in accordance with best practice advice from relevant NTG advisory agencies.</p>
Residual impact	Assess the significance of any residual impact or risk of the proposal to identified values.
Offsets	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.

3.9. Atmospheric processes

Table 12: Minimum information required for assessment of atmospheric processes.

Aspect	Specific information required
NT EPA objective: Minimise greenhouse gas emissions so as to contribute to the NT Government's target of achieving net zero greenhouse gas emissions by 2050.	
Environmental values	Describe the current energy mix of the NT with reference to greenhouse gas (GHG) emissions and proportion of renewables in use.
Potential impacts and risks	<p>Describe the proposal's impact on:</p> <ul style="list-style-type: none"> • direct GHG emissions due to Scope 1 and Scope 2 emissions (e.g., land clearing, diesel exhaust/etc. during construction and operation) • comparison with NT and national emissions • contribution to the NT target of net zero greenhouse gas emissions by 2050 and broader efforts to reduce global greenhouse gas emissions • improvements in the supply of renewable energy and meeting NT renewable energy targets.

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Aspect	Specific information required
Avoidance, mitigation and management	Describe any energy efficiency and mitigation and management measures that will be adopted during the construction and operation phase of the proposal to reduce or minimise GHG emissions, and demonstrate best practice.
Monitoring and reporting	Outline any proposed monitoring and reporting activities related to potential impacts and risks to atmospheric processes, and mitigation and management measures. The proposed monitoring and reporting should specify which proposal phase it relates to, i.e. construction or operations. All monitoring activities should be substantiated and in accordance with best practice advice from relevant NTG advisory agencies.
Residual impact	Assess the significance of any residual impact or risk of the proposal to identified values.
Offsets	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.

3.10. Community and economy

Table 13: Minimum information required for assessment of Community and economy.

Aspect	Specific information required
NT EPA objective: Enhance communities and the economy for the welfare, amenity and benefit of current and future generations of Territorians.	
Environmental values	Describe the existing socio-economic profile of the proposal's areas of influence, including reference to: <ul style="list-style-type: none"> key landowners/custodians/stakeholders/communities, and other persons with overlapping or intersecting interests social values as identified by stakeholders demographics, including skills audit of affected communities and workforce characteristics relevant accommodation type and quantity existing and required local businesses relevant 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 (e.g. rail, gas pipeline, cables etc.) 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.
Potential impacts and risks	Describe potential impacts to the NT EPA's environmental objective (including net positive benefits, particularly to local communities) associated with the proposed construction and operational activities, including:

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Aspect	Specific information required
	<ul style="list-style-type: none"> • changes to population (local and NT), employment market and businesses and indirect impacts to housing market, community and social services, infrastructure and economy. Inclusion of Sun Cable's Territory Benefit Plan may be included in the EIS to satisfy the consideration of potential impacts and risks relevant to local content • social integration of non-local construction personnel during construction • direct and indirect impacts to recreational and commercial areas and industries including Lake Woods, Middle Arm peninsula in Darwin Harbour <u>Gunn Point</u>, and offshore areas (e.g. fisheries) • impacts to waste management facilities, particularly from disposal or recycling of solar panels and batteries during the life of the proposal and following decommissioning • changes or restrictions on railway access by local traffic due to transmission line corridor during construction, operation and maintenance • changes or restrictions to local traffic <u>and access</u> due to development of new roads and intersections and construction vehicles resulting in delays or inconvenience to local communities and other road users • potential future land use conflicts within the footprint e.g. mineral and petroleum titles • visual impact of infrastructure • impacts to amenity (e.g. noise and dust) • interference with aviation/flight paths and shipping channels (current and planned) • 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 Gross Territory Product and Gross Domestic Product over the economic life of the proposal • expected employment and availability of appropriately skilled labour during construction and operation phases of the proposal • potential adverse impacts to local and regional industries due to competition for limited skilled 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 e.g. future electricity transmission. <p>Provide a social impact assessment including assessment of potential impacts, benefits and risks to communities and the economy utilising modelling, outcomes of investigations, and/or other relevant information.</p> <p>The assessment must quantify the significance of potential impacts and risks to communities and the economy.</p> <p>The assessment of each aspect should consider cumulative impacts and the reversibility of potential impacts.</p>

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Aspect	Specific information required
Avoidance, mitigation and management	<p>Outline the measures for preferentially avoiding, mitigating, or offsetting adverse impacts, and maximizing benefits identified above.</p> <p>Develop a stakeholder engagement plan and communication strategy.</p> <p>Discuss adaptation to a changing climate including design and resultant viability of the proposal.</p> <p>All mitigation measures should be substantiated and in accordance with best practice, including advice from relevant NTG advisory agencies.</p>
Monitoring and reporting	<p>Outline proposed monitoring and reporting activities related to potential impacts and risks to community and economy, and mitigation and management measures.</p> <p>The proposed monitoring and reporting should specify which project phase it relates to i.e., construction or operations.</p> <p>All monitoring activities should be substantiated and in accordance with best practice advice from relevant NTG advisory agencies.</p>
Residual impact	Assess the significance of any residual impact or risk of the proposal to identified values.
Offsets	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.

3.11. Culture and heritage

Table 14: Minimum information required for assessment of Culture and heritage.

Aspect	Specific information required
NT EPA objective: Protect sacred sites, culture and heritage.	
Environmental values	<p>Describe the local Aboriginal communities and traditional owners within (or in proximity to) the proposal area and any native title claims.</p> <p>Describe the nature and location of Aboriginal and non-Aboriginal historic cultural heritage sites/values within the proposal area, including:</p> <ul style="list-style-type: none"> • areas listed on Commonwealth and Northern Territory registers of historic and/or cultural heritage. • a description and location of Aboriginal and non-Aboriginal sites, places or objects of natural, historic or cultural heritage significance, current utilisation and spiritual significance. Information sources should include published archaeological and anthropological information, respective registers, consultations and other research. • Describe traditional land use or industry within or in proximity to the proposal area (if any).
Potential impacts and risks	<p>Describe potential impacts to the NT EPA's environmental objective associated with the proposed construction and operation activities and development, including:</p> <ul style="list-style-type: none"> • direct and indirect disturbance to significant Aboriginal cultural heritage sites and values (e.g. artefact scatters, shell middens, earth mounds, quarries, stone arrangements, petroglyphs, rock shelters, rock art, etc.) during construction, operation, and maintenance activities including vegetation clearance, topsoil stripping and subsoil

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Aspect	Specific information required
	<p>excavation</p> <ul style="list-style-type: none"> • direct and indirect disturbance to traditional and/or contemporary Aboriginal values (including sacred sites) or uses of land (e.g. hunting and ceremonial use) due to construction, operation or maintenance activities • direct and indirect disturbance to non-Aboriginal cultural heritage sites and values during project construction, operation, and maintenance activities including vegetation clearance, topsoil stripping and subsoil excavation • change or permanent land use restrictions in areas of project infrastructure • tangible and intangible impacts to cultural values and landscapes due to cultural connection to country and potential disturbance to flora and fauna, ecosystems, landscapes and landforms from construction, operation or maintenance activities • details of unexploded ordinance clearance (marine). <p>Determine the proposal footprint and area of influence that could feasibly experience those impacts.</p> <p>Provide an assessment of potential impacts, benefits and risks to culture and heritage utilising outcomes of investigations and/or other relevant information.</p> <p>The assessment must identify potential impacts and risks to sacred sites, culture and heritage and quantify their significance.</p> <p>The assessment of each aspect should consider cumulative impacts and the reversibility of potential impacts.</p>
Avoidance, mitigation and management	<p>Outline the measures for avoiding, mitigating, or offsetting impacts identified above.</p> <p>Outline approach to both substantial initial and ongoing consultation and engagement with traditional owners/representatives.</p> <p>All mitigation measures should be substantiated and in accordance with best practice, including advice from relevant NTG advisory agencies and traditional owners.</p>
Monitoring and reporting	<p>Outline proposed monitoring and reporting activities related to potential impacts and risks and mitigation and management measures to culture and heritage.</p> <p>The proposed monitoring and reporting should specify which project phase it relates to i.e., construction or operations.</p> <p>All monitoring activities should be substantiated and in accordance with best practice advice from relevant NTG advisory agencies.</p>
Residual impact	<p>Assess the significance of any residual impact or risk of the proposal to identified values.</p>
Offsets	<p>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.</p>

3.12. Human health

Table 15: Minimum information required for assessment of Human health.

Aspect	Specific information required
NT EPA objective: Protect the health of the Northern Territory population.	
Environmental values	Describe the sensitive human populations in proximity to the proposal area. Provide maps to support descriptions as appropriate.
Potential impacts and risks	<p>Describe potential impacts to the NT EPA's environmental objective associated with the proposed construction and operation activities and development, including:</p> <ul style="list-style-type: none"> • human exposure to EMF • biting insects, ticks and mites. <p>The assessment should be based on outcomes of investigations and/or other relevant information and quantify the significance of impacts against relevant guideline thresholds.</p> <p>The assessment of each aspect should consider cumulative impacts and the reversibility of potential impacts.</p>
Avoidance, mitigation and management	<p>Outline the measures for avoiding, mitigating, or offsetting impacts identified above. These should address at a minimum:</p> <ul style="list-style-type: none"> • facility design and layout • construction/installation methods • facility operations and maintenance. <p>All mitigation measures should be substantiated and in accordance with best practice, including advice from relevant NTG advisory agencies.</p>
Monitoring and reporting	<p>Outline proposed monitoring and reporting activities related to potential impacts and risks to human health, and mitigation and management measures, for all phases of the proposal.</p> <p>All monitoring activities should be substantiated and in accordance with best practice advice from relevant NTG advisory agencies.</p>
Residual impact	Assess the significance of any residual impact or risk of the proposal human health.
Offsets	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.

4. Other requirements

4.1. Other environmental factors or matters

4.1.1. Matters of national environmental significance

Where the proposal is determined to be a controlled action under the EPBC Act and is being assessed in accordance with an accredited assessment between the NT EPA and the Commonwealth in accordance with the EPBC Act, the draft EIS should address all relevant MNES.

It is expected that the following MNES that are protected under Part 3 of the EPBC Act will need to be addressed:

- Listed threatened species and communities (section 18 and 18A)
- Listed marine and/or migratory species (sections 20 and 20A)
- Commonwealth marine environment (sections 23 and 24A), for the proposal component that extends from the edge of territorial waters (3 nautical miles) to the edge of the exclusive economic zone (EEZ).

The draft EIS should address all relevant MNES, and explain how they have adequately regarded the conservation advices of each EPBC listed species that is likely to be impacted, that the project is not inconsistent with any Threat Abatement Plans, Bioregional Plans or Recovery Plans.

These include but are not limited to:

- Marine Bioregional Plans for the North and North-West Marine Regions
- EPBC Act Policy Statement 3.21 - Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species
- Conservation advices for:
 - Ghost Bat <http://www.environment.gov.au/biodiversity/threatened/species/pubs/174-conservation-advice-05052016.pdf>
 - Greater Bilby <http://www.environment.gov.au/biodiversity/threatened/species/pubs/282-conservation-advice-15072016.pdf>
 - Styliidium ensatum <http://www.environment.gov.au/biodiversity/threatened/species/pubs/86366-conservation-advice-05052016.pdf>
 - Green Sawfish, Dindagubba, Narrowsnout Sawfish <http://www.environment.gov.au/biodiversity/threatened/species/pubs/68442-conservation-advice.pdf>
- Recovery Plans for:
 - Northern Quoll <http://www.environment.gov.au/resource/national-recovery-plan-northern-quoll-dasyurus-hallucatus>
- Threat Abatement Plans for:

- Predation by feral cats
<http://www.environment.gov.au/biodiversity/threatened/publications/tap/threat-abatement-plan-feral-cats>
- predation by European red fox
<http://www.environment.gov.au/biodiversity/threatened/publications/tap/predation-european-red-fox>
- Competition and land degradation by rabbits
<http://www.environment.gov.au/biodiversity/threatened/publications/tap/competition-and-land-degradation-rabbits-2016>

4.1.2. Whole of environment considerations

Provide a holistic assessment of the impacts of the proposal on the whole of the environment, including a description of the connections and interactions between the environmental factors, and cumulative impacts. Succinctly discuss predicted outcomes in relation to the principles of environment protection and management (as set out in Part 2 of the EP Act) and the NT EPA's environmental objectives.

4.1.3. Offsets

Provide details of an overall offset strategy for the residual impacts on the terrestrial and marine environments. If a requirement for offsets is identified in the draft EIS, details of a draft implementation plan for the offset/s may be required as part of the Supplement to the EIS. Offsets may be required as a condition of any approval under the EPBC Act.

4.2. Stakeholder engagement and consultation

Proponents have a general duty under section 43 of the EP Act to provide communities that may be affected by a proposal with an opportunity for consultation to assist community understanding of the proposed action and its potential impacts and benefits.

The Proponent must engage and consult with stakeholders⁴ who are affected by and interested in the Proposal. The Proponent must document the following in the EIS:

- identified stakeholders
- the stakeholder consultation undertaken and the 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 operation of the proposal.

4.3. Public consultation requirements

The public consultation requirements for the EIS are outlined in Part 5 Division 6 of the Environment Protection Regulations 2020. Additional specific details are provided below.

⁴ As defined in the NT EPA's Stakeholder Engagement and Consultation – Environmental impact assessment guidance for proponents (NT EPA 2020)

4.3.1. Submission period

The NT EPA proposes a period (usually between 30 and 60 business days) for consultation on the draft EIS. The duration of the period will be confirmed during the draft EIS pre-lodgement phase.

4.3.2. Public consultation locations

The draft EIS should be provided to and be made available for public consultation at:

- Adelaide River Post Office Store, 1 Stuart Highway, Adelaide River
- Barkly Regional Council Office, 41 Peko Road Tennant Creek NT
- Elliott Post Office, Elliott
- Environment Centre Northern Territory, Unit 3, 98 Woods Street, Darwin
- Katherine Public Library, Level 1, Randazzo Centre, Katherine Terrace, Katherine
- Northern Land Council, 45 Mitchell Street, Darwin
- Northern Territory Library, Parliament House, Darwin
- NT EPA, Level 1, Arnhemica House, 16 Parap Road, Parap
- Victoria Daly Regional Council – Pine Creek Office, 55 Moule Street, Pine Creek

Appendix A – List of relevant guidance material

The following guidance material is considered relevant to the TOR. This list is not exhaustive, but captures key guidance used in the preparation of these TOR and to inform the preparation of the EIS. The Proponent must draw on further relevant industry and best practice guidance as part of developing the EIS.

- Commonwealth of Australia, 2013. Significant Impact Guidelines 1.1 – Matters of National Environmental Significance.
- DENR, 2019. Land clearing guidelines. Department of Environment and Natural Resources, Darwin.
- DENR, 2020. Northern Territory Climate Change Response: Towards 2050. Department of Environment and Natural Resources, Darwin.
- NT EPA, 2013a. Guidelines for Assessment of Impacts on Terrestrial Biodiversity. Northern Territory Environment Protection Authority.
- NT EPA, 2013b. Guidelines for the Preparation of an Economic and Social Impact Assessment. Northern Territory Environment Protection Authority.
- NT EPA, 2013c. Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the NT. Northern Territory Environment Protection Authority.
- NT EPA, 2014. A Stormwater Strategy for the Darwin Harbour Region. Northern Territory Environment Protection Authority.
- NT EPA, 2015. Waste Management Strategy for the Northern Territory 2015-2022. Northern Territory Environment Protection Authority.
- NT EPA, 2020a. Environmental impact assessment guidance for proponents: Preparing a proponent initiated EIS referral (draft). Northern Territory Environment Protection Authority, Darwin.
- NT EPA, 2020b. Environmental impact assessment guidance for proponents: Preparing an environmental impact statement (draft). Northern Territory Environment Protection Authority, Darwin.
- NT EPA, 2020c. Environmental impact assessment guidance for proponents: Stakeholder Engagement and Consultation (draft). Northern Territory Environment Protection Authority, Darwin.
- NT EPA, 2020d. Environmental impact assessment guidance: NT EPA Environmental Factors and Objectives. Northern Territory Environment Protection Authority.
- Significant impact guidelines 1.2: Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies: http://www.environment.gov.au/system/files/resources/a0af2153-29dc-453c-8f04-3de35bca5264/files/commonwealth-guidelines_1.pdf
- Policy 2.1 Interactions between Offshore Seismic Exploration and Whales
- Marine Bioregional Plans for the North Marine Areas: <http://environment.gov.au/coasts/marineplans/north/index.html>
- EPBC Act Policy Statement 3.21 - Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species" [<http://www.environment.gov.au/epbc/publications/shorebirds-guidelines>]
- Threatened Species Scientific Committee (2016). *Conservation Advice* Stylidium ensatum. Canberra: Department of the Environment. Available

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from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/86366-conservation-advice-05052016.pdf>.

- Hill, B.M. & S.J. Ward (2010). *National Recovery Plan for the Northern Quoll* *Dasyurus hallucatus*. Department of Natural Resources, Environment, The Arts and Sport, Darwin. Available from: <http://www.environment.gov.au/resource/national-recovery-plan-northern-quoll-dasyurus-hallucatus>
- Department of the Environment (2015). *Sawfish and River Sharks Multispecies Recovery Plan*. Canberra, ACT: Commonwealth of Australia. Available from: <http://www.environment.gov.au/biodiversity/threatened/publications/recovery/sawfish-river-sharks-multispecies-recovery-plan>
- Department of the Environment (2015). *Threat abatement plan for predation by feral cats* <http://www.environment.gov.au/biodiversity/threatened/publications/tap/threat-abatement-plan-feral-cats>
- Department of Sustainability, the Environment, Water, Population and Communities (2012) *Threat abatement plan to reduce the impacts on northern Australia's biodiversity by the five listed grasses*, Canberra, ACT. <http://www.environment.gov.au/system/files/resources/ff24e078-fbb9-4ebd-855d-db09cb4db1f8/files/five-listed-grasses-tap.pdf>
- Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008). *Threat abatement plan for predation by the European red fox*. <http://www.environment.gov.au/biodiversity/threatened/publications/tap/predation-european-red-fox>
- Australian Guidelines for Whale and Dolphin Watching (Commonwealth of Australia, 2017)
- Guidelines for preventing mosquito breeding associated with mine sites - <https://digitalibrary.health.nt.gov.au/prodjsmui/bitstream/10137/2683/1/Guidelines%20Mine%20Site.pdf>
- NESP Earth Systems and Climate Change Hub (2020). *Climate change in the Northern Territory: state of the science and climate change impacts*. NESP ESCC Hub, Melbourne.