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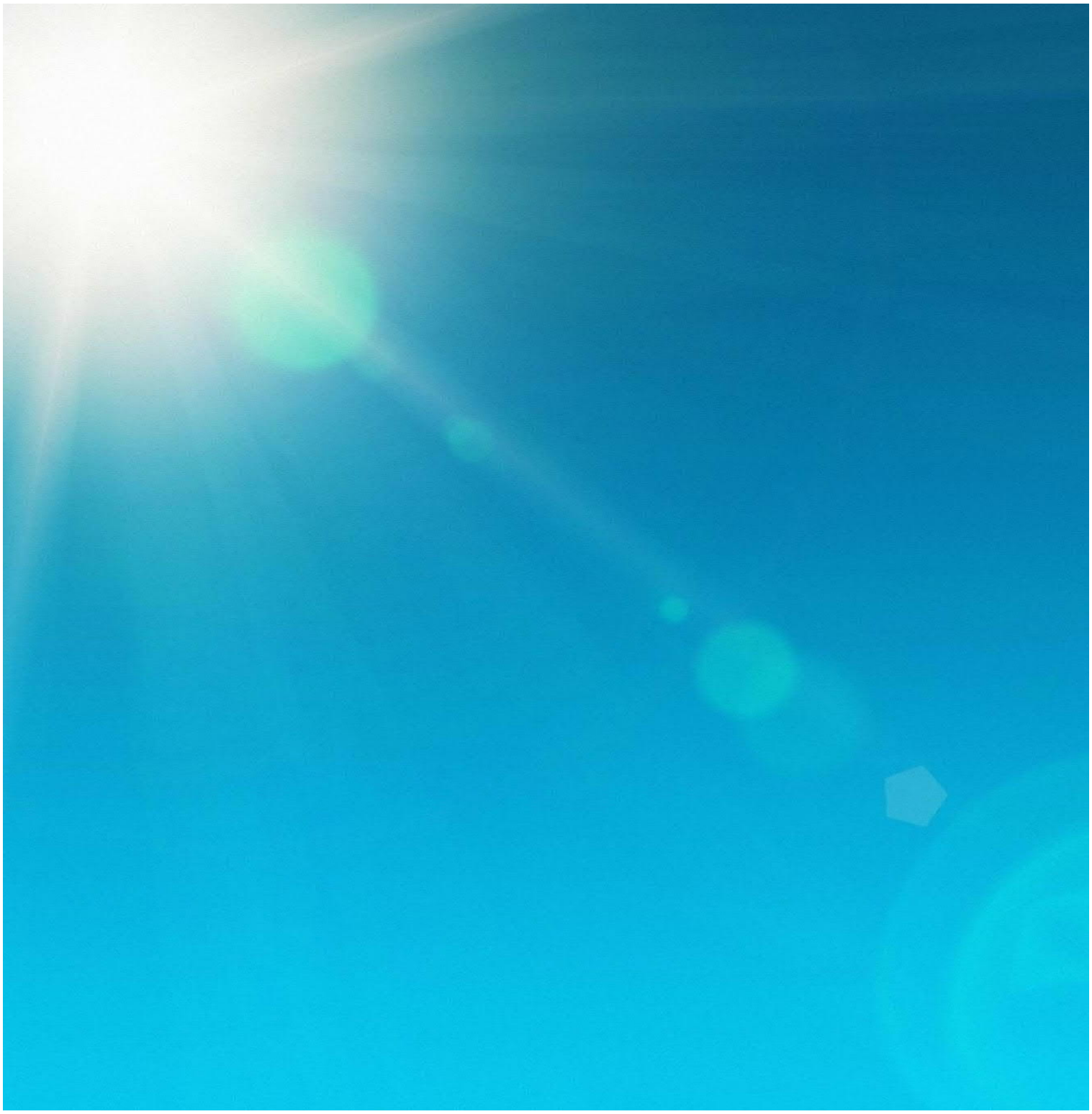
Chapter 17 – Environmental Management

Australia-Asia PowerLink Environmental Impact Statement



Chapter 17 – Environmental Management

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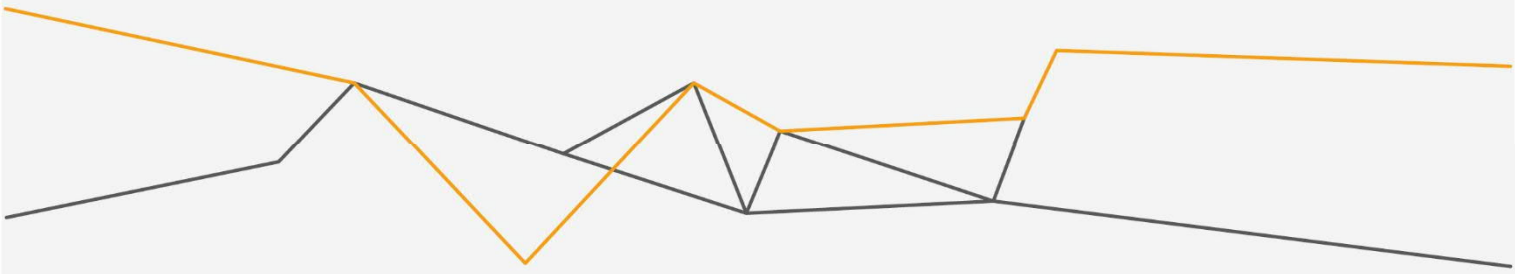
0	25/03/2022	Draft EIS Submission	Joe Sheridan	Mark Branson



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17 Environmental and Social Management

This Chapter presents the general contents of Sun Cable's proposed approach to environmental and social management, and proposed management plans and sub-plans to be developed and implemented for all phases of the Project.

Sun Cable will have overarching responsibility for construction environmental management and compliance with all conditions of approval under NT and Commonwealth legislation.

17.1 Environmental and Social Management System

The approach to environmental management for the AAPowerLink falls within an overarching Environmental and Social Management System (ESMS) developed by Sun Cable for all of its activities, including for implementation on each of its projects. Sun Cable's ESMS will be described in an ESMS Manual and will be an integrated management framework designed to achieve quality, social, and environmental objectives across all project development through adherence to a quality management system.

The framework comprises corporate policies and procedures and enterprise-wide management systems (e.g., stakeholder tracking, regulatory compliance and incident management, complaints etc) which are then implemented in practise through project-specific planning and execution tools such as site-specific Construction Environmental Management Plans (CEMP) and Operational Environmental Management Plans (OEMP) to describe how identified impacts will be mitigated and managed accordingly during each project phase. A Territory Benefit Plan (TBP) is also being developed in consultation with the Northern Territory Government (NTG) to ensure maximum benefits are delivered to the Territory through the use of local suppliers and labour. The TBP will form an integral part of the ESMS and act as a central repository for a range of management plans and supporting studies that overlap between the construction and operational phases and require ongoing monitoring and reporting. These include, but are not limited to, the Social Impact Management Plan (SIMP), Workforce Development Strategy, Industry Capability Mapping and a Cultural Heritage Management Plan (CHMP) which is currently being drafted other related Project controls.

Sun Cable's ESMS is aligned with ISO14001 Environmental Management Systems criteria for an environmental and social management system. The ESMS is designed to follow the Plan – Do – Check – Act cycle, to promote continuous improvement and adaptive management.

Enterprise-wide Sun Cable corporate policies (including Environment Policy; Health and Safety Policy, Quality Policy; HR Policies; Procurement Policy) will guide all ESMS components, management systems, and project-specific plans. Human resources procedures, clear roles and responsibilities from corporate leadership down through to contractors and sub-contractors, training, and monitoring and reporting will ensure effective implementation of the ESMS on all Sun Cable activities.

Figure 17-1 illustrates Sun Cable's ESMS and CEMP framework under development.

PLAN

Policies

Environmental and Social Management System

- Quality Management System
- HSE Management
- Stakeholder Engagement, Management & Tracking
- Reconciliation Action Plan
- Compliance Management & Tracking
- Records Management, Document and Data Control
- Geographic Information Systems
- Environmental Work Permit Procedure
- Organizational Management
- Territory Benefit Plan
- Regional (Aboriginal) Legacy Strategy

DO

Construction Environmental Management Plan

Sub-Plans:

- Air Quality Management Plan
- Cultural Heritage Management Plan
- GHG Management and Abatement Plan
- Environmental Emergency and Spill Response Plan
- Hazardous Materials and Waste Management Plan
- Surface and Groundwater Management Plan
- Weed Management Plan
- Flora and Fauna Management Plan
- Marine Environmental Management Plan
- Bushfire Management Plan
- Reinstatement Plan

Social Impact Management Plan

Sub-Plans:

- NT Community and Engagement Plan
- Local Workforce Development Strategy
- Community Funds and Governance

Operations Environmental Management Plan

- Sub-plans updated as needed

Site-Specific Procedures

- Environmental Control Plans
- Environmental Work Permits
- Land Clearing and Disturbance Procedure
- Work Instructions, Checklists
- Dangerous Goods and Hazardous Materials Register
- Waste Manifests/Waste Inventories
- Job Hazard Analysis

Check and Act:

Monitoring, Reporting, Auditing

17.1.1 Quality Management Systems

The AAPowerLink Project will be subject to and comply with the following enterprise-wide management systems:

- **HSE Management** – Sun Cable's ESMS will include an overarching health, safety, and environment (HSE) management system that will require an overarching Construction Health, Safety and Environment Management Plan for each component of the AAPowerLink and other projects. Site specific HSE management plans will be developed as required. HSE risks and hazards will be identified and controlled through a clear and systematic process of: establishing context for risk identification (when, how, and by whom the risks will be identified), risk identification records, risk assessment through risk matrix that assigns consequence/severity and likelihood/frequency, risk prioritization, risk mitigation measures, and roles and responsibilities. Key HSE risk mitigation measures may include HSE rules and procedures, training (e.g. Permit to work system), emergency response procedures, and safety inspections.

  A HSE Incident Management System will ensure that non-conformities, incidents, near-hits, and hazardous situations are reported, investigated, and analysed with the objective of improving performance. Evaluation of root-causes will result in corrective actions to further prevent re-occurrences of non-conformities. Non-compliance activities will be assigned a rating according to their severity. Ratings will inform tracking and reporting requirements, including requirements to submit non-conformance reporting.

- **Stakeholder Engagement, Management & Tracking** – Sun Cable is committed to developing and maintaining constructive relationships with stakeholders by implementing stakeholder engagement, management, and tracking systems that are underpinned by Sun Cable's overarching objectives, principles, and commitments around stakeholder engagement. Stakeholder engagement, management, and tracking includes software-based stakeholder management tools, as well as a grievance procedure and dispute resolution.

- **Reconciliation Action Plan** – Sun Cable's Reconciliation Action Plan (RAP) will articulate commitments and actions to engage with and create meaningful opportunities for Aboriginal and Torres Strait Islander people. The RAP is envisaged to include workshops, information, and resources to educate the workforce on aspects of local cultural heritage within Sub Cable's projects and activities. This will be developed with regard to other related plans and initiatives being progressed by Sun Cable such as the CHMP.

- **Compliance Management (Legal Obligations) & Tracking** – Sun Cable's compliance management and tracking system will enable, promote, and verify compliance with requirements of the ESMS, and all applicable Project requirements including regulatory approvals and permits, Project commitments, and Project standards and guidelines. Key components include Regulatory Approvals and Permit Plans, Project Commitments Registry, Environmental Design Criteria and design controls, training and awareness, measurement and verification, and change management procedures.

- **Records Management, Document and Data Control** – All management system and plan documents will be controlled and filed electronically to ensure availability at the required time and location necessary to achieve the required environmental and social objectives and targets in all activities. Environmental and social records will include audit reports, review of work processes, non-conformity reports, change management records, and training records. Changes to ESMS documents must be initiated, developed, and approved according to a Management of Change process. Project-specific records management, document, and data control measures must comply with Sun Cable's broader records management, document, and data control requirements and procedures.

- **Geographic Information Systems** – Data quality and assurance is essential to any well-maintained GIS system. Through the use of QC and QA processes, any data that is imported or created can be thoroughly checked to ensure a high level of data quality, integrity and accuracy is achieved. This data accuracy is brought through into the mapping and web-based outputs to ensure the most up to date and relevant data is being shown. Naming conventions for data (including dates) and unique identifiers for maps/figures will ensure they are easily discernible especially when revisions or updates are needed.
- **Environmental Work Permit Procedure** – Sun Cable will pre-authorise all environmental and land clearing, or earthworks, activities to ensure compliance with environmental, social, and legal requirements. Contractors will be responsible for submitting the permit and supporting information to Sun Cable for approval. Sun Cable must review and sign-off on Environmental Work Permit(s) submitted by all contractors and sub-contractors prior to any earthworks or land clearing activities. Notifications and training of this requirement, including monitoring and reporting on the implementation of this procedure will also be undertaken.

17.2 Construction Environmental Management Plan

An overarching CEMP will set environmental objectives and targets and will document the actions that will be implemented to ensure environmental impacts are managed at acceptable levels. Site-specific CEMPs for different project components will be developed as required by contractors. The CEMPs will reference sub-plans and procedures for higher risk aspects where additional detail is needed to guide on-ground implementation.

A preliminary list of sub-plans that will be developed for the AAPowerLink construction phase includes the following[1]:

- Environmental Emergency and Spill Response Plan
- Air Quality Management Plan
- GHG Management and Abatement Plan
- Hazardous Materials and Waste Management Plan
- Cultural Heritage Management Plan
- Surface and Groundwater Management Plan
- Weed Management Plan
- Flora and Fauna Management Plan
- Reinstatement Plan
- Marine Environmental Management Plan
- Bushfire Management Plan
- Social Impact Management Plan (SIMP)

[1] List of sub-plans is subject to change based on the Project approval conditions, detailed design and micro-siting activities.

In addition to these sub-plans, site-specific and/or activity-specific procedures will be developed by contractors as required over the course of the construction period. Construction Environmental Control Plans (CECPs) and Work Method Statements will be developed by construction contractors to provide site-based work instructions for implementing specific mitigation and monitoring measures in discrete areas, using specific work method statements that provide the detailed execution strategy for CEMP requirements.

Other site-specific procedures to ensure CEMP compliance include land clearing and ground disturbance procedures, work instructions, monitoring protocols, materials registers, waste manifests and inventories, standard operating procedures, and daily checklists. These site-specific procedures will be supplementary to and consistent with the CEMP and its sub-plans; as such they are not discussed further in this EIS and will be developed in detail by a Contractor(s) once selected.

The CEMP will meet Commonwealth of Australia's *Environmental Management Plan Guidelines (2014)* and Northern Territory Environment Protection Authority's *Guideline for the Preparation of an Environmental Management Plan (Version 1.0, 2015)*.

17.2.1 CEMP Scope

The CEMP will apply to all AAPowerLink components in the Northern Territory and Commonwealth marine areas (Powell Creek Solar Precinct, Overhead Transmission Line, Darwin Converter Site, Cable Transition Facilities, Subsea Cable System), and is applicable to the construction phase. The CEMP will apply to Sun Cable, primary contractors, sub-contractors, and all personnel working on the Project. The CEMP may be broken into sections focusing on various geographic or functional elements of the Project.

The CEMP excludes activities beyond the AAPowerLink scope, including shipping and handling at Australian ports, movements of personnel and equipment prior to site mobilisation, manufacturing facilities such as the East Arm Solar Array Manufacturing Facility and other logistics operations outside of the AAPowerLink footprint.

The CEMP will include a schedule and triggers for reviews of the CEMP, and personnel responsible for undertaking the review. CEMP reviews will occur periodically (every one or two years) as needed, for example following significant environmental incidents, if there are substantive changes in construction activities or project areas not previously considered (and for which additional mitigation or monitoring is required), or if there is a need to improve performance to meet environmental objectives for each factor.

17.2.2 Project Overview

The CEMP will provide a Project overview, with Project location, layout, and site plans; key works and activities covered by the CEMP, a list of major equipment, construction staging and timing, commencement / completion dates, and Sun Cable (Proponent) details and contact information.

For brevity, the CEMP is applicable to the scope described in Chapter 2 and a description of those works and activities is not repeated here.

17.2.2.1 Powell Creek Solar Precinct

The CEMP will provide an overview of the Powell Creek Solar Precinct and supporting infrastructure, site plans and boundaries, responsible parties, and key construction activities.

17.2.2.2 Overhead Transmission Line

The CEMP will provide an overview of the Overhead Transmission Line and supporting infrastructure, site plans and boundaries, temporary fly camps responsible parties, and key construction activities.

17.2.2.3 Darwin Converter Site

The CEMP will provide an overview of the Darwin Converter Site and supporting infrastructure, site plans and boundaries, responsible parties, and key construction activities.

17.2.2.4 Cable Transition Facilities

The CEMP will provide an overview of the Cable Transition Facilities, site plans and boundaries, responsible parties, and key construction activities.

17.2.2.5 Subsea Cable System

The CEMP will provide an overview of the Subsea Cable System, site plans and boundaries, responsible parties, and key construction activities.

17.2.3 Legal and Other Obligations

The CEMP will summarise all applicable legislation, regulations, and standards that underpin environmental mitigation, management, monitoring measures. The CEMP will list all approvals, licenses, and permits required for the construction phase.

17.2.4 Environmental Emergency Management

The CEMP will describe environmental emergency management plans and procedures, including responsible persons and emergency contacts. Environmental emergency management will include the following elements:

- Environmental Emergency and Spill Response Plan – a sub-plan that will describe how construction personnel will prevent, prepare for, and respond to emergency incidents. The ERP will provide construction personnel with the information necessary to respond to an emergency, either man-made or naturally occurring, with priority toward protecting human life first, then environmental protection, and then property.

  The spill response elements of the sub-plan will identify regulatory requirements related to spill response and reporting and summarize incident risk. Potentials for spills of toxic and hazardous materials (e.g., hydrocarbon fuels, lubricants, or concrete) into terrestrial and aquatic environments can be caused by inappropriate operation of machinery, faulty machinery and equipment, accidents including collisions between vessels, marine vessel grounding or collision, and breaches of environmental procedures. The Plan will describe clean-up equipment that will be required on site, and containment, clean-up, and disposal procedures for marine and terrestrial environments. Post-spill remedial actions, including redress of incidents and clean-up of spills, will cross-reference the Hazardous Materials and Waste Management Plan as appropriate. The Plan will also describe requirements for contractor-developed area- or task-specific spill notification protocols, notification contact information (both internal and external), an inventory of spill response equipment (including spill kits), and roles and responsibilities of individual contractor personnel.

- Bushfire Management Plan – a stand-alone plan for identifying, mitigating, managing, and responding to bushfires. This plan will also include procedures to respond and manage fires on site.

- Weather and other incidents management procedures (including lightning, cyclones, heat waves, flooding, etc.)

17.2.5 Environmental Management Framework

17.2.5.1 Existing Environment

The CEMP will describe the existing environment of each environmental component. This information is currently presented in each of the preceding chapters of the EIS. For brevity, this information is not duplicated here.

17.2.5.2 Environmental Impacts

The CEMP will identify residual environmental impacts for each environmental factor, including severity and scale ratings, likelihood of occurrence and certainty.

A summary of the residual impacts can be found in Chapter 3 and Appendix E; for brevity, this information is not duplicated here.

17.2.5.3 Environmental Management, Mitigation and Monitoring Strategies

For each environmental factor and associated residual impacts, the CEMP (and its sub-plans) will describe environmental mitigation and other control measures, key performance indicators (KPIs), monitoring and reporting requirements, environmental auditing, and corrective actions. Commitments, metrics, and KPIs will be designed to meet NT EPA Environmental Objectives for each of the factors.

The following sections describe identified environmental mitigation and monitoring strategies for key construction and operation activities and/or by environmental factor.

Construction Staging

To manage site access, construction staging, and transport management during the construction phase, a stand-alone Construction Plan will be developed to address these requirements. The Construction Plan will conform with ESMS and CEMP requirements.

The Construction Plan will describe how construction of land and marine-based infrastructure will be staged and managed. The plan will describe the staged approach for construction, including any dependencies or sequencing required, define the construction staging and laydown areas, outline activities to be undertaken for each stage of construction, describe efficient staging and layout of construction facilities to minimize adverse environmental impacts, and identify no-go zones around sensitive habitat or areas that are to be avoided during construction. The staging plans will refer to estimated construction schedule durations per the Project's Master Delivery Schedule.

The Construction Plan will also consider transportation requirements, which will be planned to avoid access conflicts through project design, scheduling/planning, and implementation of mitigation measures. The Construction Plan will describe traffic and delivery routes, road and rail network impacts, traffic management procedures, security and fencing, access notifications and permissions. This plan will also include procedures regarding marine access, import and export through ports and other logistics (e.g., rail safety and access).

Key avoidance and mitigation measures regarding construction staging and transport management are listed in Table 17-1 and will be addressed in the Construction Plan.

Table 17-1. Construction Staging and Transport Management - Key Mitigation Measures and Monitoring

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Construction Staging and Transport Management (Land and Marine Environment)	• Restrict public access to Project work sites • Advance communication and notification of access restrictions • Avoid/mitigate disruptions caused by construction activities to access to site areas by local communities • Consideration of public events when planning traffic restrictions • Construction site access, laydown areas, and haul roads to avoid residential areas • Posting of Construction Notices in visible locations and at pre-determined locations	• Visual inspections of construction staging and laydown areas to confirm implementation of mitigation measures and their effectiveness

Terrestrial Environmental Quality

The key terrestrial environmental impacts identified in Chapter 4 include:

- Erosion and topsoil migration caused by the disturbance of soils
- Contamination of soils
- Disturbance of ASS

To manage and mitigate impacts on terrestrial environmental quality during construction, a Flora and Fauna Management sub-plan will be developed under the CEMP. The Plan will describe measures to avoid and mitigate potential impacts on terrestrial environmental quality including any supplemental pre-construction surveys required (e.g., bird nesting activity surveys and rare-plant surveys), bird deterrence methods, rare plant relocation procedures, landscaping, and clearing and reinstatement measures. Erosion Sediment Control Plans (ESCPs), Acid Sulfate Soil Management Plans (ASS MPs) where necessary and related measures such as hazardous materials storage and handling will also be adopted. A chance find procedure will also be developed as part of this sub-plan for any unknown contaminated sites that are encountered during ground disturbance.

The key avoidance and mitigation measures and monitoring that will be implemented are listed Table 17-2 KPIs for terrestrial environmental quality will be designed to meet NT EPA Environmental Objectives and described in the CEMP. The KPIs will be used to confirm the NT EPA objective for this environmental factor is met and that residual impacts to terrestrial environmental quality have been adequately managed.

Table 17-2. Terrestrial Environmental Quality – Key Mitigation Measures and Monitoring

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Site-wide	• Solar Precinct and Darwin Converter site footprint is located and flat land above the maximum flood extent of 0.01% AEP (i.e., 1-in-1000-year flood event). • Roadside drainage and culverts will be installed in accordance with accepted road design standards. • Implementation of site-specific Erosion and Sediment Control Plan (ESCP), which will be commensurate with the risk of erosion in each location. All ESCPs are to be developed by a suitably qualified ESC specialist and/or reviewed by a CPESC. • Clearing and land disturbance will be staged (where practical) to ensure that soils are exposed for limited periods to minimise soil loss. • Construction works in high-risk areas i.e. watercourse crossings and areas subject to inundation, areas of steep slopes, will be prioritised during the dry season. • A primary site-wide Erosion and Sediment Control Plan (ESCP) will be developed for each proposal component to provide contractors a basis on which to develop site-specific ESCPs. • Separation of clean and dirty water. Diversion of up-slope, run-on water around construction areas. • Fuels and hazardous chemicals will be stored and handled in accordance with Australian standards and guidelines. • Dangerous Goods and Hazardous Substances Registers maintained at all storage and handling locations. • An Environmental Emergency and Spill Response Plan will be in place and equipment provided at all storage and handling locations. • Construction and operations personnel trained in spill response. • Development of an ASSMP if ASS is identified in soil disturbance areas during construction. • As per the developed ASSMP treatment of PASS to neutralise acidity and prevent impact on surrounding environment.	• Annual post wet season monitoring of rehabilitation success until disturbed areas stabilised. • Visual inspections of drainage structures, discharge points and site boundaries following rain events. • Post wet-season inspections of footprint and maintenance of emerging erosion issues. • Routine visual inspections around storage locations and work areas. • Visual inspections and testing of any confirmed ASS in line with National Acid Sulfate Soils Guidance material.

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Solar Precinct and Darwin Converter Site	• Stormwater system design criteria is for discharge at similar rates to existing conditions.	
OHTL	• OHTL poles will be micro sited to avoid watercourses or drainage lines, or in areas where surface drainage could be affected. • Reinstatement of cleared OHTL corridor footprint post-construction that is not required for operations with native vegetation species and erosion controls. Site reinstatement procedures and targets will be established in a Reinstatement Plan.	
Cable Transition Facilities	• Reinstatement of cleared Cable Transition Facilities footprint post-construction with native vegetation species and erosion controls. Site reinstatement procedures and targets will be established in a Reinstatement Plan.	

Terrestrial Ecosystems

The key impacts on terrestrial ecosystems identified in Chapter 5 and Chapter 16 include:

- Loss of vegetation through land clearing.
- Introduction and spread of weeds
- Habitat degradation due to fragmentation of native bushland
- Change in fire regimes and fauna behaviour
- Fauna mortality due to interaction with vehicles and infrastructure
- Impact on threatened species

To manage and mitigate impacts on terrestrial ecosystems, three sub-plans will be developed P:

- Flora and Fauna Management Plan
- Weed Management Plan
- Bushfire Management Plan

The Flora and Fauna Management Plan will describe measures to avoid and mitigate potential impacts on terrestrial ecosystems including any supplemental pre-construction surveys required (e.g., bird nesting activity surveys and rare-plant surveys), bird deterrence methods, threatened species management, landscaping, and clearing and reinstatement measures.

The Weed Management Plan is available in Appendix Q and includes direction and planning for managing the environmental risks associated with the introduction and spread of weed species during construction of the terrestrial components of the AAPowerLink. This includes guidance on applicable legislation, regulations and regional weed management strategies, regional weed record data, a framework for determining priority areas and weed species for control, management measures to avoid the spread of existing weeds and the introduction of new weed species and an overview of the monitoring, reporting and incident response procedures appropriate for the management measures.

The mitigation measures are included in Table 17-3 and apply across all project components.

The Bushfire Management Plan will describe protection measures to be implemented to avoid and reduce the risk from bushfire. This plan will also describe at a minimum, protocols, safety measures and reporting requirements in the case of a fire on site.

The key avoidance and mitigation measures and monitoring for terrestrial ecosystems that will be implemented are listed in Table 17-3.

Table 17-3. Terrestrial Ecosystems – Key Mitigation Measures and Monitoring

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Site-wide	• Micro-siting of transmission towers to avoid significant vegetation where possible. • Preferential use of existing cleared areas where possible for temporary construction requirements such as access tracks, laydown areas and construction camps. • Clearance only within the boundaries approved in licences obtained to clear native vegetation as per the Planning Act and/or the Pastoral Land Act. • Develop and implemented a Re-instatement Plan for post-construction reinstatement of all temporary construction footprints and follow-up weed control post-construction. • Post-operations rehabilitation of cleared areas as per the Decommissioning and Rehabilitation Plan. • Avoiding clearing large hollow-bearing trees where possible. • Clearing will be conducted in a single direction, allowing any fauna to move out of way of clearing activities. • If fauna is spotted in immediate clearing area and are in danger, clearing will be stopped until safe to continue. • Clearing in a progressive manner to allow wildlife to natural disperse from the area as clearing undertaken. • Site inductions will ensure that all personnel are aware of their	• Visual inspections during clearing to ensure clearing is within approved boundaries. Results recorded, along with any photographs. • Rehabilitation inspections following first wet season post-construction or until vegetation is established and sites are stable. • Record any fauna injuries or mortalities as a result of works on fauna register for the duration of works. • Visual and virtual monitoring for fires • Monitoring NAFI website for proximate fires which may impact project area. • Monitoring conditions for fire risk. •

Scope/Application	Avoidance and Mitigation Measures	Monitoring
	obligations and know the correct procedures for fauna encounters. • Vehicle speed restrictions apply when travelling near uncleared areas or in higher risk conditions. • Observe fire bans • Develop and implement a Bushfire Management Plan, including first response capability. • Reinstatement of all temporary construction footprints and follow-up weed control post-construction. • Implement a Flora and Fauna Management Plan that includes adaptive monitoring and mitigation in specific areas if collision hotspots are observed. • Installing diverting devices in response to any collision hotspots identified during operations. • Micro-siting of transmission towers and access tracks to avoid identified local occurrences (if present). • Re-routing the access track to avoid local occurrences (if present). • Clearing will be conducted in accordance with a Land Clearing and Disturbance Procedure. Procedural controls will include: • Clearing in a single direction, allowing any fauna to move out of way of clearing activities. • If fauna is spotted in immediate clearing area and are in danger, clearing will be stopped until safe to continue. • Clearing in a progressive manner to allow wildlife to natural disperse from the area as clearing undertaken. • Site inductions will ensure that all personnel are aware of their obligations and know the correct procedures for fauna encounters. • Traffic Management Plans will incorporate vehicle speed restrictions as required for high-risk locations and conditions to minimise the risk of fauna collisions.	

Scope/Application	Avoidance and Mitigation Measures	Monitoring
	• Use of electrodes removes the need for a top earth wire (which is the wire associated with most birds collision). • Powerlines will be marked with diverting devices at major river crossings and where they transect important wetland areas on Gunn Point peninsula. • Installing diverting devices in response to any collision hotspots identified during operations. • Coordination with the landholder and other land users and consistency with the landholder's fire management obligations and strategies	
Site-wide (weed management)	• Avoid introducing new weeds into proposal footprint by implementing weed hygiene, as per the Weed Management Plan (Appendix Q). • Implementation of Weed Management Plan (Appendix Q) that has been developed in accordance with the requirements of the Weeds Management Act and relevant statutory weed management plans.	• As per the Weed Management Plan (Appendix Q).

Hydrological Processes

The key hydrological processes impacts identified in Chapter 6 include:

- Changes to surface water flows from land clearing and development
- Changes to groundwater levels caused by groundwater extraction

To manage and mitigate any impacts to hydrological processes during the construction phase, a Surface and Groundwater Management Plan will be developed as a sub-plan under the CEMP. This plan will include guidance on applicable legislation, regulations, and required permits, and strategies and management measures to be used to mitigate and or avoid impacts to surface water during construction of the Project. These can include, at a minimum, measures for restricting work during severe weather to minimize the potential for erosion and sedimentation, timing of any in-water works or works adjacent to watercourses, water quality sampling and monitoring protocol, water use and re-use strategies (including groundwater), and best practice erosion and sediment control measures. The plan will also describe any reporting and incident response procedures appropriate for the management measures.

The key avoidance and mitigation measures and monitoring that will be implemented are listed in Table 17-4.

Table 17-4. Hydrological Processes - Key Mitigation Measures and Monitoring

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Site-wide	• Roadside drainage and culverts will be designed and installed in accordance with accepted Austroads standards. • For major watercourses, tracks will be cleared to access either side, avoiding disturbance to dense riparian vegetation. • Groundwater extraction sites will be located away from existing groundwater bores in use. • Drainage, ESC installed and maintained in accordance with ESCP that align with the Best Practice Erosion and Sediment Control Guidelines (IECA, 2008) • Bore locations and sustainable yields to be determined subject to investigation and recommendations from a hydrogeologist. • Bore permits and water extraction license obtained under the Water Act. • Groundwater used as water supply – no surface water extraction.	• During construction, visual inspections of disturbed areas and ESC as per ESCP (after significant rainfall events, at a minimum). • Annual post wet season monitoring or rehabilitation success until disturbed areas are stabilised. • Visual inspections of drainage structures, discharge points and site boundaries, following rain events. • Post-wet season inspections of all project locations and rectification of emerging erosion issues. • Monitoring of standing water levels and water extraction volumes, as required under water extraction license conditions. • Groundwater quality sampling and analysis of springs near Solar Precinct and aquifer targeted for groundwater extraction to ensure there is no connectivity.
Solar Precinct and Darwin Converter Site	• Footprints are located on flat land above the maximum flood extent of 0.05% AEP (i.e., 1-in-2000-year flood event) and outside of storm surge zones. • Footprints avoid watercourses. • Engagement with landowners at Solar Precinct to identify bores that can be used as a water source without affecting other uses. • Design criteria for engineered stormwater management systems installed is to discharge water to similar locations and at similar volumes to pre-development conditions. • Ground under the solar fields will not be compacted, allowing rainfall to infiltrate soils.	

Scope/Application	Avoidance and Mitigation Measures	Monitoring
OHTL	• OHTL poles will not be placed in watercourses or drainage lines, or in areas where surface drainage could be affected. • Only minor drainage lines may be crossed by the OHTL access track. Major drainages will be approached from either side to avoid the need for construction crossings. • Engagement with landowners along the OHTL to identify bores that can be used as a water source without affecting other uses. • Watercourse crossings along access roads and OHTL installed during the dry season when no flow is present. • Reinstatement of OHTL corridor footprint post-construction.	
Cable Transition Facilities	• Reinstatement of cleared Cable Transition Facilities footprint post-construction that are not required to remain cleared for operations.	

Inland Water Environmental Quality

The key inland water environmental quality impacts identified in Chapter 7 include:

- Turbidity and sedimentation in surface waters
- Contamination by release of fuels and hazardous substances
- Contamination from waste storage and disposal
- Contamination by sewage from camps and ablutions

To manage and mitigate any impacts to inland water environmental quality during the construction phase, a Surface and Groundwater Management Plan will be developed as a sub-plan under the CEMP. This plan will include guidance on applicable legislation, regulations, required permits, and strategies and management measures to be used to mitigate and or avoid impacts to surface water during construction of the Project. These can include, at a minimum, measures for restricting work during severe weather to minimize the potential for erosion and sedimentation, timing of any in-water works or works adjacent to watercourses, water quality sampling and monitoring protocol, water use and re-use strategies and best practice erosion and sediment control measures. The plan will also describe any reporting and incident response procedures appropriate for the management measures. Additionally, contractors will develop site-specific Erosion and Sediment Control CECPs.

The key avoidance and mitigation measures and monitoring to protect inland water environmental quality that will be implemented are listed in Table 17-5.

Table 17-5. Inland Water Environmental Quality - Key Mitigation Measures and Monitoring

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Site-wide	• Drainage, erosion and sediment controls will be installed and maintained in accordance with Erosion and Sediment Control Plans (ESCP) that align with the *Best Practice Erosion and Sediment Control Guidelines* (IECA, 2008). • Develop and implement a Reinstatement Plan for post-construction reinstatement of works areas to stablise soils and promote regrowth of native vegetation. • Rectification of emerging erosion issues after each wet season. • Dangerous Goods and Hazardous Substances will be stored and handled in accordance with regulated standards and codes of practice, and manufacturer's direction. • Dangerous Goods and Hazardous Substances will not be stored within 200m of a watercourse or groundwater bore, and mobile refuelling will not occur within 50m of a watercourse or groundwater bore. • Dangerous Goods and Hazardous Substances Registers maintained at all storage and handling locations. • An Environmental Emergency and Spill Response Plan will be in place and equipment provided at all storage and handling locations. • Construction and operations staff trained in spill response. • No waste will be stored within 200m of a watercourse. • Waste management will be in accordance with best practice guidelines (e.g. separation of waste, covering, bunded storage areas), and the requirements of the Waste Management and Pollution Control Act. • Progressive clearing and construction/reinstatement will be undertaken. • Stormwater drainage will be installed to capture and manage runoff. Stormwater captured within facilities will discharge to land, via erosion and sediment controls. • Roadside drainage and culverts will be installed in accordance with accepted Austroads standards.	• During construction, visual inspections will be undertaken of disturbed areas and erosion and sediment controls as per ESCP (after significant rainfall events, at a minimum). • Annual post wet season monitoring of reinstatement success until disturbed areas are stabilised. • Visual inspections of drainage structures, discharge points and site boundaries following rain events. • Post-wet season inspections of all project locations and rectification of emerging erosion issues. • Routine visual inspections around storage locations and work areas.

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Solar Precinct	• Solar Precinct site selection process included avoidance of major watercourses; site has no watercourses within the footprint. • Solar Precinct site footprint is located on flat land above the maximum modelled flood extent (1 %AEP/1-in-1000-year flood event) and outside of mapped storm surge zones. • Landfill will comply with the Guidelines for Siting, Design and Management of Solid Waste Disposal Sites in the Northern Territory 2003. • No waste will be stored within 200m of a watercourse. • Waste management will be in accordance with best practice guidelines (e.g. separation of waste, covering, bunded storage areas), and the requirements of the *Waste Management and Pollution Control Act 1998*. • All listed waste will be disposed of at a licenced waste management facility. • Onsite wastewater management systems to be designed and installed by suitably qualified person, in accordance with NT Code of Practice for Onsite Wastewater Management, plus other relevant standards and guidelines. • System to be designed for projected wastewater loads, and appropriate for applicable climate. • Any issue identified with wastewater management system to be rectified by suitably licenced person. • During operations, solar power will be used as a power source, hence no requirement for bulk fuel storages.	• Routine inspection and maintenance of wastewater management systems and land application areas, in accordance with the NT Code of Practice for Onsite Wastewater Management. • Routine visual inspections around landfill, waste storage locations and work areas.
Darwin Converter Site	• Darwin Converter Site site selection process included avoidance of major watercourses; site has no watercourses within the footprint. • Darwin Converter Site footprint is located on flat land above the maximum modelled flood extent (1 %AEP/1-in-1000-year flood event) and outside of mapped storm surge zones.	• Visual inspection of discharge point near seasonal swamp at Darwin Converter Site for evidence of sedimentation

Scope/Application	Avoidance and Mitigation Measures	Monitoring
OHTL	• OHTL poles will not be placed in watercourses or drainage lines, or in areas where surface drainage could be affected. • Reinstatement of cleared OHTL corridor footprint post-construction that is not required to remain cleared for operations. • Only minor drainage lines will be crossed by the OHTL access track. Major drainages will be approached from either side to avoid the need for constructing crossings. • Watercourse crossings along access roads and OHTL will be installed during the dry season when no flow present. • Onsite wastewater management systems to be designed and installed by suitably qualified person, in accordance with NT Code of Practice for Onsite Wastewater Management, plus other relevant standards and guidelines. • System to be designed for projected wastewater loads, and appropriate for applicable climate. • Any issue identified with wastewater management system to be rectified by suitably licenced person.	• Routine inspection and maintenance of wastewater management systems and land application areas, in accordance with the NT Code of Practice for Onsite Wastewater Management.

Aquatic Ecosystems

The key impacts for aquatic ecosystems identified in Chapter 8 include:

- Loss of aquatic habitat values due to changes in the hydrological regime or contamination by sediment/chemical contaminants through stormwater.

Impacts on the aquatic ecosystem during the construction phase will be addressed through measures identified in the Surface and Groundwater Management Plan and within the main body of the CEMP.

The key avoidance, mitigation measures and monitoring that will be implemented to protect aquatic ecosystems are listed in Table 17-6.

Table 17-6. Aquatic Ecosystems - Key Mitigation Measures and Monitoring

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Site-wide	• Minimise the disturbance footprint within waterways or wetlands to the smallest practicable area. • Clearing of significant riparian vegetation (e.g. large trees) will be avoided wherever practical by spanning the powerline across riparian zones associated with higher order watercourses. • Clearing will be undertaken progressively. • Dangerous Goods and Hazardous Substances will be stored and handled in accordance with regulated standards and codes of practice, and manufacturer's directions. • Dangerous Goods and Hazardous Substances will not be stored within 200 m of a watercourse or groundwater bore, and mobile refuelling will not occur within 50 m of a watercourse or groundwater bore. • Drainage, erosion and sediment controls installed and maintained in accordance with Erosion and Sediment Control Plans (ESCP) that align with the Best Practice Erosion and Sediment Control Guidelines (IECA, 2008). • Develop and implement a Reinstatement Plan for post-construction reinstatement of works areas to stabilise soils and promote regrowth of native vegetation. • Rectification of emerging erosion issues after each wet season. • Water carts will be used across the project footprint to minimise dust emissions in areas of high risk at regular intervals. Other dust suppressants will be used if water ineffective. • Implement on-site vehicle restrictions (e.g., limit the speed of vehicles travelling on unsealed access roads). • Provide tyre wash facilities to minimize tracking of mud or dirt onto sealed roads. • Cover or dampen any stockpiles where practical.	• Monitoring during clearing to ensure clearing remains within approved boundaries, and at approved watercourse crossing locations. • During construction, visual inspections of disturbed areas and erosion and sediment controls as per ESCP (after significant rainfall events, at a minimum). • Annual post wet season monitoring of rehabilitation success until disturbed areas are stabilised. • Visual inspections of drainage structures, discharge points and site boundaries following rain events. • Post-wet season inspections of all project locations and rectification of emerging erosion issues. • Monitoring of standing water levels and water extraction volumes, as required under water extraction licence conditions. • Visual observations for fugitive emissions of dust • Conduct regular inspections of construction areas and roads to identify potential sources of dust emissions • Develop 'watching brief' on 'nuisance' impacts to ensure quick responses to any detriment and emerging issues.

Scope/Application	Avoidance and Mitigation Measures	Monitoring
	• Dangerous Goods and Hazardous Substances Registers maintained at all storage and handling locations. • An Environmental Emergency and Spill Response Plan will be in place and equipment provided at all storage and handling locations. • Construction and operations staff trained in spill response. • Roadside drainage and culverts will be designed in accordance with accepted AustRoads standards. • Bore locations and sustainable yields to be determined subject to investigation and recommendations from a hydrogeologist. • Bore permits and water extraction licence obtained under the Water Act 1992. • Groundwater used as water supply – no surface water extraction. • Groundwater extraction sites will be located away from springs or GDEs. • Operational footprint will cover soil with infrastructure, hardstand, or vegetation to minimise wind erosion and dust • Locate site access roads, laydown areas and stationary equipment (e.g., generators) as far away as possible from sensitive receivers. • Limit the amount of time between completion of road base and any paved areas to minimize exposure of unpaved surface.	• Implement complaints procedure

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Solar Precinct and Darwin Converter Site	• Solar Precinct and Darwin Converter Site do not have watercourses within direct disturbance footprint. • Solar Precinct site, which is largest continuous footprint, is located away from sensitive receptors and aquatic ecosystems • Solar Precinct site selection process involved selecting remote area away from sensitive receptors and >10 km from Lake Woods • The final route selection process for the Solar Precinct access roads will avoid crossing locations that hold water for extended periods, riparian vegetation and aquatic vegetation, where possible. • Solar Precinct and Darwin Converter Site footprints located on flat land above the maximum modelled flood extent (1 %AEP/1-in-1000-year flood event) and outside of mapped storm surge zones. • Design criteria for engineered stormwater management systems installed at the Solar Precinct and Darwin Converter Site is to discharge water to similar locations and at similar volumes to pre-development conditions. • Watercourse crossings along Solar Precinct access roads installed in the dry season when no flow is present. • Engagement with landowners at Solar Precinct to identify bores that can be used as a water source without affecting other uses.	• Visual inspection of discharge points and monitoring of water levels in seasonal swamp at Darwin Converter Site - monthly during the wet season. • Monitoring of standing water levels and water extraction volumes, as required under water extraction licence conditions. • Water quality sampling and analysis of springs near Solar Precinct and aquifer targeted for groundwater extraction to ensure there is no connectivity.

Scope/Application	Avoidance and Mitigation Measures	Monitoring
OHTL	• OHTL pole placement will avoid watercourses or wetlands in accordance with micro-siting criteria provided in Chapter 2. • Only minor drainage lines will be crossed by the OHTL access track. Major drainages will be approached from either side to avoid the need for constructing crossings • Watercourse crossings along OHTL installed in the dry season when no flow is present. • Engagement with landowners along OHTL to identify bores that can be used as a water source without affecting other uses. • Reinstatement of the cleared OHTL corridor footprint post-construction that is not required to remain cleared for operations.	

Marine Environmental Quality

The key impacts for marine environmental quality identified in Chapter 9 include:

- Increased turbidity in marine waters caused by cable laying activities
- Sediment mobilisation from Shore Crossing Site impacting water quality
- Disturbance of PASS at Shore Crossing Site impacting water quality
- Spills of hazardous substances impacting water quality

To manage and mitigate potential impacts to marine and marine ecosystems during the construction phase, a Marine Environmental Management Plan will be developed as a sub plan under the CEMP. This plan will aim to prevent or reduce the potential environmental impacts the Project may have during the construction of the subsea cable system. The plan will include at a minimum, turbidity management and monitoring as part of the water quality monitoring program (Section 17.2.7), localized in-water excavation management and installation methods (i.e., sidecasting, removal and disposing of sediment), and detail management measures in line with relevant guidelines and requirements.

The key avoidance and mitigation measures and monitoring that will be implemented to protect marine environmental quality are listed in Table 17-7.

Table 17-7. Marine Environmental Quality - Key Mitigation Measures and Monitoring

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Subsea Cable System	• Corridor selection avoids areas of significant marine habitat as much as possible. • Cable burial methods will be selected to suit the local seabed conditions. • Construction of the Shore Crossing Site will avoid periods of monsoonal conditions, to minimise erosion risk. • Sampling and assessment prior to construction to delineate PASS area. • Besides marine fuel oil, no HAZMAT materials will be used on vessels during construction. • Minimise disturbance footprint by undertaking targeted repairs as required. • Any HAZMAT stored at Land Sea Joint Station will be >300 m from beach and on bunded storages. • Erosion and sediment controls will be installed and maintained in accordance with a site-specific Erosion an Sediment Control Plans (ESCP) that aligns with the Best Practice Erosion and Sediment Control Guidelines (IECA, 2008). • Develop and implement a Reinstatement Plan for post-construction reinstatement of works areas to promote recolonisation of shore and benthic habitats. • Development and implementation of an Acid Sulfate Soils Management Plan (if required). • Management of PASS in accordance with National Acid Sulfate Soils Guidance. • Compliance with MARPOL requirements regarding refuelling and spill prevention. • Fuels and hazardous chemicals will be stored and handled in accordance with Australian standards and guidelines • An Environmental Emergency and Spill Response Plan will be in place and equipment provided at all storage and handling locations. • Construction and operations staff will be trained in spill response.	• Turbidity monitoring in impact zone and baseline/reference site during cable installation in high-risk area (shallow waters <20m depth). • During construction and post construction, visual inspections will be undertaken of the works area and surrounding marine waters until all areas are reinstated • Visual inspections during excavation to assess for PASS in disturbed soils. • Sampling and assessment of treated ASS in accordance with National Acid Sulfate Soils Guidance. • Visual inspections of land-based storages and during refuelling activities for early spill detection. • In the event of a significant spill, water quality monitoring.

Marine Ecosystems

The key impacts for marine ecosystems identified in Chapter 10 and Chapter 16 include:

- Direct disturbance or loss of benthic habitats
- Habitat degradation due to elevated turbidity
- Changes to fauna behaviours due to noise or light
- Habitat and fauna impact due to spills
- Introduction of marine pests
- Direct fauna mortality/collisions with vessels

To manage and mitigate potential impacts to marine environmental quality and marine ecosystems during the construction phase, a Marine Environmental Management Plan will be developed as a sub plan under the CEMP. This plan will aim to prevent or reduce the potential environmental impacts the Project may have during the construction of the subsea cable system. In addition to the elements described above in 17.2, the plan will also include underwater noise thresholds and mitigation measures, visual marine mammal observations, marine flora and fauna management, and identify marine pest risks and detail management measures in line with relevant guidelines and requirements.

The key avoidance and mitigation measures and monitoring that will be implemented to protect marine ecosystems are listed in Table 17-8.

Table 17-8. Marine Ecosystems - Key Mitigation Measures and Monitoring

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Subsea Cable System	• Route design, where possible, has avoided topographical areas along the sea floor which are associated with areas of higher habitat value. • Route selection avoids important turtle breeding beaches. • Design, install and operate Subsea Cable System in accordance with the Guidelines on Best Environmental Practices in Cable Installation and Operation (OSPAR 2012) • Manage vessels in accordance with National Biofouling Guidelines to avoid establishment of marine pests on vessels. • Marine Environment Management Plan to provide controls for ensuring compliance with MARPOL requirements regarding refuelling and spill prevention and for ensuring vessels comply with the appropriate marine pest management guidelines/requirements. • Marine Environment Management Plan to the following controls: o Support vessels will adhere to low speeds, particularly in high-risk	• Turbidity monitoring in impact zone and baseline/reference site during cable installation in high-risk area (shallow, <10m depth). • Monitoring in accordance with the Marine Environment Management Plan • Visual observation for marine fauna activity in accordance with the Marine Environment Management Plan • Visual inspections of land-based storages and during refuelling activities for early spill detection. • Spill response and follow-up monitoring in accordance with a Marine Environment Management Plan. • In the event of a significant spill, water quality monitoring.

Scope/Application	Avoidance and Mitigation Measures	Monitoring
	areas (shallow waters and migration and foraging zones). o If marine fauna is spotted, vessels will reduce speeds to below 6 knots until fauna has passed. o No marine fauna will actively be approached by vessels. • Besides marine fuel oil, no HAZMAT materials will be used on vessels during construction. • HAZMAT will be stored and handled in accordance with Australian and International standards and guidelines. • Any HAZMAT stored at Land Sea Joint Station will be >300 m from beach and on bunded storages. • Fuels and hazardous chemicals will be stored and handled in accordance with Australian standards and guidelines • An Environmental Emergency and Spill Response Plan will be in place and equipment provided at all storage and handling locations. • Construction and operations staff will be trained in spill response.	

Air Quality

The key impacts for air quality identified in Chapter 11 include:

- Production of dust (nuisance) and diesel exhaust emissions (human health)

To manage and mitigate potential impacts to air quality, an Air Quality Management Plan will be developed as a sub plan under the CEMP. This plan will identify locations of sensitive receptors (e.g., residences) potentially affected by dust and equipment emissions, outline regulatory requirements pertaining to air emissions, including possible permits necessary for the operation of construction facilities, equipment or machinery, describe measures to minimize dust and mobile emissions, describe measures to minimize NOX emissions, and identify and describe any applicable air quality monitoring requirements.

The key avoidance and mitigation measures and monitoring that will be implemented to protect air quality are listed in Table 17-9.

Table 17-9. Air Quality - Key Mitigation Measures and Monitoring

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Site-wide (Air)	• Whenever possible, plan haul routes to avoid residential areas • Efficient staging and layout of construction facilities to minimize haulage, avoid double handling of materials and other excessive equipment operations • Use grid or solar power whenever practical over stationary combustion generated power • Locate site access roads, laydown areas and stationary equipment (e.g., generators) as far away as possible from sensitive receivers • NOx emissions will be minimised by using electric vehicles and equipment where practicable, and ensuring all machinery, plant and equipment complies with minimum emissions standards • Water carts will be used across the project footprint to minimise dust emissions in areas of high risk at regular intervals. • Implement on-site vehicle restrictions (e.g., limit the speed of vehicles travelling on unsealed access roads).	• Conduct regular inspections of construction areas and roads to identify potential sources of dust emissions • Develop 'watching brief' on 'nuisance' impacts to ensure quick responses to any detriment and emerging issues. • Implement complaints procedure

Atmospheric Processes

As described in Chapter 12, there are several sources of emissions for the Project including the initial emissions associated with constructing the facilities, two small increases in greenhouse gas (GHG) emission during maintenance campaigns (panel and battery replacement) during the project life and decommissioning emissions at the end of the project life (year 70). The key residual impacts for atmospheric processes identified in Chapter 12 include:

- GHG emissions as a result of combustion of fuel from vessels, plant and equipment for earthworks, air and land travel, logistics and power generation.
- GHG emissions from the decomposition of organic debris and loss of soil carbon during operation.
- GHG emissions from land clearing and land use change
- Overall reduction in GHG emissions (beneficial impact).

To manage atmospheric processes during the construction phase, a GHG Abatement Plan was developed. This plan is available in Chapter 12, Appendix H and provides a summary of the GHG emissions inventory for the Project and strategies and mitigation measures. This includes guidance on applicable legislation, regulations and policies on GHG emissions management, management measures to avoid or reduce GHG emissions and an overview of the monitoring, reporting and incident response procedures appropriate for the management measures. The mitigation measures provided in the report are included in Table 17-10 and apply across all components of the Project.

The key avoidance and mitigation measures and monitoring to manage GHG emissions that will be implemented are listed in Table 17-10.

Table 17-10. Atmospheric Processes - Key Mitigation Measures and Monitoring

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Site-wide	• Continue to identify and engage in opportunities to maximise commercially viable carbon abatement from the AAPowerLink, including: o Pursuing power purchase agreements with large fossil fuel power generators in the NT. o Supply AAPowerLink construction and operational power needs via self-generated solar energy where practicable. o Where the use of self-generated solar energy is not possible, source renewable energy via market mechanisms (if available). o Identify and (where practicable) adopt practical zero carbon technology solutions such as electric vehicles, plant and equipment and remote solar energy systems. • Develop and implement a GHG Abatement and Management Plan that aligns with ISO 140001 Environmental Management Systems. • Conduct GHG mitigation workshops every 2 years during design and construction and every five years during operations to assess performance and identify new opportunities for leveraging best practice and emerging technology. • Procurement strategies to consider adoption of carbon reduction and energy efficient technologies (where practicable), including but not limited to: • Electrification options for civil plant, machinery, and equipment. • Energy efficiency in aircraft services selection. • Electrification and alternative fuel options for transportation (e.g., marine vessels, rail)	• Monitor GHG emissions from facilities, as well as energy produced and exported in line with the requirements of NT and Commonwealth law. • Data required to calculate GHG emissions will be collected in line with the methods outlined in the National Greenhouse and Energy reporting (Measurement) Determination 2008. • Monitor performance against targets set in the GHG Abatement and Management Plan.

Scope/Application	Avoidance and Mitigation Measures	Monitoring
	• Develop vegetation management strategies that aim to retain vegetation and soil carbon • Conduct studies to identify and select clearing, fire management, vegetation disposal practices and vegetation species to plant or retain. • Develop and implement Rehabilitation Plans that aims to reinstate vegetation post-construction and post-decommissioning	

Hazardous Materials and Waste Management

To manage waste during the construction phase, a Hazardous Materials and Waste Management Plan will be developed as a sub-plan under the CEMP.

The Hazardous Materials and Waste Management Plan will describe the measures that will be implemented to reduce, reuse and recycle solid and domestic waste, as well as the measures to dispose of non-hazardous solid and liquid waste during the construction phase. The plan will also describe any monitoring and reporting frameworks to evaluate and improve non-hazardous waste management measures as required. The plan will describe measures to ensure that hazardous materials are managed in a way that avoids potential impacts to human health and the environment, consistent with environmental regulatory requirements, including the development of a Dangerous Goods and Hazardous Materials Register and procedures for storing, transporting, handling, and using hazardous substances.

The key avoidance and mitigation measures and monitoring that will be implemented are listed in Table 17-11.

Table 17-11. Hazardous Materials and Waste Management - Key Mitigation and Monitoring

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Site-wide	• Wastes will be managed in accordance with the following hierarchy of approaches: Avoidance, Minimisation, Re-use, Recycling, Recovery (of energy and other resources), Treatment and Disposal. • Wastes will be stored at designated locations at each works area, with appropriate segregation and storage in line with the waste characteristics (i.e., putrescible, inert, hazardous, listed, solid, liquid) • Listed wastes will be stored in covered bunded areas, or in suitable containers, at designated locations prior to off-site removal and disposal by a licenced waste contractor. • All storages and mobile refuelling will be located at least 200m from a watercourse or groundwater bore where practical.	

Scope/Application	Avoidance and Mitigation Measures	Monitoring
	• A Dangerous Goods and Hazardous Materials Register will be maintained, and Safety Data Sheets (SDS) will be kept at each storage location. • Manifests will be maintained where manifest quantities are exceeded. • Spill kits, Personal Protective Equipment (PPE) and firefighting equipment will be kept with machinery and equipment as required by legislation, and personnel will be trained in spill response procedures per the requirements of the Environmental Emergencies and Spill Response Plan. • Spill kits and firefighting equipment will be kept with chemicals as required by legislation. • Containment and interceptors will be installed at storage areas and maintenance areas to capture spills and contaminated runoff and minimise off-site release of pollutants.	

Community and Economy

The key community and socio-economic impacts identified in Chapter 13 include the following issues raised by community members during consultation:

- Housing affordability and availability, particularly in the Barkly where most of the construction activity will take place which could be a constraint to growth
- Training, capacity-building, and employment for local and Aboriginal groups, particularly:
    - Equitable distribution of social and economic benefits
    - Addressing high unemployment and poverty in the Barkly
    - Skills shortages, Aboriginal employment and challenges to successful employment and retention of often disengaged youth
- Social procurement and Aboriginal inclusion, particularly opportunities and challenges of local industry participation
- Protection of cultural heritage and values
- Concerns at the implications of cumulative industrial development
- Developing an inclusive work environment that recognises diversity and inclusion
- Changes in fire regime

A detailed Social Impact Management Plan has been developed and describes mitigations measures and AAPowerLink commitments in details. This is described further in 17.3.

Culture and Heritage

The key culture and heritage impacts identified in Chapter 14 include the following:

- Direct impacts to heritage features
- Indirect impacts to heritage features
- Impacts to undetected heritage features

To manage impacts on culture and heritage, a Cultural Heritage Management Plan (CHMP) will be developed as a sub plan under the CEMP. This plan will be developed in consultation with Traditional Owners and the NT Heritage Branch. The CHMP will provide detailed measures for managing inadvertent discovery of heritage features including 'stop works' procedure for burials, human remains and sites of significance. The plan will also identify "Cultural High-Risk Areas" in the Project footprint that will be surveyed prior to the commencement of works. Measures from the SIMP that relate to the protection of cultural and heritage values have been incorporated into Table 17-12.

The key avoidance and mitigation measures and monitoring that will be implemented are listed in Table 17-12.

Table 17-12. Culture and Heritage - Key Mitigation Measures and Monitoring

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Site-wide	• Obtain AAPA Authority certificates • Hire cultural managers (monitors) and liaison officers to ensure all cultural commitments are respected and met • Consult with Traditional Owners and site custodians through the ILUA and AAPA Authority Certificate processes to identify Sacred Sites and culturally significant landscape features and determine the most appropriate site protection measures. • Avoid direct impacts to recorded heritage features where practicable when finalising the locations of AAPowerLink infrastructure and temporary construction work areas. • Comply with conditions of Authority Certificates and ensure conditions are made available to all authorised personnel. • Prepare Cultural Heritage Management Plan/s (CHMP) in consultation with Traditional Owners and the NT Heritage Branch. • Where impacts to archaeological heritage features are unavoidable, obtain an approval to carry out work on a heritage place or object (work) under the Heritage Act. • Mitigation works on heritage features covered by Works Approvals will be undertaken ahead of commencing site preparation activities. • Workforce training and inductions will address cultural awareness and heritage protection	• Track and record any 'stop works' procedures during construction and operations • Track and record the number of contractors and employees that have successfully completed the cultural awareness training modules • Visual inspection of heritage features identified for protection. • Ongoing engagement with Traditional Owners to identify emerging issues or concerns regarding heritage protection • Provision of reporting processes for landholders and community to report unauthorised use of AAPowerLink access tracks. • Visual inspections of disturbed areas and erosion and sediment controls as per ESCP (after significant rainfall events, at a minimum). • Visual inspection of recorded heritage features

Scope/Application	Avoidance and Mitigation Measures	Monitoring
	• Ensure that every contractor and employee undertakes cultural awareness training before commencing work on-site • Restrict unauthorised public access along AAPowerLink access tracks and roads. • Design criteria for engineered stormwater management systems and roads to maintain flows similar to pre-development conditions to avoid indirect impacts to heritage features associated with watercourses and swamps. • Develop and implement site-specific Erosion and Sediment Control Plans (ESCPs) to minimise erosion and off-site sedimentation that could smother heritage features. • Implement dust control measures to minimise dust deposition into areas surrounding the proposal footprint where heritage features are present. • Rectify emerging issues associated with unauthorised access, alteration of flows, erosion and sedimentation, water quality and dust, to minimise potential for indirect impacts to heritage features. • CHMPs will provide measures for managing the inadvertent discovery of heritage features. • Consultation with NT Heritage Branch to determine appropriate response. • Where further impacts to archaeological heritage features are unavoidable, obtain an approval to carry out work on a heritage place or object (work) under the Heritage Act. • Undertake clearance surveys in all Heritage Risk Areas to inform final site/route selection and heritage mitigation measures. • Use archaeological predictive models developed through the HIA to identify Heritage Risk Areas where clearance survey is required.	adjacent to proposal footprint for signs of disturbance. • Monitoring of site protection or mitigation works by a qualified heritage practitioner.
OHTL		• Visual inspection of OHTL corridor and access tracks for signs of unauthorised access.

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Darwin Converter Site		• Visual inspection of discharge points and monitoring of water levels and water quality in seasonal swamp at Darwin Converter Site monthly during the wet season

Human Health

The key residual human health impacts identified in Chapter 15 include:

- Increase in biting insects
- Increase in communicable disease (COVID-19)
- Exposure to air emissions of particulate matter (PM10, PM2.5) and Nitrogen Oxide (NOx)
- Potential exposure to noise emissions

Key mitigation to address these residual human health impacts include biting insects' mitigation measures that will be described in the CEMP, health and safety requirements related to COVID-19 that will be described in the HSE Management Plan, air emissions mitigation measures contained in the CEMP and Air Quality Management Plan, and noise emissions mitigation measures described in the CEMP.

The key avoidance and mitigation measures and monitoring that will be implemented to address human health impacts are listed in Table 17-13.

Table 17-13.Human Health - Key Mitigation Measures and Monitoring

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Site-wide (Biting Insects)	• Construction camps will be adequately insect screened. • Implement NT Department of Health Guidelines for Preventing Biting Insect Problems where required. • Landfill will comply with the Guidelines for Siting, Design and Management of Solid Waste Disposal Sites in the Northern Territory 2003. • Materials arriving from overseas at Darwin Port are subject to quarantine inspections and treatment. • Inspection of imported materials, equipment and plant for pests on arrival at works areas. • Treat any pest species detected in accordance with advice from NT Medical Entomology branch. • Locations for OHTL fly camps will be selected to be as far as possible away from significant mosquito breeding habitats i.e. watercourses and wetlands that retain water during the dry season.	• Report/complaints from workers. •

Scope/Application	Avoidance and Mitigation Measures	Monitoring
Site-wide (Communicable Disease)	• Compliance with all federal (Australian Government Department of Health), state (Northern Territory Government Health), and local requirements set out for COVID 19 health measures, as well as guidelines set out by the World Health Organization (WHO). Practices to minimize the risk of COVID 19 infection while living in camps include washing hands, wearing masks while in common areas where physical distancing is not possible, and avoiding touching one's eyes, nose, and mouth without properly cleaning hands first. • No unauthorised guests will be allowed in the camps. • Workers will be required to be fully vaccinated. • Camps to be equipped with medical centre with health support and supplies for workers • If any worker exhibits cold or flu like symptoms, report to the medical centre	• Records of communicable diseases relevant to proposal personnel.
Site-wide (air)	• Whenever possible, plan haul routes to avoid residential areas. • Efficient staging and layout of construction facilities to minimize haulage, avoid double handling of materials and other excessive equipment operations. • Use grid or solar power whenever practical over stationary combustion generated power. • NOx emissions will be minimised by using electric vehicles and equipment where practicable, and ensuring all machinery, plant and equipment complies with minimum emissions standards.	
Site-wide (Noise)	• Whenever possible, schedule high noise works in areas of sensitive receptors during the NT EPA prescribed acceptable construction times (Monday to Saturday 7am to 7pm and between 9am and 6pm Sundays or public holidays). Work outside the NT EPA construction times may be needed if it is not possible to work within these times. • Locate site access roads, laydown areas and stationary equipment (e.g., generators) as far away as possible from sensitive receptors where possible. • Where possible, locate OHTL poles such that sensitive receptors are not within the screening distance	

Scope/Application	Avoidance and Mitigation Measures	Monitoring
	• Adopt construction noise minimisation measures appropriate for each work front or activity location based on an assessment of risk to surrounding receptors. Notify local communities of the construction activities, especially if overnight construction is required. Notifications should include the location, extent, and duration of construction activities. • Establish a complaint procedure, including any notification requirements.	

17.2.6 Incident Management and Corrective Actions

The CEMP will define environmental incidents and describe environmental incident management procedures and requirements, including immediate response actions, incident investigation, communications with Project personnel and relevant environmental authorities and reporting requirements and timelines.

For all environmental non-conformances, environmental incidents or regulatory non-compliance events, a corrective action process will be established in order to prevent their recurrence. Corrective actions will be identified and completed each time a non-conformity, incident or regulatory non-compliance occurs on the Project.

The CEMP will clearly state the Environmental Monitor (EM) has the written authority to issue an order to halt work to force temporary stoppage of a particular construction activity that, in the EM's professional judgment, represents a clear and significant violation of the environmental obligations of the Project or is causing or threatening to cause unacceptable risk to the environment. Any order to halt work will apply only to the specific areas of the work site, specific activities, equipment or site feature that meet the above conditions. Communication, reporting, and documentation procedures related to the Halt Work order will also be described in the CEMP.

17.2.7 Monitoring, Reporting, Inspections and Auditing

The CEMP will describe general construction environmental monitoring procedures and requirements, including the scope of monitoring programs; qualifications, training, roles, and responsibilities of environmental personnel, including site environmental monitors; schedule and duration of monitoring and what circumstances may trigger additional monitoring; and the format, content, frequency, and distribution of environmental monitoring reports.

Audits will be conducted to assess the effectiveness of the CEMP and sub-plans. Where possible, auditing and inspections will rely on principles of self-assessment, however for significant risks/impacts, third-party auditing and verification may be needed. The CEMP will define an audit schedule (e.g. Biannually, annually, etc.). At the end of every auditing/inspection program, an Audit Report will be prepared outlining the results, and provided to Sun Cable management and corporate staff.

The CEMP will define an inspection schedule (e.g., weekly, daily etc.) to ensure that mitigation and management measures described in the CEMP are being implemented correctly in the field. This could include checklists which detail specific aspects or areas to be checked (e.g., secondary containment is not overflowing, waste bins emptied etc.) and which will be developed by the Contractor. At the end of every inspection, an

Inspection Report will be prepared outlining the observed compliance and non-compliances including any photographs and provided to Sun Cable management.

17.2.8 Training and Awareness

The CEMP will include induction and training procedures for all Project personnel. This will include a mandatory environmental and safety orientation and awareness training covering topics such as the objectives and purpose of the CEMP, health, safety and environmental roles and responsibilities of Project personnel, environmental work permit requirements, environmentally sensitive areas and sensitive receptors, land disturbance training, hazardous materials and waste management practices, cultural awareness induction, identified cultural sites of significance, Sacred Sites or Restricted Works Areas (RWAs), incident management and reporting procedures, communication protocols and other potential environmental issues that could occur during construction.

17.2.9 Communications

To ensure effective implementation of environmental management during construction, Sun Cable will develop mechanisms that promote internal communication with all staff, contractors, and sub-contractors, and allow for the dissemination of information regarding the CEMP and sub-plans. The content of internal communications protocols will be described in the CEMP. Internal communications could include site induction programs, on-site safety meetings, 'toolbox talks', email communications, and written notifications at key work sites.

The CEMP will also describe external communication procedures to ensure appropriate information dissemination to the public for land-based activities as well as marine activities. The external communication procedures will be aligned with broader community and stakeholder engagement procedures as described in the Northern Territory Community and Stakeholder Engagement Plan. Sun Cable will also develop a confidential complaints process mechanism whereby both employees and the public can raise concerns directly to Sun Cable for their response and action.

17.3 Social Impact Management Plan

The SIMP summarises and addresses the social, cultural, and economic risks and opportunities of AAPowerLink throughout its life cycle (planning, construction, operations, and closure) with associated actions to ensure the greatest positive impact is made in the region.

Considering the feedback from the SIA and direct community consultation, the SIMP addresses the main issues raised by way of seven action plans, one Northern Territory Community and Stakeholder Engagement Plan, one grievance plan, and one monitoring plan.

The SIMP action plans address:

- Housing affordability and availability
- Training, capacity-building, and employment for local and Aboriginal groups
- Social procurement, service, supply, and Aboriginal inclusion
- Protection of cultural heritage and values
- Cumulative impacts on community and economy including land clearing and construction nuisances
- Embodying an inclusive work environment, developing internal policies to address
- Energy solutions for Northern Territory communities and businesses

The AAPowerLink Project Social Impact Management Plan (SIMP) is included in Appendix J.

17.3.1 Northern Territories Community and Stakeholder Engagement Plan

The SIMP includes a Northern Territory Community and Stakeholder Engagement Plan that will support Sun Cable in fostering transparent dialogue with stakeholders from planning through to post-closure. The NT CSEP describes Sun Cable's stakeholder engagement objectives, stakeholder identification, engagement and communications methods, and engagement activities.

Identified stakeholders include the Commonwealth Government; NT Government and statutory authorities; local government authorities; Land Councils; Aboriginal organisations, people and communities; environmental, community and renewable energy groups; industry and business representatives; training and employment providers; and residents in the Project footprint, including a range of Traditional Owners, Native Title Holders, Custodians, Elders, Landowners, and residents of communities and homelands across the AAPowerLink footprint.

17.4 Other Project Phases

17.4.1 Operations Environmental Management Plan

An Operations Environmental Management Plan (OEMP) consistent with ISO 14000 Environmental Management Systems will be developed, building from the CEMP and incorporating any lessons learned from the site preparation and construction phase. The OEMP will describe the environmental management processes, procedures and best management practices (BMPs) that will be in place to avoid or minimize adverse environmental impacts relating to the operation and maintenance of the Project.

The OEMP will set environmental objectives and targets and will document the actions that will be implemented to ensure environmental impacts are managed at acceptable levels. The OEMP will reference sub-plans and procedures for higher risk aspects where additional detail is needed to guide on the ground implementation.

The OEMP will apply to all Project components in Northern Territories jurisdiction (Powell Creek Solar Precinct, Overhead Transmission Line, Darwin Converter Site, Cable Transition Facilities, Subsea Cable System). The OEMP will apply to Sun Cable, primary contractors, sub-contractors, and all personnel working on the Project. Decommissioning and Rehabilitation

This section outlines the approach towards decommissioning the project elements, rehabilitating the affected sites, and end of life relinquishment. This section does not describe specific reinstatement methods which will be applied post-construction.

The transmission infrastructure is designed to have a lifespan of 70 years, whereas the solar and battery components may need to be replaced or repowered after approximately 40 and 15 years respectively. Sun Cable proposes to develop a component recycling industry to manage the replacement and decommissioning aspects of the project.

Sun Cable has committed to establish a Renewable Energy Centre of Excellence in the Northern Territory, and a principal focus of this centre will be to research, develop and establish industrial recycling projects to address this important waste consideration. The conceptual framework is to build the recycling facilities required to upcycle the disused solar PV, battery, steel, rare earth metals from batteries and other components for re-use in future projects.

It is expected that extraordinary advancements in recycling technology will have been made available in the timeframe proposed for decommissioning around the years 2068 – 2098. Furthermore, PV recycling facilities already exist in Australia, with a further two to be commissioned in 2021.

Also, recycling sub-optimal panels is unlikely to be the best option. At 0.5% degradation per annum, these panels will still have useable operational life at 50 years for use by third-party applications.

As a part of the quarrying operations, a closure plan will be developed and executed as per regulatory requirements.

17.4.2 Decommissioning and Rehabilitation Plan

A Decommissioning and Rehabilitation Plan, with defined closure objectives and agreed criteria, will be developed in consultation with pastoral lease holders, Traditional Owners and relevant government agencies, prior to commencement of these activities. The plan will address the procedures for decommissioning based on the objectives identified below.

- The objective of site rehabilitation post-operations is to return the sites to a self-sustaining, free draining stable landform. The Solar Precinct will be fully decommissioned and rehabilitated post-operations with the intention of returning it to pastoral land use.
- The Railway Corridor will be rehabilitated to pre-existing land use (i.e., a utilities corridor) once the overhead transmission infrastructure is removed. Alternatively, the infrastructure may be transferred to the NT Government for ongoing use / upgrades for the purpose of supporting electricity transmission across the NT.
- Sites in Murrumujuk will be rehabilitated in accordance with the relevant master plans in place at the time, including where practical, efforts to re-vegetate the sites.
- Underground cables and the Subsea Cable System will be decommissioned and left in situ, subject to a final rehabilitation and decommissioning plan to be approved by the relevant authorities.

Decommissioning and Closure planning will be guided by the following strategies: setting closure goals, determining post-operation land uses, setting closure objectives, defining closure criteria, rehabilitation and determining indicators to monitor effectiveness of rehabilitation.

Approaches and actions to be undertaken will be tailored to each area of the operations, as the environment at the Solar Precinct is considerably different to the Darwin Converter Site. This application of the closure criteria and objectives will be developed based on the needs of each operational area.

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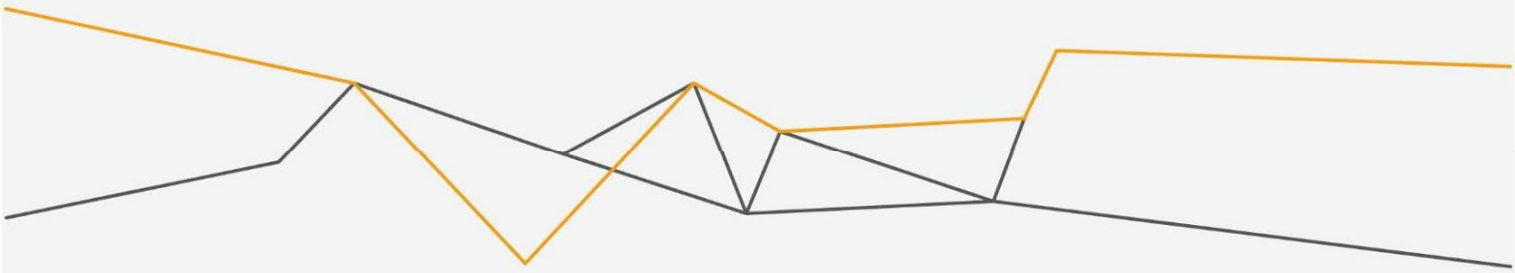

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