NORTHERN TERRITORY GOVERNMENT

Environmental Approval

PURSUANT TO SECTION *69* OF THE *ENVIRONMENT PROTECTION ACT 2019*

Approval number	EP2020/002-001
Approval holder	AAPowerlink Australia Assets Pty Ltd
Australian business number (ABN)	99 653 396 948
Registered business address	Sun Cable Australia Services Pty Ltd Level 31, 85 Castlereagh Street Sydney NSW 2000
Action	Australia-Asia Powerlink Project

Action overview

Establish, operate and decommission a large-scale solar farm, energy storage and energy transmission facility, with major components located in the Barkly and Litchfield local government areas (LGA), connected by a high-voltage direct current transmission network. A sub-sea cable through Northern Territory, National and International waters would supply energy from the facility to Singapore.

- A large-scale (>12,000 hectare) solar farm, with ancillary infrastructure and energy storage facility on Powell Creek Station (NT Portion 2094) (**Figure 1**), near Elliot in the Barkly LGA
- A high-voltage direct current transmission network (**OHTL)** including approximately 800 km of overhead transmission lines (**Figure 2**), from the solar farm to the Darwin converter site (**DCS**)
- The **DCS** (**Figure 3**) incorporating up to four voltage source converters, batteries, alternating current substations and ancillary infrastructure, at Murrumujuk on Gunn Point Peninsula, north-east of Darwin in the Litchfield LGA
- The cable transition facility (**CTF**) adjacent to the **DCS** comprising an underground cable corridor, permanently fenced land sea joint station and shore crossing site including the beachfront and intertidal zone (**Figure 3**)
- The section (approximately 100 km) of the **Subsea cable system** that is within NT coastal waters (**Figure 4**).

The action is described in full in the Environmental Impact Statement (EIS) (comprising the Draft EIS, the Supplement to the Draft EIS, and additional information dated 17 November 2023, and 8 March 2024). The action includes implementation of the environmental management measures, commitments and safeguards documented in the EIS. If there is an inconsistency between the EIS and this environmental approval, the requirements of this environmental approval prevail.

Advisory notes

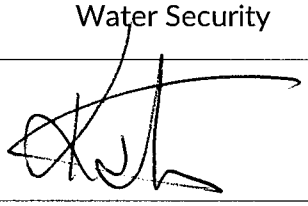
i. Approval is granted under section 69 of the *Environment Protection Act 2019* for the action to be undertaken in the manner described, including with implementation of the environmental management measures, commitments and safeguards documented in the Environmental Impact Statement (EIS) (comprising the Draft EIS, the Supplement to the Draft EIS, and additional information dated 17 November 2023, and 8 March 2024).

ii. If there is an inconsistency between the EIS and this environmental approval, the requirements of this environmental approval prevail.

iii. All statutory authorisations as required by law must be obtained and maintained as required for the action. No condition of this environmental approval removes any obligation to obtain, renew or comply with such statutory authorisations.

iv. Notification of environmental incidents must be in accordance with Part 9 Division 8 of the **EP Act** 2019 and Part 10 of the Environment Protection Regulations 2020. In an emergency, the NT EPA Pollution Response Hotline should be notified by telephoning 1800 064 567.

v. Submission of all notices, reports, documents or other correspondence required as a condition of this approval, including notification to the **CEO** or **Minister**, must be provided in electronic form by emailing environmentalregulation@nt.gov.au. All documents should be in electronic form suitable for on-line publication.

Address of action	**Solar precinct** - Pastoral Lease 948 (part of NT Portion 2094) Powell Creek Station. **OHTL** – multiple addresses (as per shapefile 'Overhead_Transmission_Line_20240412'). **DCS** and **CTF** – 3820 Gunn Point Rd, Koolpinyah (NT Portion 2626).
NT EPA Assessment Report number	107
Person authorised to make decision	Hon Kathryn (Kate) Worden MLA, Minister for Environment, Climate Change and Water Security
Signature	
Date of decision	14/07/24

Recommended environmental approval conditions

1 Limitations and extent

1-1 All activities must be carried out within the **approved extent** (**Figures 1** to **3**).

1-2 Activities must not exceed the limitations in **Table 1**.

Table 1 Limitations and extent

Action element	Figure	Limitation or maximum extent
Solar precinct including **ancillary infrastructure**	Figure 1	• No more than 12,403 ha of vegetation to be cleared. • All clearing must be within the **approved extent**.
Overhead transmission lines (**OHTL**)	Figure 2	• No more than 2,813 ha of vegetation to be cleared. • Clearing must be within the **approved extent**.
Darwin converter site (**DCS**)	Figure 3	• No more than 60 ha of vegetation to be cleared. • Clearing must be within the **approved extent**.
Cable transition facility (**CTF**) and **shore crossing**	Figure 3	• Clearing must be within the **approved extent**. • No more than 45 ha of vegetation to be cleared.
Subsea cable system in NT coastal waters	N/A	• No more than 260,000 m^3 of marine sediment material to be dredged.

Terrestrial ecosystems

2 Environmental objectives

2-1 The approval holder must ensure the action achieves the following environmental objectives:

(1) Protect terrestrial habitats to maintain environmental values.

(2) Protect **listed threatened species**, **migratory** species and their habitats.

(3) Protect vegetation quality.

2-2 To support achievement of the environmental objectives required by condition **2-1**, the approval holder must comply with conditions **3, 4 and 5.**

3 Flora and fauna

3-1 Throughout the life of the action, the approval holder must:

(1) ensure all flora and fauna surveys are conducted by a **qualified ecologist**;

(2) avoid clearing **large and very large trees** to the maximum extent reasonably practicable;

(3) prohibit driving between sunset and sunrise in the **redsan landsystem** (**Figure 5**) unless:

(a) it is on a formed road, with a cleared verge for good visibility; and

(b) speed does not exceed 25 km/h.

(4) ensure Greater bilby surveys are conducted by a **qualified ecologist** who has experience detecting sign of Greater bilbies, immediately prior to any clearing within the **redsan land system**;

(5) avoid any active Greater bilby burrows and buffer by maintaining a 50 m buffer between the active burrow and **construction activities** or roads;

(6) locate the OHTL to maintain a minimum of 8 km between any conductor and the **Kohinoor Adit** Ghost bat roost;

(7) conduct a Red goshawk and Grey falcon nest survey where:

(a) work will be conducted in the late dry season (July to September); and

(b) trees greater than 20 m tall occur within 1 km of a **river**; and

(c) trees greater than 20 m tall are within 300 m of proposed disturbance.

(8) avoid any nests in use by Red goshawks or Grey falcons by adopting:

(a) a 100 m buffer between a nest in use and **construction activities;** and

(b) a 300 m buffer between a nest in use and activities involving use of helicopters or sudden noise sources.

(9) survey to identify **potential Gouldian finch nesting trees** within 300 m either side of the construction centreline, in any area potentially comprising **Gouldian finch breeding habitat** where **construction activities** will occur during the Gouldian finch breeding season (January to April);

(10) survey **potential Gouldian finch nesting trees** (identified by the survey required by Condition **3-1(9)**) to identify any nests in use immediately prior to disturbance;

(11) avoid clearing any nest in use by Gouldian finches and buffer by 200 m while in use;

(12) survey for *Cycas armstrongii* in suitable habitat to identify **very high density stands of *Cycas armstrongii***;

(13) avoid clearing **very high-density stands of *Cycas armstrongii* is** to the maximum extent reasonably practicable within the **approved extent** of the **CTF**;

(14) **salvage and translocate** *Cycas armstrongii* plants within the **approved extent** of the **OHTL** and **DCS** to the maximum extent reasonably practicable;

(15) conduct surveys for *Stylidium ensatum* in **suitable habitat for *Stylidium ensatum*** during appropriate environmental conditions in the mid-late dry season;

(16) avoid clearing *Stylidium ensatum*.

4 Migratory and waterbird management plan

4-1 The approval holder must develop, implement and comply with a **migratory** and waterbird management plan for the **solar precinct**. The plan must:

(1) include a program for monitoring bird utilisation and fatalities across the **solar precinct**, commencing at the start of solar panel installation;

(2) identify adaptive management actions to respond to any emerging issues (including any impacts of solar panels on bird behaviour and/or mortality); and

(3) require annual reporting of monitoring effort, monitoring outcomes and any management actions implemented to the **Minister.**

5 Vegetation management

5-1 The approval holder must ensure that local, native vegetation species are reinstated as soon as reasonably practicable, and at a maximum within one year, following any vegetation clearing in the absence of permanent infrastructure.

5-2 The approval holder must conduct annual monitoring of erosion, weeds and vegetation condition in reinstated vegetation areas, and conduct remediation where required as soon as reasonably practicable and at a maximum within one year.

Hydrological processes, Inland water environmental quality, and Aquatic ecosystems

6 Environmental objectives

6-1 The approval holder must ensure that the action achieves the following environmental objectives:

(1) Protect aquatic habitats to maintain environmental values.

(2) Protect the quality of surface and ground water so that the environmental values of Lake Woods are maintained.

(3) Protect aquatic and riparian habitats associated with rivers and streams, including perennial sections of the Adelaide and Elizabeth rivers.

(4) Protect wetlands, and sandsheet heath habitats of the **Gunn Point Peninsula**.

7 Erosion and sediment control

7-1 The approval holder must develop, implement and comply with an erosion and sediment control plan (**ESCP**) prior to the commencement of any ground disturbance, to minimise erosion and the release of sediment to the receiving environment and contamination of stormwater during construction.

7-2 The **ESCP** must:

(1) be prepared by a certified professional in erosion and sediment control (**CPESC**) in accordance with the International Erosion Control Association Best Practice Erosion and Sediment Control Guideline[1].

(2) demonstrate how erosion and sediment control measures will adequately minimise the release of sediment to receiving waters and must include at least the following:

(a) assessment of all catchment areas;

(b) assessment of soil types, including sodic dispersive soils; and

(c) specify design criteria for all erosion and sediment control structures, including sediment basins.

(3) detail the locations and descriptions of all erosion and sediment control measures; and

(4) provide an inspection and monitoring schedule to ensure erosion and sediment controls are being maintained.

7-3 The approval holder must submit a report on compliance with the **ESCP** to the **Minister** by 31 May each year. The review must:

(1) assess the plan against the requirements under condition **7-2**;

(2) include recommended actions to ensure actual and potential environmental impacts are effectively managed;

(3) provide details of the actions to be taken and timelines for their completion; and

(4) identify any amendments made to the **ESCP**.

8 Stormwater drainage system

8-1 The operational stormwater drainage system at the **solar precinct** and at the **DCS** must be designed and installed to:

(1) cater for both minor (5% annual exceedance probability) and major (1% annual exceedance probability) storm events; and

(2) conform to the methods and criteria set out in Australian Rainfall and Runoff Guidelines 2019.

9 Wetlands of the Gunn Point Peninsula

9-1 The approval holder must:

(1) avoid all **high value wetlands**, and wetland systems with known records of threatened species, on the **Gunn Point Peninsula**;

[1] IECA Australasia 2008. Best practice erosion and sediment control. International erosion control association (Australasia), Picton NSW.

(2) retain a minimum buffer of 250 m around **high value wetlands**, and wetland systems with known records of threatened species, on the **Gunn Point Peninsula**, to the maximum extent reasonably practicable;

(3) ensure, where the buffer required by condition **9-1(2)** cannot be achieved, that:

(a) **high value wetlands**, and wetland systems with known records of threatened species are buffered by the maximum amount reasonably practicable;

(b) construction in buffers around **high value wetlands**, and wetland systems with known records of threatened species is undertaken in the dry season;

(c) rehabilitation of buffer around **high value wetlands**, and wetland systems with known records of threatened species is completed prior to the wet season;

(d) any other site specific avoidance and mitigation measures have been implemented to the maximum extent reasonably practicable.

(4) document the methods to achieve the requirements of condition **9-1(3)** in a wetland environmental management plan, developed in consultation with, and to the satisfaction of the Department of Environment, Parks and Water Security Flora and Fauna Division;

(5) submit the wetland environmental management plan required by condition **9-1(4)** to the **Minister** 90 business days prior to **construction activities**; and

(6) ensure that the wetland environmental management plan required by condition **9-1(4)** is adhered to at all times during construction and operation.

(7) retain a minimum buffer of 100 m around **medium value wetlands**, on the **Gunn Point Peninsula** to the maximum extent reasonably practicable;

(8) retain a minimum buffer of 50 m around low value wetlands on the **Gunn Point Peninsula** to the maximum extent reasonably practicable;

10 Sandsheet heath of the Gunn Point Peninsula

10-1 The approval holder must:

(1) avoid all **high value sandsheet heath vegetation communities** on the **Gunn Point Peninsula**;

(2) retain a minimum buffer of 250 m around **high value sandsheet heath vegetation communities**, on the **Gunn Point Peninsula**, to the maximum extent reasonably practicable;

(3) ensure where the buffer required by condition **9-1(2)** cannot be achieved, that:

(a) **high value sandsheet heath vegetation communities** are buffered by the maximum amount reasonably practicable;

(b) construction in buffers around **high value sandsheet heath vegetation communities** is undertaken in the dry season;

(c) rehabilitation of **high value sandsheet heath vegetation communities** is completed prior to the wet season;

(d) any other site specific avoidance and mitigation measures have been implemented to the maximum extent reasonably practicable.

(4) document the methods to achieve the requirements of condition **9-1(3)** in a sandsheet heath environmental management plan, in consultation with, and to the satisfaction of the Department of Environment, Parks and Water Security Flora and Fauna Division;

(5) submit the sandsheet heath environmental management plan required by condition **10-1(4)** to the Minister 90 business days prior to construction activities; and

(6) ensure that the sandsheet heath environmental management plan required by condition **9-1(4)** is adhered to at all times during construction and operation; and

(7) retain a minimum buffer of 100 m around medium value sandsheet heath vegetation communities on the **Gunn Point Peninsula** to the maximum extent reasonably practicable;

(8) retain a minimum buffer of 50 m around low value sandsheet heath vegetation communities on the **Gunn Point Peninsula** to the maximum extent reasonably practicable;

Terrestrial environmental quality

11 Environmental objectives

11-1 The approval holder must ensure the action achieves the following environmental objectives:

(1) Protect the quality of land and soils such that the environmental values of the terrestrial environment are preserved.

11-2 To support achievement of the environmental objectives required by condition **11-1**, the approval holder must comply with conditions **12** and **13**.

12 Waste management

12-1 No **e-waste**, in part or whole, is to be disposed to landfill in the NT.

12-2 The approval holder must develop, implement and comply with a waste management plan (**WMP**).

12-3 The **WMP** required by condition **12-2** must:

(1) include an inventory of all waste streams types that will be generated throughout the life of the action;

(a) the inventory of waste required by condition **12-3(1)** must be based on Schedule 2 of the NT Waste Management and Pollution Control (Administration) Regulations 1998 and the NSW Waste classification guidelines;

(2) include estimates of annual and total volumes of each waste stream for the life of the action;

(3) identify onsite and offsite waste treatment and management for each waste stream, including reuse, recycling and remanufacturing targets;

(4) *demonstrate continued application of the waste management hierarchy; and*

(5) include the framework for annual reporting on actual waste streams and volumes generated, and comparison against waste generation estimates and reuse, recycling and remanufacturing targets required by conditions **12-3(2)** and **12-3(3)**.

12-4 The **WMP** must be submitted to the **Minister** at least six months before **substantial implementation.**

12-5 A waste management report, consistent with the framework required by condition **12-3(5)**, must be provided to the **Minister** annually.

13 Decommissioning and rehabilitation

13-1 The approval holder must develop, implement, and comply with a decommissioning and rehabilitation plan (**DRP**).

13-2 The **DRP** required by condition **13-1** must:

(1) define closure objectives and criteria which have been developed in consultation with pastoral lease holders, Traditional Owners and relevant government agencies;

(2) describe the methodology and staging for dismantling and removal of infrastructure, rehabilitation and remediation;

(3) be consistent with the waste management strategies and targets including recycling, reuse and remanufacturing targets identified in the **WMP** required by condition **12-2;**

(4) include the approach for post-decommissioning monitoring and remediation;

(5) be reviewed by an **independent qualified person** to ensure it is consistent with achievement of the environmental objective at conditions **2-1, 6-1,11-1, 14-1, 17-1, 20-1** and **21-1**; and

(6) be submitted to the **Minister** with the independent review required by condition **13-2(5)** and a statement from the approval holder addressing how the reviewer's findings have been addressed, at least three months before **substantial implementation.**

13-3 The DRP required by condition **13-1** must be revised by the approval holder, and submitted to the **Minister,** every five years to account for new conditions, technologies, regulations or knowledge that could be relevant to decommissioning.

13-4 Any part of the project infrastructure that will not, or will no longer, be required for use must be decommissioned by the approval holder as soon as reasonably practicable after completion of its use.

Community and economy

14 Environmental objectives

14-1 The approval holder must ensure the action achieves the following environmental objective:

(1) Protect the health, welfare and amenity of current and future generations of Territorians.

14-2 To meet the environmental objective at condition **14-1**, the approval holder must comply with conditions **15** and **16**.

15 Human exposure to electro-magnetic fields

15-1 Prior to **substantial implementation** of **OHTL** construction, the approval holder must model predicted electro-magnetic fields (**EMF**) of the final design and ensure that the recommended exposure limit for the public (ICNIRP, 2010[2]) will be met at the boundary of the **approved extent**.

15-2 The approval holder must complete pre and post-energisation monitoring of **EMF** at the maximum power loading achievable; to ensure that ICNIRP (2010) limits are not exceeded at the boundary of the **approved extent**.

16 Human exposure to noise

16-1 Prior to commencement of **construction activities** at the **DCS**, the approval holder must model predicted noise emissions associated with the final design and ensure that the noise levels predicted by preliminary modelling[3, 4] are not exceeded at the boundary of the **approved extent**.

16-2 The approval holder must complete pre- and post- commissioning monitoring of audible noise generated by the **DCS** and apply mitigation measures to the maximum extent reasonably practicable if monitoring indicates that the noise levels predicted by modelling are exceeded at the boundary of the **approved extent**.

Marine environmental quality, Marine ecosystems

17 Environmental objectives

17-1 The approval holder must ensure the action achieves the following environmental objectives:

(1) No **material environmental harm** to the waters, sediment and biota of Shoal Bay, the Beagle Gulf, and the Timor Sea beyond the **zone of influence** of the **subsea cable system**.

(2) No **material environmental harm** to sensitive receptors, and marine environmental quality beyond the **zone of impact.**

(3) Physical injury, mortality, behavioural changes and health impacts on cetaceans and other marine megafauna are avoided.

(4) The risk of disrupting the **critical lifecycle behaviour** of marine **EMF**-sensitive species from generated **EMF** and heat is minimised.

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[2] International commission on non-ionizing radiation protection (2010). Guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz to 100 kHz). Health Physics, 99(6):818-836.

[3] Hatch (2023). Community operational noise technical assessment. Appendix D - Additional information to the EIS dated 17 November 2023.

[4] Hatch (2024). Darwin converter site operational noise model – Additional modelling for noise mitigation scenarios. Appendix B - Response to NT EPA Direction to Provide Additional Information received 10 January 2024.

17-2 To support achievement of the environmental objectives required by condition **17-1** the approval holder must comply with condition **18** and **19**.

18 Marine environment management plans

18-1 The approval holder must develop, implement, and comply with the following environmental management plans:

(1) **acid sulfate soils** (**ASS**) management plan (**ASSMP**);

(2) dredging, environmental monitoring and **dredge spoil disposal** management plan (**DEMSDMP**);

(3) marine environment management plan (**MEMP**); and

(4) subsea cable construction and management plan.

18-2 The **ASSMP** required by condition **18-1(1)** must:

(1) demonstrate presence/absence and management of (**ASS**) and potential acid sulfate soils (**PASS**) within the **approved extent** of the **shore crossing**; and

(2) be prepared by an **independent qualified person** in accordance with national[5] and Queensland[6] guidelines for the management of **ASS** and **PASS** and be submitted to the **Minister** 90 business days prior to **substantial implementation** of the **shore crossing** or **subsea cable system**.

18-3 The **DEMSDMP** required by condition **18-1(2)** must include:

(1) a description of **dredging activity, dredge spoil disposal**, spoil disposal grounds and operations;

(2) a sampling and monitoring program for baseline and operational monitoring to ensure compliance and allow for adaptive management and reporting. The sampling and monitoring program must include:

(a) establishing the water quality baseline, management **trigger values**, and **limit values** that are locally relevant e.g. for turbidity (**NTU**);

(b) monitoring the environmental variables in the predicted **zone** of **impact** and **zone of influence** e.g. tides, current, water and sediment quality;

(c) an assessment of impacts to sensitive receptors during any **critical windows of environmental sensitivity**;

(d) sediment plume prediction validation by comparisons between the predicted and actual spatial extent and characteristics of sediment plumes generated by the **dredging activity**; and

[5] Simpson, S., Mosley, L, Batley, G. and Shand, P. (2018). National Acid sulfate soils guidance: Guidelines for the dredging of acid sulfate soil sediments and associated dredge spoil management, Department of Agriculture and Water Resources, Canberra, ACT.

[6] Dear, S., Ahern, C., O'Brien, L., Dobos, S., McElnea, A., Moore, N. and Watling, K. (2014). Queensland acid sulfate soil technical manual: soil management guidelines. Brisbane: Department of Science, Information Technology, Innovation and the Arts, Queensland Government.

(e) development of operating protocols and procedures to manage vessel strikes and entrainment of cetaceans and other marine megafauna.

(3) A revised and refined fit-for-purpose (calibrated and validated) hydrodynamic and sediment transport model to predict and describe the characteristics (extent, severity, and duration) of sediment plumes, and the potential impacts of **dredging activity** to the receiving environment. The hydrodynamic and sediment transport model must provide modelling outputs that:

(a) simulate dredge plume dispersion in the **near-field zone and far-field zone**;

(b) identify the zones of impact and influence;

(c) assess whether the elevated total suspended sediments or suspended sediment concentrations, sedimentation and reduced light availability at the seafloor will be a risk to sensitive receptors;

(d) provide for targeted sampling and monitoring programs to ensure appropriate baselines are established; and

(e) identify water quality triggers, thresholds, limits and actions for management.

18-4 The hydrodynamic and sediment transport model required by condition **18-3(3)** must utilise contemporary approaches developed by the Western Australian Marine Science Institution (WAMSI) dredging science node[7], and a peer review of the model and report prepared by an **independent qualified person**.

18-5 The **DEMSDMP** required by condition **18-3** must be prepared by an **independent qualified person** and submitted to the **Minister** 90 business days prior to **substantial implementation** of the **subsea cable system**.

18-6 The **MEMP** required by condition **18-1(3)** must:

(1) include a marine megafauna noise management plan to address construction noise impacts, and to minimise the likelihood of injury or hearing impairment to species including dolphins and whales;

(2) require the approval holder to implement the protocols and procedures required by condition **18-3(2)(e)** for cetaceans and other marine megafauna including, but not limited to:

(a) appropriate exclusion or buffer zones and protocols for marine megafauna sightings;

(b) vessel speed limits and marine megafauna approach distances for all vessels used for construction and operation of the action;

(c) night and low visibility marine megafauna observation procedures

(d) trained marine megafauna observers on duty during subsea **cable laying** activities;

[7] Sun, C., Paul Branson, P., Mills, D. (2020). Guideline on dredge plume modelling for environmental impact assessment. WAMSI Dredging Science Node Themes 2/3. Western Australian Marine Science Institution (WAMSI).

(e) quantitative triggers for initiating investigative and/or adaptive management actions; and

(f) reporting of any incidents related to marine megafauna injury or mortality to the relevant regulators.

(3) ensure compliance with the Recovery Plan for Marine Turtles in Australia 2017–2027[8], the Conservation Management Plan for the Blue whale[9], and the National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Megafauna[10];

(4) include best practice lighting to reduce light pollution and minimise effect on susceptible wildlife (i.e. marine turtles, seabirds, and **migratory** shorebirds), biological and light monitoring and auditing. Night works must be completed in accordance with the National Light Pollution Guidelines[11]; and

(5) be consistent with objectives of the North Marine Parks Network Management Plan 2018[12].

18-7 The **MEMP** required by condition **18-1(3)** must be prepared by an **independent qualified person**, and submitted to the **Minister** 90 business days prior to **substantial implementation** of the **subsea cable system**.

18-8 Prior to commencement of **construction activities** for the **subsea cable system**, the approval holder must:

(1) survey the existing marine environment within the **zone of impact** (direct and indirect), and identify and map where benthic primary producers, habitat and other sensitive receptors occur;

(2) locate the **subsea cable system** to avoid sensitive receptors to the maximum extent reasonably practicable;

(3) establish marine environmental baselines and monitoring to effectively evaluate, monitor and manage environmental impacts from subsea **cable laying** activities;

(4) complete pre and post-energisation **EMF** and temperature measurements to calibrate and validate the **EMF** model,[13] and to accurately predict the **EMF** and heat generated by the **subsea cable system**.

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[8] Commonwealth of Australia (2017). Recovery Plan for Marine Turtles in Australia.

[9] Commonwealth of Australia (2015).Conservation Management Plan for the Blue Whale - A Recovery Plan under the Environment Protection and Biodiversity Conservation Act 1999.

[10] Commonwealth of Australia (2017). National Strategy for reducing Vessel Strike on Cetaceans and Other Marine Megafauna 2017.

[11] DCCEEW (2023). National Light Pollution Guidelines for Wildlife.

[12] Director of National Parks (2018). North Marine Parks Network Management Plan 2018.

[13] Notman, D. (2022) Sun Cable influence study: EMF calculations at 21 different locations along the subsea cable systems route from Darwin to Singapore. Engineering report ER1254. Prepared by Cable Consulting International Ltd for Sun Cable. Appendix E(2) - Additional information to the EIS dated 17 November 2023.

19 Subsea cable system siting and burial

19-1 The Subsea cable construction and management plan (**SCCMP**) required by condition **18-1(4)** must:

(1) define the location and maximum size of the **subsea cable system** impact **zone of influence**;

(2) include a subsea cable siting procedure that has measures for avoidance and mitigation of adverse impacts on the environment associated with the placement of subsea cables; and

(3) include a subsea cable laying and burial procedure for cable laying and burial of the **subsea cable system**.

19-2 The approval holder must ensure the subsea cable siting procedure required by condition **19-1(2)**, and the subsea cable laying and burial procedure required by condition **19-1(3)** support the achievement of condition **17-1** through:

(1) consideration of biologically important areas for Australia snubfin, Indo-Pacific humpback and Indo-Pacific spotted bottlenose dolphins, the Pygmy blue whale, Flatback, Olive ridley and Loggerhead turtle, and the Oceanic Shoals Marine Park and key ecological features;

(2) route selection and cable placement that avoids any sensitive/high value habitat and communities;

(3) ensuring cable laying and burial is conducted outside any **critical windows of environmental sensitivity**;

(4) application of **best available techniques** and **best environmental practice**, and compliance with relevant industry guidelines and the Code of Practice for Offshore Cable Laying in the Renewable Energy Industry[14]; and

(5) adopting **EMF** avoidance and mitigation measures that are directly through design (cable design/sheathing and insulation), cable circuit configuration (e.g. bundled cables), and indirectly by cable protective measures (burial, or rock covers, or mattresses).

19-3 The approval holder must:

(1) ensure laying and burial of the **subsea cable system** is in accordance with the burial procedure required by condition **19-1(3)**; and

(a) bury cables to a minimum depth of 1.0 m beneath the seabed in coastal waters that are less than 40 m below lowest astronomical tide; or

(b) cover cables with rock/mattresses to a minimum thickness of 1.0 m in coastal waters that are less than 40 m below lowest astronomical tide.

19-4 The subsea cable siting procedure required by condition **19-1(2)**, and the subsea cable laying and burial procedure required by condition **19-1(3)** must be reviewed by an **independent qualified person**, and submitted to the **Minister** prior to commencement of **construction activities**.

[14] International marine contractors association (IMCA) (2023). IMCA code of practice for offshore cable laying in the renewable energy industry. MCA M264 Rev. 0.1.

Atmospheric processes

20 Environmental objectives

20-1 The approval holder must ensure the action achieves the following environmental objectives:

(1) Minimise greenhouse gas emissions.

20-2 To support achievement of the environmental objective required by condition **20-1** the approval holder must implement and comply with the greenhouse gas abatement plan[15] including identified targets, and reporting requirements.

Culture and heritage

21 Environmental objectives

21-1 The approval holder must ensure the action achieves the following environmental objectives:

(1) Protect Aboriginal sacred sites.

(2) Protect Aboriginal cultural values.

(3) Protect maritime heritage, including shipwrecks.

21-2 To support the achievement of the environmental objectives required by condition **21-1** the approval holder must comply with condition **22**.

22 Cultural heritage management plan

22-1 The approval holder must develop and implement a cultural heritage management plan (**CHMP**).

22-2 The CHMP required by condition **22-1** must:

(1) include a register documenting known cultural and heritage values, including maritime culture and heritage sites;

(2) identify the actions that will be implemented to avoid or minimise impacts to known sites;

(3) include procedures to mitigate impacts to unexpected maritime heritage objects, including a stop work protocol, developed in consultation with, and to the satisfaction of, the Heritage Branch of the Department of Territory Families, Housing and Communities; and

(4) require ongoing consultation and engagement on cultural heritage values with stakeholders.

General conditions

23 Environment protection bond

[15] Xodus (2022). Carbon Emissions Study, Greenhouse Gas Abatement Plan. Appendix H - Australia-Asia PowerLink Environmental Impact Statement.

23-1 The approval holder must provide an environment protection bond as determined by the **Minister**.

23-2 To assist the **Minister** to determine the environment protection bond required by condition **23-1**, the approval holder must submit to the **Minister** an environment protection bond proposal, independent review of the proposal, and a statement addressing how the reviewer's findings have been addressed, at least 12 months prior to installation of any photovoltaic system component at the **solar precinct**.

23-3 The environment protection bond proposal required by condition **23-2** must include:

(1) estimated costs to remove and process or transport for reuse, recycling or disposal (excluding any anticipated salvage value) all **solar precinct** e-waste including the assumptions and calculation method used;

(2) any proposed staging of the environment protection bond taking into account staging of the action and related changes in project risk; and

(3) details of how costings and proposed management are in accordance with industry best-practice and contemporary regulatory requirements.

23-4 The environment protection bond proposal required by condition **23-2** must be reviewed by an **independent qualified person**.

23-5 A terms of reference for the review of the bond proposal required by condition **23-4** must be prepared by the approval holder and submitted to the **Minister** at least 30 business days prior to commencement of the review.

23-6 The environment protection bond proposal required by condition **23-2** must be revised by the approval holder every five years and account for new conditions, technologies, and knowledge that could be relevant to decommissioning.

23-7 The revised environment protection bond proposal must be submitted to the **Minister** for consideration under Part 7 of the **EP Act**.

24 Revision of plans

24-1 The approval holder may review and revise any management plan required by this approval and must provide the following to the **Minister** at least one month prior to any material amendment(s) being implemented:

(1) the revised plan(s);

(2) a tabulated summary of the amendment(s) with document references;

(3) reasons for the amendment(s);

(4) an assessment of environmental risks and potential impacts associated with the amendment(s); and

(5) if the **DEMSDMP** required by condition **18-1(2)**, the **MEMP** required by condition **18-1(3)**, or the **SCCMP** required by condition **18-1(4)**, is updated - a written review and endorsement from an **independent qualified person**.

24-2 The approval holder must implement the action to comply with the latest revision of management plans required by this approval.

25 Environmental performance reporting

25-1 The approval holder must submit an Environmental performance report (**EPR**) that demonstrates the environmental performance of the action, and compliance with the conditions of this environmental approval.

25-2 The **EPR** required by condition **25-1** must be endorsed by the approval holder or a person delegated to sign on the approval holder's behalf.

25-3 The **EPR** required by condition **25-1** must:

(1) be completed within twelve months of **substantial implementation** of any component of the action (the solar precinct, the **OHTL**, **DCS**, **CTF**, subsea cable) and every five years thereafter;

(2) be reviewed and endorsed by an **independent qualified person** and submitted to the **Minister** within 30 days of its completion; and

(3) include a statement as to whether the approval holder has complied with the conditions of this approval.

25-4 The **EPR** required by condition **25-1** must:

(1) provide an interpretation of all monitoring data required by the conditions of this approval;

(2) provide an analysis and interpretation of monitoring data to demonstrate whether compliance with the requirements of conditions has been achieved;

(3) identify all non-compliances and describe corrective and preventative actions taken; and

(4) include an assessment of the effectiveness of monitoring, management, and adaptive management measures implemented to comply with the requirements of condition **17-1(1)**, **17-1(2)**, **17-1(3)** and **17-1(4)**.

25-5 The assessment required by condition **25-4(4)** must include:

(1) a comparison of the predicted impacts from **dredging activity**, **dredge spoil disposal** and **cable laying** with the actual impacts of the action, with verification by reporting the results of environmental monitoring data (e.g. water quality, turbidity levels and TSS concentrations) compared against the baseline survey data; and

(2) a review of the spatial extent and characteristics of sediment plumes generated by **dredging activity**, **dredge spoil disposal** and **cable laying** activity.

26 Provision of environmental data

26-1 All environmental monitoring data required to be collected or obtained under this environmental approval must be retained by the approval holder for a period of not less than 10 years commencing from the date that the data is collected or obtained.

26-2 The approval holder must, as and when directed by the **Minister**, provide any environmental data (including sampling design, sampling methodologies, empirical data and derived information products such as maps) relevant to the assessment of the action and implementation of this environmental approval, to the **Minister** in the form and manner and at the intervals specified in the direction.

27 Change of contact details

27-1 The approval holder must notify the **Minister** in writing of any change of its name, physical address or postal address for the serving of notices or other correspondence within 10 business days of such change.

28 Commencement of action

28-1 This approval expires five years after the date on which it is granted, unless there is **substantial implementation** on or before that date.

28-2 The approval holder must provide notification in writing to the **Minister**, at least two months prior to **substantial implementation**.

Acronyms

Term	Definition
ASS	Acid sulfate soils
ASSMP	Acid sulfate soils management plan
CEO	Chief Executive Officer
CHMP	Cultural heritage management plan
CPESC	Certified professional in erosion and sediment control
CTF	Cable transition facility
DCS	Darwin converter site
DEPWS	Department of Environment, Parks and Water Security
DEMSDMP	Dredging, environmental monitoring and spoil disposal management plan
DRP	Decommissioning and rehabilitation plan
EMF	Electromagnetic field
EP Act	*Environment Protection Act 2019*
EPR	Environmental performance report
ESCP	Erosion and sediment control plan
MEMP	Marine environment management plan
NT EPA	Northern Territory Environment Protection Authority
NTU	Nephelometric turbidity units as a standard measure of turbidity.
OHTL	Overhead transmission line
PASS	Potential acid sulfate soils
SCCMP	Subsea cable construction and management plan
WMP	Waste management plan

Definitions

The terms used in this approval have the same meaning as the terms defined in the *Environment Protection Act 2019* and Environment Protection Regulations 2020.

Term	Definition
acid sulfate soils (ASS)	Soils or sediments containing iron sulfides.
ancillary infrastructure	Access tracks, temporary construction accommodation, intermodal logistics facility, internal roads, construction waste disposal area associated with the **solar precinct.**
approved extent	The extent identified in Figures 1, 2 and 3 of this approval. Also defined by: • Cable_Transition_Facilities_20240411.shp • Darwin_Converter_Site_20240411.shp • Overhead_Transmission_Line_20240412.shp • Powell_Creek_Ancillary_Infrastructure_20221027.shp • Powell_Creek_Solar_Precinct_20210630.shp
best available techniques	The latest stage of development (state of the art) of processes, of facilities or of methods of operation which indicate the practical suitability of a particular measure for limiting discharges, emissions and waste.
best environmental practice	The application of the most appropriate combination of environmental control measures and strategies.
cable laying	Activities carried out for the purpose of installing the subsea cable system including but not limited to marine surveys, boulder clearance, trenching, pre sweeping, sea bed levelling, **dredging activity**, and **dredge spoil disposal**.
Cable transition facility (CTF)	The extent identified in Figure 3 of this approval. Also defined by Cable_Transition_Facilities_20240411.shp
Chief Executive Officer (CEO)	Has the same meaning as in section 4 of the **EP Act**.
construction activities	Works and activities undertaken to establish the action including land clearing, earthworks, infrastructure installation, trenching, dredging and spoil disposal.
critical lifecycle behaviour	The behaviour of species that is critical during their lifecycle and includes breeding, feeding, migration or resting behaviour.

Term	Definition
critical windows of environmental sensitivity	Critical windows of environmental sensitivity are specific times of the year or particular sites where key species or ecological communities or critical processes (e.g. breeding cycles, timing and routes for migration, coral spawning, peak growth period for seagrass) may be particularly vulnerable to pressures from anthropogenic activity such as dredging.
Darwin converter site (DCS)	The extent identified in Figure 3 of this approval.
dredging activity	Dredging activity includes, but is not limited to: seabed levelling, pre-sweeping, dredging and dredge spoil disposal.
dredge spoil disposal	The loading of barges or similar vessels with dredged material (spoil), and movement of barges or similar vessels from the dredge footprint and disposal.
e-waste	Solar panels, inverters and energy storage system batteries.
Gouldian finch breeding habitat	Gouldian Finch breeding habitat as mapped in **Figure 6** of this approval. Also defined by Gouldian_Finch_breeding_habitat.shp
Gunn Point Peninsula	As defined in the Litchfield Subregional Land Use Plan 2016. Version 6. (NT Planning Commission, 2023).
high value sandsheet heath vegetation communities	Sandsheet heath habitat mapped and classified by the proponent as high or very high habitat quality.
high value wetlands	Wetland vegetation communities identified by Stokeld *et al.* (2020) as 'high value areas'. Stokeld, D., Leiper, I., Cuff, N., Cowie, I., Lewis, D., and Einoder, L. (2020). Mapping the Future Project - Gunn Point. Biodiversity assessment of the Gunn Point area. Technical report 4/2020, Department of Environment and Natural Resources, Darwin, NT
independent qualified person	A qualified person, to be engaged by the approval holder, as defined under section 4 of the **EP Act**; and who also meets the following requirements: a) was not involved in the preparation of the approval holder's **referral**, **EIS**, supplement or additional information; b) is independent of the personnel involved in the design and implementation of the action; and c) has obtained written approval from the **CEO** to satisfy the **independent qualified person** reporting requirements under this approval.
Kohinoor Adit	Kohinoor Adit is approximately 2 km south of Pine Creek. Coordinates are held by **DEPWS**.

Term	Definition
landfill	Disposal of waste by burial.
large and very large trees	Large (diameter at breast height >40cm) and very large (diameter at breast height >50cm) trees with the potential to support tree hollows.
limit value(s)	Values of monitored environmental parameters that represent the limit of acceptable impact beyond which the environmental values and objectives are not being met.
listed threatened species	Species listed as critically endangered, endangered, or vulnerable under the *Territory Parks and Wildlife Conservation Act 1976* or the *Environment Protection and Biodiversity Conservation Act 1999*
medium value wetlands	Has the same meaning as in the Land clearing guidelines: Northern Territory Planning Scheme
migratory	Species listed as migratory under the *Environment Protection and Biodiversity Conservation Act 1999*
material environmental harm	Has the same meaning as in section 8 of the *Environment Protection Act 2019*
Minister	The Minister responsible for administering the **EP Act**.
near-field zone and far-field zone	The zone where the sediment plume is dynamic is called the near-field zone where acute impacts to sensitive receptors are expected. The dynamic plume weakens and eventually transitions to a passive plume with low suspended sediment concentration at the far-field.
Overhead transmission line (OHTL)	The extent identified in Figure 2 of this approval.
potential acid sulfate soils (PASS)	Soils containing iron sulfides (commonly pyrite) which have the potential to produce sulfuric acid if they are drained or excavated.
potential Gouldian finch nesting trees	Hollow bearing *Eucalyptus leucophloia* and *E. tintinnans*.
qualified ecologist	Person who has professional qualifications, training, skills and/or experience related to the potential impact using the relevant protocols, standards, and methods, and who has obtained written approval from the **CEO**, on the advice of the Executive Director, of the NT **DEPWS** Flora and Fauna Division to be the qualified ecologist.
redsan land system	The Redsan land system is identified in the 'Northern Territory Land Systems' dataset held by the **DEPWS** Geospatial Services Branch, see **Figure 5** of this approval
referral	The approval holder's **referral** to the **NT EPA** under section 48 of the **EP Act**

Term	Definition
river	A waterway with a Strahler stream order of 5 or greater
salvage and translocate	Salvage and translocation of *Cycas armstrongii* must be conducted in accordance with the translocation guideline in the Management Program for Cycads in the Northern Territory of Australia 2009-2014 (Liddle, 2009). [Liddle, D.T. (2009). Management Program for Cycads in the Northern Territory of Australia 2009-2014. Northern Territory Department of Natural Resources, Environment, the Arts and Sport, Darwin.]
shore crossing	The extent identified in Figure 3 of this approval. Also defined by Cable_Transition_Facilities_20240411.shps
solar precinct	The extent of Figure 1 in this approval. Also defined by Powell_Creek_Solar_Precinct_20210630.shp and Powell_Creek_Ancillary_Infrastructure_20221027.shp
subsea cable system	The cable system laid and buried in the seabed for the transmission of high voltage direct current (DC) power between Darwin and Singapore. Subsea_Cable_Route_20220706.shp
substantial implementation	The commencement of any ground disturbing activity undertaken to carry out the action.
suitable habitat for *Stylidium ensatum*	Known occurrences (records) of *Stylidium ensatum* and modelled high likelihood habitat mapped in Cuff, N. and Green, C. (2016) Threatened Species Distribution in the Greater Darwin Region – *Stylidium ensatum.* Northern Territory Government.
trigger value(s)	The values of monitored environmental parameters that indicate when response actions are required to prevent exceedance of limit values.
very high density stand of *Cycas armstrongii*	Stands supporting >700 mature stems of *C. armstrongii* per hectare. Mature stems are considered all of those greater or equal to 50 cm in height.
zone of impact	The zones within which sensitive receptors and marine environmental quality can be directly and indirectly impacted by a particular event or action comprising the zone of high impact, and zone of moderate impact. The zone of high impact is the area where serious damage to sensitive receptors and marine environmental quality is predicted or where impacts are considered to be irreversible, and the zone of moderate impact is the area within which predicted impacts to sensitive receptors and marine environmental quality is sub-lethal, and/or the impacts are recoverable.
zone of influence	The zone of influence is the area which the marine environmental quality would be affected as a result of the action, but the effects would not result in detectable impacts to benthic habitat and communities.

Location and extent of action

Spatial data is held by **DEPWS** as follows:

- Powell_Creek_Solar_Precinct_20210630
- Powell_Creek_Ancillary_Infrastructure_20221027
- Overhead_Transmission_Line_20240412
- Darwin_Converter_Site_20240411
- Cable_Transition_Facilities_20240411 (including CTF and shore crossing)
- Gouldian_Finch_breeding_habitat
- Spatial coordinates of the **Redsan land system** are identified in the Northern Territory Land Systems dataset held by the **DEPWS** Geospatial Services Branch
- Spatial coordinates of Kohinoor Adit held by the **DEPWS** Flora and Fauna Division

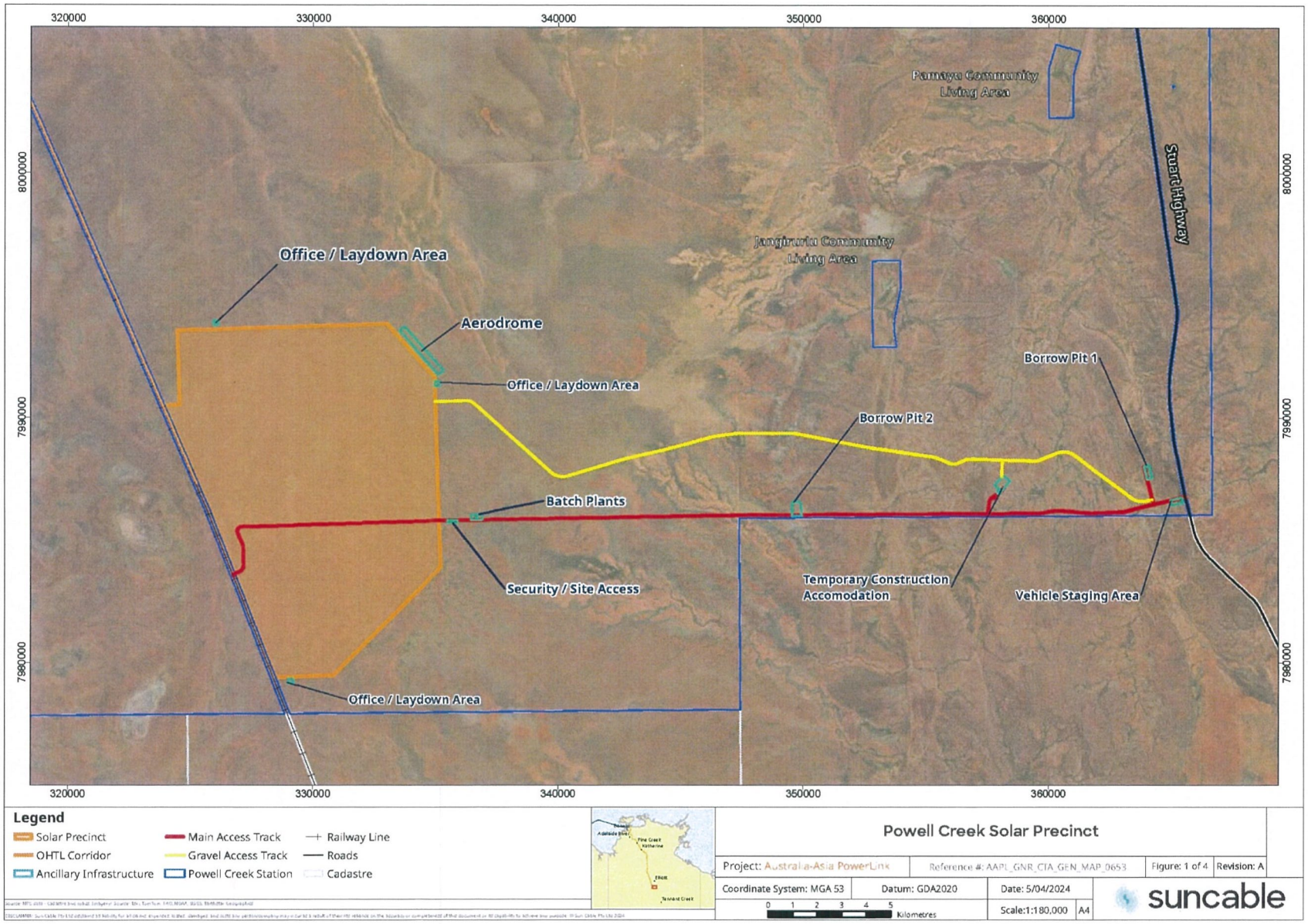

Figure 1: Solar precinct

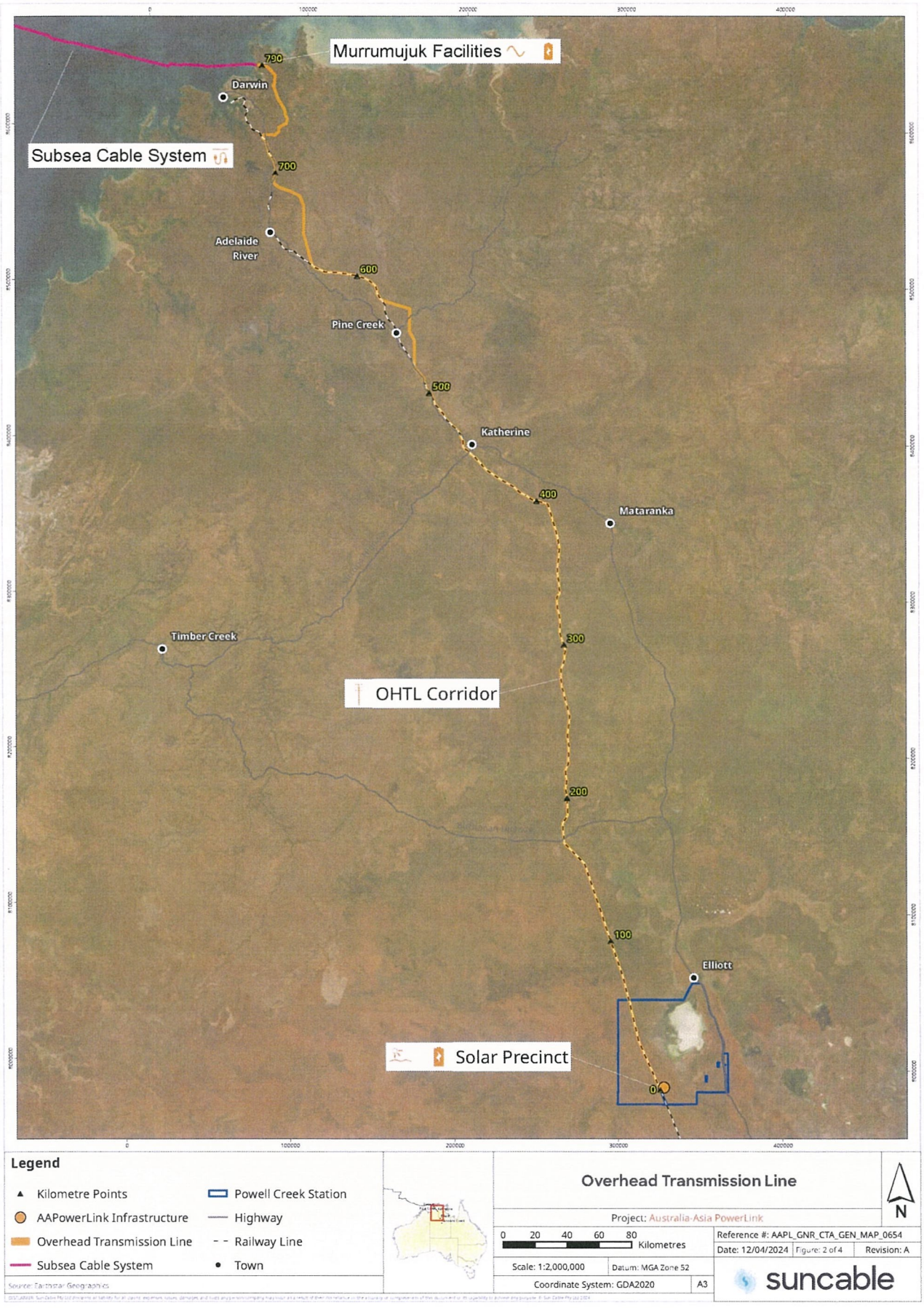

Figure 2 Overhead transmission line

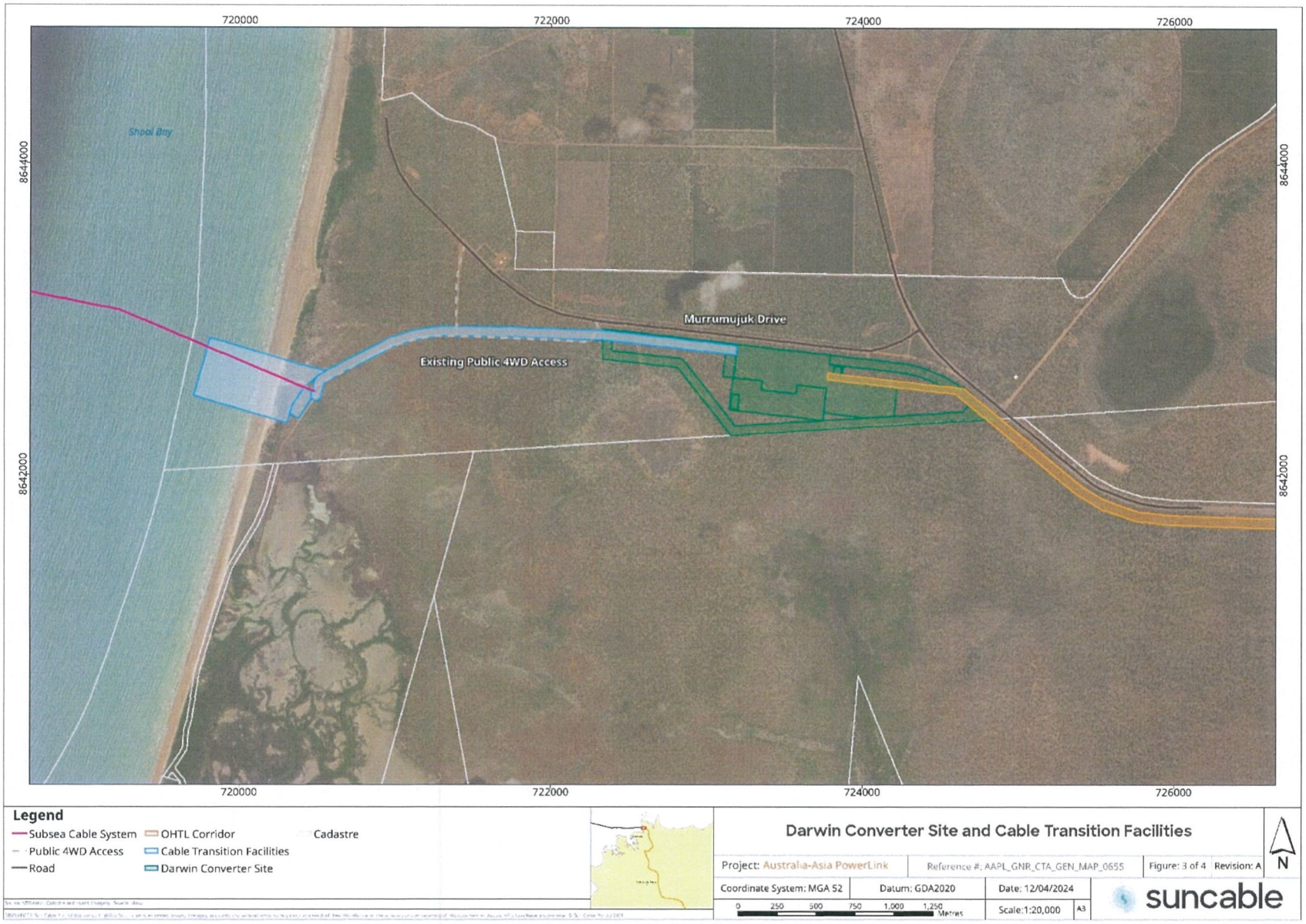

Figure 3 Darwin converter site, cable transmission facilities and shore crossing

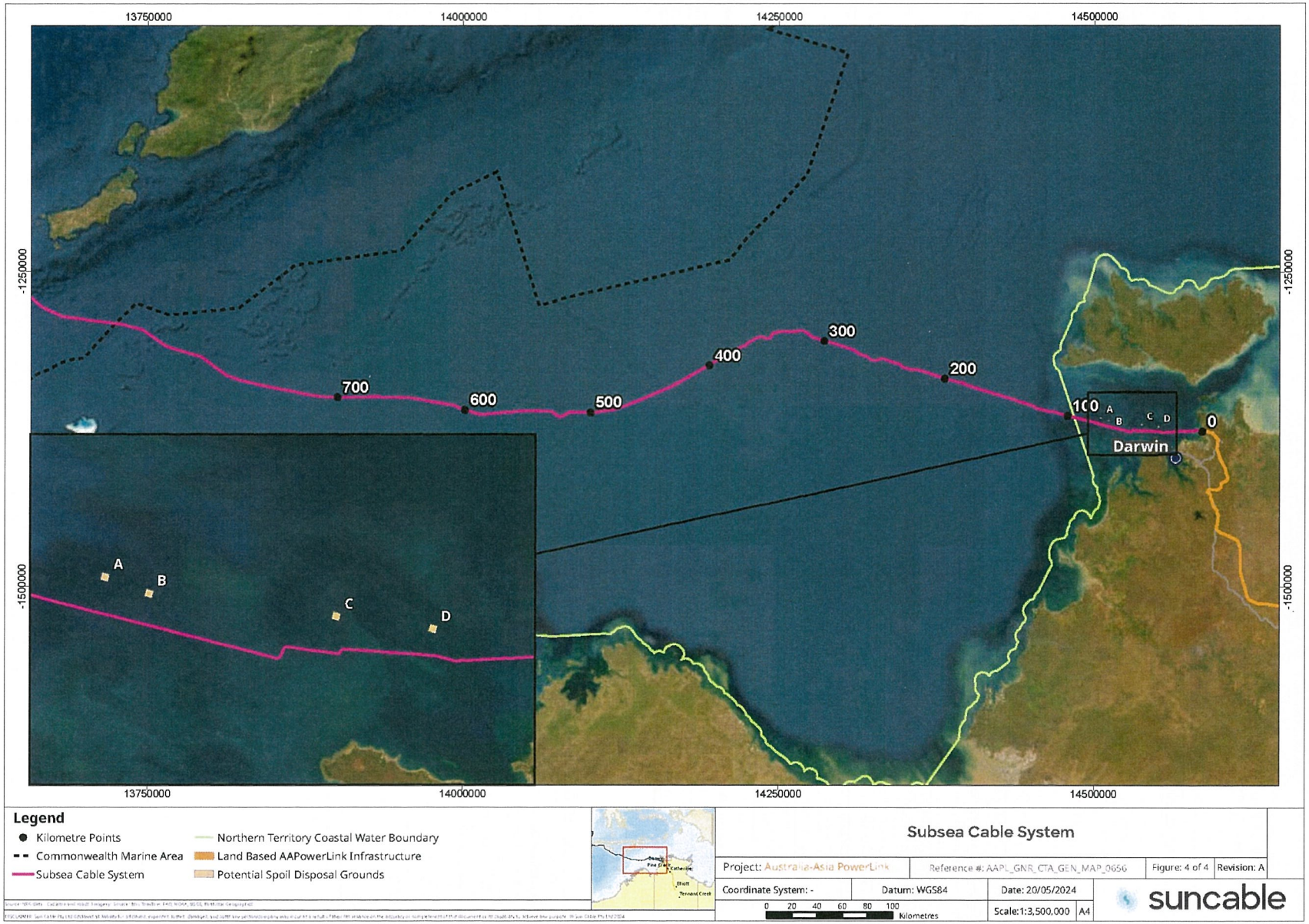

Figure 4 Subsea cable and spoil disposal grounds

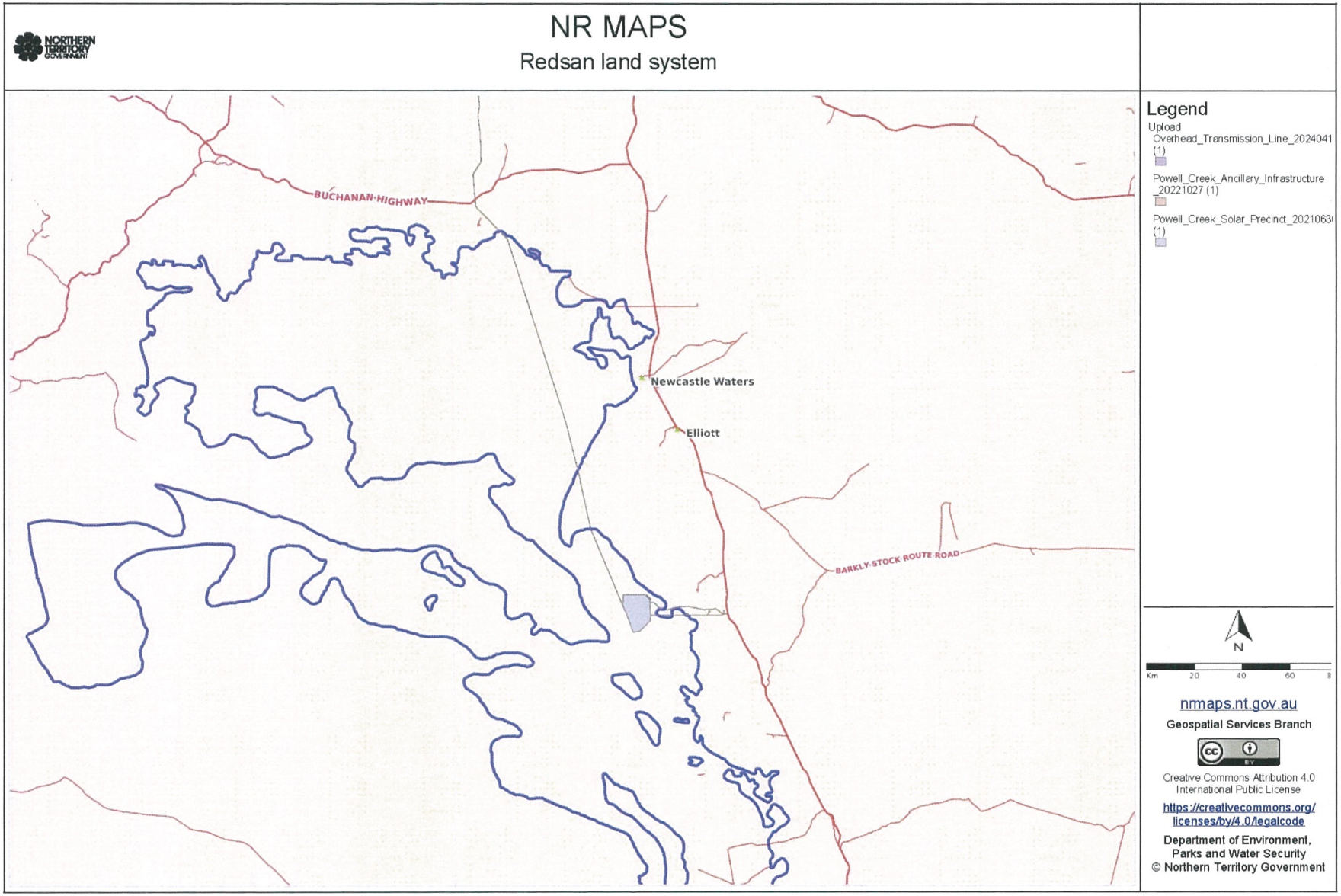

Figure 5 Redsan land system, solar precinct and OHTL

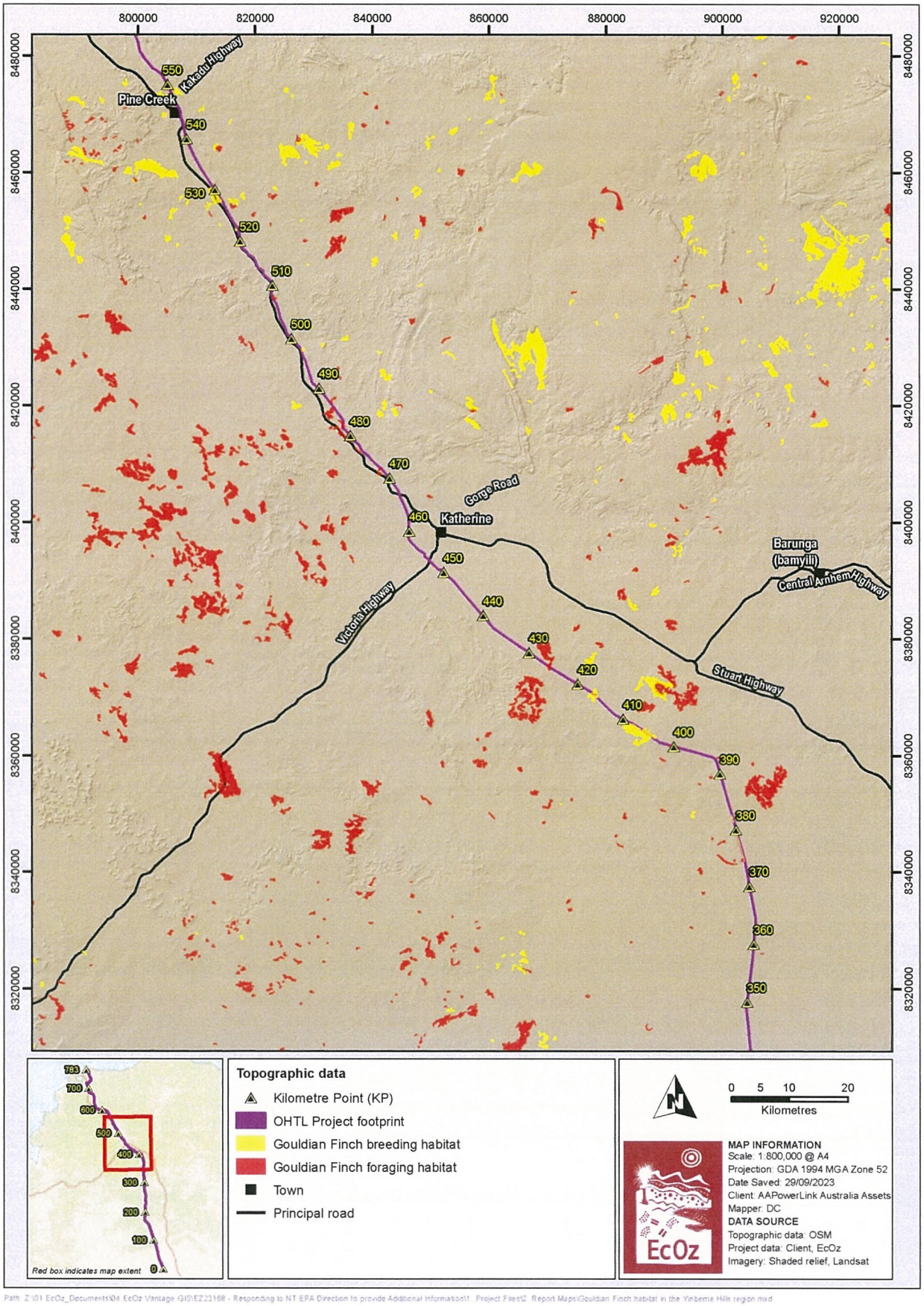

Figure 6 Gouldian finch habitat mapped in the OHTL corridor