

APPENDIX A COPY OF NT EPA DIRECTION TO PROVIDE ADDITIONAL INFORMATION

DIRECTION TO PROVIDE ADDITIONAL INFORMATION IN RELATION TO THE ENVIRONMENTAL IMPACT STATEMENT (EIS)

Direction given under section 143 of the Environment Protection Regulations 2020

Name of proposed action	Australia-Asia PowerLink Project (AAPowerLink)
Proponent	AA Powerlink Australia Assets Pty Ltd
NT EPA reference	EP2020/002
Description of proposed action	To establish: - a large-scale (12, 000 hectare) solar farm and energy storage facility on Powell Creek Station (NT Portion 2094), near Elliot in the Barkly region, NT - a high-voltage direct current transmission network including approximately 800 km of overhead transmission lines, from the solar farm to Murrumujuk on Gunn Point Peninsula, north-east of Darwin - a sub-sea cable through Northern Territory, National and International waters to Singapore.
Nature of proposed action	Energy (renewable)
Method of environmental impact assessment	Assessment by Environmental Impact Statement (EIS)
Direction	The proponent is directed to provide additional information in relation to the EIS (refer to Attachment A)
Submission period	The additional information must be submitted to the NT EPA within 12 months of the date of this Direction.
Document to be published	Additional information to the EIS
Person authorised to give direction	Dr Paul Vogel AM – Chairperson, Northern Territory Environment Protection Authority (NT EPA) Delegate of the NT EPA under section 36 of the <i>Northern Territory Environment Protection Authority Act 2012</i>.
Signature	
Date of direction	19 March 2023

Attachment A – Additional information to the Environmental Impact Statement (EIS)

AA PowerLink Assets Pty Ltd – AA PowerLink Project

Table 1. Additional information to be provided in accordance with regulation 143

Item #	Context	Additional information required
1.	Extent of the proposed action There is no succinct summary of estimated limitations and extent of the proposed action e.g. maximum extent of land clearing (for the entire proposed action).	1. Provide a table summarising the maximum extent of each element of the proposed action and the total maximum extent of the whole proposed action. 2. In the case that there is uncertainty about the need for, or aerial extent of, key physical elements of the proposal, provide the maximum development envelope and footprint as a worst-case scenario for the maximum likely impact.
2.	Proposed Action The NT EPA Direction to include additional information in the supplement to the draft environmental impact statement (Supplement) (herein referred to as Supplement Direction), Table 1 item #1 specified that uncertainties about key elements of the proposed action should be resolved in the Supplement. The Supplement retains the following options for grounded electrical current return via either a. a dedicated metallic earth return; or b. two ground electrodes.	Specify which current return option is proposed. Describe the impacts of the specified current return option on other physical and operational elements of the proposal e.g. higher towers, larger foundations, additional cable. If ground electrodes are proposed, refer to item 3 below.
3.	Ground electrode systems can cause corrosion of adjacent infrastructure through electromagnetic coupling, or health effects to people and animals through high step, transfer and touch potentials close to the electrode site. The appropriate buffer to avoid or mitigate these impacts is dependent on the magnitude of ground current, electrode design and geological characteristics of the site.	If ground electrodes are proposed, provide evidence-based design and dimensions of the exclusion zone for corrosion sensitive infrastructure and mitigation that will be applied to reduce the potential impact on community and economy receptors. Include a list of any assumptions used about the electrode design and effectiveness of mitigation.

Item #	Context	Additional information required
4.	Terrestrial ecosystems - potential impacts to sandsheet heath habitats Section 10 of the EP Act requires consideration of the environmental impacts of the proposed action including include those that are an indirect consequence of the action. The northern overhead transmission line (OHTL) footprint is mapped as crossing habitats including sandsheet heath, which support highly habitat-specific listed threatened species including: - Howard River Toadlet (<i>Uperoleia daviesae</i>, Vulnerable under the Territory Parks and Wildlife Conservation Act 1976 (TPWC Act) and the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)) <i>Typhonium taylori</i> (Vulnerable under the TPWC Act) <i>Utricularia dunstaniae</i> (Endangered under the TPWC and EPBC Acts) The direct impacts on these species have been addressed, however further information is required on the avoidance of indirect impacts on habitat values.	1. Provide an evidence-based strategy for determining appropriate buffers for sensitive and significant sandsheet heath vegetation. In particular, demonstrate that hydrological characteristics (such as sheet flow) would not be impacted. Consideration should be given to indirect impacts including impacts of tracks and drainage infrastructure on sheet flow. 2. Describe the measures that would be implemented to ensure that the proposed action causes no or minimal impacts on surface hydrology, including the quantity, distribution and movement of surface water in suitable habitat adjacent to the corridor and within the buffer determine by the above. 3. Confirm that measures to avoid and buffer these vegetation communities are in line with the NT Land Clearing Guidelines.
5.	Terrestrial ecosystems - <i>Stylidium ensatum</i> As identified in the Supplement Direction (Table 2, item #8), the Department of Environment, Parks and Water Security (DEPWS) has mapped highly suitable habitat for <i>Stylidium ensatum</i> within the OHTL corridor and surveys for this species are required where the OHTL overlaps with the DEPWS modelling and DCCEEW species distribution information. Appropriate survey times are during the mid-late dry season (June to August) when the plant is flowering/fruitlet. The EIS states that potentially suitable habitat in Section 572 was not surveyed as access permission was not obtained. Refer to submission on the Supplement from DEPWS	1. Provide the outcome of seasonally appropriate field surveys to identify how many hectares of <i>Stylidium ensatum</i> habitat and <i>Stylidium ensatum</i> suitable habitat would be cleared in NT Section 572 when access permission is obtained, and quantify the impact of proposed habitat loss on local and regional populations outside of the proposed action's footprint. 2. Identify the percentage of <i>Stylidium ensatum</i> habitat that will be cleared in relation to the local and regional <i>Stylidium ensatum</i> habitat and the area of suitable habitat available. 3. Identify a suitable buffer for species records that is suitable to avoid indirect impacts on local hydrology (see Item 4 above). 4. Propose offsets for any residual significant impacts (for habitat loss and removal of any plants).

Item #	Context	Additional information required
6.	Terrestrial ecosystems - <i>Helicteres macrothrix</i> As identified in Supplement Direction (Table 2, item #9), DEPWS has mapped highly suitable habitat for <i>Helicteres macrothrix</i> (Endangered under the TPWC and EPBC Acts) within the OHTL corridor deviation at Adelaide River. Surveys of the deviation have not been conducted, but are required. The TOR required assessment of the significance of residual impacts (Table 5). The significant residual impacts from removing <i>H. macrothrix</i> have not been discussed.	1. Provide the outcome of seasonally appropriate field surveys for this species for the OHTL deviation at Adelaide River where it overlaps with DEPWS modelling and DCCEEW species distribution information. 2. Identify: a. the maximum area (hectares) of <i>Helicteres macrothrix</i> known and suitable habitat that would be cleared b. the location of any plants within the area to be cleared. 3. Identify the percentage of <i>Helicteres macrothrix</i> habitat that will be cleared in relation to the local and regional <i>Helicteres macrothrix</i> habitat and suitable habitat availability. 4. Provide details of the avoidance and mitigation measures for this species such as determining a suitable buffer where plants are identified. 5. Discuss any potential significant residual impacts (e.g. habitat loss and removal of any plants) that cannot be avoided or mitigated and proposed offsets.
7.	Terrestrial ecosystems – Gouldian finch As identified in Supplement Direction (Table 2, item #12), the NT EPA require that the assessment of significant impact for Gouldian finches incorporates all potential Gouldian finch habitat, including core foraging and breeding habitat within 20 km of the proposed action. The supplement did not include consideration of breeding habitat including Salmon Gum (<i>Eucalyptus tintinnans</i>) and termite mounds. Refer to comment #5 of the submission on the Supplement from DCCEEW	1. Address DCCEEW comment #5. 2. Provide details of the avoidance and mitigation measures for Gouldian finch breeding habitat, including consideration of Salmon Gum (<i>Eucalyptus tintinnans</i>) and termite mounds.
8.	Terrestrial ecosystems – Ghost bat The TOR required the proponent to outline measures for avoiding, mitigating, or offsetting impacts including impacts to the Ghost Bat (<i>Macroderma gigas</i>). Refer to submission on the Supplement from DEPWS and the submission on the Supplement from DCCEEW.	1. Address DCCEEW comments #9 and #10. 2. Review, analyse and summarise available information on how the OHTL may affect Ghost bat behaviour. 3. Determine the distance from the cable at which the static magnetic field is likely to be indistinguishable from the background.

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		- Subject to the findings of points 2 and 3 above - provide avoidance/ mitigation approaches including discussion about the effectiveness and confidence in the measures and any residual significant impacts (and proposed offsets). - Demonstrate how the precautionary principle has been applied to the assessment of potential significant impacts and application of protection measures (Part 2 of the EP Act).
9.	Terrestrial ecosystems – <i>Cleome insolata</i> The TOR required targeted surveys for <i>Cleome insolata</i> conducted in the appropriate fruiting/seeding season (i.e. March-April) (Supplement Direction, Table 2 item #5), However, surveys were conducted in the OHTL corridor (excluding NT Section 572, which is private land in Lambells Lagoon) in September 2021, and surveys of the DCS were conducted in February 2022. Refer to submission on the Supplement from DEPWS.	- Provide the outcome of seasonally appropriate field surveys to identify how many hectares of <i>Cleome insolata</i> known and suitable habitat would be cleared. - Identify the percentage of <i>Cleome insolata</i> habitat that will be cleared in relation to the local and regional <i>Cleome insolata</i> habitat and the area of suitable habitat available. - Identify a suitable buffer for species records. - Propose offsets for residual significant impacts (for habitat loss and removal of any plants).
10.	Matters of National Environmental Significance - migratory species Item #8 of the DCCEEW submission on the EIS required scientific information and/or examples of successful intertidal habitat recovery and detail recovery timing. Temporary disturbance of approximately 25 ha of important intertidal habitat for migratory shorebirds from construction of the Cable Transition Facility at Gunn Point Beach is likely to have significant impacts on migratory shorebirds.	- Provide scientific evidence/examples of successful intertidal habitat recovery and recovery timing to support the statement in the EIS that the method is successful. - Provide evidence for predicted recovery time for foraging habitat and prey abundance for migratory shorebirds following construction of the shore crossing. - Demonstrate that habitat and prey availability will recover in time for the following migratory shorebird peak period.
11.	Matters of National Environmental Significance - migratory species The TOR (item #4.1.1) required that listed marine and/or migratory species need to be addressed. The appropriate guide for the assessment is the Listed Migratory Species criteria of the EPBC Significant Impact Guidelines (Significant Impact Guidelines 1.1). The migratory species that are also listed as threatened have not been assessed in line with the EPBC Significant Impact Guidelines e.g. the Supplement included an assessment for threatened species of migratory shorebirds at Gunn Point	Provide an assessment of potential impacts on migratory species using the Listed Migratory Species significant impact criteria in the Significant Impact Guidelines 1.1.

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	but used the Vulnerable and Endangered impact criteria. An assessment against the migratory species criteria has not been provided.	
12.	Matters of National Environmental Significance - Commonwealth marine areas DCCEEW comments on the EIS and the Supplement Direction required an assessment of avoidance, mitigation and monitoring of potential impacts to Key Ecological Features within and outside of the Oceanic Shoals Marine Park. The assessment has not been provided.	1. Describe the values of the Oceanic Shoals Marine Park, in accordance with the North Marine Parks Network Management Plan 2018, that could potentially be affected by the proposed action. 2. Demonstrate the adequacy of proposed avoidance, mitigation and monitoring measures to reduce impacts to Marine Park values, including Key Ecological Features, to an acceptable level (i.e. not significant).
13.	Community and economy – amenity The Supplement Direction (item #9) required clarification of whether and/or where the OHTL may be installed underground in areas to avoid potential significant impacts (and any residual significant impact) on sensitive receptors. The Supplement includes a discussion of avoiding visual impacts by installing the entire OHTL underground, but the avoidance of potential visual impacts by placing the OHTL underground only near sensitive receptors has not been addressed.	Discuss the potential to avoid visual impacts during operation by placing the OHTL underground near sensitive receptors which may include but not be limited to the sensitive receptors at Pine Creek, Katherine and between Stuart Highway at Hughes to the Darwin Converter site (including reasonably foreseeable future land uses described in the Litchfield subregional land use plan 2016 Murrumujuk, Noonamah Ridge, Noonamah and South-East Weddell).
14.	Community and economy – Noise and vibration from operation of the proposed action. The TOR required that noise and vibration during construction and operation of all components of the proposed action need to be addressed. The EIS included a prediction of the average level of audible noise for the OHTL based on the Chartier method produced by CIGRÉ (2009¹). The estimated average sound power (75 dBA, single band, 125 Hz), was compared to the Northern Territory Noise Management Framework Guideline (2018) night time noise criteria for residential land uses to identify predicted impacts. However, the EIS assessment is not in accordance with section 3.2 – Commercial and Industrial Noise of the framework (including use of averages rather than (LAeq (15 minute)), and	1. Provide a noise impact assessment in accordance with the Northern Territory Noise Management Framework Guideline for the following operational configurations of the OHTL: a. Both bipoles in operation b. One bipole in operation c. Monopolar operation - various permutations d. Unbalance operation due to differential sag on conductor 2. The noise impact assessment is to address cumulative impacts of operational noise e.g. noise from the converter site combined with the OHTL noise on future Murrumujuk residential development

¹ CIGRÉ (2009). Technical brochure 388 - Impacts of HVDC Lines on the Economics of HVDC Projects.

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	it is not clear if intrusive noise and tonal adjustments were accounted for). The EIS states that the noise estimate considered worst-case scenario (all equipment operating at one once in the worst-case climatic conditions). It is not clear whether other operational configurations have been accounted for, and whether the noise emissions from those scenarios may be worst-case and what the potential significant impacts are associated with those. Noise generation from transmission lines is dependent on conductor bundle design and operating configuration and each of these scenarios should be discussed separately. The EIS indicates operational noise criteria will not be met at several sensitive receptors. No mitigation has been suggested for the identified residual impacts to residential receptors.	3. Identify mitigation measures for operational noise emission exceedances from the proposed action. Discuss the consideration of alternatives (available technologies, best practicable mitigation technology, methods such as underground in proximity to residences) and reasons for either selecting or not selecting the option. If the option is not selected because it was considered not economically feasible, a comparison of the environmental / effectiveness of the options should still be included. 4. Identify the total number of land parcels (include NT Portion numbers or section numbers and maps at an appropriate / local scale) where the operational noise is predicted to exceed/not meet the noise limit (at sensitive receptors).
15.	Marine ecosystems - EMF-sensitive threatened and / or migratory marine fauna The Supplement refers to a review of studies of EMF impacts on marine species produced by the International Cable Protection Committee (ICPC, 2021) (Section 9.5.3.2), and asserts that the review indicates a lack of evidence for positive or negative effects of cable EMF on the species studied, with studies finding no change in biological assemblages along energised cables. The report was not provided and does not appear to be publically available.	1. Provide evidence of the outcomes of studies of EMF exposure/impacts on marine species. 2. Provide a copy of the International Cable Protection Committee (ICPC, 2021) study on EMP impacts on marine species. 3. Demonstrate that EMF in proximity to the subsea cable is not predicted to be above a level which may result in behavioural changes in elasmobranchs (sharks and rays). 4. Provide detail about how the proposed method of installing cables (laid on the seafloor, trenched into the seabed generally to a depth between 0.3 – 1 m or protected with armouring) would mitigate potential EMF impacts on marine fauna, and what post-installation verification is proposed.