

Ms Sarah Smith
Department of Environment, Parks and Water Security
Floor 1, Arnhemica House, 16 Parap Street, Parap
Darwin NT 0801

Dear Ms Smith

Re: Australia-Asia PowerLink Project invitation to comment - Supplement to Draft EIS

The Department of Environment, Parks and Water Security (DEPWS) has assessed the information contained in the above application and provides the following comments:

Flora and Fauna Division

The Flora and Fauna Division provided comments on the Draft EIS and has commented at various stage of this project, detailed comments are provided in Attachment 1.

Rangelands Division

Pastoral Assessment

The proposed development footprint intersects freehold land and land that is subject to pastoral leases.

Pursuant to the *Pastoral Land Act 1992*, a clearing permit is required for clearing native vegetation on a pastoral lease, unless the clearing is permitted under section 91D of the *Pastoral Land Act 1992*.

Applications for pastoral land clearing permits are assessed against the requirements of the Pastoral Land Clearing Guidelines, which require applications to demonstrate consideration of the NT Planning Scheme Land Clearing Guidelines.

A non-pastoral use (NPU) permit is also required on a pastoral lease to use the land for a purposes that is not a pastoral purpose.

Pursuant to section 87(2) of the *Pastoral Land Act 1992*, before granting a NPU permit, the Pastoral Land Board (the Board) must comply with the *Native title Act 1992* (NTA), consider or take into account relevant government policy, likely effects on the environment and pastoral enterprise and public submissions, and may consider other matters as it sees fit. Matters the Board considers fit, according to the NPU guidelines include a number of environmental and cultural considerations.

Pursuant to the *Planning Act 1999*, consent is required for the clearing of native vegetation of more than one hectare in aggregate of land on land subject to the Clearing of Native Vegetation overlay (the NT Planning Scheme Part 3 overlays).

Applications for permits to clear native vegetation on unzoned land are also assessed against the requirements of the NT Planning Scheme Land Clearing Guidelines.

The current proposal shows several instances of potential non-compliance or insufficient information to adequately assess the proposal against the NT Planning Scheme Land Clearing Guidelines, including but not limited to potential impacts to sensitive and significant vegetation, threatened species and biodiversity.

Weed Management Branch

The proponent has adequately addressed comments provided by the Weed Management Branch for the Draft Environment Impact Statement (EIS) in their Supplement to the Draft EIS.

For further information regarding weed management in the Northern Territory please visit our website¹, or alternatively contact the Weed Management Branch on (08) 8999 4567.

Water Resources Division

The Water Resources Division provided comments on the Draft EIS. Detailed comments on the supplement are provided in Attachment 2.

Should you have any further queries regarding these comments, please contact the Development Coordination Branch by email DevelopmentAssessment.DEPWS@nt.gov.au or phone (08) 8999 4446.

Yours sincerely



Maria Wauchope
Executive Director Rangelands
27 January 2023

¹ <https://nt.gov.au/environment/weeds>

Attachment 1 – Flora and Fauna Division Comments

NT EPA EIS – Australia-Asia PowerLink Project

Government authority: Flora and Fauna Division DEPWS

Section of Draft EIS	Theme or issue	Comment in EIS	Comment addressed in Supplement to draft EIS
Chapter 9 & Chapter 10	Marine: Physical Environment	Information on the existing environment should incorporate geomorphic and predicted mud, sand and gravel layers and data layers and interpretation of sediment chemistry characteristics (Nicholas et al. 2019) available as part of the Darwin Harbour – Bynoe Harbour habitat mapping program (data package - Siwabessy et al. 2020).	The proponent states that it has used and referenced Siwabessy et al. 2015, 2019 and Nicholas et al. 2019 and associated data layers, mainly in Appendix S of the Draft EIS. The SEIS describes in the text the geomorphological and sedimentological characteristics collected during surveys undertaken after the Draft EIS was submitted. The SEIS does not display these characteristics spatially, by means of mapping products, which is desired from an assessment point of view. Nevertheless, this was not a requirement for the TOR or comment on Draft EIS, so therefore the proponent has addressed this adequately.
Chapter 9, P9-5 & 9-13	Marine: Turbidity – Light attenuation	Modelling the relationship between turbidity, measured as NTU, and light attenuation through the water column requires more detailed information of components of total suspended solids (TSS), including particulate inorganic matter (PIM), particulate organic matter (POM) and the colour of dissolved organic matter (CDOM). These relationships are site-specific and cannot be reliably transferred from other regions, especially not using relationships derived from Cardno (2013), which were based on inner Darwin Harbour environments that are dominated by mangrove habitats.	The proponent states that it has undertaken further work, or has committed to undertake further work, to fill this information gap. Table 8-1 SEIS summarises the phases of work that have been undertaken or may be implemented. The proposed works will be triaged through an Adaptive Management Process as outlined in Table 8-1 SEIS. Much of the work depends on outputs from the hydrodynamic modelling and establishing zones of impact. This work has not been undertaken. As a consequence, Flora and Fauna Division is unable to

		<p>Until this relationship is established, the proponent cannot reliably place into context the impacts to benthic primary producer habitats from elevated TSS and changes to light availability at the seafloor and set triggers for mitigation actions.</p> <p>The Flora and Fauna Division recommends that further data are sought and water quality monitoring is undertaken, if necessary, to establish: (a) the relationship between turbidity and light attenuation; and (b) the natural variability between seasons, so that appropriate TSS triggers for benthic primary producer habitats can be developed.</p>	<p>assess whether the proponent's actions will have an impact on benthic habitats and benthic primary producer habitat (corals, macro algae and seagrass). The Proponent has committed to undertaking this work post approval.</p> <p>It is recommended that approval is conditional to providing a hydrodynamic and sediment transport modelling report for review. The report should provide modelling outputs, identify zones of influence, and assesses whether the elevated total suspended sediments, sedimentation and reduced light availability at the seafloor will be a risk to sensitive receptors. The report should also outline further works to be undertaken and provide specifics around monitoring programs that may need to be established to ensure an appropriate baseline is established. This information will ensure appropriate triggers can be set and management actions can be put into place.</p>
Chapter 9, Table 9-1, Figure 9-2	Marine: Geomorphology	<p>Table 9-1 and Figure 9-2 seem to be incomplete. Geomorphic features from the Darwin Harbour – Bynoe Harbour habitat mapping project are not displayed in Figure 9-2. See Nichols et al. (2019).</p> <p>Further, it is unclear how the proportion of each geomorphic feature intersecting the cable corridor is calculated in Table 9-1. Is this based solely on what was mapped by Geoscience Australia or on the whole corridor area?</p> <p>The Flora and Fauna Division recommends including geomorphic features from the Darwin Harbour – Bynoe Harbour habitat mapping project and undertaking additional analysis of bathymetric data for which no</p>	<p>The Proponent responded by noting that they have used Geoscience Australia data to inform Table 9.1 and Figure 9.2 of the Draft EIS. This was to provide high level context for the pipeline corridor within Australian waters. Indeed, this is the case, but only for Joseph Bonaparte Gulf and Arafura / Timor seas. This is only one of the data sets available for the project area. Additional data sets presented in Nicholas et al. (2019) would fill the data gap presented in Figure 9-2 of the draft EIS. The proponent does not discuss why it was not considered.</p>

		geomorphic data are available. This will allow Table 9-1 will be more representative of features present.	The Supplement also notes that additional surveys were undertaken after the Draft EIS was submitted. This information is presented in Appendix 8-2 of the SEIS. However, the document does not provide the full suite of data sets to inform the assessment. For example, it does not compare sediment samples with the modelled sediment grainsize data that is presented in Nicholas et al (2019). As such the assessment is still incomplete and could be undertaken more comprehensively.
Chapter 9, Table 9-2	Marine: Sediments	<p>It is unclear why Table 9-2 states that Shoal Bay is unsurveyed and sediments are “Thought to be sandy with scattered rocks and mud”, even though the first paragraph of Section 9.3.2.4 states that it was extensively surveyed as part of the Darwin Harbour – Bynoe Harbour habitat mapping project.</p> <p>Information on the existing environment should incorporate predicted mud, sand and gravel layers (Nicholas et al. 2019) available as part of the Darwin Harbour – Bynoe Harbour habitat mapping program (data package - Siwabessy et al. 2020).</p>	
Chapter 10, P10-12	Marine: Threatened and/or migratory species	<p>The Draft EIS states: “<i>Threatened and/or migratory species which may occur, or which utilise benthic habitat, within the area of influence include turtles (Loggerhead, Flatback and Olive Ridley), Dugongs, sea snakes, elasmobranchs, estuarine crocodiles, Pygmy Blue Whale, and Whale Shark.</i>”</p> <p>Although Appendix T (Marine Ecology Report) notes that Hawksbill Turtles are likely to be present within the zone of influence, the draft EIS seems to have omitted that they may occur in Shoal Bay. The Flora and Fauna Division recommends that the Hawksbill Turtle be incorporated into the risk assessment for nearshore waters.</p>	<p>The Flora and Fauna Division considers lumping mitigation actions for turtles from noise and collision appropriate. The mitigations would be same for all species of marine turtle.</p> <p>The proponent mentions that Hawksbill turtle was assessed with other migratory species as it did not forage and/or nest in Shoal Bay. The former is an assumption, as no references are provided to underpin this statement. Flora and Fauna databases have records of Hawksbill turtle in Shoal Bay and Gunn Point. Further, Gunn Point and Folsche Reef have habitats that could support Hawksbill feeding, i.e. sponge gardens. Therefore, it should have been discussed and assessed whether project activities could impact on feeding Hawksbill turtles or on the habitats that support this species.</p> <p>The Flora and Fauna Division recommends that if hydrodynamic and sediment transport modelling</p>

			identifies a zone of influence that overlaps with feeding habitats for the Hawksbill turtle, and the elevated total suspended sediments from dredging could impact on feeding habitat, then the habitat should be characterised, mapped and its importance to Hawksbill turtle assessed.
Chapter 10, P10-26	Marine: Benthic habitats	<p>The Flora and Fauna Division supports Sun Cable's commitment to undertake additional benthic surveys for either the southern or northern cable route to verify predicted modelling outputs and characterise the benthic physical environment.</p> <p>Besides characterising the benthic environment solely within the cable corridor, the proponent should map/characterise sensitive receptors within the zone of influence; in particular, for benthic primary producer habitats (corals, macro-algae and seagrass, or a mixture of these communities). This will inform site selection for WQ monitoring sites to monitor TSS / SSC and light availability at the seafloor (see Factor: Marine Environmental Quality) during and after cable-laying activities within NT waters.</p>	<p>The proponent has undertaken epibenthic benthic surveys to ground truth modelled data. The data is for the zone of impact, which is defined by the proponent as direct disturbance footprint, i.e. the cable line corridor and potential dredge spoil areas. The survey does not take into account the full zone of influence, because, to do so, this would require the proponent to undertake additional hydrodynamic and sediment transport modelling. This has not been undertaken – see comment Marine: Turbidity – Light attenuation. The characterisation of benthos was undertaken in accordance to CATAMI and nationally adopted standards.</p> <p>The proponent concludes from ground truth survey results that the model overestimated the occurrence of Benthic Primary Producer Habitat ((BPPH) coral, seagrass, macro algal and/or mixture of these communities) and that their presence is low and confined to individual specimens within a predominantly bare substrate. The majority of benthos identified were filter feeders, which are not considered a sensitive receptor by the proponent and thus require no risk assessment. However, it is an important feeding habitat for Hawksbill Turtle; thus could be considered a significant habitat that supports a threatened/migratory species and therefore should have been assessed.</p>

Chapter 10, P10-27	Marine: TSS, SSC risk assessment	<p>Turbidity will increase for about a month during cable laying activities in nearshore waters. To mitigate this impact, the Flora and Fauna Division recommends that, if possible, cable laying is confined to the late wet season, when nearshore waters generally have elevated total suspended sediments and seagrass habitats remain dormant. Light availability at the seafloor improves at the start of the dry season and triggers seagrass regeneration (see factor: Marine Ecosystems).</p>	<p>The proponent has identified that the late-Wet is the preferred time for dredging operations when considering impacts to sensitive receptors and threatened and/or list species. However, it does not commit to undertaking dredging operations within this time frame due to logistics (e.g. vessel availability, cyclone/storm activity) and financial reasons.</p> <p>The Flora and Fauna Division recommends that dredging takes place during the Wet season. If Dry season dredging is required, then enhanced monitoring program should be put in place to ensure that monitoring is statistically robust and can ensure that water quality stays within the water quality objectives.</p>
Chapter 10, P10-32	Marine: Benthic habitats Risk assessment	<p>The draft EIS concluded that the residual impact to benthic habitats from direct disturbance or loss of benthic habitat is minor. The Flora and Fauna Division considers that lumping benthic habitat into a single category is not appropriate.</p> <p>The potential impacts of cable laying on benthic species depend on biological processes, including feeding mechanism, mobility, life history characteristics, stage of development and environmental conditions. These drivers are different for each community group (corals, macro-algae, seagrasses and filter feeder communities).</p> <p>As such, the Flora and Fauna Division recommends that the draft EIS reviews impacts to each of the individual community types in terms of their tolerance to changing environmental conditions, the duration of these changes and mitigation options, such as timing of project activities to minimise their vulnerability to cable laying.</p>	<p>The response and associated risk assessment (Table 9-11 SEIS) is inadequate. It has not taken into account impacts within the zone of influence and is solely confined to the direct impact footprint (i.e., cable corridor and dredge spoil disposal areas). The Flora and Fauna Division agrees with the conclusion that benthos is sparse with low occurrences of corals, seagrass and macro algae within the direct impact footprint (see comment Marine Benthic Habitats). However, the response does not consider the inadequacy around establishing the zone of influence and associated risk assessment to BPPH and significant habitats and fauna. Further assessment is required once hydrodynamic and sediment transport modelling is undertaken. See comment Marine: Turbidity – Light attenuation for further detail.</p>

		<p>The draft EIS briefly refers to WAMSI (2019) on page 10-32. However, it should apply the recommendations provided in various reports presented on the WAMSI Dredging Science Node² in more detail, so there is a clearer understanding of site-specific impacts and changes of environmental conditions specific to the individual sensitive receptors.</p> <p>The Flora and Fauna Division agrees with the conclusion in the draft EIS that the dry season is important for maintaining health of benthic primary producer habitats. Therefore, the Division recommends that, if possible, cable laying is restricted to the late wet season, when monsoonal activity is at its greatest, where WQ is at its poorest, and when seagrass/macro-algal habitats remain dormant until light availability at the seafloor improves at the start of the dry season and triggers regeneration. Further, the early wet season (September – December) is also considered unfavourable for laying cable as anecdotal evidence points towards this being a period of reproduction for corals, and elevated TSS up to 3.2 mg/L may cause decline of coral health through bleaching and tissue damage³.</p> <p>Further, using time-series plots and accompanying assessment in conjunction with sensitive receptors is not meaningful. Figures 10-7 and 10-8 seem to suggest that elevated TSS will not impact sensitive receptors. However, it only can show the relationship between elevated TSS and WQO at a chosen site. The draft EIS cannot state with any confidence that a sensitive receptor is actually present at a chosen site, because it is based on</p>	
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² <https://wamsi.org.au/research/programs/dredging/>

³ Tittle L.J. and Donahue M. 2022. Effects of sediment exposure on corals: a systematic review of experimental studies. Environmental Evidence (2022) 11:4. <https://doi.org/10.1186/s13750-022-00256-0>

		<p>predicted models. The predictive benthic habitat map should be used carefully as there are known errors in the model. For example, it is unlikely that coral exist at HC3 and HC4, as this location consists of large sand waves devoid of any benthos (towed video benthic habitat database, DEPWS). However, the substrate type (i.e. sand) does explain why elevated TSS are lower than other plots in Figure 10-7.</p> <p>For the draft EIS to relate modelled TSS concentrations to sensitive receptors, the Flora and Fauna Division recommends that further benthic habitat mapping be undertaken where sensitive receptors are likely to occur. This should be followed by WQ sampling/monitoring at sites with known sensitive receptors. This will help establish the tolerance to TSS and set appropriate triggers for adaptive management.</p>	
Chapter 10, P10-34	Marine: Land based lighting impact on fauna	<p>Given the topography on Gunn Point Peninsula is relatively flat, light pollution from Sun Cable's infrastructure may impact on migratory and threatened species.</p> <p>The Flora and Fauna Division recommends that infrastructure design follows National Light Pollution Guidelines⁴</p>	<p>Comments are adequately addressed in 5.12.2.4.</p> <p>The Principles of Best Practice Lighting Design, as outlined in the National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds, have been incorporated into the proponent's mitigation commitments (Table 5-60).</p>
Appendix R, Section 5.0	Marine: 'Plume' modelling	<p>Plume modelling undertaken and outputs in the draft EIS are acceptable, given the underlying data and assumptions, and the modelling approach. However, the Western Australian Marine Institute – Dredging Science Program recommends that hydrodynamic model and</p>	<p>The response is inadequate. It underpins the assessments that BPPH is low, which has no connection to the question around hydrodynamic modelling approach. The SEIS 9.2.3. does discuss the modelling approach and further works that need to be undertaken. The proponent makes the commitment that "<i>where further modelling supports</i></p>

⁴ National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds, Commonwealth of Australia 2020

		<p>associated plume / sediment transport modelling is undertaken in 3D, rather than 2D⁵.</p> <p>Once the proponent has decided on the path for the cable and undertaken benthic and geotechnical surveys for the preferred path in Shoal Bay, the Flora and Fauna Division recommends that they revisit plume modelling and sediment transport modelling for the Shoal Bay cable laying campaign. They should also consider using 3D modelling techniques in conjunction with the long-term monitoring data mentioned below.</p>	<p><i>the adaptive management approach, this will be scoped and undertaken</i>". However, it makes no reference to how the decision will be made whether to opt for a 2D or 3D model.</p> <p>A 3D Hydrodynamic model remains the preferred option for the Flora and Fauna Division, until the proponent can provide a sound argument as to why this is not required noting that it does not pose a significant cost to the project without any benefit.</p>
Appendix S, Part 4.0	Marine: Water quality (WQ)	<p>The draft EIS has not collected site-specific baseline WQ data.</p> <p>To fill this information gap, the draft EIS has used INPEX monitoring data from Lee Point (Lee Point Site 02). However, there is no explanation as to why this site was chosen above the INPEX monitoring site SPO 01 (Cardno, 2015, report L384-AW-REP-10204), which is located between the two proposed cable routes and is more likely to be representative of WQ within the cable corridors in Shoal Bay. However, if the southern route is chosen as the cable corridor, then Lee Point sites, together with SPO 01, are adequate for informing risk assessment.</p> <p>The proposed monitoring program is unlikely to be suitable for setting triggers (e.g. for coral communities at Gunn Point). As such, the Flora and Fauna Division recommends further WQ monitoring at selected areas in which receptors occur. These monitoring sites should preferably be established before cable laying takes</p>	<p>The specific question "why SPO 01 site was not used to inform water quality characteristics" has not been addressed. The response points to the detail within the Draft EIS CEMP and EMP. However, these provide only broad statements of what the Plans will contain. SEIS Chapters 8 and 9 indicate that water quality monitoring may be put into place, if required, as per Adaptive Management Decision Process listed Table 8-1 SEIS, which again is dependent on outstanding works (hydrodynamic modelling, sediment transport modelling and establishing zones of influence).</p> <p>See comment Marine: Turbidity – Light attenuation for further detail.</p>

⁵ [Dredging Science Program – Western Australian Marine Science Institution \(wamsi.org.au\)](http://wamsi.org.au)

		place, so that site-specific triggers can be determined and an appropriate, reactive monitoring program can be designed. The design of the monitoring program should include establishing turbidity / light attenuation relationships (see above), as light condition will be the main driver for health of benthic primary producer habitat.	
Appendix S, P29	Marine: Water quality	The report cards should be used carefully. The DEPWS monitoring data unpinning the report cards are collected for surveillance or ambient purposes and the data are somewhat skewed towards dry season and neap tidal conditions, in order to mitigate the confounding influence of tide and season. The applicability of the report cards for spring tides and/or wet seasons is constrained.	The proponent has given further information in Chapter 9 of the Supplement addressing this comment.
Chapter 2 – section 2.4.3.2	Terrestrial: Access road	It is unclear why there is a need for two different access routes if the bitumen access road is an all-weather road. The Flora and Fauna Division recommends removing one of the roads, if feasible.	Adequately addressed in 2.2.3.1. The proponent proposes to rehabilitate the Gravel Access Road if it is no longer required for the project, pastoralists or Traditional Owners.
Chapter 2	Terrestrial: Vegetation clearing	Is there additional clearing required for construction camps, borrow pits and the concrete batching plant beyond the facilities and OHTL footprints? If so, this may require additional assessment.	Adequately addressed in 5.4-5.9. The Supplement has been updated to include the requested additional information.
Chapter 5	Terrestrial: Fauna impacts	In general, there is a lack of justification for the assessment of impacts on threatened fauna species. References are out of context or no evidence is provided for the statements being made. Potential impacts should be assessed against the EPBC significant impact criteria. There are several components for which there is a need for trenching, yet the impacts of trenching on fauna are	Adequately addressed in 5.12.2.8. The Supplement has been updated with new survey results and references to additional information. Adequately addressed in 5.12.2.10. The proponent has identified that the trench will be 500m long and 13.5m wide at its largest and require 2-3 days for the cable to be laid. Mitigation measures will include the checking of the trench each morning and

		not assessed. The Flora and Fauna Division recommends that the impact of trenching on fauna be assessed and that management of risks is clearly defined.	evening for trapped fauna. Any fauna in the trench will be rescued and relocated away from the excavation.
Chapter 5 – section 5.4	Terrestrial: Fauna impacts	<p>Impacts stated in the ToR that are not covered in the draft EIS assessment include:</p> <ul style="list-style-type: none"> - direct disturbance of fauna and fauna habitat as a result of clearing; - indirect impacts to fauna habitat due to changes to water quality, introduction or spread of weed, pathogens or pest species, fragmentation and edge effects; - indirect impacts to fauna as a result of reduced habitat availability; - direct impacts to fauna as a result of collision with overhead transmission lines; - direct impacts to fauna as a result of collision with vehicles or equipment, including solar panels; and - changes to the behaviour of fauna as a result of noise or lighting from proposal areas, including potential glare from solar panels or the 'lake effect' (solar farm mistaken for a water body). <p>The Flora and Fauna Division recommends that all impacts are assessed consistently with the ToR.</p>	<p>Adequately addressed in 5.5.3.1, 5.5.3, 5.5.3.2, 5.5.3.4, 5.5.3.7, 5.5.4.3, 5.5.4.2, 5.5.3.8, 5.5.4.5, 5.5.4.2.</p> <p>Chapter 5 of the Supplement includes further information addressing this comment.</p>
Chapter 5 – section 5.4.1.2, section 5.4.3.2	Terrestrial: Waterbirds	<p>Section 5.4.1.2 states that because the usual extent of Lake Woods is over 10 km away, it is not considered to be within the area of influence. The ToR states that the 'lake effect' should be assessed as a potential impact.</p> <p>Waterbirds undertake regional movements between waterbodies within the NT and movements to</p>	Partially addressed in 5.5.4.2. The Flora and Fauna Division agrees there remains substantial uncertainty on the likely impact of the solar arrays on waterbirds and supports the commitment to monitor these impacts in a rigorous way. However, the Flora and Fauna Division recommends that the

		<p>waterbodies in other states, and move through the area during trans-continental migrations. The distance to Lake Woods is small in comparison to these movements and there is a high likelihood that waterbirds would regularly fly over the solar array. Therefore, it is suggested that Lake Woods be incorporated into the Area of Influence.</p> <p>Section 5.4.3.2 states that very few birds regularly migrate within Australia, as patterns are more 'boom and bust'. This does not fully characterise the dynamics of birds in the region of interest. As well as having high inter-annual variability ('boom and bust'), there is a seasonal component to surface water availability, and waterbird occurrence and abundance. The different reasons for movements of waterbirds in Australia to those in North America, where cited studies were undertaken, do not justify there being a lower risk to Australian species from solar arrays.</p> <p>The Flora and Fauna Division recommends that Lake Woods be incorporated into the Area of Influence, particularly in the context of waterbird movement to and from the Lake Woods over the solar array.</p>	<p>proponent provide details on the potential mitigation actions that could be undertaken if waterbird mortality is recorded. Furthermore, the proponent should identify whether any of these mitigation actions could be implemented pre-emptively.</p>
Chapter 5 – section 5.12.2.15	Terrestrial: Pest animals	<p>Food waste is addressed as a potential cause of an increase in pest animals. Additional water sources can also increase the activity of pest animals, both predators and herbivores, and should be addressed in the draft EIS.</p>	<p>Adequately addressed in 5.12.2.16.</p> <p>The response provides more detail around the construction and operation of different aspects of the proposal, including how access to water and food waste will be secured.</p>
Chapter 5 – section 5.4.2.6	Terrestrial: Direct fauna mortality	<p>It is not clear whether night driving will be required for the project. Night driving increases the risk of vehicle strike to the Greater Bilby and should be assessed/mitigated in parts of the development where</p>	<p>Adequately addressed in 5.6.3.23 and Section 5.12.2.18.</p>

		this species occurs. Ideally, driving will be constrained to daylight hours.	
Chapter 5 – section 5.4.2.8	Terrestrial: Noise and lighting	It is stated that noise will meet residential criteria ~600 m from the works, but then states that the impacts of noise and lighting on fauna will likely be limited to a few hundred metres from the source. It is also stated that the Darwin Converter Site and Cable Transition Facilities footprints do not contain sensitive receptors to noise or lighting, and that desert landscapes are less likely to contain species that are sensitive to noise or lighting. These statements should be supported by literature and/or reference to project ecological studies.	Comment not addressed in 5.13.12
Chapter 5 – section 5.4.3.2	Terrestrial: Bird collisions with transmission wires	The assessment is focused on the OHTL utilities corridor. There is no assessment of if/how the powerline may impact birds that may be susceptible to powerline collision that are moving across the landscape to or from Lake Woods. Given the proximity of Lake Woods to the powerline, and the numbers of waterbirds that Lake Woods can support in flood, this risk of collision should be included in the assessment and the risk potentially reduced through mitigation.	Not adequately addressed in 5.12.2.22. The Flora and Fauna Division recommends that an evidence-based assessment of the risk of bird collision with the powerlines in the vicinity of Lake Woods be undertaken. This should then inform possible mitigation actions in the Flora and Fauna Management Plan. It should be noted that measures to reduce bird collisions can include careful powerline route assessments based on the movement patterns of species/species groups that are known to be vulnerable to collision, as well as the marking of powerlines to make them more visible to birds. The location for marked sections of transmission lines should be determined by survey and analysis of bird movements. Monitoring the effectiveness of the line marking is recommended.
Chapter 5 – section 5.4.3.2	Terrestrial: Bat collisions with transmission wires	No reference to literature has been provided to support the statement that bats are too small and agile to have a negative interaction with powerlines. This statement forms the basis of the conclusions regarding this issue throughout the chapter. Bat collisions with barbed wire	In their response to this comment, the proponent responds that “the operators of the high-voltage transmission lines between Katherine and Darwin have not noted any issue with bats hitting powerlines. Moreover, no mention is made of

		<p>fences indicate that linear structures can lead to collisions. The Flora and Fauna Division recommends that the assessment of potential for bat impact with powerlines be evidence-based.</p>	<p>recovering bat carcasses in any of the bird collision studies that were considered for the draft EIS.” Flora and Fauna Division notes that all but three of the Northern Territory’s 36 bat species are ‘microbats’. ‘Microbats’ are small (range of 2.7 – 100 g) and, unless a systematic program of monitoring for carcasses is instated, it is unsurprising that operators “have not noted any issues with bats hitting powerlines”. Furthermore, researchers studying bird collision are not necessarily monitoring for bat mortality. As such, the assessment of potential for bat impact with powerlines is still not evidence-based and the issue has not been adequately addressed in 5.12.2.22.</p> <p>It should be noted that, due to their larger size, frugivorous bats are more susceptible to collision and/or electrocution⁶. By extension, due to their size, this may also apply to the Ghost Bat. Thus the Flora and Fauna Division recommends that an evidence-based assessment of potential for impact with powerlines be conducted; this should include consideration of effects on both the flying-fox species that occur along the OHTL and on Ghost Bats.</p> <p>See also the response to Section 5.5.4.6 (below) for commentary on the adequacy of the assessment of</p>
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⁶ Tidemann C.R. (1999) Biology and management of the grey-headed flying-fox, *Pteropus poliocephalus*. *Acta Chiropterologica*. 1: 151-164.
and Tidemann C.R. (2011) Life expectancy, causes of death and movements of the grey-headed flying-fox (*Pteropus poliocephalus*) inferred from banding. *Acta Chiropterologica*. 13: 419-429 and Chouhan R and Shrivastava S. (2019) Observation on electrocution of Indian Flying Fox (*Pteropus giganteus*) in Ramganjmandi, Kota, (Rajasthan) and their conservation strategies. *International Journal of Research in Engineering, Science and Management* 2: 648-649
and Tella J.L., Hernandez-Brito D., Blanco G. and Hiraldo F. (2020) Urban sprawl, food subsidies and power lines: an ecological trap for large frugivorous bats in Sri Lanka? *Diversity* 12(3): 94

			potential collision with powerlines specifically on Ghost Bats.
Chapter 5 – section 5.5 Appendix P Appendix O	Terrestrial: Threatened species	<p>No individual assessment is provided for the following threatened fauna species listed in the ToR:</p> <p>Painted Honeyeater, Princess Parrot, Night Parrot, Brush-tailed Mulgara, White-throated Grasswren, Masked Owl (northern mainland), Red Goshawk, Partridge Pigeon (eastern), Crested Shrike-tit (northern), Nabarlek (Top End), Northern Quoll, Arnhem Leaf-nosed Bat, Black-footed Tree-rat (Kimberley and mainland Northern Territory), Northern Brush-tailed Phascogale, Water Mouse, Fawn Antechinus, Arnhem Land Gorges Skink, and Plains Death Adder.</p> <p>Of particular note are the Black-footed Tree-rat (Kimberley and mainland Northern Territory), Fawn Antechinus and Masked Owl (northern mainland), which Stokeld et al. (2020; https://www.ntlis.nt.gov.au/mpds/get_file?file_id=8602) classify as high-value species for the Gunn Point area.</p> <p>The Flora and Fauna Division recommends that individual impact assessments are described for all threatened fauna with a medium-to-high likelihood of occurrence within the project footprint.</p>	The proponent has provided updated assessments for these species in Chapter 5.6.3 of the Supplement.
Chapter 5 – section 5.5.2, section 5.5.3, section 5.5.4.8, Table 5-10 Appendix O	Terrestrial: Threatened species	No Greater Bilby sign was recorded during surveys of the Solar Precinct. However, there are known records of the species from the railway corridor in and close to the Solar Precinct footprint from 2008. An assessment based on one survey in the proposal footprint found that the Solar Precinct is unlikely to contain core habitat or support persistent/regular occurrence of the species, and that habitat suitability is 'marginal'. Based on the unpredictable movement ecology of bilbies and the	Adequately addressed in 5.6.3.23. The Supplement includes the results of targeted surveys for Greater Bilby and provides new records of the species ~200m from the Solar Precinct. Additional measures were provided in the Supplement to reduce the risk from construction and operation on individual bilbies.

		<p>proximity of the withheld records, the Flora and Fauna Division suggests that this species needs additional assessment. Given the previous records of Greater Bilbies at the Solar Precinct, the Flora and Fauna Division recommends that follow-up surveys of the Solar Precinct footprint and suitable habitat along the proposed access roads are undertaken immediately prior to construction. The Flora and Fauna Division also recommends that the surveys incorporate a broader area around the Solar Precinct for context.</p> <p>The EIS states that habitat suitability at the Solar Precinct is marginal, because of a lack of palaeodrainage habitats that are considered more persistently suitable for Greater Bilbies, based on findings by Southgate et al. (2018). However, Southgate et al. (2007) provide evidence of Greater Bilbies using a diversity of habitats, including sand plain substrate in the northern part of the study area (Newcastle Waters) and in the south, where they were more restricted to laterite/rock or drainage/calcrete. The statement used to justify the lack of habitat suitability at the Solar Precinct does not account for the differences in habitat use across the species' distribution. A Greater Bilby population in this location is at the edge of the species' range and is considered an important population regardless of the perceived habitat suitability.</p> <p>The proposed access roads also pass through potential Greater Bilby habitat, and the potential for vehicle collision should be assessed.</p> <p>If Greater Bilbies are detected in any of the proposed project footprints, the Flora and Fauna Division recommends that any burrows within the clearing footprint are avoided with a 20 m buffer until no longer occupied. Subsequent clearing in the surrounding area</p>	
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		<p>should give consideration to allowing Greater Bilbies to safely vacate the development area (e.g. delaying clearing until burrow verified as not in use). The Flora and Fauna Division also recommends that night driving is avoided in areas with confirmed Greater Bilby activity and night works are avoided in all potential bilby habitat.</p>	
<p>Chapter 5 – section 5.5.3, section 5.5.4.7</p>	<p>Terrestrial: Threatened species</p>	<p>A juvenile Gouldian Finch was recorded south of Lake Woods during SREBA surveys in 2021, suggesting this species inhabits and may breed in the area. There is potential breeding habitat (<i>Eucalyptus leucophloia</i> woodland) in the Ashburton Range, along with permanent springs and pastoral dams that Gouldian Finches use as water sources. This suggests that the Gouldian Finch may be present along the proposed access roads to the Solar Precinct, and this species should be assessed in relation to impacts from this component of the project.</p> <p>The Gouldian Finch has been recorded in more locations in the vicinity of the OHTL during the GBA and SREBA projects (2020-2022). As such, the distribution of foraging and breeding habitat extends further south through the Sturt Plateau bioregion and past the southern edge of Lake Woods. There are also recent records from the coastal Top End. Proposed access roads at the Solar Precinct traverse potential Gouldian Finch breeding habitat (<i>Eucalyptus leucophloia</i> woodlands in the Ashburton Range). Gouldian Finch habitat is also present along the OHTL north of Pine Creek to Gunn Point. As Gouldian Finches are Endangered under the EPBC Act, any population is considered an important population under the EPBC Significant Impact Guidelines. Therefore the map of habitat provided in Figure 5-17 displays only part of the habitat requiring assessment for this project. The Flora and Fauna</p>	<p>Adequately addressed in 5.6.3.6.</p> <p>The Supplement provides a cumulative vegetation assessment for the OHTL and the access road for the Solar Precinct. The assessments concluded: “There is 18,449 km² of Gouldian Finch foraging habitat mapped within the 20 km buffer. Of this, 29 km² (0.16%) is within the project footprint.”</p> <p>And for the access road and infrastructure at the Solar Precinct: “There is 1,444 km² of Gouldian Finch breeding habitat mapped within the 20 km buffer. Of this, 1.6 km² (0.11%) is within the project footprint. As above, this may be an overestimate because some of that habitat may have been cleared for the railway and associated infrastructure.”</p> <p>The Flora and Fauna Division acknowledges that there are inaccuracies with the assessment as not all existing cleared areas have been incorporated into the vegetation mapping used by the proponent. This inaccuracy will have minimal impact on the assessment as vegetation along the OHTL and at the Solar Precinct are relatively intact.</p> <p>The Flora and Fauna Division agrees that there will be a net loss of foraging and potential roosting habitat for this species. This loss is likely to be a minimal risk to the species with extensive areas of</p>

		<p>Division recommends that the assessment of significant impact for Gouldian Finches is undertaken to incorporate all potential Gouldian Finch habitat.</p> <p>The Flora and Fauna Division recommends that the cumulative impacts of habitat removal is assessed within a 20 km buffer of the project footprint.</p>	<p>intact habitat remaining within 20km of the OHTL and the Solar Precinct Access Road.</p>
Chapter 5 – section 5.5.4.1	Terrestrial: Threatened species	<p>It is stated that Red Goshawk nests are conspicuous. However, Red Goshawk nests can be confused with the nests of other large raptors if observers are unfamiliar with the differences. The Flora and Fauna Division recommends that any active raptor nests are avoided if possible. If avoidance is not an option, further steps should be taken to confirm the species identity of any active raptor nest.</p>	<p>Adequately addressed in 5.6.3.33.</p> <p>The proponent has stated that pre-clearance surveys will be undertaken within stands of very tall trees within 1km of a river. In the event that there are any nests within the corridor, then all attempts will be made to retain the nest.</p> <p>In the Supplement, the proponent has referred to an unpublished email and unverified accounts that Red Goshawks will tolerate anthropogenic noise and activity in the proximity of nests. Based on the advice there was no reason to restrict works near active nests during the species' breeding period unless activities involved the use of helicopters or sudden noise sources i.e. pile-driving or blasting. If these works are required then construction within 100m of the nest would be undertaken outside the breeding period.</p> <p>This response appears based on observations of a limited number of individuals and provides little context around the circumstances of the nesting Red Goshawks. Unless more robust evidence is provided, the Flora and Fauna Division reiterates its previous advice recommending that all raptor nests are checked and if confirmed to be a Red Goshawk nest then impacts need to be avoided by adopting a</p>

			100m buffer. The clearing of a Red Goshawk would constitute a significant residual impact to the species based on the criteria outlined in the Significant Impact Guidelines.
Chapter 5 – section 5.5.4.3	Terrestrial: Threatened species	It is unclear as to why Mertens' and Mitchell's Water Monitors are assessed here but Yellow-spotted Monitor is not. The Yellow-spotted Monitor occurs along the entirety of the OHTL. The Flora and Fauna Division recommends that the Yellow-spotted Monitor is also assessed.	Adequately addressed in 5.6.3.38. The proponent has provided an assessment of the potential impacts to the Yellow-spotted Monitor within the Solar Precinct and along the OHTL. The Flora and Fauna Division is satisfied that the proposal is unlikely to have a significant residual impact on this species or exacerbate existing threats (Cane Toads).
Chapter 5 – section 5.5.4.6	Terrestrial: Threatened species	As discussed in a previous comment, the assessment that Ghost Bats will not be impacted by collision with powerlines is not well-justified. Ghost Bats are much larger than other Microchiroptera and less able to avoid collision. While further justification is required for all bat species assessed, it is worth particular attention for the Ghost Bat. See recent review paper on Ghost Bats (Cramer et al. 2022 – https://doi.org/10.1071/AM21042) that discusses the collision of Ghost Bats with barbed wire fences. The Kohoonir Adit colony (400 m from the proposed OHTL route) is the largest-known Ghost bat colony globally. If the project has significant impacts on this colony, the species is likely to be significantly impacted. Potential impacts from the OHTL include electrocution, collision and changes to flight patterns, predator and prey dynamics and foraging behaviour (although it is noted that the structure of the OHTL is planned to be such that electrocution should not be possible). Surveys undertaken by the Division around this colony have	It should be noted that the claim that “DEPWS staff in the Flora and Fauna Division who have been radio-tracking Ghost Bats from these locations...have not identified any clear evidence of a negative impact of the presence of powerlines proximate to these...Ghost Bat sites” is fallacious and such information was not communicated by staff from the Flora and Fauna Division. Research undertaken by the Flora and Fauna Division was never aimed at assessing the impacts of powerlines on Ghost Bats; as such, by design, none of the research components (study design, data obtained, and analyses undertaken) provide information that can answer this question. Furthermore, even if the research had been focused on this question, there are no high-voltage DC powerlines within the study area (the Katherine region) that could inform any impacts. The Flora and Fauna Division's research therefore cannot be used to support the proponent's assertions in relation to the impacts of

		<p>indicated that activity of ghost bats remains high at least 1 km from the adit. The large numbers of this species and their high activity around the roost increases the risk that the OHTL poses. There is sufficient information about the species in relation to this roost that further field surveys are not required. However, a more thorough assessment of impact, and appropriate and justified mitigation measures should be provided. The standard practice for mitigating impacts of collision with linear structures such as powerlines and fences is the use of a visual cue, such as white bunting.</p> <p>The potential impacts to the Ghost Bat colony from construction activities should also be thoroughly assessed.</p>	<p>powerlines on either bats more generally, nor Ghost Bats specifically.</p> <p>The proponent's chief mitigation strategy for minimising collision by Ghost Bats with powerlines appears to be that of "a visual cue such as white bunting...will be applied to the powerlines...within 1 km of Kohinoor Adit". However, research undertaken by the Flora and Fauna Division, as well as in the Pilbara, WA, has identified that Ghost Bats are typically completing 25-30 km round trip movements per night. Thus using a visual cue such as white bunting on the OHTL only within 1 km of Kohinoor Adit is insufficient. The proponent should be more definitive about the nature of the "visual cue" to be used on the OHTL, should use the visual cue in the proximity of both Katherine and Pine Creek (as there are permanent Ghost Bat roosts in both localities), and should extend the distance of such a visual cue much further than 1 km at both localities.</p>
			<p>Furthermore, the proponent has not assessed the potential impact on the Ghost Bat colony from the operation of the OHTL. High-voltage Direct Current (DC) powerlines are known to produce electromagnetic frequency (EMF) and radiation. EMF in the static, extremely low frequency (ELF) and radiofrequency (RF) ranges of the non-ionising electromagnetic spectrum are capable at very low intensities of adversely affecting both fauna and flora⁷.</p>

⁷ Levitt B.B., Lai HC and Manville AM (2022) Low-level EMF effects on wildlife and plants: What research tells us about an ecosystem approach. *Frontiers in Public Health*. doi: 10.3389/fpubh.2022.1000840.

			<p>Bats use magnetoreception for directional orientation and navigation⁸. Nicholls and Racey⁵⁹ (2006 and 2009) found that EMF and radiation deter foraging bats. Thermal induction (resulting from EMF exposure) may provide an inhospitable thermal regime for foraging bats; this could vary from discomfort to hyperthermia depending on EMF strength and duration of exposure (Nicholls and Racey 2007). Bats' wing membranes present a large surface area over which radiation might be absorbed, increasing animals' heat loads. This, combined with the heat energy produced during flight, makes bats particularly susceptible to overheating¹⁰. Furthermore, bats exposed to RF of sufficient power would hear this pulse and the frequency would lie within the range used for orientation, prey detection and capture¹¹. In their particular study, Nicholls and Racey (2009) found that bat activity and foraging effort were significantly reduced in habitats exposed to an EMF strength > 2 v/m when compared to matched control sites; furthermore, even at sites with lower levels of EMF exposures (<2 v/m), bat activity and foraging effort were significantly reduced when compared to control sites. Similarly, radiation of low-frequency electromagnetic fields (ELE-EMFs) from electric</p>
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⁸ Holland R.A., Kirschvink J.L., Doak TG and Wikelski M (2008) Bats use magnetite to detect the Earth's magnetic field. *PLoS ONE*, **3**(2): e1676.
and Holland R.A., Thorup K., Vonhof M.J., Cochran W.W. and Wikelski M. (2006) Bat orientation using Earth's magnetic field. *Nature* **444**(7):653-702.

⁹ Nicholls B, Racey PA (2007) Bats Avoid Radar Installations: Could Electromagnetic Fields Deter Bats from Colliding with Wind Turbines? *PLoS ONE* 2(3): e297
and

Nicholls B. and Racey P.A. (2009) The aversive effect of electromagnetic radiation on foraging bats—a possible means of discouraging bats from approaching wind turbines. *PLoS ONE* 4(7):e6246.

¹⁰ Speakman JR, Hays GC, Webb PI (1994) Is hyperthermia a constraint on the diurnal activity of bats? *Journal of Theoretical Biology* **171**: 325-341.

¹¹ Nicholls B. and Racey P.A. (2009) The aversive effect of electromagnetic radiation on foraging bats—a possible means of discouraging bats from approaching wind turbines. *PLoS ONE* 4(7):e6246.

			<p>powerlines may cause aversive responses in foraging bats.</p> <p>The preferred alignment for the OHTL is identified in the Supplement as being through Pine Creek and within ~200 m of Kohinoor Adit. As previously mentioned, Kohinoor Adit is the largest-known Ghost Bat colony globally; it is permanently occupied and used annually for breeding. Deleterious impacts on the colony would constitute an unacceptable impact to the species. No information has been provided by the proponent with respect to the risks from EMF / radiation on the Ghost Bat colony in Kohinoor Adit, either in the context of individuals within the roost, nor on individuals traversing from Kohinoor Adit to and from their foraging areas on a nightly basis.</p> <p>Section 11 of Appendix 2.1 states: “If EMF levels are confirmed or expected to be above the recommended exposure limits, application of engineering techniques should be considered to reduce the EMF produced by power lines, substations, or transformers.” The Flora and Fauna Division understands this to relate to exposure standards for humans only, as no current radiofrequency emission guidelines take non-human species into consideration. However, human-focused exposure standards are inappropriate for trans-species sensitivities and non-human physiology¹².</p>
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¹² Levitt BB, Lai HC and Manville AM (2022) Low-level EMF effects on wildlife and plants: What research tells us about an ecosystem approach. *Frontiers in Public Health*. doi: 10.3389/fpubh.2022.1000840.

			<p>The Flora and Fauna Division notes that a range of peer-reviewed studies confirm that EMF/radiation poses a risk to bats¹³. Given the proximity of the OHTL to Kohinoor Adit, it is recommended that a robust assessment of the risks to the colony be provided by the proponent. The assessment needs to demonstrate that the OHTL alignment will not have unacceptable impacts on the globally-important colony of Kohinoor Adit specifically, and on Ghost Bats in the Pine Creek and Katherine regions more generally.</p>
			<p>The proponent has also not adequately assessed the potential impact to the Ghost Bat colony from construction activities (section 5.6.3.22). The proponent purports that the “construction of the OHTL within 1 km of [Kohinoor Adit] will be restricted to occurring outside the breeding season (i.e. not between July and September)” and asserts that the “mitigations proposed—primarily to do with the timing of works—mean that impacts to this species...are unlikely to constitute a significant impact.” However, Ghost Bats congregate to mate from April to May (in the NT) and, after pregnancy in April to August, females give birth from July to August. Young are in crèche in the roost site from August to September. Thus the proposed period of no construction (July to September) does not incorporate the entirety of the period of mating and pregnancy.</p> <p>Furthermore, the proponent claims that “it is assumed that an important Ghost Bat population</p>

¹³ Levitt, B. B, Lai, H. C, Manville, A. M (2022) Effects of non-ionizing electromagnetic fields on flora and fauna, Part 2 impacts: how species interact with natural and man-made EMF, *Reviews on Environmental Health*: 37 (3): 327-406.

			occurs very close to the project footprint for at least part of the year”. Flora and Fauna Division advises that it is well-established that Kohinoor Adit, as well as roost sites around Katherine, are permanently occupied year-round.
Chapter 5 – Table 5-15	Terrestrial: Threatened species	<p>The assessment of the potential for the proposal to lead to a long-term decrease in the size of an important population of the Howard River Toadlet only considers the impact of clearing within the footprint, not potential impacts from changed surface flow on habitat suitability.</p> <p>The mitigation measures covered under the criterion ‘Modify, destroy, remove, isolate or decrease the availability of quality of habitat to the extent that the species is likely to decline’ do not specifically relate to the habitat of the Howard River Toadlet. The Flora and Fauna Division recommends that additional information be provided on how much clearing of potential habitat is required and how any changes to surface flow will be mitigated.</p> <p>Stokeld et al. (2020; https://www.ntlis.nt.gov.au/mpds/get_file?file_id=8602) state that this species is of high value and that, outside of the Howard Sand Plains SoCS, the disturbance of habitat should be avoided and that suitable habitat be retained and native vegetation buffers of ≥ 250 m be applied. Field surveys in areas with highly suitable habitat should be undertaken at an appropriate time if there is uncertainty in the occurrence of the species.</p>	Not adequately addressed in 5.6.3.25. The proponent is proposing a buffer of 50 m only, which does not align with the recommendation of Stokeld et al. (2020) or for medium and high value wetlands. Given this small proposed buffer, the Flora and Fauna Division recommends that the proponent provide details on the steps that will be taken to ensure that there will be no or minimal impacts on the hydrology of surface flow in suitable habitat adjacent to the corridor.
Chapter 5 – section 5.5.5.4	Terrestrial: Migratory species	The assessment of significant impacts to migratory species is not in line with the EPBC <i>Significant Impact Guidelines</i> . The migratory species that are also listed as threatened are not assessed in line with their threatened status under the EPBC <i>Significant Impact Guidelines</i> .	Chapter 5.6.3 of the Supplement included an assessment for threatened species of migratory shorebirds at Gunn Point but used the Vulnerable and Endangered impact criteria. An assessment has

		The Flora and Fauna Division recommend that species are assessed consistently with the EPBC <i>Significant Impact Guidelines</i> .	not been undertaken against the migratory species criteria from the Significant Impact Guidelines 1.1. A number of EPBC Listed migratory species have also been recorded along the OHTL and were not considered by the Proponent in the Supplement.
Chapter 2 Section 2.4.3.3 Section 2.4.3.4 Section 2.4.3.5 Section 2.4.3.6	Terrestrial: impacts of various construction on biodiversity	<p>The documentation provided is not adequate to assess the potential impacts to biodiversity from ancillary construction activities, landfills, dangerous goods/hazardous chemicals storages and additional infrastructure associated with the project (i.e. location of hardstands, laydowns, warehousing, storage areas, additional compounds, weather stations etc., as outlined in Section 2.4.3.6 – Other ancillary facilities).</p> <p>These activities and this construction potentially has a high likelihood of impacting surrounding biodiversity and the impact should be assessed prior to construction.</p> <p>The Flora and Fauna Division recommends that further information be provided in the Supplementary EIS regarding the location, extent and impact of the ancillary construction activities, landfills, dangerous goods/hazardous chemicals storages and additional infrastructure associated with the proposal. The potential impact on biodiversity, along with avoidance and mitigation measures, should be assessed for these activities.</p>	<p>Adequately addressed in 5.12.2.36.</p> <p>The proponent has provided further information in relation to the storage and handling of dangerous goods/hazardous chemical storages and relevant guidelines and regulations.</p>
Chapter 2 Section 2.5.2.1	Terrestrial: route options and threatened flora	<p>The Department acknowledges that the routes of the OHTL corridor through Katherine, Pine Creek and Adelaide River are yet to be determined due to several constraints and route obstacles.</p> <p>While the Katherine and Pine Creek potential route deviations are within the 10 km buffer of the OHTL</p>	The Supplement includes further refinement of the alignment and includes a high level analysis of the impacts of each alignment option. Chapter 5 has also been updated to assess the likelihood of threatened species occurring within the preferred alignment and the risk from the development.

		<p>corridor, the Adelaide River route deviation options are well over the 10 km buffer (approx. 15 km from the proposed OHTL corridor route in some places).</p> <p>It is unclear from the mapping and the documentation provided in Chapter 5 whether the potential impact of these route deviations have been considered in the EIS. The route deviations for Adelaide River intersect the following biodiversity values (at least):</p> <ul style="list-style-type: none"> • <i>Cycas armstrongii</i> records • <i>Styliidium ensatum</i> potential habitat • <i>Helicteres macrothrix</i> potential habitat <p>The route deviations for Pine Creek intersect the following biodiversity values (at least):</p> <ul style="list-style-type: none"> • <i>Acacia praetermissa</i> record • <i>Styliidium ensatum</i> potential habitat <p>The Flora and Fauna Division recommends that further information be provided in the Supplementary EIS regarding the impact of the route deviation options. The impact on biodiversity, along with avoidance and mitigation measures, should be assessed for these options.</p>	
Chapter 5 Section 5.3.3.2	Terrestrial: sensitive and significant vegetation	<p>Clearance of sensitive and significant vegetation in the NT requires consideration of the <i>NT Land Clearing Guidelines</i>. The Flora and Fauna Division notes the occurrence of highly-significant sandsheet heath (SSH) on the Howard Springs Sandplains.</p> <p>The Flora and Fauna Division recommends that information be provided on the types and extent of sensitive and significant vegetation proposed to be</p>	The Supplement (Supplementary Report Part 1) has identified where mapped and field verified Sandsheet Heath vegetation occurs along the OHTL alignment. No further information was provided with respect to the type and extent of the vegetation such that it could be valued using the criteria in the NT Land Clearing Guidelines.

		removed through the proposed development activities. The potential impacts on significant vegetation and proposed mitigation actions should also be outlined.	Proposed mitigation measures were identified in Sections 5.4-5.9. These measures are subject to the Constraints Planning and Field Development Procedure. It is unclear if this procedure is consistent with recommendations to avoid and buffer these vegetation communities as per the NT Land Clearing Guidelines.
Chapter 5 Table 5-7	Terrestrial: threatened flora	<p>There are inconsistencies in this table with respect to other chapters or appendices of this EIS.</p> <p>For example: the 'Value Rating' for Darwin Converter Site suggests that there are no threatened species within the impact footprint. Section 5.3.3 of Appendix P-3 indicates that <i>Typhonium praetermissum</i> is present within the Darwin Converter Site footprint.</p> <p>Additionally, the potential habitat for the threatened species <i>Stylidium ensatum</i>, <i>Ptychosperma macarthurii</i>, <i>Cycas armstrongii</i>, <i>Helicteres macrothrix</i> and <i>Typhonium praetermissum</i> have not been mentioned in any of the relevant locations.</p> <p>The Flora and Fauna Division recommends reviewing all topics of the EIA result table, including residual impact ratings, for all impacts on threatened flora species.</p>	<p>The proponent has acknowledged there are inconsistencies within the Draft EIS and notes that the inconsistencies are due to information that was available at the time. The Supplement contains an updated impact assessment for all threatened species.</p> <p>The Flora and Fauna Division notes that the revised significant impact assessment for the threatened plants has been provided. The assessment for several species (<i>A. praetermissa</i>, <i>H. macrothrix</i> and <i>C. armstrongii</i>) appear to be based high level information rather than the results of targeted surveys. Specific comments on the adequacy of the assessment of each species has been provided in other sections of this table.</p>
Chapter 5	Terrestrial: hydrological changes	<p>The potential impact of hydrological changes on vegetation communities and threatened species due to construction has not been assessed.</p> <p>The Flora and Fauna Division recommends including an assessment of the impact of hydrological changes on groundwater-dependent ecosystems and threatened species.</p>	Chapter 5 of the Supplement includes a number of avoidance measures for threatened species that rely on wetland habitats. These measures appear to be high level and include avoiding potential and known wetland habitats through micro-siting and amending the OHTL alignment. Specific advice for each species is provided below:

			<p>Habitat for <i>U. daviesae</i> will be buffered by 50m at four locations with potential habitat for the species. No further information on the revised alignment at those four locations has been provided in the Supplement. The Flora and Fauna Division notes that a 50m buffer is well below the minimum buffer (250m) recommended for medium and high value wetlands as per the Land Clearing Guidelines. In the absence of targeted surveys for <i>U. daviesae</i> (and other ecological information), the Division is unable to determine the value of the four areas of potential habitat or if a 50m buffer is sufficient to protect the values of those habitats.</p>
			<p>The Supplement proposes to avoid impacts to the hydrology of wetland habitat for <i>C. insolata</i> through the design and micro-siting procedure.</p> <p>Surveys undertaken by the proponent identified one area of potential habitat but no individuals were recorded. The proposed micro-siting procedures appears to be an appropriate mechanism for avoiding impacts to potential <i>C. insolata</i> habitat.</p>
			<p>The Supplement states that “<i>the OHTL route design will ensure that areas identified from fieldwork as being suitable habitat for Utricularia dunstaniae will not be disturbed. This will include avoiding any impacts to the hydrology of these habitat areas</i>”. Chapter 5 of the Supplement provides no further detail with respect to how the hydrology of habitat for <i>U. dunstaniae</i> will be retained.</p> <p>Further information is provided in Chapter 6 with the proponent committing to avoiding impacts to wetland habitats by ensuring that “<i>roads and</i></p>

			<p>crossings will adhere to Austroads, which is proven effective in mitigating impacts to surface water flows.”</p> <p>The Flora and Fauna Division support the proponent’s intent to maintain the existing hydrology of wetlands and watercourses but note that the specific hydrological requirements for habitats that support <i>U. dunstaniae</i> are unknown. Ideally, the Division would recommend that habitats potentially supporting this species are avoided and buffered in a manner that retains the natural hydrology of the wetland.</p>
			<p>Chapter 5 of the Supplement states: “<i>The Proponent has committed to not disturbing the Stylidium ensatum records within the OHTL and buffering them by 50 m, with possibly one exception. The spatial extent of the Alverly Rd patch of Stylidium ensatum is such that it may not be possible to completely span all plants. Consequently, some disturbance may be unavoidable on the eastern side of the patch, with the possibility of approximately 12 of the 420 plants recorded in that patch being lost.</i>”</p> <p>It is unclear how the proponent intends to avoid impacting the hydrology of <i>S. ensatum</i> habitats if access tracks are still constructed beneath the OHTL where wetlands areas are being spanned. This still needs to be clarified by the proponent and if access tracks are proposed through <i>S. ensatum</i> habitat, the risks to local hydrology will need to be re-assessed.</p>
Chapter 5 Section 5.5.4.9	Terrestrial: threatened flora	There is highly suitable habitat for <i>Stylidium ensatum</i> present within the OHTL corridor. The Department acknowledges the proponent’s recommendation to undertake surveys for <i>Stylidium ensatum</i> . Appropriate	The Supplement does not contain additional targeted survey results for <i>S. ensatum</i> . The proponent has provided an updated impact assessment noting that a small number (12 plants)

		<p>survey times for <i>Stylidium ensatum</i> are during the mid-late dry season when the plant is flowering/fruiting.</p> <p>Further evidence is required to support the statement: “it is unlikely that minor additional gaps in habitat will cause fragmentation into more populations”.</p> <p>The Flora and Fauna Division recommends that, following surveys, avoidance and minimisation measures should be implemented for this species. The mitigation measures outlined in Table 5-11 should consider avoidance where possible.</p>	<p>will be lost from a single patch. The Division is not satisfied that the proponent has addressed this comment.</p> <p>The proponent has not provided any further evidence to support the statement “it is unlikely that minor additional gaps in habitat will cause fragmentation into more populations”.</p> <p>The proponent commits to not disturbing existing <i>S. ensatum</i> records and buffering them by 50m. A 50m buffer is well below what is recommended for high and medium value wetlands in the NT. Medium and high value wetlands would typically support habitat for threatened species such as <i>S. ensatum</i>. It is recommended that the proponent revise the measures to avoid/mitigate impacts to potential habitat and <i>S. ensatum</i> patches.</p>
Chapter 5 & Appendix P-3	Terrestrial: threatened flora	<p>For <i>Helicteres macrothrix</i> the Flora and Fauna Division recommends:</p> <ul style="list-style-type: none"> Further substantiation is provided in the impact assessment for <i>Helicteres macrothrix</i> regarding impact of destruction/removal of plants/loss of habitat for criterion ‘Fragment the existing population into two or more populations’. <p>Targeted surveys for <i>Helicteres macrothrix</i> in the utilities corridor where potentially suitable habitat is modelled as occurring.</p>	<p>The proponent has re-aligned the route through Adelaide River to the east of the township which passes through land that is mapped as having a high likelihood of being suitable habitat for <i>H. macrothrix</i>. The Supplement does not included the results of targeted surveys for the species but instead proposes the following: “Notwithstanding application of the micro-siting procedure which should ensure that <i>Helicteres macrothrix</i> is not disturbed at all, the impact assessment presented below takes a precautionary approach and assumes that if the species is present within the final project footprint (and some degree of impact is unavoidable), it is also present in immediately adjacent habitat that is outside the footprint – in other words, any local occurrences of the species are not confined to the narrow OHTL Corridor.”</p>

			<p>This assessment is generally supported by the Division and if a patch does occur within the OHTL alignment, a small number of individuals could be impacted but the remainder of the larger patch would be intact. The Division supports the Proponent's commitment to micro-site the proposal to avoid occurrences of the species. If impacts to individuals are unavoidable (as stated in Table 5-26) this would be considered a significant residual impact and offsets should be considered.</p>
<p>Chapter 5 Section 5.5.4.10 & Section 5.5.5.3</p>	<p>Terrestrial: threatened flora</p>	<p>For <i>Typhonium praetermissum</i>, the Flora and Fauna Division recommends:</p> <ul style="list-style-type: none"> • Targeted surveys at the appropriate time of year to optimise detection to assess and contextualise the potential significant impacts on the <i>Typhonium praetermissum</i> at the subpopulation and species level. • Include the results of targeted survey in the supplementary EIS and assessment of significant impact on the population and species. • Provide information on whether the design of the OHTL footprint will be altered to avoid impacts on plants (or the proportion of individual plants) within the footprint. • Clarify proposed actions to mitigate impacts and minimise loss of plants within the footprint. • Clarify whether the project design will be modified to avoid the loss of <i>Typhonium</i> plants (75 individuals) and proposed mitigation actions if the plants are impacted. 	<p>The proponent has assessed the impacts to sub-populations against the criteria in the significant impact guidelines. The Flora and Fauna Division agrees with the proponent's conclusions in the assessment and considers that there is unlikely to be a residual significant impact to the species and important sub-populations.</p>

		Include and clarify the level of uncertainty in assessment of low risk of fragmentation.	
Chapter 5 Section 5.5.4.12	Terrestrial: threatened flora	<p>For <i>Cycas armstrongii</i>, the Flora and Fauna Division recommends:</p> <ul style="list-style-type: none"> Targeted surveys to identify the extent of high-density stands (>400 mature stems per hectare) within the project footprint and to assess the impact of removal on the broader population. Mature stems are considered all of those greater or equal to 50 cm in height. <p>Any proposed removal of plants should refer to the translocation guidelines for this species.</p>	<p>The proponent has not undertaken targeted surveys to identify high density stands of Darwin Cycad along the corridor alignment. The Supplement states that “all efforts will be made to minimise loss of the Darwin Cycad. This will be achieved through application of the Constraints Planning and Field Development Procedure (Appendix 4.1) to ensure that careful placement of pole pads avoid high-density patches and translocation.”</p> <p>High density patches are generally considered important as source populations for the species. Without targeted surveys it is unclear how high-density patches will be avoided if the proponent is unaware of where those patches occur. Likelihood modelling for the species is available for Gunn Point but does not appear to have been considered when planning the OHTL alignment through this area.</p> <p>To inform a better assessment of the proposal on this species, it is recommended that the proponent undertake targeted surveys to identify the location of high-density stands. The results of the surveys should inform the final alignment of the OHTL and provide an estimate of the area of high and low density habitat that will be impacted.</p>
Chapter 5 Section 5.5.4.13	Terrestrial: threatened flora	<p>For Darwin palm <i>Ptychosperma macarthuri</i>, the Flora and Fauna Division recommends:</p> <ul style="list-style-type: none"> Further substantiation is required on the impact assessment regarding impact of destruction/removal of plants/loss of habitat for 	<p>The Supplement states: “Kerrigan et al. (2006) identifies fire and disturbance by feral animals as limiting factors to plants reaching maturity, neither of which are likely to increase due to the project activities at this location”.</p>

		<p>criticon 'Fragment the existing population into two or more populations'.</p> <p>Targeted surveys are undertaken.</p>	<p>There are serious risks associated with the clearing of new infrastructure corridors and the spread of invasive flora. In particular, Gamba Grass and Mission Grass are highly invasive and a key threat to rainforest vegetation that supports <i>P. macarthurii</i>. The Division supports the development and implementation of a Weed Management Plan for the proposal. The Plan should be implemented in a manner that ensures invasive flora are not introduced or spread along the OHTL alignment into habitat for threatened species.</p>
<p>Chapter 5 Section 5.5.4.15</p>	<p>Terrestrial: threatened flora</p>	<p>For <i>Utricularia dunstaniae</i>, 'General fieldwork' rather than targeted surveys is not suitable for detecting this small and highly seasonal species, which responds directly to wet season rainfall.</p> <p>The Flora and Fauna Division recommends the following for <i>Utricularia dunstaniae</i>:</p> <ul style="list-style-type: none"> • Further substantiation is required on the impact assessment regarding impact of destruction/removal of plants/loss of habitat for criterion 'Fragment the existing population into two or more populations'. <p>Undertake targeted surveys for <i>Utricularia dunstaniae</i> in the appropriate flowering season (i.e. January-May).</p>	<p>The OHTL route has been designed to ensure that areas identified as being suitable habitat for <i>Utricularia dunstaniae</i> will not be disturbed. This will include avoiding any impacts to the hydrology of these habitat areas. It is unclear if these areas will be excluded from the construction of access tracks. It is noted in Chapter 6 that tracks may be constructed through wetland areas. It is recommended that the proponent provide a commitment to avoiding all sandsheet heath vegetation and potential habitat for <i>U. dunstaniae</i>.</p>
<p>Chapter 5 Section 5.5.4.16</p>	<p>Terrestrial: threatened flora</p>	<p>For <i>Cleome insolata</i>, 'General fieldwork' rather than targeted surveys is not suitable to detect this species.</p> <p>The Flora and Fauna Division recommends targeted surveys for <i>Cleome insolata</i> in the appropriate fruiting/seeding season (i.e. March-April).</p>	<p>Sites with the potential to support <i>C. insolata</i> were surveyed in September which is outside the fruiting/seeding season for the species.</p> <p>It is unclear what variables were used to re-assess the likelihood of occurrence and field verification surveys in February 2022 were outside the recommended</p>

			survey period for the species which may have influenced the detectability.
Chapter 5 Table 5-21	Terrestrial: significant vegetation	<p>The 'Avoidance' section of this table for 'Loss of vegetation and habitat' impact states that 'no significant vegetation types are contained within the Solar Precinct' followed by 'Micro-siting of transmission towers to avoid significant vegetation where possible'. It is unclear whether there is or is not significant vegetation within the Solar Precinct.</p> <p>The Flora and Fauna Division seeks clarification on whether or not there is significant vegetation within the Solar Precinct.</p>	<p>Refer to 5.12.2.65</p> <p>The proponent has responded stating that "<i>significant vegetation was not recorded within the solar precinct in the draft EIS</i>". A review of satellite imagery confirms that the precinct is unlikely to contain vegetation classified as "significant and/or sensitive" under the NT Land Clearing Guidelines. The precinct does not have wetlands, drainage lines or other features that would support these vegetation types.</p>
Chapter 5 Table 5-21	Terrestrial: vegetation clearing outside of approved boundary	<p>The 'Monitoring' section of this table for 'Loss of vegetation and habitat' impact states 'visual inspections during clearing is within approved boundaries. Results recorded, along with any photographs'.</p> <p>The Flora and Fauna Division recommends the area to be cleared for the Solar Precinct is clearly flagged and marked on-ground so that it is clear to contractors where to clear and avoid clearing beyond approved boundaries.</p>	<p>The proponent has committed to mitigate impacts to 'Loss of vegetation and habitat' and 'Loss of significant vegetation' by updating and incorporating the flagging and marking on-ground of clearing boundaries. This is so that it is clear to contractors where to clear and avoid clearing beyond approved boundaries</p>
Chapter 5 Table 5-21	Terrestrial: threatened species habitat	<p>The 'Avoidance' section of this table for 'Threatened species (restricted range)' impact states that 're-routing the access track to avoid local occurrences (if present)'.</p> <p>The Flora and Fauna Division recommends that any areas known to support threatened flora species be clearly flagged and signposted as 'no-go zones' for contractors to avoid.</p>	<p>Refer to: 5.12.2.65</p> <p>The proponent has committed to avoiding impacts to 'Threatened species (restricted range)' but flagging and sign posting areas known to support threatened flora species so contractors can avoid.</p> <p>The Flora and Fauna Division supports this commitment and recommends that the flagging of threatened species is undertaken by a suitably</p>

			qualified person with experience identifying threatened flora.
Chapter 5 Section 5.8	Terrestrial: threatened flora	The Flora and Fauna Division recommends that the potential for cumulative impacts on the <i>Typhonium praetermissum</i> sub-population and species population be clearly outlined.	<p>The Supplement includes a cumulative summary of the species from six localities including two new sub-populations. With exception of Murrumujuk and Noonamah North, all sub-populations will have less than 10% of the recorded plants lost due to the proposal. Impacts to the Murrumujuk sub-population are estimated to be 15.7% although this estimate is likely to be conservative as not all “high likelihood” habitat was surveyed in these areas.</p> <p>The proponent has assessed the impacts to sub-populations against the criteria in the significant impact guidelines. The Flora and Fauna Division agrees with the proponent’s conclusions in the assessment and considers that there is unlikely to be a residual significant impact to the species and important sub-populations.</p>
Appendix P-3	Terrestrial: threatened flora	<p>Records and potential habitat for <i>Acacia praetermissa</i> are found within the Pine Creek route deviation options.</p> <p>The Flora and Fauna Division recommends reassessing the impact of the proposal on <i>Acacia praetermissa</i> in the Supplementary EIS following route option decisions.</p>	<p>The proponent has re-assessed the potential impact for <i>A. praetermissa</i> and concludes that the proposed alignment is unlikely to significantly impact on the species. This is due to the alignment not being co-located where populations are known to occur.</p> <p>The proponent incorrectly asserts that there has been considerable survey for the species in the wider region and that the species is restricted to two occurrences along the Stuart Highway. There has been minimal survey effort for this species outside the easily accessible populations close to the Stuart Highway.</p>

			<p>While survey effort is limited, occurrences of <i>A. praetermissa</i> are generally associated with laterite and sandstone with the species preferring skeletal soils with some degree of slope. The alignment proposed in the Supplement follows the rail-line which avoids areas with sloping hills and ridges. Based on this alignment, the Division is satisfied that suitable habitat for the species will not be present and individuals are unlikely to be lost during construction.</p>
Appendix P-3	Terrestrial: threatened flora	<p>Records of <i>Typhonium taylorii</i> are found within 7 km of the project footprint and potential habitat is likely to exist in the Howard Sand Plains.</p> <p>The Flora and Fauna Division recommends reassessing the likelihood of <i>Typhonium taylorii</i> presence in the utilities corridor.</p>	<p>Targeted surveys for sandsheet heath species identified suitable habitat for <i>Typhonium taylori</i> along the OHTL corridor in and surrounding the project footprint. In subsequent surveys, a total of 386 individual plants confirmed to be <i>Typhonium taylori</i> were detected in two sandsheet heath patches, of which 153 individuals were recorded within the proposed footprint. <i>Typhonium taylori</i> is Endangered under the EPBC Act. The records are considered to be an important population due to its size and location on the edge of the species' geographic range.</p> <p>When assessed against the criteria in the NT Land Clearing Guidelines, the wetland habitat supporting the species is "High Value" and it is recommended that impacts are avoided and buffered by 250m.</p> <p>The Supplement proposes to avoid impacts to the species by deviating to the west out of the utilities corridor. The proposed change largely avoids direct impacts to individual plants but still requires clearing of vegetation within 50m of <i>T. taylori</i> habitat which</p>

			<p>may alter the local hydrology with unknown consequences.</p> <p>Impacts to the species and its habitat may be better avoided by planning the alignment along the original route but straddling the area of habitat between towers. Vegetation associated with the habitat is typically low to the ground and should not require clearing or maintenance. It is recommended that no tracks are installed through the <i>T. taylori</i> habitat.</p>
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Attachment 2 – Water Resources Division Comments

AA Powerlink Assets Pty Ltd – AA Powerlink Project

Government authority: Department of Environment, Parks and Water Security–Water Resources Division

Summary:

Section of Referral	Theme or issue	Comment
Appendix 6.1.	Solar Precinct Study – Draft water allocation plan area	Solar Precinct Groundwater Study states that the site is outside of a water allocation plan area and that water extraction applications will be assessed by the regulator on the basis of contingent water allocation rules of the <i>NT Water Allocation Planning Framework</i> (NTWAPF) (Sec 2.3, pg 11). This statement requires updating to acknowledge the Draft Georgina Wiso Water Allocation Plan (WAP) which was released for public comment in Nov 2022. The Solar Precinct falls within the Wiso Basin Water Management Zone of the plan area. The draft plan and any subsequent declared plan will establish the estimated sustainable yield and inform water availability considerations in making a water extraction licence decision.
Various	Mobile batching plants and extraction of water in plan areas	<p>Various supplementary documents make mention of possible mobile concrete batching plants along the OHTL route. It is not apparent in the documents that any detail has been provided regarding the location, water sources or water requirements of mobile batching plants.</p> <p>The proponent should note that the OHTL route traverses several water allocation plan areas, including the Georgina Wiso and Katherine Tindall plan areas.</p> <p>Groundwater is fully allocated in the Katherine Tindall water allocation plan area and is not available to support activities in this area.</p>
Chapter 6	Hydrology	The proponent's documented response to previous comments submitted by the Water Assessment Branch in regards to groundwater resources are considered acceptable for this stage of the project.
6.10.1.2	Groundwater to supply DCS	The location of the Darwin Converter Site overlies the Central management zone of the Howard Groundwater System. Groundwater in this resource is over-used indicating there is no water available to support water requirements.