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Our ref: DEPWS2022/0083

Lisa Bradley
Department of Environment, Parks and Water Security
GPO Box 3675
DARWIN NT 0801

Dear Ms Bradley

Re: Referral under the *Environment Protection Act 2019*- Middle Arm Sustainable Development Precinct

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

Flora and Fauna Division

The referral includes a report and draft terms of reference for a proponent initiated EIS to allow the potential impact of the program to be assessed. Staff from the Flora and Fauna Division have reviewed the referral report and the Terms of Reference. Detailed comments have been provided in the attached table found at Appendix 1.

In general, the draft Terms of Reference provide for a comprehensive assessment of potential impacts for most environmental factors, although it is not entirely clear how cumulative impacts will be assessed for such a large and long-term proposal. A number of recommendations relating to the terms of reference have been made within Appendix 1, to improve technical accuracy, required content and structure of the Environmental Impact Statement (EIS).

Water Resources Division

The Water Resources Division provides the following advice in relation to the Referral under the EP Act - Middle Arm Sustainable Development Precinct:

The proposed development is located in the Darwin Rural Water Control District; however is outside of a water allocation plan area.

Underlying the area is the Blackmore River (Middle Arm) East and Elizabeth River (East Arm) management zones of the Burrell Creek Formation. Water use in these zones is considered to be low.

The referral for a strategic assessment of the proposed Middle Arm Sustainable Development precinct contains a relevant summary of the groundwater and surface water environment which makes up the strategic impact assessment area. The referral identifies a range of additional hydrological studies and assessments that will be undertaken as part of the project.

As the project location is within the Darwin Rural Water Control District, any drilling activity will require a bore work permit.

As identified in the Middle Arm Sustainable Development Precinct Draft Program (January 2022), the project may require a surface water and/or groundwater extraction licence and/or a permit to interfere with a waterway.

The applicant has identified these requirements and committed to obtaining the relevant approvals post Strategic Environmental Assessment approval, as the hydrological studies and assessments are being developed in more detail.

The Terms of Reference (ToR) related to this project identifies all potential risks related to groundwater (and dependent environment) and provides adequate guidance on the matters/studies that should be addressed as a part of the EIS.

Rangelands Division
Weed Management Branch
Middle Arm Sustainable Development Precinct Referral Report. Table 6-1. Summary of preliminary assessment of potential impacts against the NT EPA's environmental factors and objectives. Terrestrial ecosystems.

The Weed Management Branch provide the following comments:

1. The proponent should acknowledge (*Environment Protection and Biodiversity Conservation Act 1999)* that the Key Threatening Process of the 5 listed grasses for most of the native species listed, not just the Threat Abatement Plan for the 5 listed grasses.

2. In the Regional priority weed species section of the table the proponent should include the Weed Plan's for Grader Grass, Bellyache bush and Neem as these species also occur in or near to the proposed development.

In conclusion to this letter, 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
A/Executive Director Rangelands

15 June 2022

APPENDIX 1 – Flora and Fauna Division comments DEPWS

Section of Referral/Draft Terms of Reference	Theme or issue	Comment
General comment	*Cumulative impacts*	It is not clear how cumulative impacts across the range of industries within the Precinct will be calculated, thresholds set and management implemented, including roles and responsibilities and pathways to identify causation. This is particularly important in the marine environment where detection of indirect impacts to sensitive receptors may experience a time lag. A clear statement should also be provided in the ToR on the expectations for consideration of the potential for cumulative impacts in the context of planned future development, for both the marine and terrestrial environments
ToR 2.6 implementation and assurance plan	Data management	Data management and sharing of data should include derived data such as models, with a clear process for adaptive management and corrective action and a section on how monitoring (or other) data will be used to ground truth and update models and allow cumulative impacts to be determined. Pathways to identify causation and allow corrective action needs to be clear and include roles and responsibilities.
ToR 3.2 Description of natural environment	Harbour	Mapped spatial data presented should differentiate observed data from modelled data. There are areas outside the harbour within the indicative zone of influence for which little data is available. The Vernon Islands in particular are a sensitive and important area for marine biodiversity, where gaps in knowledge exist particularly for the subtidal reefs, which may need to be filled to enable comprehensive impact assessment. The identification of benthic habitats should include the community function in addition to community type eg. filter feeders that have a role in improving water quality.
ToR 3.5.1 Terrestrial Environmental Quality	EIS structure	This section highlights the need to identify land uses and environmental values that could be directly or indirectly affected by impacts to the quality and integrity of land and soils. The impact and risk section includes assessment of the severity of impacts to surrounding land uses and identified environmental values. A more streamlined approach may be to present the information and justification defining the degree of change to environmental quality under this factor in the EIS, and present the impact assessment for the change to environmental values under the relevant factor (ie Marine Ecosystems for mangrove communities).
ToR 3.5.2 Terrestrial Ecosystems	Cumulative impacts	For cumulative impacts to be assessed, impacts to the values within the Strategic Assessment Area (SAA) needs to consider these values in context of the local and regional occurrence (as stated in the ToR) but also

		accounting for planned future development, such as that planned for both Weddell and the Greater Darwin Region.
ToR 3.5.5 – 3.5.7 – All factors under the Sea Theme	*Dredging*	The approach to dredging impact assessment should follow best practice informed by the guidance and recommendations of the NESP dredging node[1].
ToR 3.5.5 – 3.5.7 – All factors under the Sea Theme	*EIS structure*	Factors under the Sea Theme have a high level of interrelatedness and so are difficult to compartmentalise, making the production and review of an EIS based around themes sometimes repetitive and cumbersome. To structure the EIS with a better flow the Flora and Fauna Division propose that the ToR for this Strategic proposal recommends the adoption of the guidance from Western Australia on what information should be included for impact assessment for each factor in the EIS[2].
ToR 3.5.5 – 3.5.7 – All factors under the Sea Theme	*Impact assessment*	Spatial maps showing pre-impact vs modelled post-impact outputs should be provided next to each for comparison, and potentially a third map next to it that shows the net difference (where appropriate).
Referral Report Sea Theme Figure 1.1	*Zone of Influence*	We assume that the indicative strategic assessment area (figure 1.1) aligns with the modelled zone of influence (ZoI) in the marine environment. Although noted as indicative in the referral report, in the EIS clear justification should be given for the ZoI footprint and exclusion of any intertidal communities. Any differentiation between high, moderate or low ZoI will also require clear evidence-based justification.
Referral Report 5.7 Coastal Processes	Additional Studies	The two additional studies highlighted are coastal hydrodynamic and sediment transport impact modelling (local and regional scales) and dredge plume modelling. The sediment deposition and sediment transport modelling should be undertaken for both fine and coarse material and should be calibrated and validated to reflect local conditions. The EIS should at least report on the extent, deposited sediment thickness, time duration and fate of deposited sediments. It should also consider the potential for sediment to be remobilised after deposition. Plume modelling and sediment transport modelling should use 3D modelling techniques in conjunction with any additional available monitoring data.
ToR 3.5.5 Coastal processes	Information requirements	The descriptive and spatial information requested in the environmental values should also specify: - Geomorphology - Water levels - include mean sea level (MSL), mean low water (spring; MLW) and lowest astronomical tide (LAT) - Currents – in 3D

[1] https://wamsi.org.au/research/programs/dredging/

[2] https://www.epa.wa.gov.au/policies-guidance/sea

		Sediment Transport – including suspended solids and mobility
ToR 3.5.6 Marine Env Quality	Light availability	Changes to light availability at the seafloor needs to be included as a potential impact for the marine environmental quality factor. A model for light availability at the seafloor using relationships between Total Suspended Solids (TSS) and Light attenuation using parameters such as Particulate Inorganic matter, Particulate Organic matter and Colour Dissolved organic matter is required. As NTU is equipment dependent, a rationale on how this problem will be mitigated is required, so that NTU from one piece of equipment can be compared to another.
ToR 3.5.6 Marine Env Quality	Offsets	The identification of offsets for this factor seems misplaced. The significance of any residual water quality impacts would most likely be measured by their effect on (and interaction with) sensitive receptors, which are more likely to be identified and assessed under the Marine Ecosystem section.
Referral Report 5.9.4 Marine Ecosystems Additional studies	Definitions of ZoHI and ZoMI	Two zones of impact within the SAA will be assessed, Zone of High Impact (ZoHI) and Zone of Medium Impact (ZoMI). The classification of ZoI will depend on the ability of the area to recover from impact. Clarity should be provided on the length of impact contributing to the classification of an area of impact as recoverable, ie a system may theoretically be able to recover from an operational impact within 5 years of completion, however, if the activity operates for a long period (such as 30 years) is that recovery still likely given the potential degree of landuse/sea use change that may occur during that time. The ability to recover needs to be supported with evidence, and where there is uncertainty monitoring needs to be in place to deal with the uncertainty. A definition of what is considered to be recovered should also be provided, perhaps through criteria for recovery that can be monitored.
ToR 3.5.7 Marine Ecosystems	*Mitigation and management*	A biodiversity management plan should be included that provides overarching information on the tolerance of sensitive receptors to the range of variables likely to be impacted by the program, the thresholds, triggers and controls that will be put in place and details of how biodiversity will be monitored across the program. The plan should identify uncertainties around species tolerance(s) and outline how these uncertainties will be resolved.
ToR 3.5.7 Marine Ecosystems	Potential impacts and risks	Specific mention should be made to the impacts of land reclamation, which may be implied under enabling land based infrastructure. Currently the ToR highlights land reclamation under the Terrestrial Environmental Quality factor (section 3.5.1), with reference to impacts to the quality and integrity of land and soils, particularly referring to processes leading to contamination, sedimentation (erosion etc) and hydrological change. However, the underlying value (including the contribution to ecological processes) of the land being reclaimed also requires assessment under the marine ecosystems factor.