

DIRECTION TO PROVIDE ADDITIONAL INFORMATION IN THE SUPPLEMENTARY ENVIRONMENTAL REPORT (SER)

This direction is given under regulations 119(2) and 121(2) of the Environment Protection Regulations 2020

Name of proposed action	HMAS Coonawarra - Dredging and Dredged Material Management
Proponent	Australian Government Department of Defence
NT EPA reference	EP2022/012
Description of proposed action	<p>Capital dredging works comprising:</p> <ul style="list-style-type: none"> • campaign one - up to 101,000 m³ of dredge material • campaign two – up to 116,000 m³ of dredge material, to occur 2 to 3 years after the first campaign • nearshore discharge of dredged material near HMAS Coonawarra in Darwin Harbour and land based disposal at Darwin Port. <p>Ongoing maintenance dredging at HMAS Coonawarra in the order of 10,000 to 15,000 m³ once every 5 to 7 years and nearshore discharge of dredged materials near HMAS Coonawarra in Darwin Harbour.</p>
Nature of proposed action	Coastal and marine
Method of environmental impact assessment type	Assessment by Supplementary Environmental Report (SER)
Direction	<p>The proponent is directed to:</p> <ul style="list-style-type: none"> • address all the submissions (received in relation to the referral information) in the SER • provide additional information in the SER as detailed in Attachment 1.
Submission period for SER	The SER must be submitted to the NT EPA within 12 months of the date of this Direction.
Form	<p>The SER must generally conform with the Web Content Accessibility Guidelines (WCAG) 2.0 Level AA and material relevant to creating accessible documents on the NT Government website.</p> <p>In particular, the SER must:</p> <ul style="list-style-type: none"> • be provided as: <ul style="list-style-type: none"> ○ accessible PDF files that do not exceed 20 MB ○ a printed copy to be displayed at the locations listed below • be divided into two parts: <ul style="list-style-type: none"> ○ a main report (with summary available as separate document) ○ appendices to the main report

NOTICE OF DIRECTION

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- have a navigable table of contents
 - present information in format that is easy to follow
 - use hyperlinks to assist with navigation through the document.
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The SER must be:

- provided electronically to the NT EPA for publishing on the NT EPA webpage public register
 - published electronically on the proponent's webpage and maintained for the duration of the proposal
 - provided in printed hard copy for display at the following locations during the public consultation submission period:
 - NT EPA, Level 1, Arnhemica House, 16 Parap Road, Parap
 - Northern Territory Library, Parliament House, Darwin
 - Environment Centre NT, Unit 3, 98 Woods Street, Darwin
 - Northern Land Council, 45 Mitchell Street, Darwin.
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Person authorised to give direction

Dr Paul Vogel AM – Chairperson, Northern Territory Environment Protection Authority.

Delegate of the NT EPA under section 36 of the *Northern Territory Environment Protection Authority Act 2012*.

Signature



Date of direction

14 October 2022

Attachment 1 – Table of additional information to be included in Supplementary Environmental Report

Environmental Factors	Comment	Additional Information Required
SEA		
Marine ecosystems	<p><u>Benthic habitats and communities</u></p> <p>The proposed dredging and dredge spoil disposal¹ is likely to impact benthic habitats and communities within the predicted zone of influence, directly due to removal, and indirectly due to short-term water quality changes (suspended sediment concentrations and turbidity levels) and sediment deposition.</p> <p>The proponent used a predictive benthic habitat mapping tool developed by the Department of Environment, Parks and Water Security in 2019 to determine the potential impacts of the action on physical and biological benthic habitats within a local and regional context, including seagrass, hard corals, macroalgae, filter feeder and bare seafloor habitats.</p> <p>Site specific mapping of benthic habitats and communities was not undertaken for the referral. Therefore, a comparison of modelled results against field based survey results within the predicted zone of influence has not been undertaken to validate (ground truth) the modelled predictions. The NT EPA considers that benthic habitat survey and mapping is require to increase the level of confidence in predicting the potential significant impacts of the proposed action.</p> <p>During nearshore disposal of dredge spoil (1-2 month duration), benthic communities within the zone of influence would be exposed to increased suspended sediment concentrations and reduced light availability and quality, potentially leading to stress and mortality. Therefore, there is a need to understand the TSS</p>	<p><u>Benthic habitats and communities</u></p> <p>Include the following additional information in the SER:</p> <ol style="list-style-type: none"> 1. Provide details of the proposed timing, methods and reporting to undertake a baseline marine field survey of benthic habitats and communities to: <ol style="list-style-type: none"> a. collect underwater video transect data at a sufficient density to produce comprehensive mapping (at an appropriate scale) of the extent of benthic habitats within the predicted zone of impact and zone of influence (see point 2 below). b. identify and describe the type and spatial extent (with consideration of temporal/seasonal variation) of benthic substrates and biota within the zone of impact and zone of influence c. provide sufficient ground-truth data to assess the accuracy of the DEPWS predictive benthic habitat model through comparison against predictive mapping. 2. Confirm that benthic habitat survey and classification would be undertaken in accordance with the following guidance: <ol style="list-style-type: none"> a. National Environmental Science Program Field Manuals for Marine Sampling to Monitor Australian Waters b. National Intertidal/Subtidal Benthic (NISB) Habitat Classification Scheme c. Collaborative and Annotation Tools for Analysis of Marine Imagery and Video (CATAMI) classification scheme. 3. Confirm that comprehensive benthic habitat mapping would be overlain with property boundaries, the nearshore discharge location, the predicted extent of the sediment plume dispersion and deposition effects, and depth contour lines for lowest astronomical tide (LAT), mean low water springs (MLWS), mean low water neaps (MLWN) and mean sea level (MSL). 4. Provide detail about how the results of the benthic survey and mapping would be taken into account for each dredging action, using an adaptive management approach. Include detail about how potential impacts (related to sediment deposition, suspended sediment,

¹ The proposed action is on Commonwealth land which is not subject to Northern Territory law under section 52(2) of the Australian Constitution. The proposed action was referred to the Northern Territory Environment Protection Authority (NT EPA) under the *Environment Protection Act 2019* (EP Act) due to the potential for significant environmental impact within areas of NT jurisdiction. The NT EPA's assessment process and the additional information direction is only relevant for potentially affected areas that are within NT jurisdiction.

Environmental Factors	Comment	Additional Information Required
	<p>(mg/L) /turbidity (NTU) – light intensity relationship at the seafloor to assist with setting appropriate turbidity triggers for benthic communities and primary productivity.</p>	<p>turbidity and benthic light levels) on sensitive benthic communities and habitats (corals, seagrass, macro algae and filter feeders where presence is confirmed during field surveys) would be managed. Include detail about how benthic impacts from dredge spoil disposal would be monitored and measured, and the expected duration of recovery periods where impacts are predicted or observed (informed by the revised hydrodynamic model – refer to item below).</p> <p>5. Confirm that the draft Dredging and Disposal Management Plan to reflect any necessary changes arising from points 1-4 above.</p>
<p>Marine environmental quality</p>	<p><u>Hydrodynamic model</u></p> <p>The proponent developed a two-dimensional (depth-averaged) hydrodynamic model in the ‘Eulerian’ Delft3D-FLOW modelling package, with suspended sediments modelled using the ‘Lagrangian’ ‘random walk’ particle tracking module, Delft3D-PART.</p> <p>The NT EPA understands that three dimensional (3D) modelling is considered best practice in most marine environments in order to predict dredging impacts to hydrodynamics, plume and sediment transport. The Western Australian Marine Science Institution (WAMSI) Dredge Science Node Guideline on dredge plume modelling for environmental impact assessment discusses 2D vs 3D hydrodynamic modelling to allow for accuracy and certainty in the assessment of impacts of changes in current strength to benthic communities; sediment transport along the seafloor, and plume density within the water column.</p> <p>Further justification should be provided to support use of the 2D model (with random walk particle tracking) for the prediction of sediment plume, transport and deposition impacts from the proposed dredging. The justification should provide information to support the decision not to use a 3D model. The justification should describe how sediment transport within ambient settings and after sediment is deposited from dredge spoil or sediment plumes is addressed by the modelling.</p>	<p><u>Hydrodynamic model</u></p> <p>Additional information is required in the SER to improve confidence in the hydrodynamic model outputs, results, and impact predictions, and to assess the significance of potential impacts of suspended, deposited and remobilised sediments on the marine environment.</p> <ol style="list-style-type: none"> 1. Provide a detailed justification with information to support the use of a 2D hydrodynamic model for the prediction of dredging impacts from the proposal. 2. Provide details and sources of the baseline data (including from field observations) that has been used in development, calibration and validation of the model to predict and validate the extent of the plume, including any plume validation data available from previous HMAS Coonawarra dredging monitoring programs. Describe how the baseline and model input data used are consistent with the requirements of the WAMSI Dredge Science Node Guideline on dredge plume modelling for environmental impact assessment (specifically sections 3, 4 and 5 of the guideline). Confirm that the timing of baseline data collection corresponds to the time of year that dredging is proposed to occur. As a guide, if dredging is proposed in the dry season/build-up, data should be provided for a minimum of 28 days. If in the wet season, data should be provided for 6-8 weeks (i.e. to capture at least two monsoonal events). Provide the baseline data as part of the information response to this Direction (either from existing or new site specific monitoring). 3. Describe how the following has been considered in development of the model and the prediction of impacts: <ol style="list-style-type: none"> a. the composition of TSS b. how TSS concentration data correlates to turbidity (NTU) level data at the proposed monitoring locations (including the two additional locations – refer to item below) c. the relationship between suspended sediment and light availability and quality at the seafloor.

Environmental Factors	Comment	Additional Information Required
	<p>Further information should be provided to describe how the transport and fate of sediments (coarse and fine) has been quantified and modelled, and how sedimentation rates and implications for water quality (TSS and turbidity) and benthic communities and habitats has been assessed.</p> <p>Describe how the modelling allows for determination of the susceptibility of marine and benthic values and sensitivities to sedimentation and the suitability of the proposed water quality trigger levels that would be applied during dredging to avoid significant impacts.</p> <p>The models should be calibrated and verified by comparing modelled results against field based measurements.</p> <p>The revised modelling and setting of trigger values should be informed by the outcomes of the benthic habitats and communities survey and mapping (refer to item above).</p>	<ol style="list-style-type: none"> 4. 5. Revise the monitoring program to include two additional sites as recommended by DEPWS; one along the western side of the Fannie Bay sand bank, as this lies in the major axis of most dredge plume modelling outputs; and at Bennet Shoal, which is likely to contain benthic primary producer habitats. 6. Review the proposed trigger values (TSS <20mg/L in dry season and <30mg/L in wet season) and the 1:1 TSS/turbidity (NTU) correlation, that would initiate a management response during nearshore spoil disposal and include triggers for time duration of exceedances for specific benthic communities including corals, seagrass, macro algae and filter feeders (where presence is confirmed during field survey). Interim triggers should be established from baseline TSS, turbidity and benthic light level data with consideration of the WAMSI Dredge Science Node research reports on ecological thresholds and environmental windows at https://www.wamsi.org.au/dredging-science-node/dsn-reports. As an example, in the case that only dry season site-specific data is available, this should be cross referenced with established guideline values (for the benthic communities present) in the WAMSI data, to establish interim guideline values for the wet season, which could be used until sufficient site-specific wet season monitoring data is available. In the case that existing site-specific seasonal baseline monitoring data is not currently available, the proponent should first obtain data for the season in which the initial dredging works are proposed to be undertaken. 7. Describe how sediment deposition modelling has been developed, including for fine and coarse material and report on the time duration, magnitude and extent of deposition, the deposited sediment thickness, and the fate of deposited sediments. Describe how the model has been designed, calibrated and validated to assess impacts related to sediment behaviour, transport pathways, fate, and deposition. 8. Demonstrate through survey, monitoring and modelling results that the proposed site for nearshore disposal is suitable for the avoidance of potential significant impacts to marine ecosystems. 9. Review and update the Draft Dredging and Disposal Management Plan to reflect any necessary changes arising from points 1-8 above.