Schedule 1 – Additional information requested

| ltem | Comments and Required Actions | RIA Response |
|------|--|---|
| 1. | Stakeholder: EPA Services Date of comment: 4 April 2025 To assist with condition setting and map generation, can you please: 1) Confirm if the Wharf_area _250204 shape file includes the "buffer 7 m to 125 m around the proposed marine infrastructure which encompasses the potential impacts from the halo effect" as outlined section 7.5 of the Environmental Supporting document (supporting doc). 2) Subject to the outcome of 1), combine the following shape files into one (ZoHI) file which can be applied for maps and condition setting: • Wharf_area _250204 • Dredge_area_250204 • Zone_High_Influence_250204 In preparing this shape file, please confirm that the modelled direct (permanent) impact to seagrass remains 1.98 ha. Note – If it is determined that Wharf_area _250204 does not include the appropriate buffer, as outlined in section 7.5 of the supporting doc, this file must be amended. | Rottnest Island Authority has undertaken edits as requested to shape files provided, and confirms that this aligns with section 7.5 of the supporting document therefore the supporting document will not be updated. Shapefiles were provided to Kane Jackson (Environmental Officer , Infrastructure Assessment Branch) via email dated 15 April 2025. |
| | Please ensure this is rectified as soon as possible. | |
| 2. | Stakeholder: EPA Services Date of comment: 7 April 2025 Additional information is required to provide the decision maker with confidence that the modelling of BCH and specifically seagrass recovery within the ZoMI is accurately presented. This information should be included in section 7. 5the supporting document. It is not appropriate to reference documents that are not readily available for review or included in the public review package. This update to the supporting doc can be included with the response to submission due 28 April 2025 – I've included the assessment timeline email to avoid confusion. | Please see memo titled South Thomson Bay Barge Landing Development – Response to ongoing assessment feedback (RPS) dated 23 April 2025 that responds to this query (Attachment 1). |
| 3. | Stakeholder: RecFishWest Date of comment: 7 April 2025 | The DEMMP includes monitoring and management measures to manage turbidity and monitor seagrass health. |
| | Implementation of stringent controls to manage turbidity plumes and seagrass disturbance to ensure minimal disruption to the surrounding marine ecosystem and the fishing opportunities that they underpin. | The South Thomson Barge Landing Development will incorporate opportunities for recreation fishing into the detailed design of the facility and aim to not diminish the current fishing access or amenity. The careful |
| | We do not object to the proposed South Thomson Development Barge Landing project, provided that: • Fishing access is maintained from the groyne and any associated new rock groynes. | planning for the segregation of public access to this operational area will consider the safety of users, including fencing, lighting and accessibility for fishing. Wheelchair accessible facilities are not planned in Stage 1 of the |

| Recreational fishing opportunities are enhanced through the inclusion of lighting and freshwater availability. Wheelchair access is considered under the new proposal. | development, with no specialised structures proposed in the creation of the barge landing. Stage 2 of the development includes structures such as a small craft landing and ferry berth, and RIA will look to include design for all access recreational fishing. |
|---|---|
| | Please refer to the attached map (Attachment 2) that identifies existing wheelchair accessible fishing locations at Rottnest which are located at the Main Jetty and Fuel Jetty. Fishing access (non-wheelchair accessible) proximal to the project site is also available at Stark Jetty and the Hotel Jetty (see Attachment 2) and it is also noted that fishing is permitted from the nearby beaches at Thomson Bay and also across Rottnest excent in Sanctuary zones |
| Date of comment: 14 April 2025 | The South Thomson Barge Landing Development will consider all access recreational fishing opportunities as part of the Stage 2 development. |
| Recfishwest strongly recommended all ability fishing platforms are incorporated into the final design for the proposal and are willing to assist in the design of these platforms. | |
| Stakeholder: DPIRD Date of comment: undated | The following points are noted in response to these items: Marine and fishing groups including Recfishwest, BoatingWA, UWA, WADDL Reef life AMCS Pew Trust and Save our Seas were included as |
| DPIRD consider itself a 'relevant person' and is seeking to be consulted in relation to the proposal. Key points:It is recommended consultation be undertaken with peak fishing bodies in WA including Recfishwest, the | stakeholders in the public consultation that RIA undertook in March 2024. No response was received during that consultation. See Table 25 of the |
| Western Australian Fishing Industry Council and Western Rock Lobster Council. Consultation should also be undertaken with the Whadjuk People in relation to potential customary fishing interests in the area. The consultation should be aimed at assisting with reducing negative impacts on fish resources, aquatic habitats and fisheries. | ERD. Recfishwest provided a submission dated 7th April 2025 and also 14th April 2025, and RIA has responded regarding the recreational fishing opportunities. See response under item 3 |
| Consultation with Recfishwest could include consideration of maintained and safe access for recreational fishers upon completion of works. To minimise impacts in the case of a marine maritime emergency or oil spill it is recommended contingency | Traditional Owners were included as a stakeholder and significant consultation was conducted between 2018 to 2024. Fishing activities by Aboriginal people was discussed in the 2019 Ethnographic Report (see Appendix Macfabra 500) |
| Plans be developed and implemented to assist with a prompt response to potential incidents during the construction phase that include pre and post monitoring programs. It is recommended management plans are developed and implemented aimed at reducing the risk of pest and aquatic diseases. DPIRD advocates for best practice biofouling management, where biofouling is kept to a | A Spill Prevention and Response Plan is included as Appendix V of the ERD. The various management plans (CEMP, DEMMP, OEMP) include measures to reduce the biosecurity risks. |
| minimum to mitigate the risk of harbouring marine pests and disease. Note: Please ensure this information is forwarded directly to all vessel operators associated with the project. In addition, project planning should consider impacts once the barge landing has been completed aimed at | Vessel operators have been included as a stakeholder. Once constructed, RIA will monitor the accumulation of seawrack and any changes to the existing coastal processes. The aim of the monitoring is to |
| reducing seawrack accumulation and if possible, for this accumulation to be in a location where it can remain on the shoreline as upon re-entering the ocean it becomes a food source for both juvenile fish and aquatic invertebrates. | ensure the new facility performs as the existing facility, and where there are changes that contingencies are in place (such as wrack removal or other means) to manage the wrack accumulation |
| Stakeholder: BoatingWA | The following points are noted in response to these items: |
| Date of comment: 14 April 2025 | • Marine and fishing groups including Recfishwest, BoatingWA, UWA, WADDI, Reef life, AMCS, Pew Trust and Save our Seas were included as |
| Key points: | stakenolders in the consultation that RIA undertook in March 2024. No response was received during that consultation. See Table 25 of the ERD. Recfishwest, being a similar stakeholder to BoatingWA, provided a |

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- BWA places the highest priority on preserving the marine environment and safeguarding the future of recreational boating in WA. BWA does not consider adequate consultation on the proposal has occurred and strongly recommended our feedback be incorporated into the final design for the proposal.
- Our recommendations build on the possibilities made possible by the proposal to construct a Barge Landing facility. The Army Groyne has always been a favored land-based fishing spot and the recent collapse of the concrete jetty has denied fishers one of the better fishing spots on the island. By incorporating fishing platforms into the proposal, it will re-establish the social connection to this important location and once again enable elderly fishers or those with disabilities to connect with the Island.
- Our recommendation to divert traffic "inland" through a new road will improve public amenity and safety by removing the need for all dangerous, unattractive and space taking vehicles from travel through the Settlement and along the Thomson Bay foreshore.
- Our recommendation to retain the existing boat ramp would serve as an "Emergent facility" for boats in distress and allow boats leaking fuel or taking on water to be quickly removed from the water preventing likely environmental issues from occurring.
- Boating WA have not been advised about plans for the existing barge area and would hope RIA consult with us to ensure any proposals for this area can provide benefit for all stakeholders.

response to the current round of consultation, dated 7th April 2025 and also 14th April 2025. See response under item 3. RIA considers that an adequate level of consultation has therefore been undertaken.

- The South Thomson Barge Landing Development will incorporate • opportunities for recreation fishing into the detailed design of the facility and aim to not diminish the current fishing access or amenity. The careful planning for the segregation of public access to this operational area will consider the safety of users, including fencing, lighting and accessibility for fishing. Wheelchair accessible facilities are not planned in Stage 1 of the development, with no specialised structures proposed in the creation of the barge landing. Stage 2 of the development includes structures such as a small craft landing and ferry berth, and RIA will look to include design for all access recreational fishing. Please refer to the attached map (Attachment 2) that identifies existing wheelchair accessible fishing locations at Rottnest which are located at the Main Jetty and Fuel Jetty. Fishing access (non-wheelchair accessible) proximal to the project site is also available at Stark Jetty and the Hotel Jetty (see Attachment 2) and it is also noted that fishing is permitted from the nearby beaches at Thomson Bay and also across Rottnest except in Sanctuary Zones.
- Regarding traffic, one of the main objectives of the South Thomson Barge Landing Development is to reduce the traffic along Thomson Bay and through the settlement, by moving the barge landing area from its current central location and providing options for alternative traffic routes. The recommendation to divert traffic "inland" through a new road is under consideration, together with options to make changes to existing roads to improve public amenity and safety. The options for "inland" roads must take into consideration many factors including the road geometry considerations, bus routes / stops, other infrastructure development, ecological sensitive areas, culturally sensitive areas, and areas of heritage significance.
- The existing boat ramp, will be impacted by the construction of the South Thomson Barge Landing Development. The future viability of the existing boat ramp or a replacement boat ramp will be considered in the detailed design. Boats in distress are currently assisted via emergency management communication lines such as Sea Rescue, RIA Rangers, Police which are always available. It is noted that the existing boat ramp has not been used for any boats in distress in recent years.
- A Spill Prevention and Response Plan is included as Appendix V of the ERD.
- RIA will consider the need for consultation in relation to the future use of the existing barge landing area.

The ERD and all of its appendices has considered all of these potential impacts, assessing the impacts and identifying the residual risks with mitigation and/or management measures where applicable. Cumulative

| The Proposal will produce residual environmental impact The Proposal will directly impact a range of conservation significant species The Proposal will add to the cumulative impacts to Wadjemup. Outcomes sought. The Proposal presents a range of complex environmental risks, including those relating to: Residual loss of habitat for conservation significant species. Impacts from dredging on benthic habitat and water quality. Impacts from increased human activity in the Proposal area. | impacts were also considered. The information is presented in the following sections of the ERD: Residual loss of habitat for conservation significant species – Sections 7, 10, 11 and 12. Impacts from dredging on benthic habitat and water quality – Section 7. Impacts from increased human activity in the Proposal area – Section 13. Impacts from increased human activity on Wadjemup – Section 13. Increased risk for the introduction of marine pest species – Section 7. |
|---|--|
| Impacts from increased human activity on Wadjemup. Increased risk for the introduction of marine pest species. Impacts from increased light pollution. Risk from pollution incidents. Risk of mobilisation of existing contamination in sediments. Cumulative risk to the marine and terrestrial habitats of Rottnest Island. | Impacts from increased light pollution – Sections 12 and 13. Risk from pollution incidents – Sections 7, 9 and 10. Risk of mobilisation of existing contamination in sediments – Section 9. Cumulative risk to the marine and terrestrial habitats of Rottnest Island – Section 17. Given the substantial amount of related information already presented in the ERD, there is not considered to be any need for further assessment of these points. |
| Stakeholder: DoT Date of comment: 14 April 2025 Key points: The Environmental Supporting Document refers to monitoring of wrack and sediment accumulation in the CHRMAP and OEMP. The proposed coastal processes monitoring program in the CHRMAP and OEMP has been reviewed. It is recommended that additional quantitative pre-and post-construction survey monitoring of sediment and wrack accumulation is undertaken on both sides of the proposed facility. It is also recommended that the methods, timing, extents and responsible authority for the monitoring are made clear in a table or similar. In the CHRMAP, Section 7.1.2 new structures that are part of the facility and provide coastal protection (e.g. breakwaters) are recommended to be added to the RIA's asset management and structural inspections program. In the CHRMAP it is recommended that the proposed design life of the facility is included and considered. In the CHRMAP it is recommended to consider the influence coastal hazards may have on the design of the breakwater e.g. how far back do the breakwaters need to extend shoreward to ensure sufficient protection from coastal erosion. In the CHRMAP it is recommended to consider how coastal inundation will change following construction of the facility, e.g. the facility/road may provide an inundation entry point through the existing dunes. | The following points are noted in response to these items: Additional quantitative post construction survey monitoring will include photo monitoring of seagrass and wrack on the west side of the structure in addition to the east side of the structure. Photo monitoring requirements are outlined in Appendix B3 of the OEMP. The South Thomson Barge Landing Development will be included in the asset management plan for Maritime Assets and will include regular inspections of the assets. Table 4 of the ERD includes information about the design life, which will be 50 years, as per AS4997 –2005 recommendation for a normal commercial structure. all elements will be designed to meet the appropriate design life, remaining fit for use for its intended purpose with appropriate maintenance. Section 2.4.1 of the CHRMAP has considered the impacts of coastal erosion. |
| Stakeholder: EPA Services Date of comment: 16 April 2025 Benthic Communities and Habitats 3.71 hectares of benthic communities and habitats, including 2.62 hectares of seagrass, will be subject to (recoverable) loss within the Zone of Marine Influence (ZoMI). The proponent has applied Baird (2024b) to determine that impacts to these benthic communities and habitats will be recoverable within five years | See response to item 2. |

| | following the completion of dredging activities. | |
|----|--|---|
| | Currently, the supporting document is not suitable for an assessment of the ZoMI. It does not provide the | |
| | decision maker with sufficient confidence that the assessment of the ZoMI accurately models the recoverable | |
| | impacts of the proposal. | |
| | | |
| | Requirement: | |
| | Additional information is required to provide the decision maker with confidence that the modelling of BCH | |
| | and specifically seagrass recovery within the ZoMI is accurately presented. | |
| 9. | Stakeholder: EPA Services | Section 2.6 of the OEMP will be updated to include information pertaining to |
| | Date of comment: 16 April 2025 | EPA's EQMF. |
| | | |
| | Marine Environmental Quality | It is considered that monitoring for physico-chemical parameters is not |
| | The EPA Technical Guidance for Protecting the Quality Western Australia's Marine Environment (EPA 2016) sets | required on the basis that there is no impact pathway that requires |
| | out the EPA's Environmental Quality Management Framework (EQMF) to protect the following environmental | monitoring of temperature, salinity, nutrients etc. The only physical |
| | values: | parameter potentially impacted during operations (through vessel activity) is |
| | • Ecosystem Health | SSC, which is already being monitored at every site and compared against |
| | • Fishing and aquaculture | reference sites |
| | Recreation and aesthetics | DIA considers that the constant of the colling data is not as with does not write |
| | Industrial water supply | RIA considers that two years of baseline data is not required as no waste |
| | • Cultural and spiritual. | discharges during operations are expected. However, prior to construction |
| | | establishing a more reduct baseline. Results will also be compared to |
| | Currently there is no reference to the EQMF in the OEMP. EPA guidance (EPA 2016) recommends water quality | reference site data and the appual monitoring that informs the Bottnest |
| | indicators for monitoring should be based on pressures to the ecosystem from the proposal. The UEINP | Island Marine Conservation Action Plan will also provide applicable reference |
| | currently does not include monitoring of physico-chemical parameters. Baseline surveys identified the | data |
| | presence of PPOS in marine sediments. The DEMP also does not currently include monitoring for PPAS. | |
| | It is noted that haseline data does not meet the 2-year baseline data recommendation in the FPA (2016) | Regarding PFAS in sediments, as outlined in Table 25 of the ERD and also |
| | guidance. | Section 8.1 of the contamination assessment report (Appendix H of the ERD), |
| | | there is not considered to be any risk to human health or the environment |
| | Recommendation: | from PFAS in sediment/water and as such management measures are not |
| | See Operational Environmental Management Plan (OEMP) for details. | considered to be required. |
| | The DEMMP does not include monitoring that will be undertaken in the event maintenance dredging is | It should be noted that there are two separate activities that will manage |
| | required. | seagrass/wrack adjacent to the facility as follows: |
| | | Regular wrack/sediment removal from the beach using an excavator, |
| | Recommendation: | subject to the monitoring regime as outlined in the OEMP. This material will |
| | See Dredge Environmental Monitoring and Management Plan (DEMMP) for details. | be disposed onto the shoreline to the east of the structure which will not |
| | | intersect with the fairy tern exclusion area. Please see the proposed |
| | | disposal area in Attachment 2 . |
| | | Maintenance dredging of the vessel turning circle via dredging equipment is |
| | | estimated to be undertaken every 5 years according to estimates prepared |
| | | by Baird. |
| | | |

| | | Regarding maintenance dredging for the vessel turning circle, as outlined in the ERD, a Maintenance Dredging Framework will be prepared prior to these activities being undertaken that will outline dredging frequency, volumes and disposal options. This framework is dependent on the monitoring regime that will be undertaken for sediment and wrack within the vessel turning circle. Whilst Baird provided an estimated volume and frequency for sediment and wrack removal on the east side of the facility, it is noted that this was a desktop-based estimate. It is therefore considered prudent for the Maintenance Dredging Framework to be based upon accurate site-based information that will be collected during the monitoring program. Disposal of dredge spoil would not be onto the beach east of the facility and would most likely be via a Sea Dumping Permit that would be obtained prior to dredging occurring. |
|-----|--|--|
| .0. | Stakeholder: EPA Services Date of comment: 16 April 2025 | Appendix B2 of the CEMP will be updated to reflect the stated best practice guidelines Zones will be updated to cover TTS and the observation zone will |
| | | be expanded to reflect the nominal 250m distance. Attachment 3 includes |
| | Marine Fauna | the updated table and figure outlining these distances. |
| | Transport 2023): | |
| | • Shutdown Zone: based on the potential for Temporary Threshold Shift (TSS). When marine fauna is sighted | |
| | within or appears to enter the shut-down zone, piling or dredging activities must be stopped as soon as reasonably practical. | |
| | Observation Zone: movement of animals is monitored to determine if they are approaching or entering a shutdown zone. For marine mammals the observation zone is based on a nominal 250m distance from the outer edge of the shutdown zone. | |
| | • Current designated shutdown zones for marine fauna, as outlined in the CEMP, do not align with the temporary | |
| | threshold shift (TTS) limits to prevent auditory injury to marine low frequency whales and dolphins during | |
| | hammer piling. | |
| | Recommendation: | |
| | See Construction Environmental Management Plan (CEMP) for details. | |
| 1. | Stakeholder: EPA Services | Please refer to the memo titled South Thomson Bay Barge Landing |
| | Date of comment: 16 April 2025 | Development – Response to ongoing assessment feedback (RPS) dated 24 April 2025 that responds to the query about Fairy Terns (Attachment 1). |
| | Coastal Process & Marine Fauna | |
| | The environmental supporting document identifies that there is "the natural jetty at Phillip Point is an important | Regarding sediment disposal activities, as outlined in the response to item 9, |
| | roosting site for Australian fairy terns", and that 'breeding may occur between October and March with peak | there are two separate activities that will manage seagrass/wrack adjacent to |
| | breeding between December and January' (p. 113 of the supporting doc). It is noted that if sediment is removed | the facility as follows: |
| | during operations to mitigate impacts of the proposal to coastal processes that 'the removed sediment will be | Regular wrack/sediment removal from the beach using an excavator, |
| | placed onto the shorelines east of Thomson Bay between Army Groyne and Philip Point to mimic natural | subject to the monitoring regime as per the OEMP. This material will be |
| | processes' (p.85 of the supporting doc; p. 75 of the OEMP). It is unclear in the environmental supporting | disposed onto the shoreline to the east of the structure which will not |
| | document (or OEMP) whether fairy tern roosting or breeding sites may intersect with sediment disposal activities | intersect with the fairy tern exclusion area. Please see the proposed |
| | and be at risk of indirect impacts. | disposal area in Attachment 2 . |

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| | Requirement: Provide further information to demonstrate whether and how potential indirect impacts to roosting or breeding fairy terns from sediment disposal activities have been considered and would be avoided. Ideally provide a map showing sediment disposal locations and exclusion zones to further demonstrate how impacts would be avoided. | Maintenance dredging of the vessel turning circle via dredging equipment would be undertaken every 5 years according to estimates prepared by Baird. A Maintenance Dredging Framework will be prepared prior to this activity being undertaken that will outline dredging frequency, volumes and disposal options. Disposal would not be onto the beach east of the facility and would most likely be via a Sea Dumping Permit. |
| 12. | Stakeholder: EPA Services | Please see response to item 10. |
| | Date of comment: 16 April 2025 | |
| | construction Environmental Management Plan (CEWP) | |
| | Marine FaunaRequirementNoting comments in Marine Fauna (above) and to ensure consistency with (Dept. of Infrastructure and Transport2023), amend the CEMP to ensure Exclusion or Shutdown Zones include the entire TTS Limit during hammerpiling. | |
| 13. | Stakeholder: EPA Services | Appendix B.2.5 of the OEMP will be updated to include the correct details. |
| | Date of comment: 16 April 2025 | RIA confirms that the guadrat method will be used and data analysis used to |
| | | compare control and impact sites |
| | Operational Environmental Management Blan (OEMD) | |
| | Operational Environmental Management Plan (OEMP) | |
| | Seagrass Monitoring There appears to be an error in the OEMP in relation to seagrass monitoring. Section B.2.5 describes a method for data analysis (the line intercept method) which is inconsistent with the method described in Section B.2.4 (based on quadrats). | |
| | Requirement | |
| | Amend the OEMP to confirm whether the line intercept method or quadrats will be used to monitoring seagrass | |
| | Data analysis should be based on comparisons between "impact" and reference sites to ensure that any impacts | |
| | from the exercise of the proposal seggrass health can be detected | |
| | Nom the operation of the proposal seagrass health can be detected. | |
| | Dequirement | riedse see response to item 9. |
| | | |
| | Noting comments in Marine Environmental Quality (above), update the OEMP to include: | |
| | • EQMF tramework and monitoring for the "Ecosystem Health" environmental value recognised in the EPA's | |
| | Technical Guidance Protecting the Quality of Western Australia's Marine Environment. | |
| | Monitoring for physico-chemical parameters in accordance with EPA's Technical Guidance Protecting the Quality | |
| | of Western Australia's Marine Environment for high level of ecological protection areas. | |
| | Periodic monitoring of PFAS in marine sediments | |
| 14. | Stakeholder: EPA Services | Please see response to item 9. |
| | Date of comment: 16 April 2025 | |
| | · | |
| | Dredge Environmental Monitoring and Management Plan (DFMMP) | |
| | Requirement | |
| | <u>nequirement</u> | |

| | Noting comments in Marine Environmental Quality (above), update the DEMMP to include: a maintenance dredging monitoring and management framework in accordance with <i>Technical guidance</i> - <i>Environmental Impact Assessment of Marine Dredging Proposals</i> (EPA 2021). | |
|-----|---|---|
| 15. | Stakeholder: EPA Services | As confirmed by EPA Services (Tonja Boyd, A/Manager, Infrastructure |
| | Date of comment: 16 April 2025 | Assessments) on 22 April via email, no changes to the titles of these |
| | | management plans is required. |
| | <u>General</u> | |
| | | |
| | Update the CEMP and OEMP to include "monitoring" in the title. | |
| | Construction Environmental Monitoring and Management plan | |
| | Operational Environmental Monitoring and Management plan. | |

Attachment 1



MEMO

| Date: | 28 April 2025 |
|------------|--|
| To: | EPA Services; Department of Water and Environmental Regulation Rebecca |
| From: | Dawson / Jeremy Fitzpatrick |
| Pages: | 7 inc. this page |
| Regarding: | South Thomson Bay Barge Landing Development comments |

South Thomson Bay Barge Landing Development – Response to ongoing assessment feedback

The South Thomson Development Barge Landing Project was referred to the Environmental Protection Authority (EPA) on 23 August 2024 (Assessment Number: 2487), with a determination of 'Assess -Additional Assessment Information (public review)' made on 16 September 2024. The EPA has provided a request for further information on the referral. This memorandum has been prepared to address the request for further information as outlined in Table 1.

Table 1: EPA comments and required actions

| EPA comment | Required action |
|--|--|
| 3.71 hectares of benthic communities and habitats, including 2.62 hectares of seagrass, will be subject to (recoverable) loss within the Zone of Marine Influence (ZoMI). The proponent has applied Baird (2024b) to determine that impacts to these benthic communities and habitats will be recoverable within five years following the completion of dredging activities. Currently, the supporting document is not suitable for an assessment of the ZoMI. It does not provide the decision maker with sufficient confidence that the assessment of the ZoMI accurately models the recoverable impacts of the proposal <u>Requirement</u> | The further information and assessment provided in this memo is based on our review of the Baird (2025) modelling report and further interpretation of relevant literature. Some information is provided to further clarify the rationale underpinning the prediction of recoverability of seagrasses in the moderate effect zone. The assessment of impacts on the perennial <i>Posidonia</i> seagrass meadows in the area affected by the dredging, was based on modelled zones of effect from the dredging. Direct loss (death) primarily through direct removal or burial by infrastructure was accounted for as the ZoHI and was shown to be an acceptably low percentage of the perennial seagrasses in the LAU. Modelling of impacts to seagrasses in the area surrounding the ZoHI, which may be subject to a range of indirect moderate effects, confirmed there will only be a temporary impact on the seagrasses within the conservative buffer around the modelled high impact zone, applied to account for unknowns and proximal sedimentation. Further rationale behind the predicted extent of seagrass impacts within the ZoMI and assumption that the seagrasses will fully recover within 5 years, is presented below and in Further Information Section 1. |
| Additional information is required to provide the decision maker with confidence that the modelling of BCH and specifically seagrass recovery within | • The area of seagrass affected to a sub-lethal level by shading (turbidity and sedimentation) is highly conservative in the original assessment and the ZoMI exaggerates the area of moderate effect by adding a buffer to the modelled moderate impact zone. |
| the ZoMI is accurately presented. | • The most frequent spikes in suspended sediment concentrations were inshore of the dredge area in areas of sandy seabed where no seagrass is present. |
| | • Thresholds used for <i>Posidonia</i> spp. seagrass were drawn from local studies relevant to Perth metro waters and are highly conservative in that they are instantaneous whereas to have an impact on the seagrass, |



Regarding:

Date:

OFFICIAL 07 April 2025 South Thomson Bay Barge Landing Development comments

| | shading must be sustained e.g. Said et al. (2024). See Further Information Section 1.2. |
|--|--|
| | The modelling showed no exceedance of the ZoMI thresholds outside the dredge footprint (ZoHI). A conservative buffer was added to account for uncertainty in the model, but the level of shading is low (only intermittent exceedance of thresholds) and no <i>Posidonia</i> loss (death) is predicted within the ZoMI. |
| | "Loss" or "recoverable loss" in the Zone of Moderate Impact (ZoMI) refers to short-term, energetic impacts including reduced productivity, potentially leading to lower shoot numbers if sustained, but not death of seagrass or long-term effects on meadow integrity or ecosystem health. |
| | • Seagrasses such as <i>Posidonia</i> with well-developed rhizome reserves will recover once the light regime and photosynthetic rate return to normal, and via nutrient transfer from adjacent parts of the meadow (Libes and Boudouresque 1987). |
| | Loss of 0.08 ha of seagrass associated with temporary construction moorings was included in the ZoMI; however, these moorings will be placed to avoid seagrass and therefore will have no impact on seagrasses. |
| | Resistance to, and recovery from, sub-lethal impacts, particularly short-term decreases in productivity, are documented for <i>Posidonia</i> which relies on its rhizome stores to buffer such events. Studies that have shown serious loss of seagrass due to shading, have applied very severe shading (<10% surface irradiance, which is below the compensation irradiance and therefore too low to sustain photosynthesis at a higher rate than respiration) for long periods (weeks-months) without breaks (e.g. Fitzpatrick and Kirkman 1995; Gordon et al. 1992). In contrast the Barge Landing works will cause only intermittent low-level reductions in light interspersed with periods of normal light regime. The <i>Posidonia</i> will recover from the non-lethal effects of intermittent, low-level shading within the ZoMI in less than 5 years as stated. Collier et al |
| | (2009) estimated 3-5 years for recovery from shading (light reduction) where <i>Posidonia</i> seagrasses were exposed to moderate to heavy shading but where shoot density was not significantly reduced. |
| The environmental supporting document identifies that the "the natural jetty at | Response provided in Section 2 of this memorandum and management measures summarised below: |
| Phillip Point is an important roosting site for Australian fairy terns", and that | The OEMP will be updated to include the following measures to ensure impacts to the Fairy Tern are mitigated and managed: |
| 'breeding may occur between October and March with peak breeding between December and January' (p. 113 of the supporting doc). It is noted that if sediment is removed during operations to mitigate impacts of the proposal to coastal processes that 'the removed sediment will be placed onto the shorelines east of Thomson Bay between Army Groyne and Philip Point to mimic natural processes' (p.85 of the supporting doc; p. 75 of the OEMP). It is unclear in the environmental supporting document (or OEMP) whether fairy tern roosting or breeding sites may intersect with sediment disposal activities and be at risk of indirect impacts. <u>Requirement</u> | During the breeding period between October and March, an Exclusion Zone will be implemented around the Fairy Tern aggregation and breeding site at Phillip Point. This exclusion zone encompasses a 200m buffer from the last recorded breeding attempt of the Fairy Terns at Phillip Point (Figure 5) and extends up to existing disturbance areas (e.g. buildings and roads). To avoid disturbance of breeding or roosting Fairy Terns, wrack/ sediment from the project site will not be disposed on the shoreline within the Exclusion Zone (Figure 5) between October and March. A site visit by an experienced ornithologist will be conducted prior to any shoreline disposal in the Exclusion Area prior to October or after March to confirm the terns are not breeding in this area. Prior to commencing sediment disposal on beaches outside the Exclusion Zone during the October to March breeding period, a site visit by an experienced ornithologist will be conducted to confirm that the target area is not being actively used by Fairy Terns. |
| demonstrate whether and how potential indirect impacts to roosting | |



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or breeding fairy terns from sediment disposal activities have been considered and would be avoided.

 Ideally provide a map showing sediment disposal locations and exclusion zones to further demonstrate how impacts would be avoided

Source: EPA correspondence 4/4/2025

FURTHER INFORMATION

1. BENTHIC COMMUNITIES AND HABITATS

1.1 Impacts on seagrass

A small area of *Posidonia* seagrass will be removed (permanently lost) in the area to be dredged. This is the area of direct effect. The plume of suspended sediments generated by dredging is not predicted to cause additional permanent loss of seagrass outside this area of direct effect. The dredge modelling report (Baird 2025), predicted that the only locations where suspended sediment concentrations repeatedly exceeded the thresholds for high impacts to seagrass (irreversible loss = ZoHI if sustained at >20 mg/L), sat within the dredge footprint itself. Intermittent light reduction and minor sedimentation over the seagrass outside the area of direct effect is not predicted to have any long-term effects. Further, no additional seagrass loss is predicted due to temporary construction vessel moorings as these will be placed outside seagrass meadows.

The area modelled as the zone of moderate impacts to seagrass (recoverable effects = ZoMI if sustained at >10 mg/L) was similarly constrained to the dredge area. A conservative buffer was added to the modelled ZoMI but no lasting effects are predicted in that buffer area because thresholds are unlikely to be exceeded for a sustained period. This means the dredge plume related impacts are predicted to be very localised and would not extend beyond the area where a small area of seagrass would be removed by the dredge. This supports the prediction that the level of impact in the ZoMI is limited to a highly localised and recoverable decrease in the productivity of *Posidonia* seagrass with possibility of some recoverable shoot loss towards the end of the campaign.

1.2 Suitability of modelled ZoMI

Said et al. (2024) on behalf of WAMSI collated expert opinions from WA seagrass scientists. One finding of the review was that the while the standard ZoMI approach applies useful thresholds, the duration of time for which seagrass species can survive under reduced light conditions and the recovery time, are equally important and this is relevant to management of pressures over a period of time e.g. from dredge plumes. Experiments have shown that seagrass species can survive below their minimum light requirements for some time, however, the duration over which seagrasses can survive under reduced light conditions depends greatly on the species and seagrasses such as *Posidonia* spp. with rhizome stores survive longer. A study of the relevant literature indicated that consistent severe shading for 3-4 weeks does not have lethal affects but sets a nominal "maximum allowable pressure duration" until more empirical data are available (conservative effect threshold).

Given the low volumes of dredging, the short dredging campaign duration (7.5 weeks), open coastal setting and analogues from nearby areas of similar ecological sensitivity, the model presents a reliable prediction of the extent of impacts. The uncertainties in the model input parameters were accounted for by applying very conservative buffers around the modelled effect zones.



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The modelled extent of the ZoMI mirrored other modelling and effect zone predictions completed in the region in support of environmental approvals, which is appropriate given the similarities between the programs. In determining the thresholds and associated boundaries of the zones of impact from the predicted sediment plume, Baird used similar parameters and thresholds to those adopted at Port Beach (BMT 2021) due to similarities between the project methodologies and environments. The Port Beach dredging campaign was an order of magnitude greater volume than the Barge Landing campaign, lending additional conservatism to the Baird model. A comparison of the dredging methodology for the Thomson Bay Barge Landing and Port Beach projects is provided in the table below, along with a discussion of the similarities between the projects.

Comparison of the Rottnest Barge Landing (Baird) and Port Beach (BMT) dredge methods

| Description | | | Discussion | | |
|--------------------------------|--|---|--|--|--|
| | Baird | ВМТ | | | |
| Dredge design | Volume: 16,000 m ³ Dredge depth: -3.0 CD Timeframe: 7.5 weeks Excavation rate: A target production rate of 302 m ³ /day. | Volume: 150,000 m ³ Total dredging duration modelled: 8.5 weeks. | The dredged volume of the proposal is much smaller than the Port Beach project. The Port Beach dredging campaign is proposed for an additional week to that of the proposal. | | |
| Dredge materials | Sediment only contained no, or a small percent of, clay and silt. The majority of the material comprised coarse sand with some gravel. | Sediment had small percent of clay and silt, with the majority of the material being coarse/medium sand. | Both projects comprise the proposed dredging of sand/coarse sand. The Barge Landing sediments have lower fines content and are less likely to create plumes as they will settle faster. Similar settling rates were used | | |
| Seagrass species present | Posidonia australis Posidonia sinuosa Amphibolis sp. Halophila ovalis | <i>Amphibolis</i> spp. <i>Posidonia</i> spp. <i>Halophila</i> spp. Zosteraceae | Similar seagrass suite with perennial, habitat forming species present | | |

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2. COASTAL PROCESS AND MARINE FAUNA

Philip Point is a highly dynamic site, where sand accumulation and erosion is influenced by storm waves and swells throughout the year. In years of high sand accumulation, the habitat is potentially suitable for Australian Fairy tern breeding.

Fairy Tern breeding may occur at Phillip Point between October and March, with peak breeding between December and January. RPS' Senior Marine Scientist Claire Greenwell is a leading authority on the Australian Fairy Tern and has confirmed that the terns have nested on the sand spit at Philip Point, but not always successfully. Fairy terns shift breeding sites regularly, depending on habitat and food availability. The two breeding attempts listed below are the first such records from Philip Point since Claire Greenwell has been keeping records. In the seven years prior, they have used other sites.

- On 15 November 2024, 178 breeding pairs were recorded (C. Greenwell, unpub. data). However, two separate low-pressure systems led to inundation of the colony, resulting in complete breeding failure.
- The remnants of a colony were located at Philip Point in November 2023. Breeding adults were present at the site, but eggs were found to be partially buried suggesting inundation or burial due to strong winds (C. Greenwell, pers. comm.).

Sand management (such as the proposed placement of wrack/sediment to the east of the development envelope) in the lead up to the summer breeding period may help to improve habitat by ensuring the site is sufficiently wide and elevated to support any possible future nesting attempts or roosting by the Australian Fairy Tern (C. Greenwell, pers. comm.).

The following measures will be included in an updated version of the OEMP to ensure impacts to the Fairy Terns at Phillip Point from operation of the proposal are avoided:

- During the breeding period between October and March, an Exclusion Zone will be implemented around the Fairy Tern aggregation and breeding site at Phillip Point. This exclusion zone encompasses a 200 m buffer from the last recorded breeding attempt of the Fairy Terns at Phillip Point (Figure 5) and extends up to existing disturbance areas (e.g. buildings and roads).
- To avoid disturbance of breeding or roosting Fairy Terns, wrack/sediment from the project site will not be disposed on the shoreline within the Exclusion Zone (Figure 5) between October and March.
- A site visit by an experienced ornithologist will be conducted prior to any shoreline disposal in the Exclusion Area prior to October or after March to confirm the terns are not breeding in this area.
- Prior to commencing sediment disposal on beaches outside the Exclusion Zone during the October to March breeding period, a site visit by an experienced ornithologist would be conducted to confirm that the target area is not being actively used by Fairy Terns.



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Figure 1 Proposed exclusion zones

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REFERENCES

Baird. 2025. South Thomson Bay Barge Development; Dredge Plume Modelling Assessment

BMT. 2021. Port Beach Sand Nourishment via Dredging - Environmental Review Document . .

Collier C. J., Lavery, P. S., Ralph, P. J., & Masini, R. J. 2008. Physiological characteristics of the seagrass *Posidonia sinuosa* along a depth-related gradient of light availability. *Marine Ecology Progress Series*, 353, 65–79. <u>http://www.jstor.org/stable/24871883</u>.

Collier C. J., Lavery, P. S., Ralph, P. J., & Masini, R. J. 2009. Shade-induced response and recovery of the seagrass *Posidonia sinuosa*. *Journal of Experimental Marne Biology and Ecology*, 370, 89-103.

Fitzpatrick J. & Kirkman H. 1995. Effects of prolonged shading stress on growth and survival of seagrass *Posidonia australis* in Jervis Bay, New South Wales, Australia. *Marine Ecology Progress Series* 127. 279-289. 10.3354/meps127279.

Gordon D.M., Grey K.A., Chase S.C., Simpson C.J. 1992. Imposed in situ shading and recovery in a *Posidonia sinuosa* seagrass meadow in Princess Royal Harbour, Western Australia. Environmental Protection Authority Technical Series No 35, Perth

in2Dredging. 2023. Dredging Budget and Schedule Estimates

Libes M., & Boudouresque C.F. 1987. Uptake and long-distance transport of carbon in the marine phanerogam *Posidonia oceanica*. *Marine Ecology Progress Series* 38:177-186.

Said N., Webster, C., Dunham, N., Strydom, S., McMahon, K. 2024. Current state of knowledge for dredging and climate change impacts on seagrass ecosystems to inform environmental impact assessment and management. A case study: Cockburn Sound and Owen Anchorage. Prepared for the WAMSI Westport Marine Science Program. Western Australian Marine Science Institution, Perth.

Statton J., McMahon K.M., Armstrong P., Strydom S., McCallum R., Kendrick G.A., Lavery P.S. 2017. Determining light stress bio-indicators and thresholds for a tropical multi-species seagrass assemblage. Report of Theme 5 - Project 5.5.1 prepared for the Dredging Science Node, Western Australian Marine Science Institution, Perth, Western Australia.

Strydom, S., McMahon K.M., Kendrick G.A., Statton J., Lavery P.S. 2017. Short-term Responses of *Posidonia australis* to Changes in Light Quality. *Frontiers in Plant Science*, 2018. - Vol. 8.

Webster C., Said, N., Dunham, T., Bywater, A., Strydom, S., McMahon, K. 2024. Resilience of seagrass *Posidonia sinuosa* is negatively affected by high levels of burial of dredged material. Prepared for the WAMSI Westport Marine Science Program, 2024.

Attachment 2





The Rottnest Island Authority does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

Attachment 3

Table B1: Marine Fauna - Observation and Exclusion Zones (Based on Tetra Tech 2024, impact hammer piling scenario – worst-case scenario for PTS and TTS, Vibratory Piling for Behavioural distance)

| Species | Impact TTS distance limit | Impact PTS distance limit | Impact behavioural response | Vibro-piling TTS distance limit | Vibro-piling PTS distance limit | Vibro-piling behavioural distance limit | Observation Zone | Exclusion Zone |
|--|------------------------------|---------------------------------|-----------------------------------|---------------------------------------|---------------------------------------|---|---------------------|-------------------|
| Whales (low frequency cetaceans) | 404 | 73 | 84 | 19 | - | 167 | 850 | 600 |
| Toothed whales (mid-frequency cetaceans) | 36 | - | 84 | - | - | 167 | 600 | 300 |
| Dolphin (high- frequency cetaceans) | 500 | 73 | 84 | - | - | 167 | 850 | 600 |
| Australian sea lion and New Zealand furl seal (Otariids pinnipeds) | 25 | - | 84 | - | - | 167 | 600 | 300 |
| Turtles | 30 | 3 | 37 | - | - | - | 400 | 150 |

