s. 22(1)(a)(ii)

From: s. 47F(1) @dbca.wa.gov.au>
Sent: Wednesday, 12 May 2021 4:57 PM
To: s.22(1)(a)(ii)
Subject: RE: Ningaloo Coast World Heritage Advisory Committee Consultation: Recfishwest Exmouth Deepwater Artificial Reef [SEC=OFFICIAL]

Attention: Sea Dumping Section, Environment Approvals Division, Department of Agriculture, Water and the Environment

Dear s.22(1)(a)(ii)

Thank you for the recent discussion in relation to my previous email below and Rechfishwest's request to obtain a copy of the Committee's advice forwarded to the Sea Dumping Section (Exmouth Deepwater Artificial Reef proposal). The Committee has discussed options available. Upon review of the initial correspondence sent to the Sea Dumping Section I notice that the Committee did state that under current Terms of Reference, they do not provide advice direct to proponents, however welcome early consultation with proponents to ensure the outstanding universal value (OUV) is considered within the project proposal. I apologise if this was not clear at the time of receiving the letter.

For the Committee to work within the current Terms of Reference, the Committee does not provide advice direct to proponents, whether in full or by summary. Where the Committee has provided the advice direct to the regulatory agency, it would be at the discretion of the regulator and their current consultation/assessment process obligations as the whether the proponent would receive a copy of the advice provided by the Committee. The Committee's preference would be that only details relevant to the proponent be provided and any non-relevant information such a government processes, placement of committee advice and other correspondence directed at the regulatory agency be omitted when providing details to the proponent.

The Committee will respond to Rechfishwest to reiterate the Committee's Terms of Reference and current position on the provision of advice direct to proponents. The Committee will also reiterate its appreciation for early consultation by proponents for any proposal relevant to the Ningaloo Coast World Heritage property to ensure the OUV is considered.

Please let me know if you have any other queries or would like any further details.

Many thanks

s. 47F(1)

Ningaloo Coast
Department of Biodiversity, Conservation and Attractions
Parks and Wildlife Service | Exmouth District
PO Box 201, Exmouth, Western Australia 6707
s. 47F(1) @dbca.wa.gov.au
s. 47F(1)

NINGALOO COAST
WORLD HERITAGE

Ngarnurra nhuna nhugurarrima Baiyungu, Thalanyji and Yinikurtura ganyarajarri thanardi ngarrari

We acknowledge Baiyungu, Thalanyji and Yinikurtura People as the original custodians of the land and water we manage

From: s. 47F(1) @dbca.wa.gov.au>
Sent: Monday, 3 May 2021 1:53 PM
To: s.22(1)(a)(ii) @awe.gov.au>
Subject: Re: Ningaloo Coast World Heritage Advisory Committee Consultation: Recfishwest Exmouth Deepwater Artificial Reef

Dear s.22(1)(a)(ii)

The Ningaloo Coast World Heritage Advisory Committee is seeking advice from DAWE in relation to the Recfishwest Exmouth Deepwater Artificial Reef proposal. Rechfishwest has engaged with the Committee and requested a copy of the committee advice provided to DAWE, please see the email thread attached with the Committee's initial response to Rechfishwest.

In line with the Committee's terms of reference, the Committee does not directly provide advice to proponents, only direct to regulatory agencies. I understand NOPSEMA provide proponents with copies of advice from stakeholders during the consultation process. Is this a similar process with DAWE and assessment or permit approvals? Would it be appropriate for the Committee to suggest Rechfishwest contact DAWE for a copy of the advice? Any advice on this matter would be greatly appreciated.

Many thanks

s. 47F(1)

Ningaloo Coast
Department of Biodiversity, Conservation and Attractions
Parks and Wildlife Service | Exmouth District
PO Box 201, Exmouth, Western Australia 6707
s. 47F(1) @dbca.wa.gov.au
s. 47F(1)

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From: s. 47F(1)
Sent: Wednesday, 10 February 2021 7:34 PM
To: andrew.mcnee@awe.gov.au
Cc: s.22(1)(a)(ii) @awe.gov.au>
Subject: RE: Ningaloo Coast World Heritage Advisory Committee Consultation: Recfishwest Exmouth Deepwater Artificial Reef

Dear Mr McNee,

Please find attached recent correspondence from s. 47F(1) Ningaloo Coast World Heritage Advisory Committee in relation to the Recfishwest Exmouth Deepwater Artificial Reef proposal. The Committee appreciates the opportunity to consult with the Sea Dumping Division on this matter. Should you have any queries please let me know.

Many thanks
s. 47F(1)

s. 47F(1)

Ningaloo Coast
Department of Biodiversity, Conservation and Attractions
Parks and Wildlife Service | Exmouth District
PO Box 201, Exmouth, Western Australia 6707
s. 47F(1) @dbca.wa.gov.au
s. 47F(1)

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From: s.22(1)(a)(ii) @awe.gov.au>
Sent: Wednesday, 13 January 2021 8:41 AM
To: s. 47F(1) @dbca.wa.gov.au>
Cc: Sea Dumping <Seadumping@environment.gov.au>; s.22(1)(a)(ii) @environment.gov.au>
Subject: RE: Ningaloo Coast World Heritage Advisory Committee Engagement [SEC=OFFICIAL]

[External Email] This email was sent from outside the department – be cautious, particularly with links and attachments.
s. 47F(1)

Further to my last, updating the most appropriate person to contact with regard to the Recfishwest Exmouth Deepwater Acritical Reef will be the delegate for that decision, our branch head (who is currently acting as First Assistant Secretary), Andrew McNee. His details are below.

Confirming that the best approach to Recfishwest is via their public inbox/website and that I'm unable to release specific applicant contact details.

Andrew McNee
Acting First Assistant Secretary
Environment Approvals Division
Department of Agriculture, Water and the Environment
Email: Andrew.mcnee@awe.gov.au

Regards,

s.22(1)(a)(ii)
Assistant Director
Sea Dumping Section
Environment Assessments Queensland and Sea Dumping
Environment Approvals Division
Department of Agriculture, Water and the Environment
s.22(1)(a)(ii) **E:** s.22(1)(a)(ii) @environment.gov.au

From: s. 47F(1) @dbca.wa.gov.au>
Sent: Tuesday, 12 January 2021 6:52 PM
To: s. 22(1)(a)(ii) @awe.gov.au; s. 22(1)(a)(ii) @awe.gov.au
Subject: Ningaloo Coast World Heritage Advisory Committee Engagement

Hi s. 22(1)(a)(ii)

Thanks for taking the time to discuss matters this morning, relating to sea dumping and decommissioned infrastructure nearby the Ningaloo Coast World Heritage Area. As discussed the Ningaloo Coast World Heritage Advisory Committee is interested in engaging with the Sea Dumping Division on matters such as this. The Committee would like to write to your division, could you please provide details for the most appropriate contact.

I would also like to give the Committee the option to get in touch with Rechfishwest in relation to the RTM integrated artificial reef proposal, given Rechfishwest had previously tried to contact the Committee but was unsuccessful, could you please also provide these details.

I will be in touch shortly once I have passed on all information to the Committee.

Many thanks

s. 47F(1)
s. 47F(1)
Ningaloo Coast
Department of Biodiversity, Conservation and Attractions
Parks and Wildlife Service | Exmouth District
PO Box 201, Exmouth, Western Australia 6707
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Department of Biodiversity, Conservation and Attractions
GOVERNMENT OF WESTERN AUSTRALIA

PARKS AND WILDLIFE SERVICE

We're working for Western Australia.

s.22(1)(a)(ii)

From: s. 47F(1) @dbca.wa.gov.au>
Sent: Monday, 3 May 2021 1:53 PM
To: s. 22(1)(a)(ii)
Subject: Re: Ningaloo Coast World Heritage Advisory Committee Consultation: Recfishwest Exmouth Deepwater Artificial Reef
Attachments: RE: Exmouth Deepwater Artificial Reef - Invitation to Consult

Follow Up Flag: Follow up
Flag Status: Completed

Dear s.22(1)(a)(ii)

The Ningaloo Coast World Heritage Advisory Committee is seeking advice from DAWE in relation to the Recfishwest Exmouth Deepwater Artificial Reef proposal. Rechfishwest has engaged with the Committee and requested a copy of the committee advice provided to DAWE, please see the email thread attached with the Committee's initial response to Rechfishwest.

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Many thanks

s. 47F(1)
s. 47F(1)
Ningaloo Coast
Department of Biodiversity, Conservation and Attractions
Parks and Wildlife Service | Exmouth District
PO Box 201, Exmouth, Western Australia 6707
s. 47F(1) @dbca.wa.gov.au
s. 47F(1)

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Cc: s.22(1)(a)(ii) @awe.gov.au>
Subject: RE: Ningaloo Coast World Heritage Advisory Committee Consultation: Recfishwest Exmouth Deepwater Artificial Reef

Dear Mr McNee,

Please find attached recent correspondence from s. 47F(1) , Ningaloo Coast World Heritage Advisory Committee in relation to the Recfishwest Exmouth Deepwater Artificial Reef proposal. The Committee appreciates the opportunity to consult with the Sea Dumping Division on this matter. Should you have any queries please let me know.

Many thanks
s. 47F(1)

s. 47F(1)
Ningaloo Coast
Department of Biodiversity, Conservation and Attractions
Parks and Wildlife Service | Exmouth District
PO Box 201, Exmouth, Western Australia 6707
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s. 47F(1)

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Department of Biodiversity, Conservation and Attractions
PARKS AND WILDLIFE SERVICE
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Sent: Wednesday, 13 January 2021 8:41 AM
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Cc: Sea Dumping <Seadumping@environment.gov.au>; s.22(1)(a)(ii) @environment.gov.au>
Subject: RE: Ningaloo Coast World Heritage Advisory Committee Engagement [SEC=OFFICIAL]

[External Email] This email was sent from outside the department – be cautious, particularly with links and attachments.
s. 47F(1)

Further to my last, updating the most appropriate person to contact with regard to the Recfishwest Exmouth Deepwater Acritical Reef will be the delegate for that decision, our branch head (who is currently acting as First Assistant Secretary), Andrew McNee. His details are below.

Confirming that the best approach to Recfishwest is via their public inbox/website and that I'm unable to release specific applicant contact details.

Andrew McNee
Acting First Assistant Secretary
Environment Approvals Division
Department of Agriculture, Water and the Environment
Email: Andrew.mcnee@awe.gov.au

Regards,

s.22(1)(a)(ii)
Assistant Director
Sea Dumping Section
Environment Assessments Queensland and Sea Dumping
Environment Approvals Division
Department of Agriculture, Water and the Environment
P: s.22(1)(a)(ii) **E:** s.22(1)(a)(ii) @environment.gov.au

From: s. 47F(1) @dbca.wa.gov.au>
Sent: Tuesday, 12 January 2021 6:52 PM
To: s.22(1)(a)(ii) @awe.gov.au; s.22(1)(a)(ii) @awe.gov.au
Subject: Ningaloo Coast World Heritage Advisory Committee Engagement

His. 22(1)(a)(ii)

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I would also like to give the Committee the option to get in touch with Rechfishwest in relation to the RTM integrated artificial reef proposal, given Rechfishwest had previously tried to contact the Committee but was unsuccessful, could you please also provide these details.

I will be in touch shortly once I have passed on all information to the Committee.

Many thanks

s. 47F(1)
s. 47F(1)
Ningaloo Coast
Department of Biodiversity, Conservation and Attractions
Parks and Wildlife Service | Exmouth District
PO Box 201, Exmouth, Western Australia 6707
s. 47F(1) @dbca.wa.gov.au
s. 47F(1)

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Department of Biodiversity, Conservation and Attractions

PARKS AND WILDLIFE SERVICE

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s.22(1)(a)(ii)

From: s. 47F(1) @recfishwest.org.au>
Sent: Thursday, 29 April 2021 6:58 PM
To: s. 47F(1)
Cc: s. 47F(1)
Subject: RE: Exmouth Deepwater Artificial Reef - Invitation to Consult

[External Email] This email was sent from outside the department – be cautious, particularly with links and attachments.
Hi 47F(1)

Thank you for your response, I understand that proposals of this nature can take some time to consider. We appreciate the Ningaloo Coast World Heritage Advisory Committee for their time in considering our proposal for the Exmouth Deepwater Artificial Reef.

As Recfishwest is a community-based Not-For-Profit, could the NCWHAC please provide the advice submitted to DAWE?

Thanks again and happy to discuss further if you have any questions.

Kind regards,

s. 47F(1)

recfishwest

Suite 3, 45 Northside Drive, Hillarys WA 6025
Tel: (08) 9246 3366
Web: recfishwest.org.au

From: s. 47F(1) @dbca.wa.gov.au>
Sent: Thursday, 29 April 2021 9:14 AM
To: s. 47F(1) @recfishwest.org.au>

Cc: s. 47F(1) @recfishwest.org.au>
Subject: RE: Exmouth Deepwater Artificial Reef - Invitation to Consult

Dear s. 47F(1)

Exmouth Deepwater Artificial Reef - Invitation to Consult

On behalf of the Ningaloo Coast World Heritage Advisory Committee, I would like to thank you for providing the Committee with an opportunity to provide feedback on the Exmouth Deepwater Artificial Reef Proposal and to provide advice relevant to the outstanding universal value (OUV) of the Ningaloo Coast World Heritage Area (NCWHA). s. 47F(1) has provided the Committee's advice in relation to the Exmouth Deepwater Artificial Reef proposal, directly to the Department of Agriculture, Water and the Environment (DAWE) as the regulatory agency assessing the proposal. This is in accordance with the Committee's Terms of Reference (ToR) which states:

The role of the Ningaloo Coast World Heritage Advisory Committee is to:

- provide advice to the Commonwealth and State Environment Ministers and management agencies on the protection, conservation, presentation and management of the outstanding universal value of the World Heritage area
- represent the viewpoint of the local and broader community
- contribute to enhancing the stewardship and community connection to the World Heritage area
- develop and provide input into initiatives and opportunities for the promotion and presentation of the outstanding universal value to the local, national and international community.

The Committee welcomes early consultation to ensure the OUV is considered in proposals, however to ensure the Committee is operating within its ToR, the Committee provides advice direct to management and regulatory agencies. The Committee is appreciative Rechfishwest has engaged with the Committee in relation to the Exmouth Deepwater Artificial Reef proposal. As a key stakeholder for the World Heritage property the Committee welcomes any opportunity to provide advice on future proposals that are relevant to the NCWHA.

Apologies for not getting back to you sooner, the Committee has been working through items of interest over the past few months and unfortunately this has taken longer than expected.
Should you have any further queries please contact me.

Many thanks

s. 47F(1)
s. 47F(1)
Ningaloo Coast
Department of Biodiversity, Conservation and Attractions
Parks and Wildlife Service | Exmouth District
PO Box 201, Exmouth, Western Australia 6707
s. 47F(1) @dbca.wa.gov.au
s. 47F(1)

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From: s. 47F(1) @recfishwest.org.au>
Sent: Friday, 23 April 2021 5:12 PM
To: s. 47F(1) @dbca.wa.gov.au>
Cc: s. 47F(1) @recfishwest.org.au>
Subject: RE: Exmouth Deepwater Artificial Reef - Invitation to Consult

[External Email] This email was sent from outside the department – be cautious, particularly with links and attachments.

Hi 47F(1)

Hope you have been well.

Just thought I'd check in to see if there is any word from the Ningaloo Coast World Heritage Advisory Committee on the consultation materials we sent through last month.

Kind regards,

s. 47F(1)

recfishwest

Suite 3, 45 Northside Drive, Hillarys WA 6025
Tel: (08) 9246 3366
Web: recfishwest.org.au

From: s. 47F(1) @dbca.wa.gov.au>
Sent: Wednesday, 24 March 2021 12:45 PM
To: s. 47F(1) @recfishwest.org.au>

Cc: s. 47F(1) @recfishwest.org.au>
Subject: RE: Exmouth Deepwater Artificial Reef - Invitation to Consult

Dear Sam,

Thankyou for the information and opportunity for the Ningaloo Coast World Heritage Advisory Committee, I will forward the information the s. 47F(1) and members, and get back to you shortly.

Many thanks

s. 47F(1)

s. 47F(1)
Ningaloo Coast
Department of Biodiversity, Conservation and Attractions
Parks and Wildlife Service | Exmouth District
PO Box 201, Exmouth, Western Australia 6707
s. 47F(1) @dbca.wa.gov.au
s. 47F(1)

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---

From: s. 47F(1) @recfishwest.org.au>
Sent: Wednesday, 24 March 2021 10:56 AM
To: s. 47F(1) @dbca.wa.gov.au>
Cc: s. 47F(1) @recfishwest.org.au>
Subject: Exmouth Deepwater Artificial Reef - Invitation to Consult

[External Email] This email was sent from outside the department – be cautious, particularly with links and attachments.
To Whom It May Concern,

Recfishwest is conducting consultation for the proposed location for the Exmouth Deepwater Artificial Reef, and are seeking to include the Ningaloo Coast World Heritage Advisory Committee as part of the consultation process. This consultation is being undertaken in accordance with the submission of a reef permit application for the placement of artificial reefs, to be assessed by the Commonwealth Department of Agriculture, Water and the Environment.

An artificial reef will provide long term social and ecological benefits for the community of Exmouth.
Please find the attached consultation letter and reef location map with GPS coordinates.

For the purposes of consultation, your response is appreciated by the 8th of April, 2021.
Should an extension of time be required, please advise in advance.

Kind regards,

recfishwest

Suite 3, 45 Northside Drive, Hillarys WA 6025
Tel: (08) 9246 3366
Web: recfishwest.org.au

s. 22(1)(a)(ii)

From: s. 22(1)(a)(ii)
Sent: Monday, 12 April 2021 9:09 AM
To: s. 22(1)(a)(ii)
Cc: s. 22(1)(a)(ii) s. 22(1)(a)(ii); s. 22(1)(a)(ii) s. 22(1)(a)(ii)
Subject: Advice - Exmouth Reef RTM [SEC=OFFICIAL]
Attachments: SD2020-3998 - 001 - Exmouth Reef RTM - CSAS Advice - cleared.docx

Hi s. 22(1)(a)(ii),

Please find attached advice from the Contaminants, Standards and Advice Section regarding the Exmouth Reef Riser Turret Mooring. Please do not hesitate to contact me, should you have any questions regarding this advice.

Regards,

s. 22(1)(a)(ii)
Contaminants, Standards and Advice | Chemicals Managment Branch
Department of Agriculture, Water and the Environment
GPO Box 787, Canberra ACT 2601
s. 22(1)(a)(ii) | email: s. 22(1)(a)(ii) @environment.gov.au

CONTAMINANTS, STANDARDS, AND ADVICE SECTION
LINE AREA SUPPORTING ADVICE

SD 2020/3998 Exmouth Deepwater Artificial Reef

Sea Dumping (Application)	SD 2020/3998	**Stage**	Assessment
Location	Proposed artificial reef site: offshore from the town of Exmouth, Western Australia (approximately 18 km north of the coast of North West Cape; 116 x 116 m; with an area of 13 456 m^2; centroid: 21° 38' 45" S, 114° 04' 16" E; approximate depth: -153 m).		
Requested by	Sea Dumping Section Assessment Officer: s. 22(1)(a)(ii) Director: s. 22(1)(a)(ii)		
Request date	15 January 2021	**Due date**	1 February 2021
Documents	• EDAR PART I r2 - Summary • EDAR PART II r2 - Applicant • EDAR PART III r2 - Long Term Management Plan • EDAR PART IV r2 - Description of Placement Procedures • EDAR PART V r2 - Appendices • EDAR Request for Additional Information r2		
SPIRE location	s. 22(1)(a)(ii)		
CSAS contact	s. 22(1)(a)(ii) Assessment Officer, Contaminants, Standards, and Advice Section s. 22(1)(a)(ii)		
Cleared by	s. 22(1)(a)(ii) CSAS s. 22(1)(a)(ii)	**Date**	08 February 2021 10 February 2021 ☑
	s. 22(1)(a)(ii) Director, CSAS s. 22(1)(a)(ii)		09 February 2021 edit and revise 11 April 2021 revise and clear ☑

Purpose

This document provides technical advice from the Contaminants, Standards, and Advice Section ("the Section") to the Sea Dumping Section in relation to polybrominated diphenyl ethers (PBDEs) and hydraulic oils within the Nganhurra Riser Turret Mooring ("the RTM"), which is to be decommissioned and repurposed as the Exmouth Deepwater Artificial Reef (SD 2020/3998 refers).

The Section has reviewed the application documentation for the proposed Exmouth Deepwater Artificial Reef, s. 47G(1)(a)

s. 47G(1)(a) The Section's review has focused on potential contamination associated with the RTM's buoyancy foam, which is reported to contain fire retarding polybrominated diphenyl ethers (PBDEs) and remnant hydraulic oils. The review examined the potential for these contaminants to be mobilised, their potential impacts, and how potential impacts will be managed during the decommissioning and repurposing of the RTM.

EPBC Request for Advice

On 15 January 2021 the Sea Dumping Section (s. 22(1)(a)(ii)) contacted the Contaminants, Standards, and Advice Section requesting advice by 01 February 2021[1] on:

> The applicant is proposing to construct and operate an artificial reef integrating the now disused Nganhurra Riser Turret Mooring, which will be relocated to a site 1.7kms from the boundary of the Ningaloo Coast World Heritage Area/Marine Park.
>
> The Nganhurra RTM is proposed to be reefed at~170m depth, including a quantity of polyurethane buoyancy foam (65m3). This foam in compartment 13, is proposed to be encapsulated with grout, with a lifespan of 50 years. It is estimated by the applicant that the foam will be released over a period 400 – 1500 years into the future. The polyurethane buoyancy foam includes a quantity of fire retardant, up-to 120kg. It is assumed by the applicant due to the pre 2006 timeframe of the RTMs construction, that the fire retardant is a worst case scenario material, polybrominated diphenyl ethers (PBDEs) a persistent organic pollutant. See Part III, pdf page 73, 199 and 305 for details.
>
> The Department is seeking your advice in relation to the release of the foam and PBDEs into the marine environment and possible future transport, bioaccumulation and ecotoxicity.
>
> (e-mail: s. 22(1)(a)(ii) dated 15 January 2021 at 10:10).
>
> Draft advice provided 11 February 2021. Final advice requested 25 March 2021.

Contaminants, Standards and Advice Section Advice

The Section has reviewed the application documentation for the proposed Exmouth Deepwater Artificial Reef. The proposed artificial reef is to be installed offshore from the town of Exmouth, Western Australia approximately 18 km north of North West Cape (see **Maps A-1 to A-3**) (Recfishwest 2020: Part I - 3.0). The proposed reef is to be 116 x 116 m and positioned at an approximate depth of 153 m below the astronomical low tide level (LAT) (Recfishwest 2020: Part I - 3.0) (see **Figure B-1**).

Based on the available information, the Section found that the contaminants of concern were likely to include fire retarding polybrominated diphenyl ethers (PBDEs), specifically penta BDE, and remnant hydraulic oils. Short conclusions are as follows:

[1] See e-mail: s. 22(1)(a)(ii) , dated 15 Jan 21 at 10:10 [in SPIRE at: s. 22(1)(a)(ii)

- The expected concentration of pentaBDE in the foam is expected to present a material risk to the marine invertebrates, fish, and the marine ecosystems present at or near the site. Risks to human health cannot be ruled out.

- The expected concentration of pentaBDE is calculated to be in the order of 20 000 - 50 000 mg/kg. Penta BDE is listed under the Stockholm Convention for Persistent Organic Pollutants. Wastes containing pentaBDE at these concentrations must be disposed of through destruction or irreversible transformation.

- Hydrocarbons are a secondary contaminant of concern, including hydraulic oil (that is, Tellus 32 and HW525). Given the relatively small quantity estimated to be residing within the RTM (≤50 L), combined with the comparatively low risk of the products involved, the Section considers the potential impacts to be negligible.

Additional detail is below.

PBDEs are assumed by the Applicants to be present as a flame retardant in the polyurethane buoyancy foam (that is, foam MB 163P) located within compartment 13 of the RTM (see **Figure B-2**) (Recfishwest 2020: Part III – 187). The Applicants have reported that '[T]he foam contains a flame retardant but its not clear on what exactly this material is, so have assumed a worst case scenario (i.e. that the flame retardant is a PBDE [polybrominated diphenyl ether])' (Recfishwest 2020: Part III - 187). The applicants estimate that the RTM may contain up to 118 kg of PBDEs (Recfishwest 2020: Part III - 187). The presence of other contaminants of concern cannot be ruled out, due to the lack of investigation, sampling and analysis data.

Five PBDE congeners are listed under the Stockholm Convention on persistent Organic Pollutants: decabromodiphenyl ether (decaBDE), heptabromodiphenyl ether (heptaBDE), hexabromodiphenyl ether (hexaBDE), pentabromodiphenyl ether (pentaBDE), and tetrabromodiphenyl ether (tetraBDE) (UNEP, 2017: 6). The previous patterns of use of these chemicals are discussed in UNITAR (2017) and UNEP (2017)[2]. PentaBDE was mainly used in polyurethane foams (UNEP, 2017: 8; UNITAR, 2017: 15; ASC NEPM 2013: Sched B7 App A5 p. 7; Thoms et al, 2006: 5). [3].

The RTM was constructed prior to oil field operations commencing in 2006 and before restrictions were placed on use of selected PBDEs by the Stockholm Convention in 2009. Their use was widespread at that point in time. Given the age of the RTM, and in the absence of sampling data, it is considered more likely than not that the RTM's polyurethane foam contains pentaBDE. The Applicants have made a similar assumption (Recfishwest 2020: Part III – 187). PentaBDE is toxic, persistent and bioaccumulative (Cooke 2017). Usage patterns in polyurethane foam range from 3-5%. If 5% is assumed then the quantity of pentaBDE in the foam would be in the order of 295 kg, based on a reported mass of 5.9 t of polyurethane foam (Recfishwest 2020: Part III – 187).

[2] See, for example, UNITAR (2017). Pages 15–16 discuss former uses of pentaBDE and pages 16–17 for discussion on former uses of OctaBDE.
[3] The Section notes that decaPDE and HBB were also used in polyurethane foams, but to a limited extent and primarily in the transport sector (UNITAR 2017: 17, 50).

Eventually all the foam and its flame retarding chemicals are expected to be released in the surrounding marine environment. It is not clear whether this would be through failure of the grout, corrosion of the RTM's structure, or a combination of both. If bound to the foam, the PBDE may be consumed if the foam is ingested or inhaled by reef dwelling organisms attracted to the artificial reef. If the flame retardant leaches out of the foam, which is generally expected since this is an additive component of the foam and not chemically bound, then it would be released directly into surrounding water column. It is difficult to predict whether the contaminant load would be released incrementally into the environment over an extended period of time, or if there would be significant release and dispersal over a shorter time period once the integrity fails. If the latter occurs, then localised concentrations may be higher and impacts could be reasonably expected. If the intention of the reef is also to provide for recreational fishing, then it would be difficult to exclude potential risks to humans through ingestion. PentaBDE is known to have associations with loss of IQ.

The Stockholm Convention sets expectations around disposal of wastes containing listed POPs. The Low Content Limit, which defines when wastes have sufficiently high concentrations to require destruction or irreversible transformation, is 50 mg/kg for pentaBDE (UNEP, 2017: 17)[4]. Based on the advice from the Applicants regarding the 5.9 t mass of the foam, and the expected concentration of pentaBDE in polyurethane foam of 3–5% by weight as reported by UNEP (2010), the expected concentration of pentaBDE is calculated to be in the order of 20 000 - 50 000 mg/kg[5]. This is three orders of magnitude greater than the Stockholm Convention's Low Content Limit..[6]

Some PBDEs are considered highly acutely toxic to some aquatic organisms, are persistent, can bioaccumulate, and are capable of long-range transport through the environment (NICNAS, 2019, 2007, 2001). PBDEs with fewer bromine atoms are highly bioaccumulative and biomagnify in human, fish, and other animals (NICNAS, 2019 and 2007; Siddiqi et.al, 2003). Aquatic sediment provides a final sink for persistent organic pollutants such as PBDEs as their water solubility and vapour pressures are very low; they therefore adsorb onto solid particles such as dust and sediment (Thoms et al., 2006; Hyötyläinen and Hartonen, 2002). Once adsorbed onto sediment, PBDEs are only slowly degraded and can accumulate over time (Thoms et al, 2006). PBDEs can also be transported through water and migratory species and can accumulate in terrestrial and aquatic ecosystems (UNITAR, 2017; DEWR, 2007)[7]. Human exposure to legacy persistent organic pollutants such as pentaPBDE occurs primarily through consumption of fish, meat, and dairy products (Gyalpo et.al, 2015).

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[4] The provisional definition of low POP content for hexaBDE, heptaBDE, pentaBDE and tetraBDE is 50 mg/kg, or 1 000 mg/kg as a sum. Provisional definitions of low POP contents for specific POPs are indicated in the general technical guidelines on the environmentally sound management of wastes of wastes consisting of, containing or contaminated with persistent organic pollutants (see UNEP/CHW.12/5/Add.2/Rev.1, section III.A).

[5] These estimates are based on available information suggesting a range of concentrations of PBDEs in foam, ranging from 2% to 5%. For example, 295 kg of pentaBDE may be present in 5 900 kg of foam, suggesting a concentration of approximately 50 000 mg/kg.

[6] Wastes with a content of POP-BDEs above the low POP content must be disposed of in such a way that the POP content is destroyed or irreversibly transformed (UNEP, 2017: 19).

[7] See, for example, http://www.environment.gov.au/protection/chemicals-management/brominated-flame-retardants.

There are substantial uncertainties in the Applicants' assessment. No assessment of potential impacts of contamination on the environment or to human consumers of fish have been provided. Limited supporting data, chemical information, engineering and laboratory reports were included with the application. Assessment uncertainties include:

- the identities, masses, and concentrations of any PBDEs present in the foam;
- sampling and analysis data;
- Australian sediment and water quality guideline values for PBDEs, capable of protecting 95% and 99% of aquatic species
- the timeframe for degradation and release of contaminated foam into the marine environment of 400–1500 years (which is based on an engineering study that was not available for inclusion in the Section's review).

Given these uncertainties, the Applicants should give consideration to sampling within Compartment 13 to more accurately determine the contaminants present in the foam and their concentrations. In absence of such, a precautionary approach based on 'reasonable worst case' hazard assumptions should be adopted, with the conclusions outlined above.

Background

Environment Protection (Sea Dumping) Act 1981

The application for the proposed artificial reef triggers Section 19 Part 3 of the *Environment Protection (Sea Dumping) Act 1981*[8].

Proposed Development

s. 47G(1)(a) propose to repurpose the decommissioned Nganhurra RTM (see **Figure B-3**) as the main structure in an integrated artificial reef, referred to by the Applicants as Exmouth Deepwater Artificial Reef (Recfishwest 2020: Part I - 3.0). The repurposed RTM, an 85 m long cylindrical structure with a diameter ranging between 4.5 m and 12.5 m and approximate weight of 2452 tonnes, has a displaced volume of 6572 m^3 and once laid horizontally on the seabed, the RTM will sit some 8.5 m above the seabed (Recfishwest 2020: Part I - 3.0). In addition to the RTM, the reef site will also be augmented by 24 purpose-built concrete modules as well as 24 smaller Bombora modules (**Attachment B**). These concrete modules will be emplaced around the RTM to provide additional fish habitat (Recfishwest; 2020, Part I - 3.0).

The RTM has until relatively recently been used by Woodside Energy Ltd ("Woodside") in Exmouth Plateau oil and gas extraction. The RTM was constructed prior to 2006 and uses a ballast system with 13 compartments to sit vertically in the water column, allowing the Nganhurra floating production, storage, and offloading (FPSO) facility to connect and disconnect at will (Recfishwest 2020: Part III - 3.0; Woodside, 2019). The Nganhurra FPSO ceased production of oil in 2018 and disconnected from the RTM, which has also since been

[8] See: https://www.legislation.gov.au/Series/C2004A02478.

disconnected from the subsea infrastructure (Recfishwest 2020: Part III - 3.0 Woodside, 2019).

In 2019 the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) issued an Environmental Improvement Notice to Woodside citing that: 'Woodside has failed and continues to fail to preserve the condition of the riser turret mooring (RTM) and remove the RTM for onshore disposal' (NOPSEMA 2019: 1)[9]. According to the notice, programmed maintenance had also not been completed when the opportunity arose to do so; and the RTM had degraded in at least two areas, namely flooding of a lower compartment following a loss of hull integrity and failing ballast valves (NOPSEMA 2019: 1). A hydrodynamic stability analysis has since been completed on the RTM structure and it has been shown to be stable according to internationally recognised subsea structure design codes (Recfishwest 2020: Part III - 15.9).

PBDEs are assumed by the Section and the Applicants to be present as a flame retarding chemical in the polyurethane buoyancy foam (that is, foam MB 163P) located within compartment 13 of the RTM (Recfishwest 2020: Part III - 187). Given the uncertainties in the Applicants' documentation, based on a precautionary approach and the absence of evidence to the contrary, the Section has assumed that Pentabromodiphenyl ether (pentaBDE) are present in the foam (UNEP 2010). For the purposes of this review, on the available evidence the Section has assumed pentaBDE is present in the foam. The applicant estimates the RTM may contain up to 118 kg of PBDEs (Recfishwest 2020: Part III - 187). Physical removal of the foam has been considered by Applicants but due to the confined space limitations, conditions at sea, and the absence of an access hatch on the RTM into the compartment 13 Recfishwest consider this impractical. Grout is therefore proposed to be injected under pressure into the shrink space between the foam and the compartment wall to seal compartment 13 of the RTM, thereby encapsulating the pentaBDE containing polyurethane foam. This grout has a lifespan of some 50 years (Recfishwest 2020: Part III - Table 7).

Artificial reef structures have an operational design life of 30 years. According to Recfishwest it is likely that the structures would remain operational for several decades beyond the specified design life (Recfishwest 2020: Part I: 3.0). Taken collectively, this suggests an operational life expectancy of not more 30-50 years, at which point a progressive loss of containment can be expected.

PBDEs

The Applicants describe the polyurethane foam as a two-part polyurethane foam (referred to as MB 163P). The foam was manufactured by mixing an isoscyanate-containing part A with a polyol-based part B (Recfishwest 2020: 187-88). It is unclear whether the foam was manufactured locally or imported. The average content of c-pentaBDE in polyurethane foam is reported to be around 3–5% by weight in various applications (UNEP 2010; ENVIRON 2003). This is higher than the applicant's estimation of 2%[10] (Recfishwest 2020: Part III – p. 201), suggesting that the mass of PBDEs present in the RTM may be in the order of 295 kg

[9] NOPSEMA Notice number 775, dated 23 Oct 2019
s. 22(1)(a)(ii)

[10] See, for example, Table 40 and Table 41 in Recfishwest 2020: Part III – p. 201.

(rather than the 118 kg estimated by the Applicants)[11]. The Applicants state that a detailed engineering study has been completed to demonstrate how foam might be released into the sediment which they report will take place over a period of 400 – 1 500 years (Recfishwest 2020: Part III - 52). No reference was provided for the engineering study, and a copy was not made available for inclusion in this review.

Australia has adopted toxicity reference values (TRVs) for lower chain length BDEs, for use in the derivation of Health Investigation Levels (HILs). Soil HILs for PBDEs are set out in Schedule B7 of the ASC NEPM (2013: 15). Both Canada and the USA have issued guidelines in 2013 and 2010 respectively (USA EPA 2017; CEPA 1999). See Table 1, below, and Table C-2 in Appendix C for details.

Table 1: Available international guideline values for PBDEs (CRC CARE, 2014: 13).

PBDEs	**Human Health and Environmental: Aquatic GLVs**					
Substance	**Toxicity Reference Values (TRV) (RfDs)**	**Drinking Water (health/aesthetic)**	**Fresh**	**Marine**	**Recreation**	**Agriculture**
triBDE	-	0.0005 µg/L (EC)	46 ng/L (BC, Canada)		-	-
tetraBDE	1 x .0001 mg/kg (US EPA 2017, 2014a)	0.0005 µg/L (EC)	24 ng/L (BC, Canada)		-	-
pentaBDE	2 x 0.001 mg/kg/day (US EPA 2017, 2014a)	0.0005 µg/L (EC)	0.2 ng/L (BC, Canada)		-	-
hexaBDE	2 x 0.0001 mg/kg/day (US EPA 2017, 2014a)	0.0005 µg/L (EC)	120 ng/L (BC, Canada)		-	-
octBDE	3 x 0.001 mg/kg/day (US EPA 2017, 2014a)	0.0005 µg/L (EC)	17 ng/L (BC, Canada)		-	-
nonaBDE	-	0.0005 µg/L (EC)	-		-	-
decaDBE	7 x 0.001 mg/kg/day (US EPA 2017, 2014a)	0.0005 µg/L (EC)	-		-	-
PBDEs	**Human Health: Soil HILs (Australia [ASC NEPM 2013])**					
Substance	**Residential A**	**Residential B**	**Recreational C**		**Commercial D**	
triBDE	1 mg/kg	2 mg/kg	2 mg/kg		10 mg/kg	
tetraBDE	1 mg/kg	2 mg/kg	2 mg/kg		10 mg/kg	
pentaBDE	1 mg/kg	2 mg/kg	2 mg/kg		10 mg/kg	
hexaBDE	1 mg/kg	2 mg/kg	2 mg/kg		10 mg/kg	
octBDE	1 mg/kg	2 mg/kg	2 mg/kg		10 mg/kg	
nonaBDE	1 mg/kg	2 mg/kg	2 mg/kg		10 mg/kg	
decDBE	-	-	-		-	

The PBDE assumed to be present in within the foam has the potential to contaminate a substantial mass of sediment. The Section has calculated that sufficient PBDE may be present to contaminate approximately 700 000 000 tonnes of sediment at the Canadian sediment guideline value, assuming equal distribution throughout the sediment volume (see Table C-1 in **Attachment C**). UNEP (2010) suggests that pendaBDE was the most common PBDE used for polyurethane foams prior to restrictions on its use. While PBDEs are likely to be released from within the RTM into the marine environment over an extended time period, even the implied rate of release could cause harm. The applicant estimates that the foam

[11] The Section could not find independent information confirming the PBDE-content of polyurethane buoyancy foam. The Applicants provide no reference for their estimate of PBDE content of the buoyancy foam.

would release its load of PBDEs over centuries, although the grout they plan to use to seal the foam has an expected life expectancy of approximately 50 years (Recfishwest 2020, Part III - Table 7). Moreover, PBDEs are known to break down slowly in the environment, and the deep-water location could cause degradation to be particularly slow. The contamination currently contained in within the RTM would then make its way into the surrounding sediments, water column, and marine food-chains.

Hydraulic Oil

Due to the low amount of residual hydraulic oil (≤50 L) reported to be contained within the multiple pipes within the pipework of the RTM, and the comparatively low toxicity of the oils, the Section does not consider the residual hydraulic oils to be a material concern. It has been reported that c-pentaBDE may have been used as a component of a mixture of hydraulic fluid in petroleum drilling and mining. The use of c-pentaBDE in the RTM's hydraulic fluid is considered unlikely as the use of c-pentaBDE was discontinued by the mid-1990s (UNEP, 2006b), well before the RTM entered production in 2006 (Woodside, 2019).

The US Department of Health and Human Services (US DHHS), the International Agency for Research on Cancer (IARC), and the US EPA have not classified mineral oil hydraulic fluids, polyalphaolefin hydraulic fluids, or organophosphate ester hydraulic fluids as a known carcinogenic (ATSDR, 1997). Although their major constituents are inherently biodegradable, Tellus 32 and HW525 as a whole are not readily biodegradable. They contain components that may persist in the environment and have the potential to accumulate and float on water (Recfishwest 2020: Part III: 17.14). Hydraulic oil can take up to a year to break down in the environment. The main source of risk is toxicity to particularly sensitive organisms, and fouling. Any potential leaks are assumed to be modest, less than 50 L in total, and to occur over a timeframe of 100s of years (Recfishwest 2020: Part III: 17.14).

Proposed Site Location and Environs

Proposed Site Location

The proposed artificial reef is intended to be installed offshore from the town of Exmouth, Western Australia approximately 18 km north of the coast of North West Cape (see **Attachment A**

) (Recfishwest 2020: Part I - 3.0). The proposed reef is to be 116 x 116 m at an approximate depth of 153 m below the astronomical low tide (m balt) (Recfishwest 2020: Part I - 3.0) (see **Attachment A**

).

Proposed Site Description

Sedimentology

Regional sedimentology for the North West Cape and surrounding environments is dominated by marine carbonates. Sediments of the region show broad zonation, with a transition from coarse, carbonate sediments, to fine, non-carbonate sediments with depth. The continental shelf is dominated by carbonate sands and gravels, whilst the outer shelf and continental slope are characterised by silty and muddy carbonate sediments, and the

continental rise and abyssal plain zones are characterised by relatively homogenous, non-carbonate muds (Heyward et al. 2006; DEWHA 2007; Recfishwest 2020: Part III - 15.8).

Bathymetry

Water depth over the survey area generally increases in a north-westerly direction, from 133.6 m below lowest astronomical tide (LAT) in the south-east, to 198.6 m in the north-west. The seafloor is generally flat and featureless. A seabed gradient of ~ 1° produces a slight slope towards deeper water to the north-west. Very fine (2 – 5 m) seabed topographic features were unable to be discerned from the dataset, and no features greater than 5 m were detected at the proposed reef site (Recfishwest 2020: Part III - 18.3).

Environs

Wave action, wind, currents, cyclones and storm surges are considered potential contaminant source-transport-receptor pathways for any chemical contamination, and the sediment, sea water, and aquatic life are considered sinks.

The wave climate of the North West Cape is varied. Offshore swells predominantly propagate from a south-west to westerly direction, associated with the Indian and Southern Oceans (Heyward et al. 2006; DEWHA 2007). Locally generated wind waves can propagate in all directions, and are influenced by the bimodal sea breeze structure, thunderstorms, and tropical cyclones (Recfishwest 2020: Part III - 15.3).

Winds in the Exmouth and North West Cape region vary daily and seasonally. During the winter, the Gascoyne is dominated by high pressure systems (Heyward et al. 2006; BoM 2020a). During the summer months, the convergence of the trade winds and monsoonal winds migrates southward, resulting in tropical low-pressure systems. A sea breeze effect prevails during this period. Wind speeds generated by tropical lows and the occasional tropical cyclone can result in extremely windy conditions from various directions (Recfishwest 2020: Part III - 15.3).

The main currents which persist in the North West (see Maps A-5 of **Attachment A**

) include the poleward flowing Indonesian Flowthrough and the Leeuwin, South Equatorial and Eastern Gyral currents (Heyward et al. 2006). The Holloway and Ningaloo Current and the Shark Bay Outflow are seasonal surface currents in the region. Subsurface currents such as the Leeuwin Undercurrent and the West Australian Current flow in an opposite direction to the aforementioned currents, towards the equator. The southward flowing Indonesian Flowthrough influences water circulation in the North West and the power of its influence is determined by the strength of the north-west Monsoon season (Recfishwest 2020: Part III - 15.5).

The North West Cape is situated within the most cyclone-prone area of the Western Australian coastline (BoM 2020b). Tropical cyclones affect the North West Cape annually with cyclones rated category 3 or above impacting the region every 25 years. Most cyclones in the region are generated over the warm tropical ocean to the north of Australia, and track in a south-westerly direction off the coast before making landfall (Recfishwest 2020: Part III - 15.7).

Receptors (MNES, Environmental Values, etc)

Western Australia's North West marine environment is characterised by shallow-water tropical ecosystems (DSEWPC 2012). A majority of the species found here have tropical distributions and are also found throughout low latitudes in the Indian and Pacific oceans. The southern extent of the region is a transition zone between tropical and temperate ecosystems, as the range of tropical species extends southward via the warm water Leeuwin Current, intersecting with the northern extent of temperate species which are more typical of Western Australia's South West. The result is high biodiversity of marine life and ecosystems throughout the region. The region also supports internationally important breeding and feeding grounds for a number of threatened and migratory species (DEWHA 2007).

Significant nesting and feeding grounds for marine turtles are found throughout coastal beaches and islands in the region. Humpback Whales migrate from their feeding grounds in the Antarctic to breeding grounds in the Kimberly, travelling northwards along Western Australia's coastline. The Ningaloo Coast hosts the most well-known aggregation site for migrating whale sharks, with the highest known density of whale sharks globally. Other threatened or migratory marine fauna including dugongs, dolphins, sharks, sea snakes, birds, and fish are supported by the various habitats along Western Australia's North West (Recfishwest; 2020, Part III - 16.0).

The Applicants identified 46 EPBC-listed threatened and migratory species. The Applicants conclude that the proposed artificial reef will not have a significant impact on any of these species through impacts to population size, population structure, critical habitat, breeding cycle, migratory behaviour, or any other aspects which may influence the population size or recovery of these species (Recfishwest 2020: Part III - 16.1). Contamination risks were not assessed.

Marine protected areas (see Maps A-3 and A-4, at **Attachment A**

) were identified in the vicinity of the proposed artificial reef site, though none of these intersect with the site. Recfishwest states that it is not expected that end users of the proposed artificial reef will access these protected areas given the significant geographical separation. Likewise, Recfishwest states that activities at the artificial reef are unlikely to have an impact on the ecological or social values these protected areas provide.

The proposed site is approximately 20 km from the Muiron Islands Marine Management Area (see Maps A-3 and A-4, at **Attachment A**

The proposed site is located north of the Commonwealth Ningaloo Marine Park boundary, and east of the Gascoyne Marine Park boundary (Maps A-3 and A-4, at **Attachment A**

The Applicants do not report the distance to Montebellow and Barrow Island Marine Parks, both of which are also nearby protected marine areas.

Monitoring Plan

Woodside is the current owner and holds liability for the RTM. Impacts and risks associated with the transport of the RTM and installation of the RTM and reef modules are classified as petroleum activities within Woodside's Environment Plan submitted to NOPSEMA. Once the artificial reef has been deployed, the ownership and liability of the artificial reef will move to

the State of Western Australia, as detailed in section 6.7 of the WA Government Policy on Habitat Enhancement Structures in Western Australia. (Recfishwest 2020: Part III - 2.0).

Woodside are required to submit an Environment Plan (EP) meeting all requirements of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009, to then be accepted by NOPSEMA (Recfishwest 2020: Part I - 1.0). Throughout the duration of the permit, monitoring will be undertaken by Recfishwest to ensure these objectives are being met (Recfishwest 2020: Part III - 11.4).

Recfishwest has proposed a Long Term Management Plan (LTMP) under the *Environment Protection (Sea Dumping) Act 1981* and Regulation 147B of the Fish Resources Management Regulations 1995 (Recfishwest 2020: Part III - 5.0).

Whilst monitoring is proposed to be undertaken by Recfishwest for the life of the permit, it would appear that the responsibility of maintenance of the artificial reef as well as any necessary remediation due to a release of contamination, falls to the State of Western Australia.

Uncertainty

The amount, type, quality, and relevance of the evidence provided by Recfishwest was considered by the Section to be limited. The degree of agreement in the data was low. The Section's confidence in the evidence provided by the proponent was therefore considered to be low. This was due a range of factors, including:

- The amount of PBDEs within the buoyancy foam stated to be contained within compartment 13 is considered to potentially be under-reported;
- The lifespan of the grout is considered inadequate given the product it is containing;
- The lack of certainty around Woodside-Recfishwest capacity to ensure compartment 13 remains sealed, or to remediate the marine environment should the contaminant be released after the RTM has been installed as an artificial reef .

Attachments

A. Attachment A

MAP A-1: Proposed artificial reef site boundary coordinates and location.

MAP A-2: Proposed artificial reef site boundary coordinates and location.

MAP A-3: Proposed Exmouth Deepwater Artificial Reef site centroid, depth contours, Marine Protected Areas, and Offshore Oil and Gas Tenures.

MAP A-4: Proposed Exmouth Deepwater Artificial Reef site and Marine Protected Areas in relation to Exmouth, WA.

MAP A-5: Intersection of the major surface and seasonal currents for the Western Australian coastline and the proposed site location.

B. Attachment B – Figures:

Figure B-1: Riser Turret Mooring (RTM).

Figure B-2: Riser Turret Mooring (RTM).

C. Attachment C – Tables:

Table C-1: Assumed / estimated values for Potential Sediment Contamination.

Table C-2: Relevant International guidelines for PBDEs

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ATTACHMENT A

MAP A-1: Proposed artificial reef site boundary coordinates and location.

recfishwest

EXMOUTH DEEPWATER INTEGRATED ARTIFICIAL REEF SITE

Reef Site Boundary	Letter	DDM	DD
NW NE SW SE	NW	21 39.415'S 114 4.580'E	-21.656917 114.076333
	NE	21 39.415'S 114 4.754'E	-21.656917 114.079233
	SW	21 39.575'S 114 4.580'E	-21.659583 114.076333
	SE	21 39.575'S 114 4.754'E	-21.659583 114.079233

Figure: Boundary co-ordinate for reef side including degrees decimal minutes and decimal degrees

Figure: Fish species observed on Exmouth's King Reef expected to inhabit the Deepwater Reef

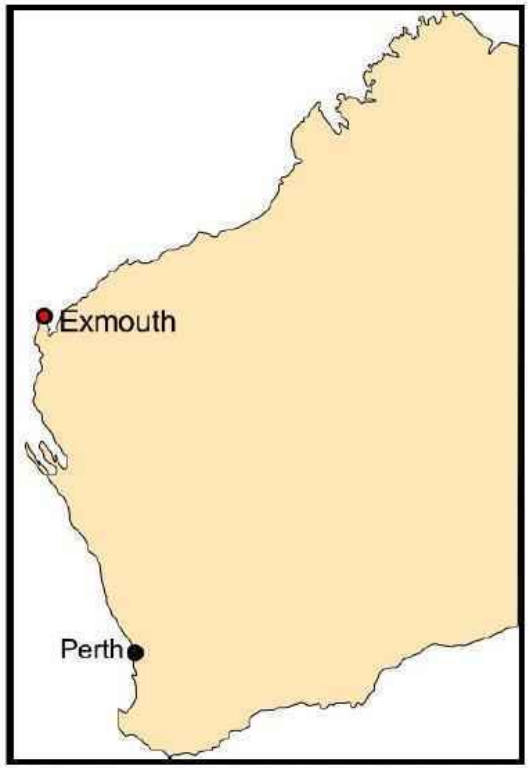
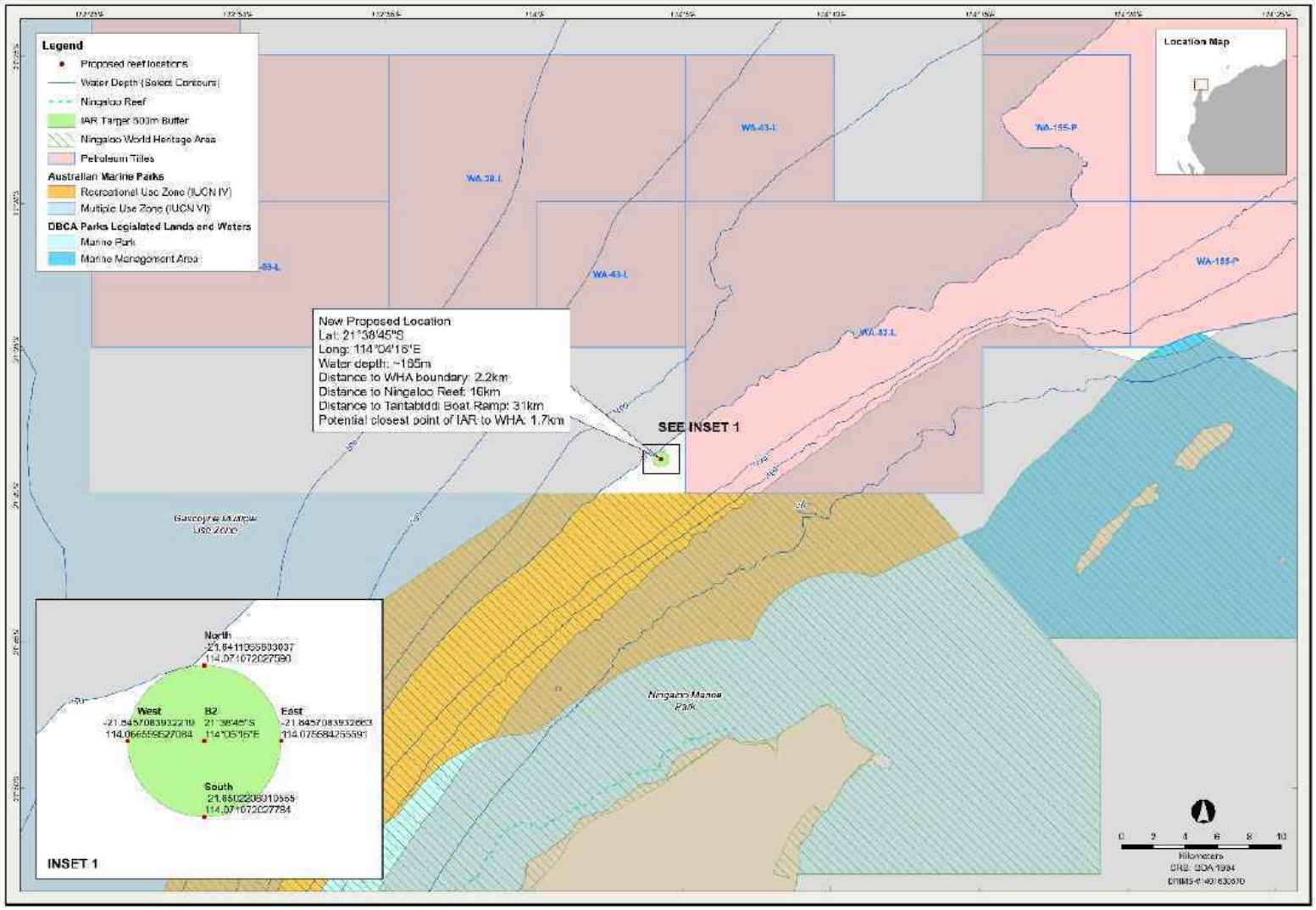


Figure: Map of Western Australia with Perth and Exmouth

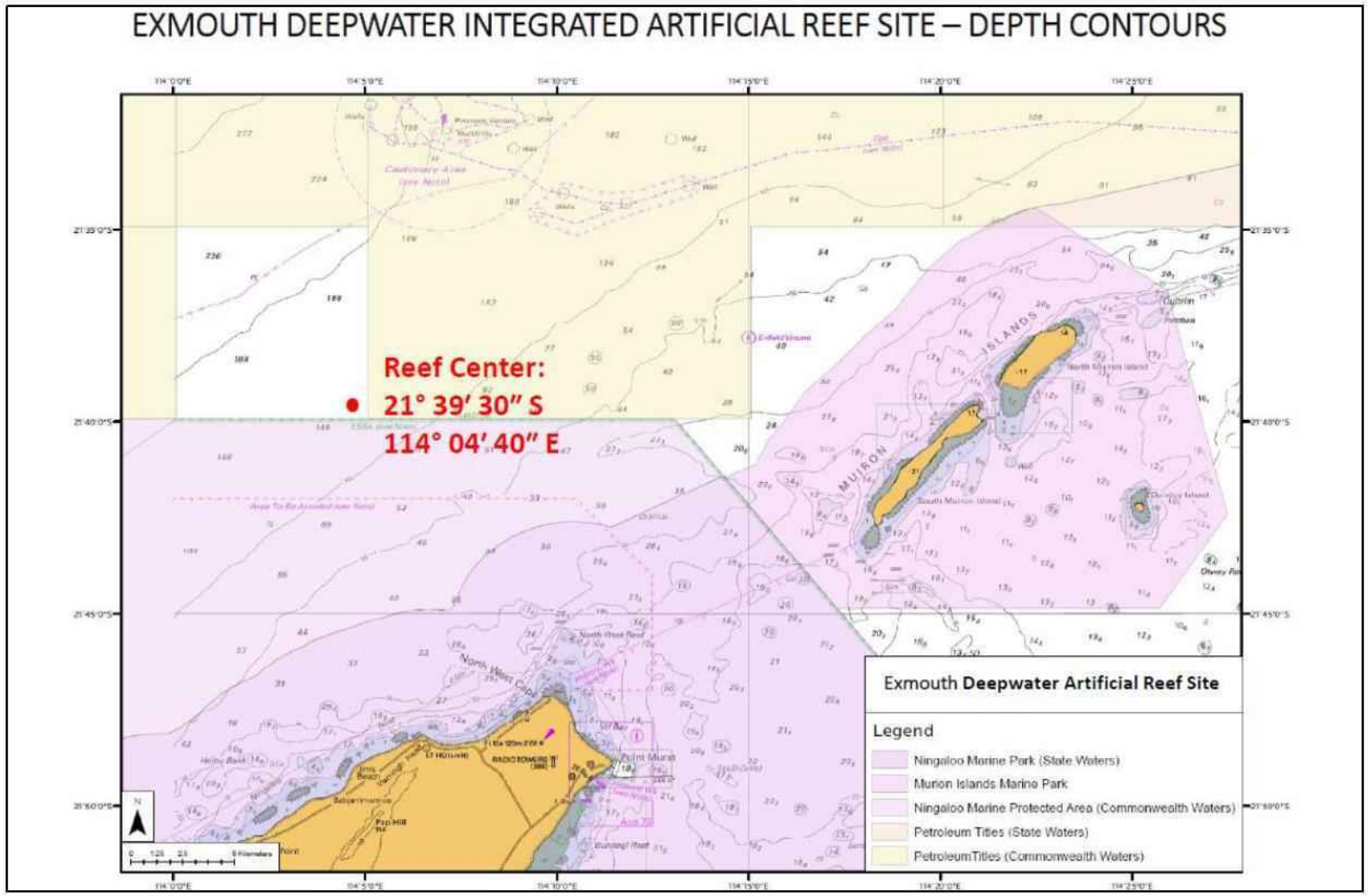
Source: Recfishwest 2020: Part III – Figure 19, p. 53 of 309.

MAP A-2: Proposed artificial reef site boundary coordinates and location.



Source: Recfishwest 2020: Part I - Figure 1, p. 9 of 12.

MAP A-3: Proposed Exmouth Deepwater Artificial Reef site centroid, depth contours, Marine Protected Areas, and Offshore Oil and Gas Tenures.

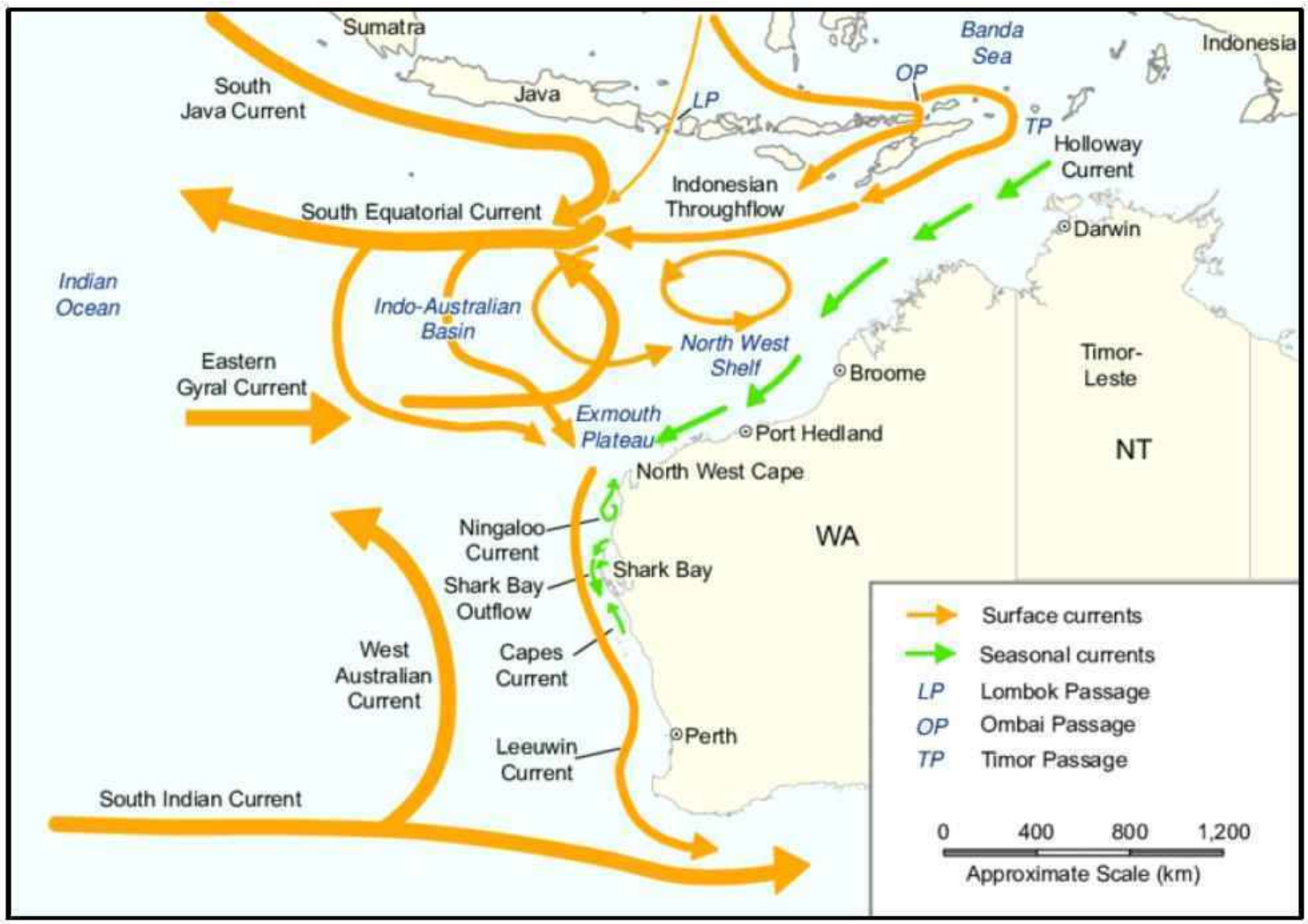


Source: Recfishwest 2020: Part III – Figure 19, p. 55 of 309.

MAP A-4: Proposed Exmouth Deepwater Artificial Reef site and Marine Protected Areas in relation to Exmouth, WA.

Source: Recfishwest 2020: Part III – Figure 47, p. 170 of 309.

MAP A-5: Intersection of the major surface and seasonal currents for the Western Australian coastline and the proposed site location.



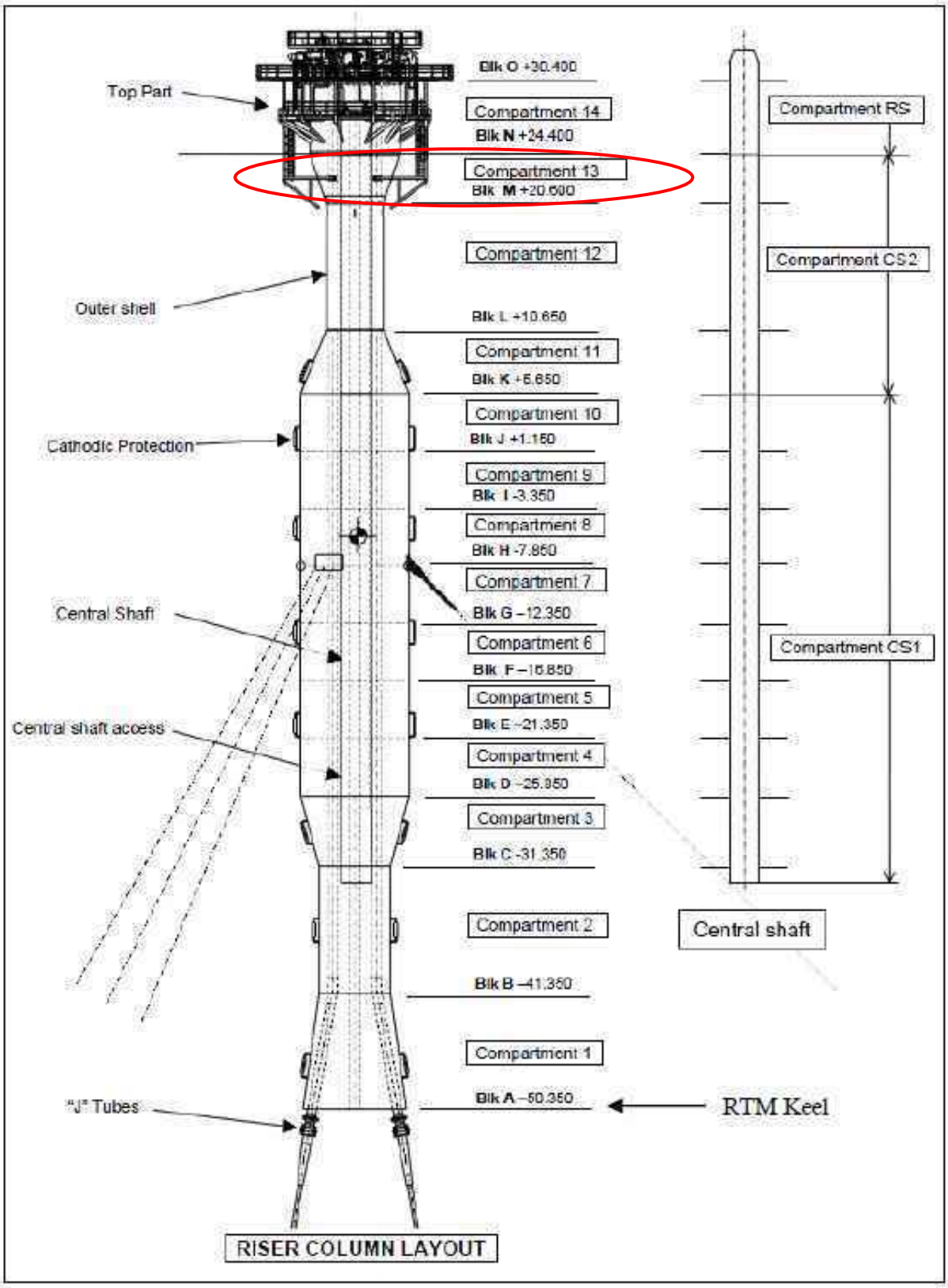
Source: Recfishwest 2020: Part III – Figure 45, p. 144 of 309.

ATTACHMENT B

Figure B-1: Riser Turret Mooring (RTM).

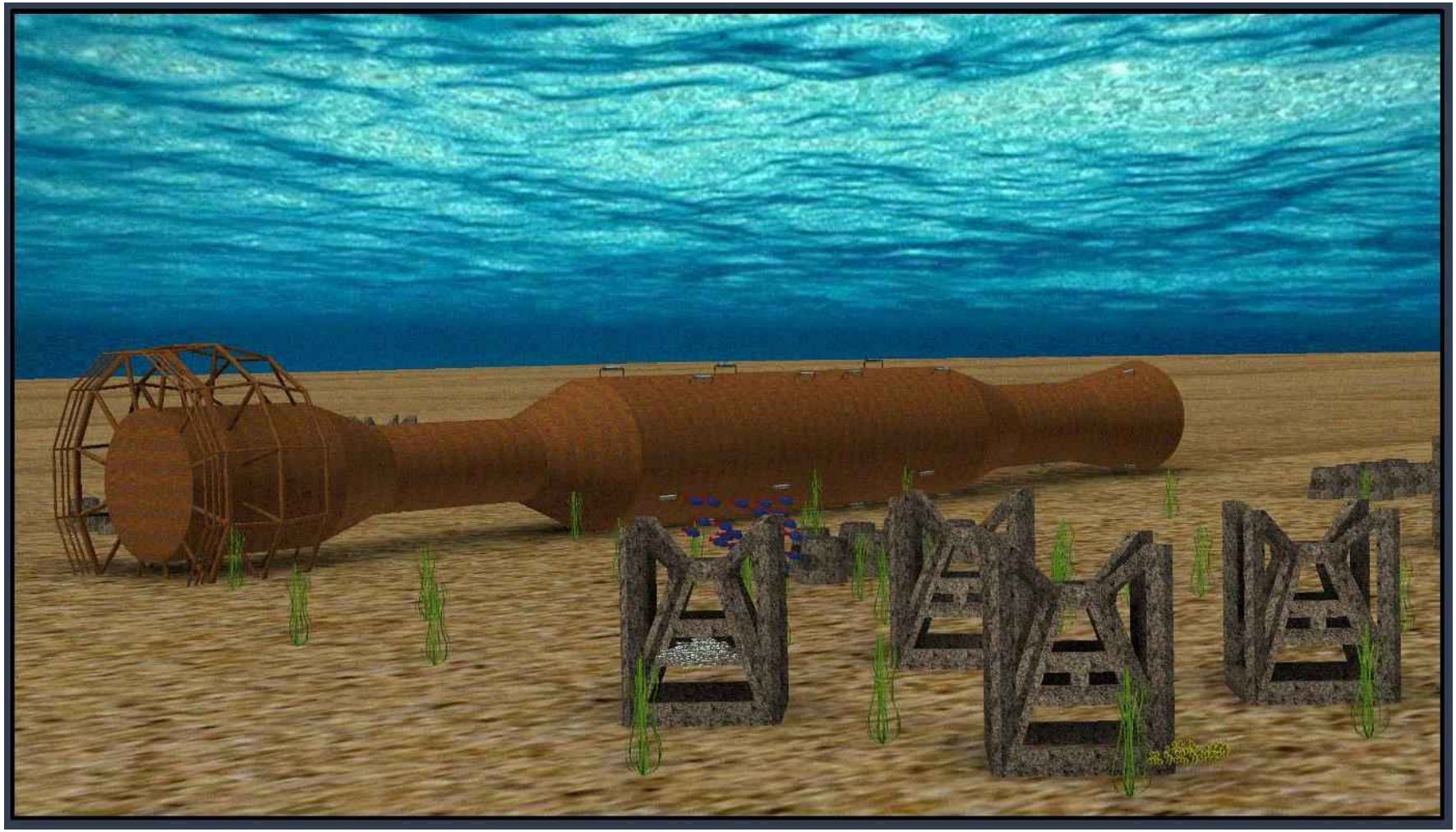
Source: DOF Subsea 2020: 7 of 151

Figure B-2: Riser Turret Mooring (RTM).



Source: DOF Subsea 2020: 12 of 151.

Figure B-3: Proposed Exmouth Deepwater Artificial Reef Riser Turret Mooring (RTM).



Source: Recfishwest 2020: Part I – Cover, p. 1 of 12.

Attachment C

Table C-1: Assumed / estimated values for Potential Sediment Contamination.

Item	Quantity	Unit	Source
Volume	65	m^3	Recfishwest 2020: Part III: 187
Density	90	kg/m^3	Recfishwest 2020: Part III: 187
Mass of foam	5 850	kg	Calculation
Fraction flame retardant	5%		Upper end of the range reported in ENVIRON (2003); UNEP (2010)
Mass of flame retardant	292.5	kg	Calculation
Mass of flame retardant	2.925 E+11	µg	Unit conversion
Concentration of flame retardant in foam	50 000	mg/kg	Calculation
Canadian sediment guideline value	0.4	µg/kg	Canadian EPA (1999)
Mass of sediment contaminated	7.3125 E+11	kg	Calculation
Mass of sediment contaminated	731 250 000	t	Unit conversion

Table C-2: Relevant International guidelines for PBDEs

Guideline				
Canadian Environmental Protection Act, 1999* – Federal Environmental Quality Guidelines – *Polybrominated Diphenyl Ethers (PBDEs)	**Homologue**	**Congener**	**Water (ng/L)**	**Sediment (ng/g dw)**
	TriBDE	Total	46	44
	TetraBDE	Total	24	39
	PentaBDE	Total	0.2	0.4
	PentaBDE	BDE-99	4	0.4
	PentaBDE	BDE-100	0.2	0.4
	HexaBDE	Total	120	440
	HeptaBDE	Total	17||	-
	OctaBDE	Total	17||§	5600§
	NonaBDE	Total	-	-
	DecaBDE	Total	-	19§#
United States of America Environmental Protection Agency – Screening Levels (PBDEs)*	**Chemical**	**Residential Soil (mg/kg)**	**Industrial Soil (mg/kg)**	**Tap Water (µg/L)**
	DecaBDE209	440	3,300	110
	OctaBDE	190	2,2500	62
	PentaBDE	160	2,300	40
	TetraBDE	6.3	82	2.0
	HexaBDE153	13	160	4.0
	PentaBDE99	6.3	82	2.0

Notes:

^ 1 ng/L=0.001 µg/L, 20ng/L = 2.0E-5mg/L

|| Values based on commercial OctaBDE mixture DE-79, which is composed mainly of heptaBDE and octaBDE (octabromodiphenyl ether).

§ Values adopted from Ecological Screening Assessment Report (Environment Canada 2006). Sediment guidelines for octaBDE and decaBDE were adapted from the SAR by being corrected for the sediment organic carbon in the actual tests, then normalised to 1% organic carbon instead of the 4% in the SAR.

Values based on commercial decaBDE mixture which is composed mainly of nonaBDE and decaBDE.

* For lower brominated PBDEs, the Agency for Toxic Substances and Disease Registry (ATSDR) has established a minimal risk level (MRL) of 0.006 milligrams per cubic meter for intermediate duration inhalation exposure. In addition, ATSDR established an MRL of 6 x 10-5 mg/kg/day for acute-duration oral exposure and 3 x 10-6 mg/kg/day for intermediate-duration oral exposure (ATSDR 2016).

s.22(1)(a)(ii)

From: s.22(1)(a)(ii)
Sent: Monday, 22 February 2021 5:58 PM
To: s.22(1)(a)(ii)
Cc: s.22(1)(a)(ii)
Subject: DRAFT Heritage advice - Proposed Exmouth Deepwater Artificial Reef [SEC=OFFICIAL]
Attachments: 1-Line Area advice template - Heritage Branch.docx

Hi s.22(1)(a)(ii)

Please find attached the draft heritage advice as requested.

Happy to discuss.

Thanks

s.22(1)(a)(ii)

s.22(1)(a)(ii)
Director
Natural Heritage Section
s.22(1)(a)(ii)
s.22(1)(a)(ii)

Department of Agriculture, Water and the Environment
Heritage Branch | Heritage, Reef and Wildlife Trade Division
John Gorton Building, Level 4, King Edward Terrace
Parkes ACT 2600

www.awe.gov.au

Sea Dumping Permit Application – Heritage Advice

Recfishwest - Sea Dumping Permit Application (SD2020/3998) - Exmouth Deepwater Artificial Reef

✓ World Heritage property	✓ National Heritage place	☐ Commonwealth marine area
☐ Commonwealth land	☐ Commonwealth Action	☐ Other whole of environment matter

Note: The Ningaloo Coast National Heritage place and World Heritage property have different heritage values.

Ningaloo Coast National Heritage place

The Ningaloo Coast was included on the National Heritage List in 2010 primarily for its terrestrial natural heritage values, its outstanding karst environment and anchialine communities characterised by the presence of remipede crustaceans (DAWE AHD, 2020).

The proposed action is unlikely to have any impact on the National Heritage values of the Ningaloo Coast.

Ningaloo Coast World Heritage property

The Ningaloo Coast was included on the World Heritage List in 2011.

The Statement of Outstanding Universal Value for the Ningaloo Coast was approved by the World Heritage Committee in 2011 and is the key reference for the ongoing protection of the World Heritage property.

Statements of Outstanding Universal Value outline the values to be protected (as justified according to 10 criteria), a statement of integrity, and the protection and management in place for the property at the time of inclusion on the World Heritage List. In accordance with the *Operational Guidelines for the Implementation of the World Heritage Convention* (UNESCO 2019), *t*he values (and attributes of those values) and integrity of the property are to be maintained over time and the commitments to protection and management upheld.

Excerpts from the Statement of Outstanding Universal Value likely to be relevant to the proposed action.

Heritage values likely to be relevant to the proposed action:

World Heritage criterion (vii) *contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance*. The Ningaloo Coast supports rare fish species, marine mammals and the largest documented aggregation of whale sharks (*Rhincodon typus*) in the world.

World Heritage criterion (x) *contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation*. The Ningaloo Coast harbours a high marine diversity of more than 300 documented coral species, over 700 reef fish species, roughly 650 mollusc species, as well as around 600 crustacean species and an unusual diversity of marine turtle species with an estimated 10,000 nests deposited along the coast annually.

Excerpts from the Statement of Integrity likely to be relevant to the proposed action:
Noting that the proposed action is only approximately 1.7km from the boundary of the Ningaloo Coast World Heritage Area (WHA), the maintenance of integrity of the WHA also needs to be considered. The Statement of Integrity included in the Statement of Outstanding Universal Value notes that while no formal buffer zones have

been established for the property, the *Environment Protection and Biodiversity Conservation Act 1999* serves as a legal buffer zone. Both the marine and the terrestrial areas face a number of threats to the property's integrity, including invasive marine species, illegal fishing and disturbance to wildlife.

Excerpts from the Protection and Management Requirements likely to be relevant to the proposed action:
The Statement of Outstanding Universal Value notes there is a need for ongoing management of fisheries and careful planning to ensure effective management and to protect the values of the property.

Stage: assessment
Previous Decisions:
N/A

Background
In Australia the placement and construction of artificial reefs are regulated under the *Environment Protection Act 1981* (Sea Dumping Act) and a sea dumping permit is required.

The Department of Agriculture, Water and the Environment's website notes that:

> [Sea dumping] Permits are necessary to ensure that appropriate sites are selected, materials are suitable and appropriately prepared, there are no significant adverse impacts on the marine environment and that the reef does not pose a danger to marine users.
>
> [Artificial] Reefs may only be created for legitimate purposes (i.e. not waste disposal) and cannot pose a significant threat to users or surrounding environments (DAWE Artificial Reefs, 2020).

Artificial Reef and Sea Dumping Permit application
The Applicant (Recfishwest) is proposing to construct and operate an artificial reef integrating the now decommissioned Nganhurra Riser Turret Mooring (RTM). The RTM was part of a two-component bow mooring system used in the extraction of petroleum by Woodside Energy Ltd (Recfishwest Part III: 8). If the placement of the artificial reef is approved and the artificial reef deployed, the ownership and liability associated with the artificial reef will move to the State of Western Australia, specifically the Department of Primary Industries and Regional Development (Recfishwest Part III: 11). The RTM is an 85m long cylindrical structure with a diameter ranging between 4.5m and 12.5m with an approximate weight of 2,452 tonnes when ballasted (Recfishwest Part III: 8).

The artificial reef is proposed to consist of 24 reef pyramids (six clusters of four concrete purpose-built modules 4m x 4m x 5m high), two clusters of 12 (24 units) Bombora modules and the repurposed RTM which is the main feature of the artificial reef, 49 units in total (Recfishwest Part III: throughout). The proposed location of the artificial reef is approximately 18km offshore in Western Australia, approximately 1.7kms from the boundary of the Ningaloo Coast World Heritage Area (WHA) (Recfishwest Part III: 277). The proposed reef site is 116m x 116m with an area of 13,456m^2 and has an approximate depth of 148m below LAT (Recfishwest Part III: 211). According to the Applicant this is one of the first projects of this nature in Australia and the southern hemisphere, and if successful, will be the first deep-water artificial reef in Australia.

<u>The Nganhurra Riser Turret Mooring (RTM)</u>

According to the application:

> The RTM is a steel structure comprised of 14 individual compartments separated by watertight bulk heads. The bottom compartment is filled with seawater and iron ore ballast. The topside structure of the RTM contains a range of equipment, materials and steel work. The upper most compartment is filled with 65m^3 of polyurethane foam. Hydraulic oil, paint coatings and anti-foul coatings are also found on the RTM. Prior to sinking, the RTM structure will undergo a series of works to ensure it is suitable for use within an artificial reef. This includes the removal of topside accessories, flushing of residual chemicals and the removal of the

riser tail stubs and bend stiffeners. The sinking process involves flooding a series of compartments to create a controlled descent to the seafloor. Once sunk to the seafloor the foam within the RTM will be grouted with an estimated amount of 36m^3 of grout. The grout used to fill will consist of a mixture of either general purpose cement, sodium silicate and seawater, or Ground Granulated Blast Furnace Slag, sodium silicate and seawater. The material composition of this general-purpose cement is the same as the cement used in the concrete purpose-built structures (reef pyramids) (Recfishwest Part III: 189).

The steel used in the construction of the RTM has no associated risks in seawater, similarly the iron ore used in the ballast has no identified risks in seawater (Recfishwest Part III: 197). Hydraulic oil contains components that may persist in the environment and components with the potential to accumulate and float on water (Recfishwest Part III: 199). Despite these components the potential risk to the environment is considered low given the small amount within the RTM overall (< 50L) (Recfishwest Part III: 199). An assessment was undertaken for paint coatings in their 'liquid' form, it suggests that the toxicity level may decrease once dried as solvents and other harmful contents within the paint evaporate once dried (Recfishwest Part III: 199). Paint coatings in their liquid forms can be considered toxic to marine biota to varying degrees, however the presence of marine growth already on the RTM provides evidence that the toxicity of the paint is below the levels that have substantially lethal impacts on marine organisms (Recfishwest Part III: 199). Based on the above factors, the risk posed by paint coatings has been deemed low (Recfishwest Part III: 199). The anti-foul paint has a service life of only 5 years however the RTM has been in the ocean for almost 15 years, so it is expected that most of the active ingredients within the anti-foul paint have already degraded away (Recfishwest Part III: 199).

Proposed duration of permit

The Applicant requests a 30 year permit stating that the artificial reef has an operational design life of 30 years, however it is likely that the structures would remain operational for several decades beyond the specified design life (Recfishwest Part I: 3).

The application also notes that:

- the grout to be used to stabilise the RTM will have a **50 year** lifespan (RecfishWest Part III: 60),
- the RTM structure is expected to take **100-400 years** to fully degrade (RecfishWest Part III: 287), and
- there will be slow formation and release over extremely long timeframes (**hundred[s] to thousands of years**) of microplastics from residual polymers in the RTM (RecfishWest Part III: 277).

It will be important to consider the appropriate duration of the permit (if one is to be issued) and the length of time to monitor the impact of the artificial reef, and particularly the use to the RTM, on the Ningaloo Coast WHA, World Heritage values and integrity.

Nature and extent of impacts on heritage matters as a result of the proposed action

Heritage values and potential impacts posed by the action

The project has the potential to impact the Outstanding Universal Value (OUV) or World Heritage values of the Ningaloo Coast World Heritage Area (WHA).

The Ningaloo Coast has Outstanding Universal Value (OUV) due to its interconnected ocean and arid coastline, limestone karst system and extensive network of underground caves, terrestrial species endemism, high marine diversity and the largest aggregation of whale sharks in the world. The Ningaloo Coast is included on the World Heritage List for:

Criterion (vii): contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;
The landscapes and seascapes of the property are comprised of mostly intact and large-scale marine, coastal and terrestrial environments. The lush and colourful underwater scenery provides a stark and

spectacular contrast with the arid and rugged land. The property supports rare and large aggregations of whale sharks (Rhincodon typus) along with important aggregations of other fish species and marine mammals. The aggregations in Ningaloo following the mass coral spawning and seasonal nutrient upwelling cause a peak in productivity that leads approximately 300-500 whale sharks to gather, making this the largest documented aggregation in the world (UNESCO 2020).

The attributes of OUV that were used to justify inclusion on the World Heritage List under Criterion (vii) that are likely to be relevant to the proposed action are the rare fish species, marine mammals and whale sharks.

Criterion (x): contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.
In addition to the remarkable aggregations of whale sharks the Ningaloo Reef harbours a high marine diversity of more than 300 documented coral species, over 700 reef fish species, roughly 650 mollusc species and around 600 crustacean species. The high numbers of 155 sponge species and 25 new species of echinoderms add to the significance of the area. On the ecotone, between tropical and temperate waters, the Ningaloo Coast hosts an unusual diversity of marine turtle species with an estimated 10,000 nests deposited along the coast annually. The majority of subterranean species on land, including aquatic species in the flooded caves are rare, taxonomically diverse and not found elsewhere in the southern hemisphere. The combination of relict rainforest fauna and small fully aquatic invertebrates within the same cave system is exceptional. The subterranean fauna of the peninsula is highly diverse and has the highest cave fauna (troglomorphic) diversity in Australia and one of the highest in the world. Above ground, the diversity of reptiles and vascular plants in the drylands is likewise noteworthy (UNESCO 2020).

The attributes of OUV or World Heritage values that were used to justify inclusion on the World Heritage List under Criterion (x) likely to be relevant to the proposed action are the marine diversity found within the Ningaloo Coast WHA including all the fish, mollusc, crustacean and turtle species.

The potential threats to the OUV or World Heritage values of the Ningaloo Coast WHA posed by the proposed action include but are not limited to, release of plastics, leaching of chemicals and contaminants into the environment (including into the WHA, or being ingested by species that are listed as attributes of OUV and that move in and out of the WHA), increased vessel strikes to marine mammals, turtles and whale sharks, marine pollution including the potential movement of some or parts of the artificial reef closer to or within the Ningaloo Coast WHA through storm surge and/or corrosion.

Details are provided below.

<u>Heritage protection and Matters of National Environmental Significance</u>

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) protects National Heritage places and World Heritage properties (such as the Ningaloo Coast WHA) as Matters of National Environmental Significance (MNES). A person must not take an action that has, will have or is likely to have a significant impact on the heritage values of a declared heritage place. This includes actions within or adjacent to the heritage place.

The EPBC Act policy statement *Matters of National Environmental Significance: Significant Impact Guidelines 1.1* provides overarching guidance on determining whether an action is likely to have a significant impact on a matter of National Environmental Significance (NES) (DoE MNES, 2013). The guidelines outline a 'self-assessment' process, including detailed criteria, to assist persons in deciding if an action is likely to have a significant impact upon any MNES and whether or not a referral under the EPBC Act should be submitted to the Australian Government for assessment.

The application includes some self-assessment for 'nationally threatened species and ecological communities' concluding that the proposed artificial reef would not have a significant impact on listed species:

> Overall, there are 46 EPBC-listed threatened and/or migratory species which may occur or have important habitat occur in the defined area, including 18 birds, 11 fishes, 11 marine mammals, and six marine reptiles. (Table 25). No listed threatened ecological communities occur near the proposed area. The proposed artificial reef is not considered to have a significant impact on any of these species through impacts to population size, population structure, critical habitat, breeding cycle, migratory behaviour, or any other aspects which may influence the population size or recovery of these species. In determining whether an action is likely to have a significant impact, all stages, components, related infrastructure, and related activities of the action were assessed based on the nature and magnitude of potential impacts. (Recfishwest Part III - Section 16, page 140).

The application also includes a risk assessment for potential impacts to physical environmental conditions from the proposed artificial reef (Recfishwest Part III: Table 20) and a risk assessment for potential biological impacts from the proposed artificial reef (Recfishwest Part III: Table 23). The environment risk assessment includes proposed mitigation of risks for aspects of 'nearshore coastal', 'local processes', 'benthos' and 'water and sediments' including leaching of contaminants. The biological risk assessment includes proposed mitigation of risks for cetaceans, marine reptiles, sharks, seabirds, fish, non-indigenous marine species, key threatening processes, marine protected areas and Biologically Important Areas (BIAs).

The assessment considers BIAs within the operational area and includes maps of each BIA within the region, however the maps do not show the location of the proposed artificial reef in relation to the BIAs (Recfishwest Part V: 109-134).

This information is provided in disparate sections of the application and does not clearly identify those species that are World Heritage values. This makes it difficult to properly assess potential impacts on the World Heritage property and its World Heritage values.

The assessment of potential impact on individual species in the application does not identify which of these species are World Heritage values of the Ningaloo Coast WHA, or how collectively any impacts on these species may affect the integrity of the World Heritage property. The application only provides short and cursory assessments of impact to World Heritage values, such as:

> The artificial reef is located approximately 18 km offshore, in 165 m water depth, and on relatively featureless seafloor characteristic of deeper waters of the continental shelf off the northwest of Australia. It should also be noted that the artificial reef will be located (at minimum) 1.7 km from the boundary of the NCWHA boundary. It is not considered a likely outcome that the artificial reef impacts on the superlative natural phenomena, exceptional natural beauty, and/or aesthetic importance of the NCWHA given its position on the seafloor (fish populations, boat traffic, and marine debris are considered in other sections of the permit application and Request for Further Information). The location, relatively small size, and function of the artificial reef makes impacts to geomorphic or physiographic landforms/features improbable. No significant impacts to threatened species or their associated habitats were identified in consideration of the proposed artificial reef (RecfishWest Part III: 276).

Although the proposed action is only 1.7km from the Ningaloo Coast WHA, the self-assessment under the EPBC Act, and the Biological and Environmental Risk Assessments in the application focus on individual listed and threatened species and do not sufficiently assess the proposed action in relation to the World Heritage values or integrity of the Ningaloo Coast WHA.

<u>Impact of the release of plastics and microplastics</u>

Threat Abatement Plan for the impacts of marine debris

Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris was listed as a key threatening process under the EPBC Act in August 2003. The *Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia's coasts and oceans* (TAP, 2018) addresses key threatening

processes and harmful marine. Harmful marine debris includes land-sourced garbage, fishing gear from recreational and commercial fishing abandoned or lost to the sea, and vessel-sourced, solid, non-biodegradable floating materials disposed of or lost at sea. Most of these items are made of synthetic plastics. Harmful marine debris is recognised as a ubiquitous, global problem.

Although Threat Abatement Plans are not statutory, they provide for the research, management and other actions necessary to reduce the key threatening processes to an acceptable level in order to maximise the chances of the long-term survival in nature of native species and ecological communities affected by the process

The application references the Threat Abatement Plan for the impacts of marine debris (in the form of fishing gear) on the vertebrate wildlife of Australia's coasts and oceans (RecfishWest Part III, 157), but does not take it into consideration in relation to the potentially large amount and likely release of plastics, microplastics, foam and other debris from the use of the RTM as part of the proposed artificial reef.

Amount of plastic expected to be released into the marine environment

The Long Term Management Plan (LTMP) states that a large amount (up to 12.4 tonnes) of plastics could be released to the surrounding environment over a timeframe extending from hundreds to thousands of years:

> .. it is expected that a base case of approximately 5.9 tonnes and a maximum of approximately 12.4 tonnes of plastics could be released to the surrounding environment over a timeframe extending from hundreds to thousands of years. These plastics could be released as fragments (probably mesoplastic sized pieces - ~5-20 mm) that will sink to the seabed in the immediate vicinity of the RTM and be incorporated into surface sediments (worst-case quantity ~9.1 tonnes), or fragments that will float in the water column and undergo further degradation to form microplastics (worst-case quantity ~3.3 tonnes), which will disperse until they are washed ashore or sink because their density changes. (RecfishWest Part III: 292).

Elsewhere in the application the amount of plastics to be released into the environment is estimated as being much less under a "best-case" scenario. For the purposes of this advice a precautionary approach has been used and the so-called "worst-case" quantities are referenced.

The Applicant also notes that:

> Any inputs of floating microplastics into waters offshore from North West Cape and the Ningaloo Coast from the RTM will be inconsequential compared to other inputs of plastics into the region. Woodside has developed and will be implementing a plastics offsets program that will result in the removal of an equivalent volume of plastics (i.e. a minimum of 12.4 tonnes) from the marine environment of Western Australia. (RecfishWest Part III: 277).

It is recommended that this application be assessed on its own merits. The amount of plastic that will enter the environment needs to assessed irrespective of the amount of plastics already present in the marine environment, as is argued by the Applicant.

Potential impacts of plastics on the Ningaloo Coast WHA

The LTMP states that there will be no impact on any values of the Ningaloo Coast WHA from the release of residual plastics, primarily because plastics are likely to be released at a very slow rate and are not expected to result in any significant impacts.

> Slow formation and release over extremely long timeframes (hundred to thousands of years) of microplastics from residual polymers in the RTM will not significantly impact any ecosystems or habitats at or adjacent to the proposed IAR location (RecfishWest Part III: 277).

The LTMP concludes that ingestion of microplastics originating from residual PE and PP in the RTM by foraging **turtles** is not likely to occur in the waters at and surrounding the proposed Artificial Reef location, as turtles will not use these deep, offshore waters for foraging.

However the LTMP acknowledges there will be ingestion of microplastics by **fish** and **sharks**, noting that:

> .. there is the potential for whale sharks feeding within region to ingest microplastics from prey organisms. Globally, ingestion of microplastics has been identified as a threat to filter-feeding elasmobranchs, such as whale sharks, basking sharks and manta rays, in a number of locations (Germanov et al. 2018, 2019; Parton et al. 2020). (RecfishWest Part III: 277).

The Applicant also refers to potential ingestion of microplastics by **whales** as negligible with humpback whales not known to feed during their annual migration.

> Any ingestion of microplastics originating from residual PE and PP in the RTM by foraging pygmy blue whales is likely to be negligible, given the very small quantity of PE and PP potentially ending up as microplastics floating in the upper layers of the water column (worst-case quantity ~3.3 tonnes), and because this process will occur over an extremely long timeframe (hundreds to thousands of years) at a very slow rate. This input is not expected to result in any significant impacts to feeding pygmy blue whales in the region (RecfishWest Part III: 295).

For **seabirds**, the Applicant acknowledges that many species are contaminated by plastic, but assesses any impact as not being significant due to what they described as:

> the very small quantity of PE and PP potentially ending up as microplastics floating in the upper layers of the water column (worst-case quantity ~3.3 tonnes), and because this process will occur over an extremely long timeframe (hundreds to thousands of years) at a very slow rate (RecfishWest Part III: 296).

The Applicant concludes that:

> …any ingestion of microplastics via prey species is not likely to cause any significant impacts, given the given the [sic] very small quantities of residual polymers in the RTM, long degradation timeframes and release rates, and very low levels likely to be present in target prey species. (RecfishWest Part III: 277).

Monitoring

The LTMP is deficient as there is no mention of monitoring plastic and microplastic ingestion by marine species. This is particularly important to address the claims made by the Applicant that:

> … breakdown of the residual plastics within the RTM, and release of microplastics to the marine environment, will not result in an impact greater than a slight, short-term impact on species, habitats (but not affecting ecosystem function), physical or biological attributes. This impact will occur over extremely long timeframes (hundreds to thousands of years) and at a very slow rate. (RecfishWest Part III:297).

Plastics offset program

The proposal for a plastics offset program is questionable.

It is known that plastics and microplastics are a key and increasing threat to the marine environment (and are recognised as a key threatening process under the EPBC Act). Any program for removal of marine plastics should be encouraged.

However, with only scant information provided in the application, it is not possible to assess the merits of a proposal to remove an equivalent quantity of marine debris from the marine/ coastal environment (described as

"beach clean up" presumably of drink bottles and other plastic containers and objects) compared to the large quantity of possibly contaminated plastics, foam and grout likely to degrade from the proposed disposal of the RTM.

From a policy perspective it is recommended that the Waste Taskforce be consulted on the proposed release of plastics to the environment and the proposed plastics offset program.

Leaching of chemicals and contaminants into the environment and physical ingestion by marine species

Leaching of contaminants is considered within the environmental risk assessment (Recfishwest Part III, Table 20). Leaching of contaminants received a rating of D4, meaning "*unlikely and minor*" with a mitigation of "*Structures are built to Australian Standards for corrosion rates, and materials do not adversely affect the environment*". Once the mitigation was applied, leaching of contaminants was reduced to the lowest rating of E5, meaning "*Rare and Minimal*". The risk assessment has rated leaching of contaminants as the lowest rating, which seems very conservative considering the toxicity of the polyurethane foam within the RTM. The polyurethane foam contains polymeric Diphenyl Methyl Di Isocyanate, polyols, catalysts, flame retardants and blowing agents, it is not biodegradable and can persist in the environment (Recfishwest Part III: 187). The main risk associated with the foam is not a toxicological risk but rather the risk of physical ingestion by marine species if the foam was released into the environment. The application states that any inherent risk posed by the foam being released into the water column or being physically ingested by marine species could be mitigated through sealing of the foam compartment, this will be done by pumping grout into any void spaces within the structure to secure the foam. The process involves the following steps: once the RTM is sunk to the seafloor two ports are required to be cut into the RTM, one port will be used as a grout injection port and the other will act as a returns/outlet port. Water is first to be pumped through the entire system to ensure that flow is being received at the seafloor and there are no blockages (Recfishwest Part IV: 10).

Although the grout will block foam once properly applied, there is potential for polyurethane foam to be flushed out during the flushing process and there is the potential for the grout to degrade and be released into the environment and ingested.

If the polyurethane foam was to leach into the environment and be ingested by marine species it could have negative ecological and environmental impacts and a direct impact on the heritage values of the Ningaloo Coast WHA. There is potential for ingestion of foam (or degraded grout) by species such as fish, turtles, sharks, whales, and whale sharks, all of which are listed as attributes of the Outstanding Universal Value (OUV) of the Ningaloo Coast WHA. The application does not provide an appropriate mitigation strategy for leaching of chemicals and contaminants into the environment.

It is not apparent whether there has been any assessment of flushing of residual chemicals or the release of hydraulic oil on the listed threatened or migratory species.

It is recommended that specialist advice be sought on the potential for chemicals and contaminants to leach into the environment and their potential environmental impacts, especially on species that are World Heritage values of the Ningaloo Coast WHA.

Storm surge and corrosion

The application states that:

> Storm surge is the major threat to the Ningaloo Coast during a cyclone event. Tropical cyclones may have direct effects on the artificial reef ecosystem through the destruction caused by storm waves and high winds, mixing of marine waters and strong currents. However, these impacts are expected to be rare and localised (approximately once every 25 years) (Recfishwest Part III).
>
> The concrete reef pyramids are designed to retain their functional characteristics for a period exceeding 30 years. The decommissioned oil and gas structures are not assessed for structural integrity as it is assumed

they will corrode over time. Both the reef pyramids and the decommissioned oil and gas structure (RTM) are designed to be stable for a 1 in 10,000-year cyclonic event (Recfishwest Part III).

The application also states that the Applicant will not monitor the artificial reef after a storm event, instead adhering to predetermined monitoring rates, being a visual inspection annually in the first three years, and once every five years up until 20 years post deployment and a final monitoring trip on the last year (30th year).

The RTM structure is cylindrical and has the potential to roll during storm events. Additionally, it has the potential to corrode and break up over time. Other than sinking the RTM to a desired "on bottom weight" (1040T) there is no indication in the application documentation of how the structure is going to be stabilised on the seabed or during the sinking process.

There is potential for the RTM or components of the RTM to shift location during the sinking process and/or after a storm event and/or due to corrosion as the structure ages over time. Some or all of the RTM could potentially move closer to, or within the Ningaloo Coast WHA.

If relocation of the RTM was to occur closer or within the WHA, it could impact the integrity of the WHA, affecting its pristine environment. The application does not provide an appropriate mitigation strategy for corrosion/breakup/movement of the RTM or storm surge events.

Marine pollution from increased fishing activities

In addition to the remarkable aggregations of whale sharks the Ningaloo Coast WHA harbours a high marine diversity of more than 300 documented coral species, over 700 reef fish species, roughly 650 mollusc species and around 600 crustacean species.

Increased recreational fishing at the proposed artificial reef could result in an increase in marine debris (plastics and discarded fishing gear). If not mitigated appropriately the increased marine debris could have a direct impact on the abundant marine species recognised as part of the OUV of the Ningaloo Coast WHA. The Applicant, Recfishwest, is the peak body representing the interests of 750,000 recreational fishers in Western Australia, are advocates for education on ways to minimise debris being left in the marine environment. Their application states that given the high level of stewardship for the marine environment and public fishing assets that recreational fishers generally uphold, any increase in marine debris from increased fishing activities at the site is expected to be minimal (Recfishwest Part II).

Vessel strikes

Vessel strikes are unlikely to increase as long as appropriate guidelines and procedures are put in place and adhered to.

The Ningaloo Coast WHA is a major migratory route for humpback whales, which take up residence in the Exmouth Gulf annually. Green turtles, flatback turtles, and hawksbill turtles all utilise the sandy beaches along the coast as nesting and rookery sites. Other marine megafauna can also be found in the area, including sharks, whale sharks, dolphins, dugongs, manta rays, and orcas.

Whale sharks are one of the key species listed as an attribute of the OUV of the Ningaloo Coast WHA and are prevalent in the vicinity of the location for the proposed artificial reef.

Whale sharks are vulnerable to vessel strike as they spend considerable periods of time at or close to the surface of the water. There is potential for the increased number of vessels at the artificial reef to increase the number of vessel strikes on whale sharks, turtles and whales. If appropriate guidelines and procedures are put in place for cetacean interactions, being no closer than 50m for a dolphin or 100m for a whales, and adhered to, increased vessel strike is unlikely to occur.

The application states that all vessels participating in the project must adhere to cetacean interaction regulations (State and Commonwealth*)* during all stages of the project (Recfishwest Part III).

Additionally, post deployment, if all vessels adhere to cetacean regulations (State and Commonwealth) in place to ensure minimal impact, it is unlikely vessel strikes would increase due to the placement artificial reef.

Recreational fishing

Some concerns have been raised by IUCN about the impacts of recreational fishing at and near the Ningaloo Coast WHA.

At the time of inscribing the Ningaloo Coast on the World Heritage List in 2011 the World Heritage Committee noted that there is a need for ongoing assessment of effects of recreational fisheries to ensure management frameworks remain effective to protect the values of the World Heritage property (World Heritage Committee, 2011).

The December 2020 IUCN Conservation Outlook Assessment for the Ningaloo Coast notes that recent research investigating the population status of important fish species in the Ningaloo Marine Park has indicated declining population trends for some species, including emperors, both inside and outside sanctuary zones. However the degree to which this is attributable to fishing activities is not clear, with declines in targeted fish possibly influenced by additional factors such as large scale variation in climate (IUCN, 2020).

On the basis of the information provided in the application it is not possible to accurately predict the extent to which the proposed artificial reef will increase recreational fishing near the Ningaloo Coast WHA. If the artificial reef is approved for placement it will be important to monitor and set appropriate limits for the catch of species such as emperors.

Other issues

Ningaloo Coast Strategic Management Framework and Draft Joint Management Plan - Nyinggulu (Ningaloo) Coastal Reserves, 2019

The Ningaloo Coast Strategic Management Framework (the framework) was published in 2010. The framework presents the overall planning regime for the Ningaloo Coast and provides direction and guidance to the managing agencies/owners in the formulation of their policies. The framework does not contain detailed management policies as these are included in the individual management plans for the area (Framework 2010). There is no reference or consideration of the placement of artificial reefs.

The draft joint management plan for the Nyinggulu (Ningaloo) Coastal Reserves 2019 (draft management plan) does not apply to the proposed location of the artificial reef (approximately 1.7km from the Ningaloo Coast WHA boundary). However the draft management plan is relevant to the Ningaloo Coast WHA. The draft management plan provides direction for the proposed coastal conservation and recreation reserves along the Ningaloo Coast. It aims to conserve and protect the values of the area in the long-term and provides a summary of operations proposed to be undertaken in the area. The Western Australian Government are currently considering public comments submitted during the consultation period. The management plan will remain in draft until all submissions have been considered.

Artificial reefs are not discussed within the draft management plan and are not listed as one of the operations proposed to be undertaken within the planning area.

Ningaloo Coast World Heritage Advisory Committee (NCWHAC)

On 26 August 2020 the NCWHAC wrote to the Environment Approvals Division (WA Assessments) outlining their concerns about the disposal of decommissioned oil and gas infrastructure at sea, the proximity of the proposed

artificial reef to the Ningaloo Coast WHA and the potential impact on OUV, pollution; stability; and detraction of fish species from the World Heritage Area.

The Applicant has consulted with the Ningaloo Coast World Heritage Advisory Committee (NCWHAC). The NCWHAC wrote to Woodside Energy Ltd on 23 November 2020 indicating that they do not support the re-purposing of decommissioned and surplus marine infrastructure as artificial reefs within or adjacent to the Ningaloo Coast WHA, given the likelihood for potentially significant ecological and habitat impacts within and adjacent to the Ningaloo Coast WHA.

The NCWHAC's preference is for any decommissioned and surplus marine structures to be removed to an onshore location. The NCWHAC have also expressed concern with the shift in responsibility for continual monitoring and remediation of values from the Applicant to the Western Australia Government, adding additional pressure on the State's resources.

On 10 February 2021 the NCWHAC wrote to the Environment Approvals Division (Sea Dumping Section) again outlining their concerns on the proposed artificial reef, including the potent marine waste disposal/sea dumping action, the residual contaminants within the RTM and the close proximity to the WHA. The NCWHAC reiterated that they do not support artificial reefs within the WHA or within proximity to the WHA.

Quarterly reporting to the UNESCO World Heritage Centre

If it is considered that the proposed action may have a significant impact on the Ningaloo Coast WHA, it will be important to consider whether to inform the UNESCO World Heritage Centre of the proposed action in accordance with the World Heritage Operational Guidelines - 'before making any decisions that would be difficult to reverse'. This is particularly important to consider as the department has now received two letters from the NCWHAC outlining their concerns about the proposed artificial reef, its proximity to the WHA and the proposed use of decommissioned oil and gas infrastructure.

As a signatory to the *World Heritage Convention*, Australia has the responsibility to protect the Outstanding Universal Value (OUV) of its World Heritage properties. In particular, each State Party has a responsibility to advise the UNESCO World Heritage Centre of proposed actions that may impact OUV. Paragraph 172 of the *Operational Guidelines for the Implementation of the World Heritage Convention* (UNESCO, 2019) states that:

> *"The World Heritage Committee invites the States Parties to the Convention to inform the Committee, through the Secretariat, of their intention to undertake or to authorize in an area protected under the Convention major restorations or new constructions which may affect the Outstanding Universal Value of the property. Notice should be given as soon as possible (for instance, before drafting basic documents for specific projects) and before making any decisions that would be difficult to reverse, so that the Committee may assist in seeking appropriate solutions to ensure that the Outstanding Universal Value of the property is fully preserved*."

In accordance with Paragraph 172 of the *Operational Guidelines* the department informs the UNESCO World Heritage Centre of proposals in or near World Heritage properties considered to be a 'controlled action' (CA) under s.12 of the EPBC Act and key stages following the CA decision – i.e. if the action is approved, not approved or withdrawn.

A quarterly report is sent to the UNESCO World Heritage Centre informing them of proposals in or near a World Heritage property that have the potential to impact the OUV of that property. The quarterly report is made publicly available on DAWE's website.

The department also informs the UNESCO World Heritage Centre on proposals accepted for assessment by NOPSEMA.

Indigenous consultation

The application states the Thanardi Garrbu Aboriginal Corporation (NGTAC) were consulted on the location of the proposed action during the stakeholder consultation period. Information provided included a consultation letter, GPS coordinates of the artificial reef boundary and maps indicating the reef location. The NGTAC raised no objections to the project, their statement is as follows "We *see no harm in the Exmouth Deepwater Artificial Reef*

and that the proposed works are not within any boundaries of any Aboriginal Heritage Sites or Places. Fish for the future…".

It would be advisable for the NGTAC to also be consulted on the potential impacts to heritage values of the Ningaloo Coast WHA, such as pollution, recreational fishing, leaching of chemicals into the environment and potential changes in location of artificial reef components due to storm surge events or corrosion.

When consulting it is recommended the Applicant refer to the Department of Agriculture, Water and the Environment's '*Engage early – best practise Indigenous engagement guideline for environmental* assessments' to ensure appropriate consultation has been undertaken with Indigenous peoples with rights and interests. These guidelines provide guidance on best practice Indigenous engagement for environmental assessments.

It is recommended that the Traditional Owners (the NTGAC) are consulted on the potential impacts to the Ningaloo Coast WHA.

Summary of advice

Proposed duration of permit

- Given the varying lifespan of the concrete artificial reef modules (30 years), the grout to be used to stabilise the RTM (50 years), the RTM structure (100-400 years) and the release of microplastics (over hundreds to thousands of years), it will be important to consider the appropriate duration of the permit (if one is to be issued) and the length of time to monitor the impact of the artificial reef, and particularly the use to the RTM, on the Ningaloo Coast WHA, World Heritage values and integrity.

Heritage values and potential impacts posed by the action

- The project has the potential to impact the Outstanding Universal Value (OUV) or World Heritage values of the Ningaloo Coast World Heritage Area (WHA).

Heritage protection and Matters of National Environmental Significance

- Although the proposed action is only 1.7km from the Ningaloo Coast WHA, the self-assessment under the EPBC Act, and the Biological and Environmental Risk Assessments in the application focus on individual listed and threatened species but do not sufficiently assess the proposed action in relation to the World Heritage values or integrity of the Ningaloo Coast WHA.

Impact of the release of plastics and microplastics

- The application references the Threat Abatement Plan (TAP) for the impacts of marine debris (in the form of fishing gear) on the vertebrate wildlife of Australia's coasts and oceans, but does not take the TAP into consideration in relation to the large amount and likely release of plastics, microplastics, foam and other debris from the use of the RTM as part of the proposed artificial reef.
- A large amount (up to 12.4 tonnes) of plastics could be released to the surrounding environment over a timeframe extending from hundreds to thousands of years. The amount of plastic that will enter the environment needs to assessed irrespective of the amount of plastics already present in the marine environment, as is argued by the Applicant.
- The Long Term Management Plan (LTMP) is deficient as there is no mention of monitoring of plastic and microplastic ingestion by marine species following the placement of the artificial reef.
- The proposal for a plastics offset program is questionable.
- From a policy perspective it is recommended that the Waste Taskforce be consulted on the proposed release of plastics to the environment and a plastics offset program.

Leaching of chemicals and contaminants into the environment and physical ingestion by marine species

- There is a possibility of chemicals and contaminants (including flushed chemicals and hydraulic oil) being released into waters within and adjacent to the Ningaloo Coast WHA during deployment and as the RTM ages which could result in ingestion by marine species that are World Heritage values of the Ningaloo Coast WHA. This requires further specialist expert advice.
- It is not apparent whether there has been any assessment of flushing of residual chemicals or the release of hydraulic oil on the listed threatened or migratory species.

Storm surge and corrosion

- The proposed location for placement of the artificial reef is in close proximity to the Ningaloo Coast WHA and there is a possibility for components of the RTM to move closer to, or within the WHA after storm events or over time due to age and corrosion. This would constitute pollution of the WHA.

Recreational fishing

- Some concerns have been raised by IUCN about the impacts of recreational fishing at and near the Ningaloo Coast WHA.
- If the artificial reef is approved it will be important to monitor and set appropriate limits for the catch of species such as emperors.

Vessel strikes on cetaceans

- Vessel strikes are unlikely to increase as long as appropriate guidelines and procedures are put in place and state and Commonwealth cetacean regulations are adhered to.

Ningaloo Coast World Heritage Advisory Committee (NCWHAC)

- The Ningaloo Coast World Heritage Advisory Committee does not support the proposed artificial reef within or adjacent to the Ningaloo Coast WHA, given that they consider the use of the RTM as part of the artificial reef is inappropriate, and the ecological and habitat impacts to the Ningaloo Coast WHA are unacceptable.

Quarterly reporting to the UNESCO World Heritage Centre

- If it is considered that the proposed action may have a significant impact on the Ningaloo Coast WHA, it will be important to consider whether to inform the UNESCO World Heritage Centre of the proposed action in accordance with the World Heritage Operational Guidelines - 'before making any decisions that would be difficult to reverse'.

Traditional Owner consultation

- It is recommended that the Traditional Owners (the NTGAC) are consulted on the potential impacts of the artificial reef to the Ningaloo Coast WHA.

Relevant Management Plans

Name, date and SPIRE Link	**Plans cover:** Not specific to National or World Heritage – covers a broader area than the Ningaloo Coast WHA.	**Advise whether the Action proposed may be consistent with this plan**
Draft Joint Management Plan - Nyinggulu (Ningaloo) coastal reserves, 2019,		Artificial reefs not referenced.
Ningaloo Coast Strategic Management Framework 2010		

Summary of Advice

Primary Heritage Contact Officer for ongoing contact through Assessment/Approval stages	**Cleared by**

s. 22(1)(a)(ii)	Heritage Officer	22/02/2021	s. 22(1)(a)(ii)	Director – Natural Heritage	Click here to enter a date.	[signature]

Sources

- DAWE Artificial Reefs, 2020. Department of Agriculture, Water and the Environment Website, 2020 – Sea Dumping and Artificial Reefs
- DoE MNES, 2013. Department of Environment – Matters of National Environmental Significance, Significant Impact Guidelines 1.1 2013
- EPBC Act Protected Matters Report. Report created 11/11/20.
- Framework, 2010. Ningaloo Coast Strategic Management Framework 2010
- IUCN Report, 2020. IUCN Conservation Outlook Report 2020
- Management Plan, 2019. Draft Joint Management Plan - Nyinggulu (Ningaloo) coastal reserves, 2019
- Recfishwest Part I. Sea Dumping Permit Application – Recfishwest Requirements for the Exmouth Deepwater Artificial Reef. Submitted August 2020.
  Recfishwest Part III. Sea Dumping Permit Application – Recfishwest Requirements for the Exmouth Deepwater Artificial Reef - Part III – Long Term Management Plan
- Recfishwest Part IV. Sea Dumping Permit Application – Recfishwest Requirements for the Exmouth Deepwater Artificial Reef – Part IV Description of placement procedures.
- Recfishwest Part V. Sea Dumping Permit Application – Recfishwest Requirements for the Exmouth Deepwater Artificial Reef - Part V – Appendix
- TAP, 2018. Department of Environment and Energy – Marine Debris Threat Abatement Plan, 2018
- World Heritage Committee, 2011. World Heritage Nomination – IUCN Technical Evaluation, 2011
- UNESCO, 2019. Operational Guidelines for the Implementation of the World Heritage Convention, 2019
- UNESCO, 2020. UNESCO Website, 2020 – The Ningaloo Coast, Statement of Outstanding Universal Value
- DAWE AHD, 2020. Department of Agriculture, Water and the Environment website, 2020 - Australian Heritage Database

s. 22(1)(a)(ii)

From: s. 22(1)(a)(ii)
Sent: Thursday, 11 February 2021 12:10 AM
To: s. 22(1)(a)(ii)
Cc: s. 22(1)(a)(ii); Admin Sea Dumping; s. 22(1)(a)(ii); s. 22(1)(a)(ii) ; s. 22(1)(a)(ii)
Subject: RE: CSAS Advice – SD2020/3998 - Exmouth Deepwater Artificial Reef [SEC=OFFICIAL]
Attachments: SD2020-3998 - 001 - Exmouth Reef RTM - CSAS Advice - DRAFT.docx

Follow Up Flag: Follow up
Flag Status: Completed

Hi s. 22(1)(a)(ii)

Our draft advice will be back with s. 22(1)(a)(i tomorrow for clearance (not sure when she will be able to review it to accept the edits).

In the interim, I've attached an uncleared Track Change draft, for your information.

Please ring if you have any questions.

Yours,

s. 22(1)(a)(ii)

s.22(1)(a)(ii)

Contaminants, Standards, and Advice Section | T: + s. 22(1)(a)(ii) | E: s. 22(1)(a)(ii)@environment.gov.au
Department of Agriculture, Water and the Environment
John Gorton Building s. 22(1)(a)(ii)
PARKES ACT 2600

s. 22(1)(a)(ii)

E: s. 22(1)(a)(ii)@environment.gov.au

From: s. 22(1)(a)(ii) @environment.gov.au>
Sent: Friday, 15 January 2021 10:10 AM
To: s. 22(1)(a)(ii) @environment.gov.au>
Cc: s. 22(1)(a)(ii) @environment.gov.au>; Admin Sea Dumping <Admin.seadumping@environment.gov.au>
Subject: FW: CSAS Advice – SD2020/3998 - Exmouth Deepwater Artificial Reef [SEC=OFFICIAL]

Hi s. 22(1)(a)(ii)

I wasn't sure who to send this to or if you have a generic team inbox.

Can you let me know if there is a procedure for sending formal requests to your team please?

Thanks

s. 22(1)(a)(ii)

Dear Contaminants, Standards, and Advice,

I am writing to request comments on the following Sea Dumping project:

Sea Dumping Number: 2020/3998

Referral Title: Exmouth Deepwater Artificial Reef

Project stage: Assessment of sea dumping permit

Project Documentation s. 22(1)(a)(ii)

Relevant file links to the latest version of the application and its attachments are at the bottom of this email.

Potential Issues:

The applicant is proposing to construct and operate an artificial reef integrating the now disused Nganhurra Riser Turret Mooring, which will be relocated to a site 1.7kms from the boundary of the Ningaloo Coast World Heritage Area/Marine Park.

The Nganhurra RTM is proposed to be reefed at~170m depth, including a quantity of polyurethane buoyancy foam (65m^3). This foam in compartment 13, is proposed to be encapsulated with grout, with a lifespan of 50 years. It is estimated by the applicant that the foam will be released over a period 400 – 1500 years into the future. The polyurethane buoyancy foam includes a quantity of fire retardant, up-to 120kg. It is assumed by the applicant due to the pre 2006 timeframe of the RTMs construction, that the fire retardant is a worst case scenario material, polybrominated diphenyl ethers (PBDEs) a persistent organic pollutant. See Part III, pdf page 73, 199 and 305 for details.

The Department is seeking your advice in relation to the release of the foam and PBDEs into the marine environment and possible future transport, bioaccumulation and ecotoxicity.

Timeframe for providing advice:

Please email your advice to the primary EAB contact officer by 01 February 2021.

Previous Advice/referrals

As far as we are aware, due to the uniqueness of the project, no prior project or advice is relevant. The protected matters search is available within the project documentation (saved in spire).

Name of primary EAB contact officer:

s. 22(1)(a)(ii) Email: s. 22(1)(a)(ii) @awe.gov.au

Name of secondary EAB contact officer:

s. 22(1)(a)(ii) Email: s. 22(1)(a)(ii) @awe.gov.au

Relevant ESD Director:

s. 22(1)(a)(ii) Email: s. 22(1)(a)(ii) @awe.gov.au

Please contact me if there are any issues with the above time frame for a response. I am also happy to schedule some time to discuss the project and the request with the officer preparing the line area advice.

s. 22(1)(a)(ii)

s. 22(1)(a)(ii)

Regards,

s. 22(1)(a)(ii)
Assistant Director
Sea Dumping Section
Environment Assessments Queensland and Sea Dumping
Environment Approvals Division
Department of Agriculture, Water and the Environment
P: s. 22(1)(a)(ii) **E:** s. 22(1)(a)(ii) @environment.gov.au

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s. 47C(1)

s.22(1)(a)(ii)

From: s.22(1)(a)(ii)
Sent: Monday, 22 February 2021 5:58 PM
To: s.22(1)(a)(ii)
Cc: s.22(1)(a)(ii)
Subject: DRAFT Heritage advice - Proposed Exmouth Deepwater Artificial Reef [SEC=OFFICIAL]
Attachments: 1-Line Area advice template - Heritage Branch.docx

Hi s.22(1)(a)(ii)

Please find attached the draft heritage advice as requested.

Happy to discuss.

Thanks

22(1)(a)(ii)

s. 22(1)(a)(ii)
Director
Natural Heritage Section
s. 22(1)(a)(ii) | s. 22(1)(a)(ii)
s. 22(1)(a)(ii) @awe.gov.au

Department of Agriculture, Water and the Environment
Heritage Branch | Heritage, Reef and Wildlife Trade Division
John Gorton Building, Level 4, King Edward Terrace
Parkes ACT 2600

www.awe.gov.au

Sea Dumping Permit Application – Heritage Advice

Recfishwest - Sea Dumping Permit Application (SD2020/3998) - Exmouth Deepwater Artificial Reef

✓ World Heritage property	✓ National Heritage place	☐ Commonwealth marine area
☐ Commonwealth land	☐ Commonwealth Action	☐ Other whole of environment matter

Note: The Ningaloo Coast National Heritage place and World Heritage property have different heritage values.

Ningaloo Coast National Heritage place

The Ningaloo Coast was included on the National Heritage List in 2010 primarily for its terrestrial natural heritage values, its outstanding karst environment and anchialine communities characterised by the presence of remipede crustaceans (DAWE AHD, 2020).

The proposed action is unlikely to have any impact on the National Heritage values of the Ningaloo Coast.

Ningaloo Coast World Heritage property

The Ningaloo Coast was included on the World Heritage List in 2011.

The Statement of Outstanding Universal Value for the Ningaloo Coast was approved by the World Heritage Committee in 2011 and is the key reference for the ongoing protection of the World Heritage property.

Statements of Outstanding Universal Value outline the values to be protected (as justified according to 10 criteria), a statement of integrity, and the protection and management in place for the property at the time of inclusion on the World Heritage List. In accordance with the *Operational Guidelines for the Implementation of the World Heritage Convention* (UNESCO 2019), *t*he values (and attributes of those values) and integrity of the property are to be maintained over time and the commitments to protection and management upheld.

Excerpts from the Statement of Outstanding Universal Value likely to be relevant to the proposed action.

Heritage values likely to be relevant to the proposed action:

World Heritage criterion (vii) *contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance*. The Ningaloo Coast supports rare fish species, marine mammals and the largest documented aggregation of whale sharks (*Rhincodon typus*) in the world.

World Heritage criterion (x) *contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation*. The Ningaloo Coast harbours a high marine diversity of more than 300 documented coral species, over 700 reef fish species, roughly 650 mollusc species, as well as around 600 crustacean species and an unusual diversity of marine turtle species with an estimated 10,000 nests deposited along the coast annually.

Excerpts from the Statement of Integrity likely to be relevant to the proposed action:
Noting that the proposed action is only approximately 1.7km from the boundary of the Ningaloo Coast World Heritage Area (WHA), the maintenance of integrity of the WHA also needs to be considered. The Statement of Integrity included in the Statement of Outstanding Universal Value notes that while no formal buffer zones have

been established for the property, the *Environment Protection and Biodiversity Conservation Act 1999* serves as a legal buffer zone. Both the marine and the terrestrial areas face a number of threats to the property's integrity, including invasive marine species, illegal fishing and disturbance to wildlife.

Excerpts from the Protection and Management Requirements likely to be relevant to the proposed action:
The Statement of Outstanding Universal Value notes there is a need for ongoing management of fisheries and careful planning to ensure effective management and to protect the values of the property.

Stage: assessment
Previous Decisions:
N/A

Background
In Australia the placement and construction of artificial reefs are regulated under the *Environment Protection Act 1981* (Sea Dumping Act) and a sea dumping permit is required.

The Department of Agriculture, Water and the Environment's website notes that:

> [Sea dumping] Permits are necessary to ensure that appropriate sites are selected, materials are suitable and appropriately prepared, there are no significant adverse impacts on the marine environment and that the reef does not pose a danger to marine users.
>
> [Artificial] Reefs may only be created for legitimate purposes (i.e. not waste disposal) and cannot pose a significant threat to users or surrounding environments (DAWE Artificial Reefs, 2020).

Artificial Reef and Sea Dumping Permit application
The Applicant (Recfishwest) is proposing to construct and operate an artificial reef integrating the now decommissioned Nganhurra Riser Turret Mooring (RTM). The RTM was part of a two-component bow mooring system used in the extraction of petroleum by Woodside Energy Ltd (Recfishwest Part III: 8). If the placement of the artificial reef is approved and the artificial reef deployed, the ownership and liability associated with the artificial reef will move to the State of Western Australia, specifically the Department of Primary Industries and Regional Development (Recfishwest Part III: 11). The RTM is an 85m long cylindrical structure with a diameter ranging between 4.5m and 12.5m with an approximate weight of 2,452 tonnes when ballasted (Recfishwest Part III: 8).

The artificial reef is proposed to consist of 24 reef pyramids (six clusters of four concrete purpose-built modules 4m x 4m x 5m high), two clusters of 12 (24 units) Bombora modules and the repurposed RTM which is the main feature of the artificial reef, 49 units in total (Recfishwest Part III: throughout). The proposed location of the artificial reef is approximately 18km offshore in Western Australia, approximately 1.7kms from the boundary of the Ningaloo Coast World Heritage Area (WHA) (Recfishwest Part III: 277). The proposed reef site is 116m x 116m with an area of 13,456m^2 and has an approximate depth of 148m below LAT (Recfishwest Part III: 211). According to the Applicant this is one of the first projects of this nature in Australia and the southern hemisphere, and if successful, will be the first deep-water artificial reef in Australia.

<u>The Nganhurra Riser Turret Mooring (RTM)</u>

According to the application:

> The RTM is a steel structure comprised of 14 individual compartments separated by watertight bulk heads. The bottom compartment is filled with seawater and iron ore ballast. The topside structure of the RTM contains a range of equipment, materials and steel work. The upper most compartment is filled with 65m^3 of polyurethane foam. Hydraulic oil, paint coatings and anti-foul coatings are also found on the RTM. Prior to sinking, the RTM structure will undergo a series of works to ensure it is suitable for use within an artificial reef. This includes the removal of topside accessories, flushing of residual chemicals and the removal of the

riser tail stubs and bend stiffeners. The sinking process involves flooding a series of compartments to create a controlled descent to the seafloor. Once sunk to the seafloor the foam within the RTM will be grouted with an estimated amount of 36m^3 of grout. The grout used to fill will consist of a mixture of either general purpose cement, sodium silicate and seawater, or Ground Granulated Blast Furnace Slag, sodium silicate and seawater. The material composition of this general-purpose cement is the same as the cement used in the concrete purpose-built structures (reef pyramids) (Recfishwest Part III: 189).

The steel used in the construction of the RTM has no associated risks in seawater, similarly the iron ore used in the ballast has no identified risks in seawater (Recfishwest Part III: 197). Hydraulic oil contains components that may persist in the environment and components with the potential to accumulate and float on water (Recfishwest Part III: 199). Despite these components the potential risk to the environment is considered low given the small amount within the RTM overall (< 50L) (Recfishwest Part III: 199). An assessment was undertaken for paint coatings in their 'liquid' form, it suggests that the toxicity level may decrease once dried as solvents and other harmful contents within the paint evaporate once dried (Recfishwest Part III: 199). Paint coatings in their liquid forms can be considered toxic to marine biota to varying degrees, however the presence of marine growth already on the RTM provides evidence that the toxicity of the paint is below the levels that have substantially lethal impacts on marine organisms (Recfishwest Part III: 199). Based on the above factors, the risk posed by paint coatings has been deemed low (Recfishwest Part III: 199). The anti-foul paint has a service life of only 5 years however the RTM has been in the ocean for almost 15 years, so it is expected that most of the active ingredients within the anti-foul paint have already degraded away (Recfishwest Part III: 199).

Proposed duration of permit

The Applicant requests a 30 year permit stating that the artificial reef has an operational design life of 30 years, however it is likely that the structures would remain operational for several decades beyond the specified design life (Recfishwest Part I: 3).

The application also notes that:

- the grout to be used to stabilise the RTM will have a **50 year** lifespan (RecfishWest Part III: 60),
- the RTM structure is expected to take **100-400 years** to fully degrade (RecfishWest Part III: 287), and
- there will be slow formation and release over extremely long timeframes (**hundred[s] to thousands of years**) of microplastics from residual polymers in the RTM (RecfishWest Part III: 277).

It will be important to consider the appropriate duration of the permit (if one is to be issued) and the length of time to monitor the impact of the artificial reef, and particularly the use to the RTM, on the Ningaloo Coast WHA, World Heritage values and integrity.

Nature and extent of impacts on heritage matters as a result of the proposed action

Heritage values and potential impacts posed by the action

The project has the potential to impact the Outstanding Universal Value (OUV) or World Heritage values of the Ningaloo Coast World Heritage Area (WHA).

The Ningaloo Coast has Outstanding Universal Value (OUV) due to its interconnected ocean and arid coastline, limestone karst system and extensive network of underground caves, terrestrial species endemism, high marine diversity and the largest aggregation of whale sharks in the world. The Ningaloo Coast is included on the World Heritage List for:

Criterion (vii): contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;
The landscapes and seascapes of the property are comprised of mostly intact and large-scale marine, coastal and terrestrial environments. The lush and colourful underwater scenery provides a stark and

spectacular contrast with the arid and rugged land. The property supports rare and large aggregations of whale sharks (Rhincodon typus) along with important aggregations of other fish species and marine mammals. The aggregations in Ningaloo following the mass coral spawning and seasonal nutrient upwelling cause a peak in productivity that leads approximately 300-500 whale sharks to gather, making this the largest documented aggregation in the world (UNESCO 2020).

The attributes of OUV that were used to justify inclusion on the World Heritage List under Criterion (vii) that are likely to be relevant to the proposed action are the rare fish species, marine mammals and whale sharks.

Criterion (x): contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.
In addition to the remarkable aggregations of whale sharks the Ningaloo Reef harbours a high marine diversity of more than 300 documented coral species, over 700 reef fish species, roughly 650 mollusc species and around 600 crustacean species. The high numbers of 155 sponge species and 25 new species of echinoderms add to the significance of the area. On the ecotone, between tropical and temperate waters, the Ningaloo Coast hosts an unusual diversity of marine turtle species with an estimated 10,000 nests deposited along the coast annually. The majority of subterranean species on land, including aquatic species in the flooded caves are rare, taxonomically diverse and not found elsewhere in the southern hemisphere. The combination of relict rainforest fauna and small fully aquatic invertebrates within the same cave system is exceptional. The subterranean fauna of the peninsula is highly diverse and has the highest cave fauna (troglomorphic) diversity in Australia and one of the highest in the world. Above ground, the diversity of reptiles and vascular plants in the drylands is likewise noteworthy (UNESCO 2020).

The attributes of OUV or World Heritage values that were used to justify inclusion on the World Heritage List under Criterion (x) likely to be relevant to the proposed action are the marine diversity found within the Ningaloo Coast WHA including all the fish, mollusc, crustacean and turtle species.

The potential threats to the OUV or World Heritage values of the Ningaloo Coast WHA posed by the proposed action include but are not limited to, release of plastics, leaching of chemicals and contaminants into the environment (including into the WHA, or being ingested by species that are listed as attributes of OUV and that move in and out of the WHA), increased vessel strikes to marine mammals, turtles and whale sharks, marine pollution including the potential movement of some or parts of the artificial reef closer to or within the Ningaloo Coast WHA through storm surge and/or corrosion.

Details are provided below.

<u>Heritage protection and Matters of National Environmental Significance</u>

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) protects National Heritage places and World Heritage properties (such as the Ningaloo Coast WHA) as Matters of National Environmental Significance (MNES). A person must not take an action that has, will have or is likely to have a significant impact on the heritage values of a declared heritage place. This includes actions within or adjacent to the heritage place.

The EPBC Act policy statement *Matters of National Environmental Significance: Significant Impact Guidelines 1.1* provides overarching guidance on determining whether an action is likely to have a significant impact on a matter of National Environmental Significance (NES) (DoE MNES, 2013). The guidelines outline a 'self-assessment' process, including detailed criteria, to assist persons in deciding if an action is likely to have a significant impact upon any MNES and whether or not a referral under the EPBC Act should be submitted to the Australian Government for assessment.

The application includes some self-assessment for 'nationally threatened species and ecological communities' concluding that the proposed artificial reef would not have a significant impact on listed species:

> Overall, there are 46 EPBC-listed threatened and/or migratory species which may occur or have important habitat occur in the defined area, including 18 birds, 11 fishes, 11 marine mammals, and six marine reptiles. (Table 25). No listed threatened ecological communities occur near the proposed area. The proposed artificial reef is not considered to have a significant impact on any of these species through impacts to population size, population structure, critical habitat, breeding cycle, migratory behaviour, or any other aspects which may influence the population size or recovery of these species. In determining whether an action is likely to have a significant impact, all stages, components, related infrastructure, and related activities of the action were assessed based on the nature and magnitude of potential impacts. (Recfishwest Part III - Section 16, page 140).

The application also includes a risk assessment for potential impacts to physical environmental conditions from the proposed artificial reef (Recfishwest Part III: Table 20) and a risk assessment for potential biological impacts from the proposed artificial reef (Recfishwest Part III: Table 23). The environment risk assessment includes proposed mitigation of risks for aspects of 'nearshore coastal', 'local processes', 'benthos' and 'water and sediments' including leaching of contaminants. The biological risk assessment includes proposed mitigation of risks for cetaceans, marine reptiles, sharks, seabirds, fish, non-indigenous marine species, key threatening processes, marine protected areas and Biologically Important Areas (BIAs).

The assessment considers BIAs within the operational area and includes maps of each BIA within the region, however the maps do not show the location of the proposed artificial reef in relation to the BIAs (Recfishwest Part V: 109-134).

This information is provided in disparate sections of the application and does not clearly identify those species that are World Heritage values. This makes it difficult to properly assess potential impacts on the World Heritage property and its World Heritage values.

The assessment of potential impact on individual species in the application does not identify which of these species are World Heritage values of the Ningaloo Coast WHA, or how collectively any impacts on these species may affect the integrity of the World Heritage property. The application only provides short and cursory assessments of impact to World Heritage values, such as:

> The artificial reef is located approximately 18 km offshore, in 165 m water depth, and on relatively featureless seafloor characteristic of deeper waters of the continental shelf off the northwest of Australia. It should also be noted that the artificial reef will be located (at minimum) 1.7 km from the boundary of the NCWHA boundary. It is not considered a likely outcome that the artificial reef impacts on the superlative natural phenomena, exceptional natural beauty, and/or aesthetic importance of the NCWHA given its position on the seafloor (fish populations, boat traffic, and marine debris are considered in other sections of the permit application and Request for Further Information). The location, relatively small size, and function of the artificial reef makes impacts to geomorphic or physiographic landforms/features improbable. No significant impacts to threatened species or their associated habitats were identified in consideration of the proposed artificial reef (RecfishWest Part III: 276).

Although the proposed action is only 1.7km from the Ningaloo Coast WHA, the self-assessment under the EPBC Act, and the Biological and Environmental Risk Assessments in the application focus on individual listed and threatened species and do not sufficiently assess the proposed action in relation to the World Heritage values or integrity of the Ningaloo Coast WHA.

<u>Impact of the release of plastics and microplastics</u>

Threat Abatement Plan for the impacts of marine debris

Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris was listed as a key threatening process under the EPBC Act in August 2003. The *Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia's coasts and oceans* (TAP, 2018) addresses key threatening

processes and harmful marine. Harmful marine debris includes land-sourced garbage, fishing gear from recreational and commercial fishing abandoned or lost to the sea, and vessel-sourced, solid, non-biodegradable floating materials disposed of or lost at sea. Most of these items are made of synthetic plastics. Harmful marine debris is recognised as a ubiquitous, global problem.

Although Threat Abatement Plans are not statutory, they provide for the research, management and other actions necessary to reduce the key threatening processes to an acceptable level in order to maximise the chances of the long-term survival in nature of native species and ecological communities affected by the process

The application references the Threat Abatement Plan for the impacts of marine debris (in the form of fishing gear) on the vertebrate wildlife of Australia's coasts and oceans (RecfishWest Part III, 157), but does not take it into consideration in relation to the potentially large amount and likely release of plastics, microplastics, foam and other debris from the use of the RTM as part of the proposed artificial reef.

Amount of plastic expected to be released into the marine environment

The Long Term Management Plan (LTMP) states that a large amount (up to 12.4 tonnes) of plastics could be released to the surrounding environment over a timeframe extending from hundreds to thousands of years:

> .. it is expected that a base case of approximately 5.9 tonnes and a maximum of approximately 12.4 tonnes of plastics could be released to the surrounding environment over a timeframe extending from hundreds to thousands of years. These plastics could be released as fragments (probably mesoplastic sized pieces - ~5-20 mm) that will sink to the seabed in the immediate vicinity of the RTM and be incorporated into surface sediments (worst-case quantity ~9.1 tonnes), or fragments that will float in the water column and undergo further degradation to form microplastics (worst-case quantity ~3.3 tonnes), which will disperse until they are washed ashore or sink because their density changes. (RecfishWest Part III: 292).

Elsewhere in the application the amount of plastics to be released into the environment is estimated as being much less under a "best-case" scenario. For the purposes of this advice a precautionary approach has been used and the so-called "worst-case" quantities are referenced.

The Applicant also notes that:

> Any inputs of floating microplastics into waters offshore from North West Cape and the Ningaloo Coast from the RTM will be inconsequential compared to other inputs of plastics into the region. Woodside has developed and will be implementing a plastics offsets program that will result in the removal of an equivalent volume of plastics (i.e. a minimum of 12.4 tonnes) from the marine environment of Western Australia. (RecfishWest Part III: 277).

It is recommended that this application be assessed on its own merits. The amount of plastic that will enter the environment needs to assessed irrespective of the amount of plastics already present in the marine environment, as is argued by the Applicant.

Potential impacts of plastics on the Ningaloo Coast WHA

The LTMP states that there will be no impact on any values of the Ningaloo Coast WHA from the release of residual plastics, primarily because plastics are likely to be released at a very slow rate and are not expected to result in any significant impacts.

> Slow formation and release over extremely long timeframes (hundred to thousands of years) of microplastics from residual polymers in the RTM will not significantly impact any ecosystems or habitats at or adjacent to the proposed IAR location (RecfishWest Part III: 277).

The LTMP concludes that ingestion of microplastics originating from residual PE and PP in the RTM by foraging **turtles** is not likely to occur in the waters at and surrounding the proposed Artificial Reef location, as turtles will not use these deep, offshore waters for foraging.

However the LTMP acknowledges there will be ingestion of microplastics by **fish** and **sharks**, noting that:

> .. there is the potential for whale sharks feeding within region to ingest microplastics from prey organisms. Globally, ingestion of microplastics has been identified as a threat to filter-feeding elasmobranchs, such as whale sharks, basking sharks and manta rays, in a number of locations (Germanov et al. 2018, 2019; Parton et al. 2020). (RecfishWest Part III: 277).

The Applicant also refers to potential ingestion of microplastics by **whales** as negligible with humpback whales not known to feed during their annual migration.

> Any ingestion of microplastics originating from residual PE and PP in the RTM by foraging pygmy blue whales is likely to be negligible, given the very small quantity of PE and PP potentially ending up as microplastics floating in the upper layers of the water column (worst-case quantity ~3.3 tonnes), and because this process will occur over an extremely long timeframe (hundreds to thousands of years) at a very slow rate. This input is not expected to result in any significant impacts to feeding pygmy blue whales in the region (RecfishWest Part III: 295).

For **seabirds**, the Applicant acknowledges that many species are contaminated by plastic, but assesses any impact as not being significant due to what they described as:

> the very small quantity of PE and PP potentially ending up as microplastics floating in the upper layers of the water column (worst-case quantity ~3.3 tonnes), and because this process will occur over an extremely long timeframe (hundreds to thousands of years) at a very slow rate (RecfishWest Part III: 296).

The Applicant concludes that:

> …any ingestion of microplastics via prey species is not likely to cause any significant impacts, given the given the [sic] very small quantities of residual polymers in the RTM, long degradation timeframes and release rates, and very low levels likely to be present in target prey species. (RecfishWest Part III: 277).

Monitoring

The LTMP is deficient as there is no mention of monitoring plastic and microplastic ingestion by marine species. This is particularly important to address the claims made by the Applicant that:

> … breakdown of the residual plastics within the RTM, and release of microplastics to the marine environment, will not result in an impact greater than a slight, short-term impact on species, habitats (but not affecting ecosystem function), physical or biological attributes. This impact will occur over extremely long timeframes (hundreds to thousands of years) and at a very slow rate. (RecfishWest Part III:297).

Plastics offset program

The proposal for a plastics offset program is questionable.

It is known that plastics and microplastics are a key and increasing threat to the marine environment (and are recognised as a key threatening process under the EPBC Act). Any program for removal of marine plastics should be encouraged.

However, with only scant information provided in the application, it is not possible to assess the merits of a proposal to remove an equivalent quantity of marine debris from the marine/ coastal environment (described as

"beach clean up" presumably of drink bottles and other plastic containers and objects) compared to the large quantity of possibly contaminated plastics, foam and grout likely to degrade from the proposed disposal of the RTM.

From a policy perspective it is recommended that the Waste Taskforce be consulted on the proposed release of plastics to the environment and the proposed plastics offset program.

Leaching of chemicals and contaminants into the environment and physical ingestion by marine species

Leaching of contaminants is considered within the environmental risk assessment (Recfishwest Part III, Table 20). Leaching of contaminants received a rating of D4, meaning "*unlikely and minor*" with a mitigation of "*Structures are built to Australian Standards for corrosion rates, and materials do not adversely affect the environment*". Once the mitigation was applied, leaching of contaminants was reduced to the lowest rating of E5, meaning "*Rare and Minimal*". The risk assessment has rated leaching of contaminants as the lowest rating, which seems very conservative considering the toxicity of the polyurethane foam within the RTM. The polyurethane foam contains polymeric Diphenyl Methyl Di Isocyanate, polyols, catalysts, flame retardants and blowing agents, it is not biodegradable and can persist in the environment (Recfishwest Part III: 187). The main risk associated with the foam is not a toxicological risk but rather the risk of physical ingestion by marine species if the foam was released into the environment. The application states that any inherent risk posed by the foam being released into the water column or being physically ingested by marine species could be mitigated through sealing of the foam compartment, this will be done by pumping grout into any void spaces within the structure to secure the foam. The process involves the following steps: once the RTM is sunk to the seafloor two ports are required to be cut into the RTM, one port will be used as a grout injection port and the other will act as a returns/outlet port. Water is first to be pumped through the entire system to ensure that flow is being received at the seafloor and there are no blockages (Recfishwest Part IV: 10).

Although the grout will block foam once properly applied, there is potential for polyurethane foam to be flushed out during the flushing process and there is the potential for the grout to degrade and be released into the environment and ingested.

If the polyurethane foam was to leach into the environment and be ingested by marine species it could have negative ecological and environmental impacts and a direct impact on the heritage values of the Ningaloo Coast WHA. There is potential for ingestion of foam (or degraded grout) by species such as fish, turtles, sharks, whales, and whale sharks, all of which are listed as attributes of the Outstanding Universal Value (OUV) of the Ningaloo Coast WHA. The application does not provide an appropriate mitigation strategy for leaching of chemicals and contaminants into the environment.

It is not apparent whether there has been any assessment of flushing of residual chemicals or the release of hydraulic oil on the listed threatened or migratory species.

It is recommended that specialist advice be sought on the potential for chemicals and contaminants to leach into the environment and their potential environmental impacts, especially on species that are World Heritage values of the Ningaloo Coast WHA.

Storm surge and corrosion

The application states that:

> Storm surge is the major threat to the Ningaloo Coast during a cyclone event. Tropical cyclones may have direct effects on the artificial reef ecosystem through the destruction caused by storm waves and high winds, mixing of marine waters and strong currents. However, these impacts are expected to be rare and localised (approximately once every 25 years) (Recfishwest Part III).
>
> The concrete reef pyramids are designed to retain their functional characteristics for a period exceeding 30 years. The decommissioned oil and gas structures are not assessed for structural integrity as it is assumed

they will corrode over time. Both the reef pyramids and the decommissioned oil and gas structure (RTM) are designed to be stable for a 1 in 10,000-year cyclonic event (Recfishwest Part III).

The application also states that the Applicant will not monitor the artificial reef after a storm event, instead adhering to predetermined monitoring rates, being a visual inspection annually in the first three years, and once every five years up until 20 years post deployment and a final monitoring trip on the last year (30th year).

The RTM structure is cylindrical and has the potential to roll during storm events. Additionally, it has the potential to corrode and break up over time. Other than sinking the RTM to a desired "on bottom weight" (1040T) there is no indication in the application documentation of how the structure is going to be stabilised on the seabed or during the sinking process.

There is potential for the RTM or components of the RTM to shift location during the sinking process and/or after a storm event and/or due to corrosion as the structure ages over time. Some or all of the RTM could potentially move closer to, or within the Ningaloo Coast WHA.

If relocation of the RTM was to occur closer or within the WHA, it could impact the integrity of the WHA, affecting its pristine environment. The application does not provide an appropriate mitigation strategy for corrosion/breakup/movement of the RTM or storm surge events.

Marine pollution from increased fishing activities

In addition to the remarkable aggregations of whale sharks the Ningaloo Coast WHA harbours a high marine diversity of more than 300 documented coral species, over 700 reef fish species, roughly 650 mollusc species and around 600 crustacean species.

Increased recreational fishing at the proposed artificial reef could result in an increase in marine debris (plastics and discarded fishing gear). If not mitigated appropriately the increased marine debris could have a direct impact on the abundant marine species recognised as part of the OUV of the Ningaloo Coast WHA. The Applicant, Recfishwest, is the peak body representing the interests of 750,000 recreational fishers in Western Australia, are advocates for education on ways to minimise debris being left in the marine environment. Their application states that given the high level of stewardship for the marine environment and public fishing assets that recreational fishers generally uphold, any increase in marine debris from increased fishing activities at the site is expected to be minimal (Recfishwest Part II).

Vessel strikes

Vessel strikes are unlikely to increase as long as appropriate guidelines and procedures are put in place and adhered to.

The Ningaloo Coast WHA is a major migratory route for humpback whales, which take up residence in the Exmouth Gulf annually. Green turtles, flatback turtles, and hawksbill turtles all utilise the sandy beaches along the coast as nesting and rookery sites. Other marine megafauna can also be found in the area, including sharks, whale sharks, dolphins, dugongs, manta rays, and orcas.

Whale sharks are one of the key species listed as an attribute of the OUV of the Ningaloo Coast WHA and are prevalent in the vicinity of the location for the proposed artificial reef.

Whale sharks are vulnerable to vessel strike as they spend considerable periods of time at or close to the surface of the water. There is potential for the increased number of vessels at the artificial reef to increase the number of vessel strikes on whale sharks, turtles and whales. If appropriate guidelines and procedures are put in place for cetacean interactions, being no closer than 50m for a dolphin or 100m for a whales, and adhered to, increased vessel strike is unlikely to occur.

The application states that all vessels participating in the project must adhere to cetacean interaction regulations (State and Commonwealth*)* during all stages of the project (Recfishwest Part III).

Additionally, post deployment, if all vessels adhere to cetacean regulations (State and Commonwealth) in place to ensure minimal impact, it is unlikely vessel strikes would increase due to the placement artificial reef.

Recreational fishing

Some concerns have been raised by IUCN about the impacts of recreational fishing at and near the Ningaloo Coast WHA.

At the time of inscribing the Ningaloo Coast on the World Heritage List in 2011 the World Heritage Committee noted that there is a need for ongoing assessment of effects of recreational fisheries to ensure management frameworks remain effective to protect the values of the World Heritage property (World Heritage Committee, 2011).

The December 2020 IUCN Conservation Outlook Assessment for the Ningaloo Coast notes that recent research investigating the population status of important fish species in the Ningaloo Marine Park has indicated declining population trends for some species, including emperors, both inside and outside sanctuary zones. However the degree to which this is attributable to fishing activities is not clear, with declines in targeted fish possibly influenced by additional factors such as large scale variation in climate (IUCN, 2020).

On the basis of the information provided in the application it is not possible to accurately predict the extent to which the proposed artificial reef will increase recreational fishing near the Ningaloo Coast WHA. If the artificial reef is approved for placement it will be important to monitor and set appropriate limits for the catch of species such as emperors.

Other issues

Ningaloo Coast Strategic Management Framework and Draft Joint Management Plan - Nyinggulu (Ningaloo) Coastal Reserves, 2019

The Ningaloo Coast Strategic Management Framework (the framework) was published in 2010. The framework presents the overall planning regime for the Ningaloo Coast and provides direction and guidance to the managing agencies/owners in the formulation of their policies. The framework does not contain detailed management policies as these are included in the individual management plans for the area (Framework 2010). There is no reference or consideration of the placement of artificial reefs.

The draft joint management plan for the Nyinggulu (Ningaloo) Coastal Reserves 2019 (draft management plan) does not apply to the proposed location of the artificial reef (approximately 1.7km from the Ningaloo Coast WHA boundary). However the draft management plan is relevant to the Ningaloo Coast WHA. The draft management plan provides direction for the proposed coastal conservation and recreation reserves along the Ningaloo Coast. It aims to conserve and protect the values of the area in the long-term and provides a summary of operations proposed to be undertaken in the area. The Western Australian Government are currently considering public comments submitted during the consultation period. The management plan will remain in draft until all submissions have been considered.

Artificial reefs are not discussed within the draft management plan and are not listed as one of the operations proposed to be undertaken within the planning area.

Ningaloo Coast World Heritage Advisory Committee (NCWHAC)

On 26 August 2020 the NCWHAC wrote to the Environment Approvals Division (WA Assessments) outlining their concerns about the disposal of decommissioned oil and gas infrastructure at sea, the proximity of the proposed

artificial reef to the Ningaloo Coast WHA and the potential impact on OUV, pollution; stability; and detraction of fish species from the World Heritage Area.

The Applicant has consulted with the Ningaloo Coast World Heritage Advisory Committee (NCWHAC). The NCWHAC wrote to Woodside Energy Ltd on 23 November 2020 indicating that they do not support the re-purposing of decommissioned and surplus marine infrastructure as artificial reefs within or adjacent to the Ningaloo Coast WHA, given the likelihood for potentially significant ecological and habitat impacts within and adjacent to the Ningaloo Coast WHA.

The NCWHAC's preference is for any decommissioned and surplus marine structures to be removed to an onshore location. The NCWHAC have also expressed concern with the shift in responsibility for continual monitoring and remediation of values from the Applicant to the Western Australia Government, adding additional pressure on the State's resources.

On 10 February 2021 the NCWHAC wrote to the Environment Approvals Division (Sea Dumping Section) again outlining their concerns on the proposed artificial reef, including the potent marine waste disposal/sea dumping action, the residual contaminants within the RTM and the close proximity to the WHA. The NCWHAC reiterated that they do not support artificial reefs within the WHA or within proximity to the WHA.

Quarterly reporting to the UNESCO World Heritage Centre

If it is considered that the proposed action may have a significant impact on the Ningaloo Coast WHA, it will be important to consider whether to inform the UNESCO World Heritage Centre of the proposed action in accordance with the World Heritage Operational Guidelines - 'before making any decisions that would be difficult to reverse'. This is particularly important to consider as the department has now received two letters from the NCWHAC outlining their concerns about the proposed artificial reef, its proximity to the WHA and the proposed use of decommissioned oil and gas infrastructure.

As a signatory to the *World Heritage Convention*, Australia has the responsibility to protect the Outstanding Universal Value (OUV) of its World Heritage properties. In particular, each State Party has a responsibility to advise the UNESCO World Heritage Centre of proposed actions that may impact OUV. Paragraph 172 of the *Operational Guidelines for the Implementation of the World Heritage Convention* (UNESCO, 2019) states that:

> *"The World Heritage Committee invites the States Parties to the Convention to inform the Committee, through the Secretariat, of their intention to undertake or to authorize in an area protected under the Convention major restorations or new constructions which may affect the Outstanding Universal Value of the property. Notice should be given as soon as possible (for instance, before drafting basic documents for specific projects) and before making any decisions that would be difficult to reverse, so that the Committee may assist in seeking appropriate solutions to ensure that the Outstanding Universal Value of the property is fully preserved*."

In accordance with Paragraph 172 of the *Operational Guidelines* the department informs the UNESCO World Heritage Centre of proposals in or near World Heritage properties considered to be a 'controlled action' (CA) under s.12 of the EPBC Act and key stages following the CA decision – i.e. if the action is approved, not approved or withdrawn.

A quarterly report is sent to the UNESCO World Heritage Centre informing them of proposals in or near a World Heritage property that have the potential to impact the OUV of that property. The quarterly report is made publicly available on DAWE's website.

The department also informs the UNESCO World Heritage Centre on proposals accepted for assessment by NOPSEMA.

Indigenous consultation

The application states the Thanardi Garrbu Aboriginal Corporation (NGTAC) were consulted on the location of the proposed action during the stakeholder consultation period. Information provided included a consultation letter, GPS coordinates of the artificial reef boundary and maps indicating the reef location. The NGTAC raised no objections to the project, their statement is as follows "We *see no harm in the Exmouth Deepwater Artificial Reef*

and that the proposed works are not within any boundaries of any Aboriginal Heritage Sites or Places. Fish for the future…".

It would be advisable for the NGTAC to also be consulted on the potential impacts to heritage values of the Ningaloo Coast WHA, such as pollution, recreational fishing, leaching of chemicals into the environment and potential changes in location of artificial reef components due to storm surge events or corrosion.

When consulting it is recommended the Applicant refer to the Department of Agriculture, Water and the Environment's '*Engage early – best practise Indigenous engagement guideline for environmental* assessments' to ensure appropriate consultation has been undertaken with Indigenous peoples with rights and interests. These guidelines provide guidance on best practice Indigenous engagement for environmental assessments.

It is recommended that the Traditional Owners (the NTGAC) are consulted on the potential impacts to the Ningaloo Coast WHA.

Summary of advice

Proposed duration of permit

- Given the varying lifespan of the concrete artificial reef modules (30 years), the grout to be used to stabilise the RTM (50 years), the RTM structure (100-400 years) and the release of microplastics (over hundreds to thousands of years), it will be important to consider the appropriate duration of the permit (if one is to be issued) and the length of time to monitor the impact of the artificial reef, and particularly the use to the RTM, on the Ningaloo Coast WHA, World Heritage values and integrity.

Heritage values and potential impacts posed by the action

- The project has the potential to impact the Outstanding Universal Value (OUV) or World Heritage values of the Ningaloo Coast World Heritage Area (WHA).

Heritage protection and Matters of National Environmental Significance

- Although the proposed action is only 1.7km from the Ningaloo Coast WHA, the self-assessment under the EPBC Act, and the Biological and Environmental Risk Assessments in the application focus on individual listed and threatened species but do not sufficiently assess the proposed action in relation to the World Heritage values or integrity of the Ningaloo Coast WHA.

Impact of the release of plastics and microplastics

- The application references the Threat Abatement Plan (TAP) for the impacts of marine debris (in the form of fishing gear) on the vertebrate wildlife of Australia's coasts and oceans, but does not take the TAP into consideration in relation to the large amount and likely release of plastics, microplastics, foam and other debris from the use of the RTM as part of the proposed artificial reef.
- A large amount (up to 12.4 tonnes) of plastics could be released to the surrounding environment over a timeframe extending from hundreds to thousands of years. The amount of plastic that will enter the environment needs to assessed irrespective of the amount of plastics already present in the marine environment, as is argued by the Applicant.
- The Long Term Management Plan (LTMP) is deficient as there is no mention of monitoring of plastic and microplastic ingestion by marine species following the placement of the artificial reef.
- The proposal for a plastics offset program is questionable.
- From a policy perspective it is recommended that the Waste Taskforce be consulted on the proposed release of plastics to the environment and a plastics offset program.

Leaching of chemicals and contaminants into the environment and physical ingestion by marine species

- There is a possibility of chemicals and contaminants (including flushed chemicals and hydraulic oil) being released into waters within and adjacent to the Ningaloo Coast WHA during deployment and as the RTM ages which could result in ingestion by marine species that are World Heritage values of the Ningaloo Coast WHA. This requires further specialist expert advice.
- It is not apparent whether there has been any assessment of flushing of residual chemicals or the release of hydraulic oil on the listed threatened or migratory species.

Storm surge and corrosion

- The proposed location for placement of the artificial reef is in close proximity to the Ningaloo Coast WHA and there is a possibility for components of the RTM to move closer to, or within the WHA after storm events or over time due to age and corrosion. This would constitute pollution of the WHA.

Recreational fishing

- Some concerns have been raised by IUCN about the impacts of recreational fishing at and near the Ningaloo Coast WHA.
- If the artificial reef is approved it will be important to monitor and set appropriate limits for the catch of species such as emperors.

Vessel strikes on cetaceans

- Vessel strikes are unlikely to increase as long as appropriate guidelines and procedures are put in place and state and Commonwealth cetacean regulations are adhered to.

Ningaloo Coast World Heritage Advisory Committee (NCWHAC)

- The Ningaloo Coast World Heritage Advisory Committee does not support the proposed artificial reef within or adjacent to the Ningaloo Coast WHA, given that they consider the use of the RTM as part of the artificial reef is inappropriate, and the ecological and habitat impacts to the Ningaloo Coast WHA are unacceptable.

Quarterly reporting to the UNESCO World Heritage Centre

- If it is considered that the proposed action may have a significant impact on the Ningaloo Coast WHA, it will be important to consider whether to inform the UNESCO World Heritage Centre of the proposed action in accordance with the World Heritage Operational Guidelines - 'before making any decisions that would be difficult to reverse'.

Traditional Owner consultation

- It is recommended that the Traditional Owners (the NTGAC) are consulted on the potential impacts of the artificial reef to the Ningaloo Coast WHA.

Relevant Management Plans

Name, date and SPIRE Link	**Plans cover:** Not specific to National or World Heritage – covers a broader area than the Ningaloo Coast WHA.	**Advise whether the Action proposed may be consistent with this plan**
Draft Joint Management Plan - Nyinggulu (Ningaloo) coastal reserves, 2019,		Artificial reefs not referenced.
Ningaloo Coast Strategic Management Framework 2010		

Summary of Advice

Primary Heritage Contact Officer for ongoing contact through Assessment/Approval stages	**Cleared by**

s. 22(1)(a)(ii)	Heritage Officer	22/02/2021	s. 22(1)(a)(ii)	Director – Natural Heritage	Click here to enter a date.	[signature]

Sources

- DAWE Artificial Reefs, 2020. Department of Agriculture, Water and the Environment Website, 2020 – Sea Dumping and Artificial Reefs
- DoE MNES, 2013. Department of Environment – Matters of National Environmental Significance, Significant Impact Guidelines 1.1 2013
- EPBC Act Protected Matters Report. Report created 11/11/20.
- Framework, 2010. Ningaloo Coast Strategic Management Framework 2010
- IUCN Report, 2020. IUCN Conservation Outlook Report 2020
- Management Plan, 2019. Draft Joint Management Plan - Nyinggulu (Ningaloo) coastal reserves, 2019
- Recfishwest Part I. Sea Dumping Permit Application – Recfishwest Requirements for the Exmouth Deepwater Artificial Reef. Submitted August 2020.
  Recfishwest Part III. Sea Dumping Permit Application – Recfishwest Requirements for the Exmouth Deepwater Artificial Reef - Part III – Long Term Management Plan
- Recfishwest Part IV. Sea Dumping Permit Application – Recfishwest Requirements for the Exmouth Deepwater Artificial Reef – Part IV Description of placement procedures.
- Recfishwest Part V. Sea Dumping Permit Application – Recfishwest Requirements for the Exmouth Deepwater Artificial Reef - Part V – Appendix
- TAP, 2018. Department of Environment and Energy – Marine Debris Threat Abatement Plan, 2018
- World Heritage Committee, 2011. World Heritage Nomination – IUCN Technical Evaluation, 2011
- UNESCO, 2019. Operational Guidelines for the Implementation of the World Heritage Convention, 2019
- UNESCO, 2020. UNESCO Website, 2020 – The Ningaloo Coast, Statement of Outstanding Universal Value
- DAWE AHD, 2020. Department of Agriculture, Water and the Environment website, 2020 - Australian Heritage Database

s. 22(1)(a)(ii)

From: s. 22(1)(a)(ii)
Sent: Wednesday, 3 February 2021 10:42 AM
To: s. 22(1)(a)(ii)
Cc: s. 22(1)(a)(ii)
Subject: FW: Compartment 13 [SEC=OFFICIAL]

Hi s. 22(1)(a)(ii)

Quick question – do you have an engineering drawing / cross section / exploded view / design or construction diagram depicting the RTM and in particular compartment 13? We'd like to be able to show our decision makers the construction details and where Compart 13 sits within the structure.

And if he hasn't done so already, s. 22(1)(a)(will shortly be in contact with you to ask about NOPSEMA's statements of reasons underpinning the Environmental Improvement Notice (#775, dated 23 Oct 19). We're interested to know if they looked at and / or considered chemical contamination risks from the foam and any residual oils.

Yours,

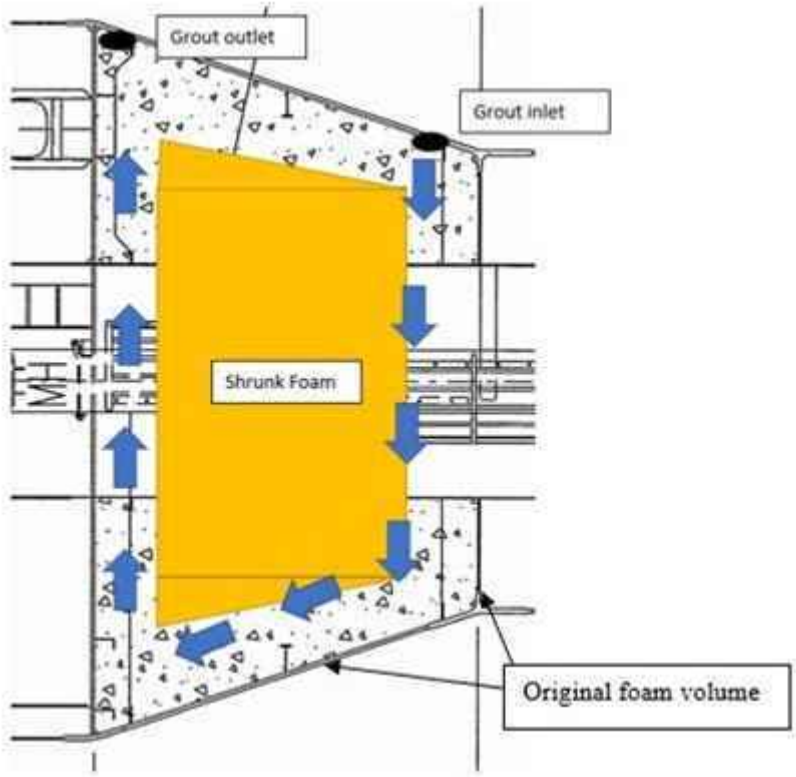
s. 22(1)(a)(ii)
s. 22(1)(a)(ii)
Contaminants, Standards, and Advice Section | s. 22(1)(a)(ii) | s. 22(1)(a)(ii) | s. 22(1)(a)(ii) @environment.gov.au
Department of Agriculture, Water and the Environment
John Gorton Building (1BS.223)
PARKES ACT 2600
s. 22(1)(a)(ii)

s. 22(1)(a)(ii)
s. 22(1)(a)(ii) @environment.gov.au

From s. 22(1)(a)(ii) @environment.gov.au>
Sent: Wednesday, 3 February 2021 9:48 AM
To s. 22(1)(a)(ii) @environment.gov.au>
Subject: Compartment 13 [SEC=OFFICIAL]

Hi s. 22(1)(a)(ii)

This is the only diagram I've been able to find of compartment 13



It's on p. 13 of part IV of the documentation.

I've also found NOPSEMA's notice (they're published). I've saved it in the folder here.

Regards,

s. 22(1)(a)(ii)

Contaminants, Standards and Advice | Chemicals Managment Branch
Department of Agriculture, Water and the Environment
GPO Box 787, Canberra ACT 2601
s. 22(1)(a)(ii) @environment.gov.au

s.22(1)(a)(ii)

From: s.22(1)(a)(ii)
Sent: Thursday, 11 February 2021 4:14 PM
To: s.22(1)(a)(ii)
Cc: s.22(1)(a)(ii)
Subject: FW: Heritage Advice - SD2020/3998 - Exmouth Deepwater Artificial Reef [SEC=OFFICIAL]

Follow Up Flag: Follow up
Flag Status: Completed

Hi s.22(1)(a)(ii)

As discussed earlier with s.22(1)(a)(ii), we will not be able to provide you with heritage advice on this application this week due to unforeseen circumstances. Our sincere apologies.

At this stage of our review and preparation of advice we do however have two high level comments:

1. The self-assessment of potential impacts of the proposal action on the Ningaloo Coast World Heritage property in the application is not comprehensive in its assessment of the property's Outstanding Universal Value (OUV), attributes of OUV and integrity. This overall deficiency in the application raises the question of whether this proposal should be referred under the EPBC Act for full environmental assessment to determine the extent of potential impacts on the World Heritage property.

2. As with any proposed action in or near a World Heritage property subject to environmental regulation under Australian law (in this case the Sea Dumping Act), it will be important to consider whether to inform the UNESCO World Heritage Centre of the proposed action in accordance with the World Heritage Operational Guidelines - 'before making any decisions that would be difficult to reverse'. This is particularly important to consider as the department has now received two letters from the Ningaloo Coast World Heritage Advisory Committee (NCWHAC) outlining their concerns about the proposed artificial reef, its proximity to the World Heritage property and the proposed use of decommissioned oil and gas infrastructure.

   As background:

   As a signatory to the World Heritage Convention, Australia has the responsibility to protect the Outstanding Universal Value (OUV) of its World Heritage properties. In particular, each State Party has a responsibility to advise the UNESCO World Heritage Centre of proposed actions that may impact OUV. Paragraph 172 of the Operational *Guidelines for* the *Implementation of the World Heritage Convention* (UNESCO, 2019) states that:

   > *"The World Heritage Committee invites the States Parties to the Convention to inform the Committee, through the Secretariat, of their intention to undertake or to authorize in an area protected under the Convention major restorations or new constructions which may affect the Outstanding Universal Value of the property. Notice should be given as soon as possible (for instance, before drafting basic documents for specific projects) and before making any decisions that would be difficult to reverse, so that the Committee may assist in seeking appropriate solutions to ensure that the Outstanding Universal Value of the property is fully preserved*."

   In accordance with Paragraph 172 of the *Operational Guidelines* the department informs the UNESCO World Heritage Centre of proposals in or near World Heritage properties considered to be a 'controlled action' under s.12 of the EPBC Act and key stages following the decision – i.e. if the action is approved, not approved or withdrawn.

A quarterly report is sent to the UNESCO World Heritage Centre informing them of proposals in or near a World Heritage property that have the potential to impact the OUV of that property. The quarterly report is made publicly available on DAWE's website.

The department also informs the UNESCO World Heritage Centre of proposals accepted for assessment by NOPSEMA.

We will be back in contact when we have finalised the advice.

Apologies again for the delay.

Kind regards

s.22(1)(a)(ii)

s.22(1)(a)(ii)
Director
Natural Heritage Section
s.22(1)(a)(ii)
s.22(1)(a)(ii) @awe.gov.au

From: s.22(1)(a)(ii) @environment.gov.au>
Sent: Friday, 15 January 2021 9:58 AM
To: Heritage EPBC Mailbox <HeritageEPBC.HeritageEPBC@environment.gov.au>
Cc: Admin Sea Dumping <Admin.seadumping@environment.gov.au>
Subject: Heritage Advice – SD2020/3998 - Exmouth Deepwater Artificial Reef [SEC=OFFICIAL]

Dear Heritage,

I am writing to request comments on the following Sea Dumping project:

Sea Dumping Number: 2020/3998

Referral Title: Exmouth Deepwater Artificial Reef

Project stage: Assessment of sea dumping permit

Project Documentation s.22(1)(a)(ii)

Relevant file links to the latest version of the application and its attachments are at the bottom of this email.

Potential Issues:

The applicant is proposing to construct and operate an artificial reef integrating the now disused Nganhurra Riser Turret Mooring, which will be relocated to a site 1.7kms from the boundary of the Ningaloo Coast World Heritage Area. See map, Application Part I, Page 9.

The Department is seeking Heritage Advice regarding the potential for the proposed action to impact on the heritage values of the Ningaloo Coast World Heritage Area.

The Sea Dumping Section has been contacted by the World Heritage Program Manager at WA DBCA, indicating that the Ningaloo Coast World Heritage Advisory Committee at their December meeting resolved to write to our department, with regard to the Exmouth Deepwater Artificial Reef. The Sea Dumping Section is aware that the Ningaloo Coast World Heritage Advisory Committee have written to Woodside, the current owner of the Nganhurra RTM, as part of the consultation process for Woodsides Environment Plan application to NOPSEMA, for decommissioning the RTM. We understand that Heritage is in possession of a copy of this letter.

Timeframe for providing advice:

Please email your advice to the primary EAB contact officer by 01 February 2021.

Previous Advice/referrals

As far as we are aware, due to the uniqueness of the project, no prior project or advice is relevant. The protected matters search is available within the project documentation (saved in spire).

Name of primary EAB contact officer:

s.22(1)(a)(ii) Email: s.22(1)(a)(ii) @awe.gov.au

Name of secondary EAB contact officer:

s.22(1)(a)(ii) Email: s.22(1)(a)(ii) @awe.gov.au

Relevant ESD Director:

s.22(1)(a)(ii) Email: s.22(1)(a)(ii)@awe.gov.au

Please contact me if there are any issues with the above time frame for a response. I am also happy to schedule some time to discuss the project and the request with the officer preparing the line area advice.

s.22(1)(a)(ii)

Regards,

s.22(1)(a)(ii)
Assistant Director
Sea Dumping Section
Environment Assessments Queensland and Sea Dumping
Environment Approvals Division
Department of Agriculture, Water and the Environment
s.22(1)(a)(ii) @environment.gov.au

s.22(1)(a)(ii)

From: s.22(1)(a)(ii)
Sent: Monday, 1 February 2021 3:36 PM
To: s.22(1)(a)(ii)
Subject: Ngunhurra Operations Cessation [SEC=OFFICIAL]

Follow Up Flag: Follow up
Flag Status: Completed

Thank you for requesting further advice from Parks Australia regarding the proposed repurposing of the Riser Turret Mooring (RTM) as an Integrated Artificial Reef (IAR) as per RecFishWests IAR application to locate the proposed reef 1.7 km from the northern boundary of the AMP.

In the context of the North-west Marine Parks Network Management Plan 2018 (management plan) objectives and values, we reiterate that the EP:

- identifies and manages all impacts and risks on Australian marine park values (including ecosystem values and their representativeness) to an acceptable level and that all options to avoid or reduce them to as low as reasonably practicable have been considered
- clearly demonstrate that the activity will not be inconsistent with the management plan

We acknowledge advice from Woodside that the revised EP "includes a standalone section (Section 6.10) that describes the assessment that Woodside has undertaken to demonstrate the activity will not result in unacceptable impacts to the values of either the Ningaloo or Gascoyne AMPs. This assessment concluded that the activity is not inconsistent with the North-west Marine Parks Network Management Plan 2018. Where potential impacts and risks may occur to the values of the Ningaloo and Gascoyne AMPs, the relevant impacts assessment sections of the EP refer to controls that will be implemented to reduce residual impacts and risks to ALARP and acceptable levels

We also reiterate previous requests made regarding notification of certain activities associated with the proposal, if approved, including:

- notification on commencement of artificial reef creation/movement of the RTM in to place; and
- notification of completion of the artificial reef construction process.

We restate that Parks Australia is specifically concerned about the plastics proposed to remain in-situ on the RTM, as well as the Buoyancy foam, hydraulic oils and the fire retardant, and the potential for these materials to impact on the values of the Ningaloo and Gascoyne Marine Park as outlined in the Management Plan in the event that there is failure of grout intended to contain these products.

Parks Australia also notes that objective 1 of the Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia's coasts and oceans (2018) is to contribute to long term prevention of the incidence of marine debris. We note in Woodsides response that they have indicated that this Objective does not specifically relate to Woodside actions in respect to the IAR and that "none of the actions under that objective are relevant, and responsibility for those actions is assigned primarily to government entities, and to producers and retailers of plastics (particularly single-use products". This statement would presumably assign responsibility of future management of the IAR to the WA State Government once the IAR is in situ.

Moving the proposed IAR to a new location 1.7km from the northern boundary does not necessarily abrogate the likelihood of marine debris reaching the Marine Park. It would be appropriate for some tidal flow analysis to be provided (if not already) to help understand the potential impacts and distribution in the event of an unplanned release from grout or structural failure.

Woodside have stated that “Ingestion of floating microplastics originating from the RTM will not result in any significant impacts to turtles, whales, sharks or seabirds foraging in the region” and refer to a proposed plastics offset program that “will result in a net reduction of marine debris in the North West Cape/Ningaloo Coast region, consistent with Action 3.01 of the Marine Debris Threat Abatement Plan. The plastics offsets program will likely result in removal of macroplastics that pose more of an entanglement/ingestion risk (e.g. plastic bags, ropes, nets, utensils etc.) to marine fauna over a wide area.” This proposal in effect acknowledges the movement of plastics through a range of habitats, possibly including the AMP and lends further weight to understanding the tidal current stream movements downstream from the proposed location.

Parks Australia reiterates the following:

- The DNP objects to the release of plastics into the Marine Environment that may impact on the values of the Ningaloo Marine Park. The Ningaloo and Gascoyne Marine Park includes Biologically Important Areas include breeding and or foraging habitat for seabirds, inter-nesting habitat for marine turtles, a migratory pathway for humpback whales, foraging habitat and migratory pathway for pygmy blue whales, breeding, calving, foraging and nursing habitat for dugong and foraging habitat for whale sharks.

- In regards to the residual plastics on the RTM the DNP considers the EP is still not clear regarding the timeframe for the degradation of the grout and steel encasing that will prevent the release of these plastics, hydraulic oils, fire retardant and Buoyancy foam into the marine environment. Further there is insufficient information in the EP regarding the impacts of plastics and buoyancy foam once released, including possible ingestion by marine fauna. To ensure that the proposed activity does not impact on the Values of the Ningaloo and Gascoyne Marine Parks, Parks Australia recommends that all plastics hydraulic oils, fire retardant and Buoyancy foam material be removed from the RTM prior to repurposing as an IAR if safe to do so. We acknowledge that Woodside have specifically responded to this with the comment “Plastics within the RTM will be removed to levels that are ALARP, leaving a residual <10 kg in electrical cabling, insulation, chemical lines, valves and gauges. The risers, riser bend stiffeners and umbilical are planned to be removed from the RTM once it is on the seabed at the proposed artificial reef location, potentially leaving ~3.2 tonnes of bend stiffener material.”

- With specific regard to the plastic Risers present within the RTM. The EP notes that the proposed repurposing of the RTM as an IAR may result in damage to the IAR such that removal of the plastic Risers may be prevented. This would result in result in an additional 3.3 tonnes of plastic remaining on the RTM following disposal. Noting the possibility of damage preventing removal of the Risers when the IAR is placed on the seabed, the Risers should be removed before the RTM is placed in position as an IAR. We note Woodsides response to this “Removing the risers once the RTM is on the seabed removes personnel interaction during extraction and removes RTM motions thereby providing an improved probability of success.”

Other considerations that the DNP has identified include:

- The potential impact of species recruitment (drawdown)from associated natural system reef systems from the AMP to the IAR
- The longer term resulting displacement of species and attraction of predator species to this proposed IAR
- The London Protocol recommends that infrastructure of this nature not be used in artificial reef construction due to the presence of a range of associated contaminants
- Potential for annual inspections via ROV or similar to monitor integrity and respond to maintain integrity should the IAR go ahead

We also note Woodsides assertions regarding the breakdown of plastics and the apparently “inconsequential” effects of these in comparison to existing and substantially increasing plastic inputs in the region (as described in the following), however we disagree that this abrogates any responsibility for adding additional inputs into the marine environment that may impact on the Values of the AMP now or in the future. “Any ingestion of microplastics originating from the RTM by foraging pygmy blue whales is likely to be negligible, given the very small quantity of material potentially ending up as microplastics floating in the upper layers of the water column (worst case quantity ~3.3 tonnes), and because this process will occur over an extremely long timeframe (hundreds to thousands of years) at a very slow rate. This input is not expected to result in any significant impacts to feeding pygmy blue whales in the region. Any inputs of floating microplastics into waters offshore from North West Cape and the Ningaloo Coast from the RTM will be inconsequential compared to other inputs of plastics into the region. Current levels of microplastic pollution on the surface waters offshore from North West Cape appear to be significant

(Reisser et al. 2013. Marine plastic pollution in waters around Australia: Characteristics, concentrations, and pathways. PLoS ONE 8(11): e80466). In 2012, the Reisser et al. study recorded mean sea surface plastic concentrations at a location ~8-9 km offshore from North West Cape of 1932 – 12,846 pieces km2, and this level of contamination is likely to have increased substantially since then."

Cheers

s.22(1)(a)(ii)

s.22(1)(a)(ii)
Director, Parks Australia Marine Parks | T: TBA | s.22(1)(a)(ii)

Department of Agriculture, Water and the Environment
Marine Parks Branch |
John Gorton Building, Parkes ACT 2600
GPO Box 787
Canberra ACT 2601

s.22(1)(a)(ii) @awe. gov.au

s.22(1)(a)(ii)

From: s.22(1)(a)(ii)
Sent: Wednesday, 3 February 2021 12:28 PM
To: s.22(1)(a)(ii)
Subject: RE: Compartment 13 [SEC=OFFICIAL]

s.22(1)(a)(ii)

s.22(1)(a)(ii)

From: s.22(1)(a)(ii) @environment.gov.au>
Sent: Wednesday, 3 February 2021 10:42 AM
To: s.22(1)(a)(ii) @environment.gov.au>
Cc: s.22(1)(a)(ii) @environment.gov.au>
Subject: FW: Compartment 13 [SEC=OFFICIAL]

Hi s. 22(1)(a)(ii)

Quick question – do you have an engineering drawing / cross section / exploded view / design or construction diagram depicting the RTM and in particular compartment 13? We'd like to be able to show our decision makers the construction details and where Compart 13 sits within the structure.

And if he hasn't done so already s. 22(1)(a)(ii) will shortly be in contact with you to ask about NOPSEMA's statements of reasons underpinning the Environmental Improvement Notice (#775, dated 23 Oct 19). We're interested to know if they looked at and / or considered chemical contamination risks from the foam and any residual oils.

Yours,

s. 22(1)(a)(ii)

s.22(1)(a)(ii)
Contaminants, Standards, and Advice Section | T: s.22(1)(a)(ii) | s.22(1)(a)(ii) | E: s.22(1)(a)(ii)@environment.gov.au
Department of Agriculture, Water and the Environment
John Gorton Building 22(1)(a)(ii)
PARKES ACT 2600

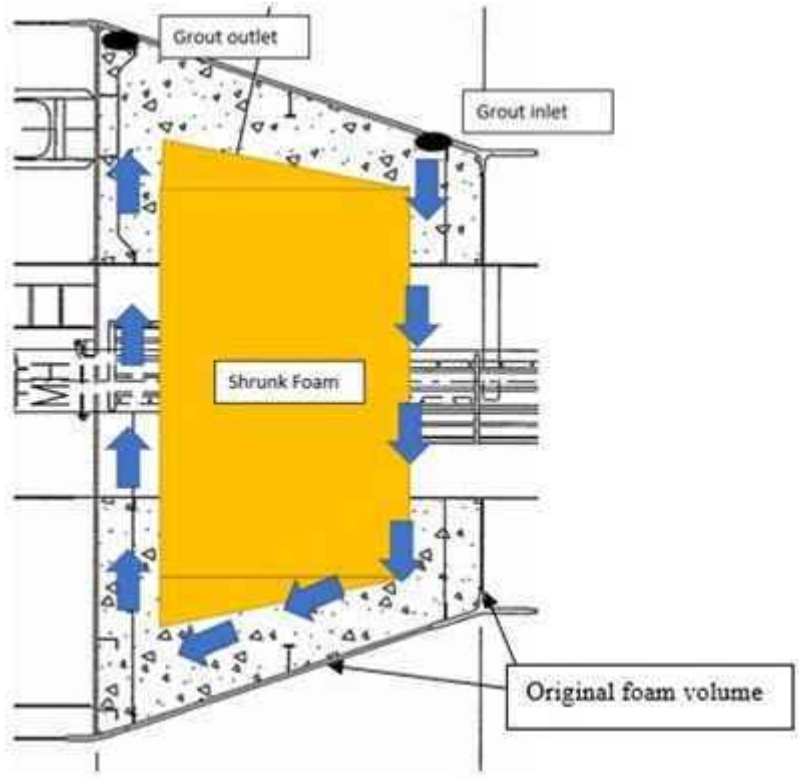
s.22(1)(a)(ii)
s.22(1)(a)(ii)

JGB: BS.223
s.22(1)(a)(ii)@environment.gov.au

From: s.22(1)(a)(ii) @environment.gov.au>
Sent: Wednesday, 3 February 2021 9:48 AM
To: s.22(1)(a)(ii) @environment.gov.au>
Subject: Compartment 13 [SEC=OFFICIAL]

Hi s.22(1)(a)(ii)

This is the only diagram I've been able to find of compartment 13



It's on p. 13 of part IV of the documentation.

I've also found NOPSEMA's notice (they're published). I've saved it in the folder here.

Regards,

s.22(1)(a)(ii)

Contaminants, Standards and Advice | Chemicals Managment Branch
Department of Agriculture, Water and the Environment
GPO Box 787, Canberra ACT 2601
Tel: s.22(1)(a)(ii) | email: s.22(1)(a)(ii) @environment.gov.au

s.22(1)(a)(ii)

From: s.22(1)(a)(ii)
Sent: Friday, 15 January 2021 10:40 AM
To: s.22(1)(a)(ii)
Cc: s.22(1)(a)(ii) Admin Sea Dumping; s.22(1)(a)(ii)
Subject: RE: CSAS Advice – SD2020/3998 - Exmouth Deepwater Artificial Reef [SEC=OFFICIAL]

Hi s.22(1)(a)(ii)

Thanks – perfect RfA; much appreciated. When would you like the Advice by? Smallish detail: was this also referred under EPBC? If so, was there an EPBC decision?

Yours,

s.22(1)(a)(ii)

s.22(1)(a)(ii)
Contaminants, Standards, and Advice Section | s.22(1)(a)(ii) @environment.gov.au
Department of Agriculture, Water and the Environment
John Gorton Building s. 22(1)(a)(ii)
PARKES ACT 2600

s.22(1)(a)(ii)
s.22(1)(a)(ii)
s. 22(1)(a)(ii)
s.22(1)(a)(ii) @environment.gov.au

From: s.22(1)(a)(ii) @environment.gov.au>
Sent: Friday, 15 January 2021 10:10 AM
To: s.22(1)(a)(ii) @environment.gov.au>
Cc: s.22(1)(a)(ii) @environment.gov.au>; Admin Sea Dumping <Admin.seadumping@environment.gov.au>
Subject: FW: CSAS Advice – SD2020/3998 - Exmouth Deepwater Artificial Reef [SEC=OFFICIAL]

Hi s.22(1)(a)(ii)

I wasn't sure who to send this to or if you have a generic team inbox.

Can you let me know if there is a procedure for sending formal requests to your team please?

Thanks

s.22(1)(a)(ii)

Dear Contaminants, Standards, and Advice,

I am writing to request comments on the following Sea Dumping project:

Sea Dumping Number: 2020/3998

Referral Title: Exmouth Deepwater Artificial Reef

Project stage: Assessment of sea dumping permit

Project Documentation s.22(1)(a)(ii)

Relevant file links to the latest version of the application and its attachments are at the bottom of this email.

Potential Issues:

The applicant is proposing to construct and operate an artificial reef integrating the now disused Nganhurra Riser Turret Mooring, which will be relocated to a site 1.7kms from the boundary of the Ningaloo Coast World Heritage Area/Marine Park.

The Nganhurra RTM is proposed to be reefed at~170m depth, including a quantity of polyurethane buoyancy foam (65m^3). This foam in compartment 13, is proposed to be encapsulated with grout, with a lifespan of 50 years. It is estimated by the applicant that the foam will be released over a period 400 – 1500 years into the future. The polyurethane buoyancy foam includes a quantity of fire retardant, up-to 120kg. It is assumed by the applicant due to the pre 2006 timeframe of the RTMs construction, that the fire retardant is a worst case scenario material, polybrominated diphenyl ethers (PBDEs) a persistent organic pollutant. See Part III, pdf page 73, 199 and 305 for details.

The Department is seeking your advice in relation to the release of the foam and PBDEs into the marine environment and possible future transport, bioaccumulation and ecotoxicity.

Timeframe for providing advice:

Please email your advice to the primary EAB contact officer by 01 February 2021.

Previous Advice/referrals

As far as we are aware, due to the uniqueness of the project, no prior project or advice is relevant. The protected matters search is available within the project documentation (saved in spire).

Name of primary EAB contact officer:

s.22(1)(a)(ii) @awe.gov.au

Name of secondary EAB contact officer:

s.22(1)(a)(ii) @awe.gov.au

Relevant ESD Director:

s.22(1)(a)(ii) @awe.gov.au

Please contact me if there are any issues with the above time frame for a response. I am also happy to schedule some time to discuss the project and the request with the officer preparing the line area advice.

s.22(1)(a)(ii)

Regards,

s.22(1)(a)(ii)
Assistant Director
Sea Dumping Section
Environment Assessments Queensland and Sea Dumping
Environment Approvals Division
Department of Agriculture, Water and the Environment
s.22(1)(a)(ii) @environment.gov.au

s.22(1)(a)(ii)

From: MigratorySpecies
Sent: Monday, 1 February 2021 8:10 AM
To: s.22(1)(a)(ii)
Cc: s.22(1)(a)(ii)
Subject: RE: Request for MSS advice – SD2020/3998 - Exmouth Deepwater Artificial Reef [SEC=OFFICIAL]
Attachments: MSS Advice - SD2020.3998 Artificial deepwater Reef Exmouth WA.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Good morning s.22(1)(a)(ii)

Please find attached the MSS advice for SD2020/3998 – Exmouth Deepwater Artificial Reef.

If you have any questions please don't hesitate to contact me.

s.22(1)(a)(ii)

Migratory Species Section
Biodiversity Conservation Division
Department of Agriculture, Water and the Environment

s.22(1)(a)(ii)

From: s.22(1)(a)(ii) @environment.gov.au>
Sent: Friday, 15 January 2021 12:57 PM
To: MigratorySpecies <MigratorySpecies@environment.gov.au>
Cc: Species Conservation Referrals <SpeciesConservationReferrals@environment.gov.au>; s.22(1)(a)(ii) @environment.gov.au>; Admin Sea Dumping <Admin.seadumping@environment.gov.au>
Subject: Request for MSS advice – SD2020/3998 - Exmouth Deepwater Artificial Reef [SEC=OFFICIAL]

Hello Migratory Species,

I am writing to request advice on the following EPBC project: Exmouth Deepwater Artificial Reef and WA (SD2020/3998)

Proposal stage: Assessment of sea dumping permit

Background on the proposal:

The applicant is proposing to construct and operate an artificial reef integrating the now disused Nganhurra Riser Turret Mooring, which will be relocated to a site 1.7kms from the boundary of the Ningaloo Coast World Heritage Area. See map, Application Part I, Page 9.

Provide SPIRE and/or web links to relevant documentation:

s.22(1)(a)(ii)

Relevant file links to the latest version of the application and its attachments are at the bottom of this email.

List each species of concern:

- 40 listed migratory species – see attached protected matters report

Describe key issues / uncertainties and provide specific questions:

Does the statement below taken from the Matters of National Environmental Significance Significant impact guidelines 1.1 extend to the 40 listed migratory species listed within the protected matters report (attached)?

'Marine activities - Otherwise lawful recreational fishing and recreational boating would not normally be expected to have a significant impact on a matter of national environmental significance.'

Furthermore, does this statement extend to the risks of gear hookup (fouled fishing and boating related gear, lines and ropes) and vessel strike onsite or in transit to the proposed Exmouth Deepwater Artificial Reef on the 40 listed migratory species listed?

Name of primary EAB contact officer:

s.22(1)(a)(ii) @awe.gov.au

Name of secondary EAB contact officer:

s.22(1)(a)(ii) @awe.gov.au

Relevant ESD Director:

s.22(1)(a)(ii) @awe.gov.au

Please contact me if there are any issues with the above time frame for a response. I am also happy to schedule some time to discuss the project and the request with the officer preparing the line area advice.

s.22(1)(a)(ii)

s.22(1)(a)(ii)

Regards,

s.22(1)(a)(ii)
Assistant Director
Sea Dumping Section
Environment Assessments Queensland and Sea Dumping
Environment Approvals Division
Department of Agriculture, Water and the Environment
s.22(1)(a)(ii) @environment.gov.au

DEPARTMENT OF AGRICULTURE, WATER AND THE ENVIRONMENT
PROTECTED SPECIES AND COMMUNITIES BRANCH

MIGRATORY SPECIES SECTION EPBC ACT REFERRAL ADVICE

SD2020/3998 Artificial Deepwater Reef, Exmouth, WA

Stage: Assessment of sea dumping permit

1.0 Proposed action

Recfishwest is proposing to install an artificial reef approximately 18 km north of the coast of the North West Cape, Exmouth, Western Australia. The artificial reef site will be 116 x 116 m, covering a total area of 13,456 m^2. Water depth at the site will be approximately 153 m below LAT. The proposed timeframe for the installation of the artificial reef is for 2 weeks between 1 November – 30 April (year to be confirmed). The main feature of the artificial reef is the repurposed Nganhurra Riser Turret Mooring surrounded by six concrete purpose-built Reef Pyramid modules.
The following advice considers threatened and migratory cetaceans that may be impacted by this proposal.

2.0 Listed Threatened and Migratory Species

2.1 Cetaceans

Five species of EPBC Act listed cetaceans were identified on the Protected Matters Search Tool as potentially occurring in the proposed action area. For two species, the Vulnerable Sei whale (*Balaenoptera borealis*) and the Vulnerable Fin whale (*Balaenoptera physalus*), the distribution and importance of this area is unknown. The Endangered Southern Right whale (*Eubalaena australis*) is an occasional visitor to the area.

2.1.1 Pygmy Blue whale (*Balaenoptera musculus brevicauda)*

The proposed action area is within a Biologically Important Area (BIA) for migrating Pygmy Blue whales and in close proximity to a foraging BIA. Pygmy Blue whales are known to migrate northwards through this corridor from April to August and southwards from October to December utilising the foraging area during this period.

2.1.2 Humpback whales (*Megaptera novaeangliae*)

The North West Cape is part of a migratory BIA for Humpback whales. The species is known to migrate along the corridor and through the proposed action area from May to September. On the southward migration, Humpback whales pass through the area with their calves and utilise the waters of the Exmouth Gulf for resting.

2.2 Marine turtles

Five species of EPBC Act listed marine turtles were identified on the Protected Matters Search Tool as potentially occurring in the proposed action area. The Endangered Leatherback turtle (*Dermochelys coriacea*) has been sighted in waters off the North West Cape but are not common in the area. For the remaining four species the Endangered Loggerhead turtle (*Caretta caretta*), the Vulnerable Green turtle (*Chelonia mydas*), the Vulnerable Hawksbill turtle (*Eretmochelys coriacea*) and the Vulnerable Flatback turtle (*Natator depressus*), the proposed action area falls within biologically important inter-nesting areas. During these inter-nesting periods, female sea turtles rest on the seafloor in between nesting events.

The Green turtle is likely to utilise the inter-nesting biologically important area from November to March, the Loggerhead turtle from November to May, the Hawksbill turtle from October to February and the Flatback turtle from October to March. Generally, the Flatback turtle inter-nests at the largest depths (which have been recorded up to 50 m), so it is unlikely that the installation of the artificial reef at water depths of 153 m will adversely impact marine turtle inter-nesting.

2.3 Dugong (*Dugong dugon*)

The EPBC Act listed Dugong (Marine and Migratory) was identified as potentially occurring in the proposed action area. The proposed action area is in close proximity to BIAs for foraging and nursing. Dugong are usually found in shallow inshore waters and so are considered unlikely to be adversely impacted by the installation of the artificial reef.

3.0 Potential impacts

3.1 Anthropogenic noise

Actions that generate anthropogenic noise should be avoided, where possible, in areas when whales are undertaking important biological behaviours such as migrating, breeding, calving, resting or foraging. Anthropogenic noise is a key threat identified in the *Conservation Management Plan for the Blue Whale*, the *Humpback Whale Conservation Advice and the Recovery Plan for Marine Turtles in Australia.* Anthropogenic underwater noise covers a large range of frequencies, and the way in which a species is impacted by these sounds will depend on the proximity to the source, hearing sensitivity of the species, the intensity and frequency of the noise source and the behavioural state of the species. Due to the short timeframe of two weeks for reef installation adverse impacts to cetaceans are unlikely as long as appropriate mitigation measures are implemented to reduce the likelihood of disturbance and/or injury.

While marine turtles may be impacted by acute noise, it is unlikely that a significant proportion of any marine turtle genetic stock would be adversely impacted by noise generated during the installation of the artificial reef.

3.2 Increased risk of vessel strike

Vessel strike is a key threat identified in the *Conservation Management Plan for the Blue Whale*, the *Humpback Whale Conservation Advice* and the *Recovery Plan for Marine Turtles.* Additional vessel traffic poses an increased risk of interactions to all nationally listed marine fauna, resulting in an increased risk of injury or mortality. Increased vessel traffic can also result in disruption to important benthic feeding and nesting/nursing behaviours and can cause serious injury and/or death to individual marine turtles or dugong.

The assessment of the proposed action and development of measures to minimise impacts to marine fauna should be guided by the National Strategy for Reducing Vessel Strike on Cetaceans and Other Marine Megafauna (the Strategy). Collisions with vessels are one of the main known causes of mortality to baleen whales and other marine megafauna species. The highest risk from vessel strike is during migration and breeding, particularly when females with young calves are likely to transit or rest closer to shore in shallower waters. The Strategy includes a description of data that should be collected to determine the risk of vessel strike and how to reduce the risk, including the adoption of maximum speed limits that should be employed in areas where marine fauna may potentially be encountered. The process for reporting marine megafauna incidents should be described. A vessel management plan should be prepared to minimise risk of injury to cetaceans (and other marine species).

3.3 Marine debris – entanglement and ingestion

'Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris' was listed in 2003 as a key threatening process under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Threat Abatement Plan (TAP) for the impacts of marine debris on vertebrate marine life should be considered in the assessment of this activity.

Construction of the artificial reef will result in increased fishing activity and therefore an increased risk of marine fauna entanglement with fishing gear. Entanglement from discarded fishing gear can harm or kill individual marine fauna and can reduce the fitness of an individual by restricting mobility and impairing breathing, swimming or feeding ability. Ingestion can prevent feeding, leading to starvation and can create intestinal blockages that increase buoyancy and stop a turtle from diving, for example.

4.0 Proposed mitigation measures

Recfishwest should provide more detailed mitigation measures for the installation phase of the artificial reef, such as use of a minimum of two Marine Fauna Observers and other options to monitor for the presence of any marine fauna (eg drones) within 300 m of the installation site, application of precautionary shutdown zones and maximum vessel speed limits. More information should also be provided on the fouled-gear monitoring strategy to be implemented. Clarification should also be sought regarding how Recfishwest intend to educate fishers about minimising the risk of entanglement and ingestion of fishing gear.

Recfishwest's proposed management of cetacean interactions during transit to the installation site or during the operation of any associated vessels is noted (*Management of cetacean interactions; pg 14 EDAR IV*). When navigating the vessel to the installation site, a caution zone of 150 m of dolphins and 300 m for a whale is required, and operating the vessel at 6 or less knots is in accordance with Part 8 of the EPBC Act Regulations and the *Australian National Guidelines for Whale and Dolphin Watching*. When installing the concrete modules and operating the crane, a 300 m exclusion zone is recommended to minimise the risk of injury and disturbance to marine fauna.

5.0 Recommendations

- Given the location of the proposed action area and the overlap of BIAs for whales, the planned preparation of the RTM and installation of the artificial reef should occur outside of peak whale season (December to March);
- A minimum of two trained and experienced Marine Fauna Observers should be on duty to monitor for the presence of any cetaceans, marine turtles or dugongs within 300 m of the installation site. Precautionary zones should be implemented during installation works to reduce the risk of injury and/or disturbance to marine fauna and operations should temporarily cease if any of the above species comes within 300 m;
- During installation of the artificial reef Remotely Operated Vehicles (ROVs) a confirm the absence of marine species in the path of the concrete modules being lowered to the seafloor; and
- Vessel speed limits of 6 knots or less should be implemented around the artificial reef site and during towing of artificial reef components to the installation site during peak marine fauna periods.

Prepared by: s.22(1)(a)(ii)
Cleared by: s. 22(1)(a)(ii) , A/g Director, Migratory Species Section
Date: 29th January 2021

s.22(1)(a)(ii)

From: s.22(1)(a)(ii)
Sent: Friday, 15 January 2021 10:58 AM
To: Marine Parks
Cc: Admin Sea Dumping
Subject: Request for Parks Australia Advice – SD2020/3998 - Exmouth Deepwater Artificial Reef [SEC=OFFICIAL]

Dear Parks,

I am writing to request comments on the following Sea Dumping project:

Sea Dumping Number: 2020/3998

Project Title: Exmouth Deepwater Artificial Reef

Project stage: Assessment of sea dumping permit

Summary of proposed action and location: The applicant is proposing to construct and operate an artificial reef integrating the now disused Nganhurra Riser Turret Mooring, which will be relocated to a site 1.7kms from the boundary of the Ningaloo Coast World Heritage Area. See map, Application Part I, Page 9.

Project Documentation s.22(1)(a)(ii)

Relevant file links to the latest version of the application and its attachments are at the bottom of this email.

In particular, the following information is available:

- Relevant Parks Australia, Australian Marine Park Management Plan: Australian Marine Parks, North-west Marine Parks Network Management Plan 2018

Potential Issues:

The Department is seeking Parks advice regarding the potential for the proposed action to impact on the Ningaloo Marine Park, due to its proximity to the Marine Park boundary.

Timeframe for providing advice:

Please email your advice to the primary EAB contact officer by 01 February 2021.

Previous Advice/referrals

As far as we are aware, due to the uniqueness of the project, no prior project or advice is relevant. The protected matters search is available within the project documentation (saved in spire).

Name of primary EAB contact officer:

s.22(1)(a)(ii) Email: s.22(1)(a)(ii) @awe.gov.au

Name of secondary EAB contact officer:

s.22(1)(a)(ii) Email: s.22(1)(a)(ii) @awe.gov.au

Relevant ESD Director:

s.22(1)(a)(ii) s.22(1)(a)(ii) @awe.gov.au

Please contact me if there are any issues with the above time frame for a response. I am also happy to schedule some time to discuss the project and the request with the officer preparing the line area advice.

Regards,

s.22(1)(a)(ii)
Assistant Director
Sea Dumping Section
Environment Assessments Queensland and Sea Dumping
Environment Approvals Division
Department of Agriculture, Water and the Environment
s.22(1)(a)(ii) @environment.gov.au

s.22(1)(a)(ii)

From: s.22(1)(a)(ii)
Sent: Monday, 2 August 2021 10:47 AM
To: s.22(1)(a)(ii)
Subject: Doc - 210727 - VARIATION to SD permit application RTM Deepwater arificial reef 2020-3998 - Updated advice.docx [SEC=UNOFFICIAL]
Attachments: Doc - 210727 - VARIATION to SD permit application RTM Deepwater arificial reef 2020-3998 - Updated advice.docx

Follow Up Flag: Follow up
Flag Status: Completed

Hi s.22(1)(a)(ii)

James Barker has cleared the attached, but happy to discuss . I've added a couple of additional impacts (highlighted). Let me know if you think Im wide of the mark on these.

Cheers

s.22(1)(a)(ii)
Assistant Director | Natural Heritage Section | s.22(1)(a)(ii)

Department of Agriculture, Water and the Environment
Heritage Branch | Heritage Reef and Marine Division
John Gorton Building, King Edward Terrace
GPO Box 787
Canberra ACT 2601

awe.gov.au

VARIATION - Sea Dumping Permit Application – Heritage Advice

Recfishwest - Sea Dumping Permit Application (SD2020/3998) - Exmouth Deepwater Artificial Reef

✓ World Heritage property	✓ National Heritage place	☐ Commonwealth marine area
☐ Commonwealth land	☐ Commonwealth Action	☐ Other whole of environment matter

Project variation

In response to requests by the Department of Agriculture, Water and the Environment (DAWE) for additional information in relation to Sea Dumping Permit Application (SD2020/3998), Recfishwest submitted a letter and supporting information on 16 July 2021.

These documents focus on three key areas; contaminants of concern, ownership and liability, and impacts to the Ningaloo Coast World Heritage Area.

The documents indicate that key aspects of this project have now changed, as follows:

- All bulk plastics, including foam bend stiffeners and risers, will be removed from the RTM once it is in place on the seabed. Approximately 10kg of plastic will remain.
- Ownership of the structure, once was placed on the seabed, was previously thought to be with the State of Western Australia. However, this is now unresolved, and the Commonwealth proposed as the owner.
- The proposed location of the artificial reef is now approximately 2km northwest of that originally proposed, increasing the distance from the Ningaloo Coast World Heritage Area to 1.7km (Heritage Branch were aware of this change in the preparation of the original Heritage Advice).

Heritage advice in relation to this updated information is provided below.
Heritage advice was provided on the original Sea Dumping application on 22 February 2021.

Heritage values

Note: The Ningaloo Coast National Heritage place and World Heritage property have different heritage values.

Ningaloo Coast National Heritage place

The Ningaloo Coast was included on the National Heritage List in 2010 primarily for its terrestrial natural heritage values, its outstanding karst environment and anchialine communities characterised by the presence of remipede crustaceans (DAWE AHD, 2020).

The proposed action is unlikely to have any impact on the National Heritage values of the Ningaloo Coast.

Ningaloo Coast World Heritage property

The Ningaloo Coast was included on the World Heritage List in 2011.

The Statement of Outstanding Universal Value for the Ningaloo Coast was approved by the World Heritage Committee in 2011 and is the key reference for the ongoing protection of the World Heritage property.

Statements of Outstanding Universal Value outline the values to be protected (as justified according to 10 criteria), a statement of integrity, and the protection and management in place for the property at the time of inclusion on the World Heritage List. In accordance with the *Operational Guidelines for the Implementation of the World Heritage Convention* (UNESCO 2019), the values (and attributes of those values) and integrity of the property are to be maintained over time and the commitments to protection and management upheld.

Excerpts from the Statement of Outstanding Universal Value likely to be relevant to the proposed action.

Heritage values likely to be relevant to the proposed action:

World Heritage criterion (vii) *contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance*. The Ningaloo Coast supports rare fish species, marine mammals and the largest documented aggregation of whale sharks (*Rhincodon typus*) in the world.

World Heritage criterion (x) *contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation*. The Ningaloo Coast harbours a high marine diversity of more than 300 documented coral species, over 700 reef fish species, roughly 650 mollusc species, as well as around 600 crustacean species and an unusual diversity of marine turtle species with an estimated 10,000 nests deposited along the coast annually.

Excerpts from the Statement of Integrity likely to be relevant to the proposed action:
Noting that the proposed action is now approximately 1.7km from the boundary of the Ningaloo Coast World Heritage Area (WHA), the maintenance of integrity of the WHA also needs to be considered. The Statement of Integrity included in the Statement of Outstanding Universal Value notes that while no formal buffer zones have been established for the property, the *Environment Protection and Biodiversity Conservation Act 1999* serves as a legal buffer zone. Both the marine and the terrestrial areas face a number of threats to the property's integrity, including invasive marine species, illegal fishing and disturbance to wildlife.

Excerpts from the Protection and Management Requirements likely to be relevant to the proposed action:
The Statement of Outstanding Universal Value notes there is a need for ongoing management of fisheries and careful planning to ensure effective management and to protect the values of the property.

Stage: assessment
Previous Decisions:
N/A

Background
In Australia the placement and construction of artificial reefs are regulated under the *Environment Protection Act 1981* (Sea Dumping Act) and a sea dumping permit is required.

The Department of Agriculture, Water and the Environment's website notes that:

> [Sea dumping] Permits are necessary to ensure that appropriate sites are selected, materials are suitable and appropriately prepared, there are no significant adverse impacts on the marine environment and that the reef does not pose a danger to marine users.
>
> [Artificial] Reefs may only be created for legitimate purposes (i.e., not waste disposal) and cannot pose a significant threat to users or surrounding environments (DAWE Artificial Reefs, 2020).

Artificial Reef and Sea Dumping Permit application
The Applicant (Recfishwest) is proposing to construct and operate an artificial reef integrating the now decommissioned Nganhurra Riser Turret Mooring (RTM). The RTM was part of a two-component bow mooring

system used in the extraction of petroleum by Woodside Energy Ltd (Recfishwest Part III: 8). The RTM is an 85m long cylindrical structure with a diameter ranging between 4.5m and 12.5m with an approximate weight of 2,452 tonnes when ballasted (Recfishwest Part III: 8).

The artificial reef is proposed to consist of 24 reef pyramids (six clusters of four concrete purpose-built modules 4m x 4m x 5m high), two clusters of 12 (24 units) Bombora modules and the repurposed RTM, which is the main feature of the artificial reef, 49 units in total (Recfishwest Part III: throughout).

The proposed location of the artificial reef is approximately 18km offshore from Western Australia, approximately 1.7kms from the boundary of the Ningaloo Coast World Heritage Area (WHA) (Recfishwest Part III: 277). The proposed reef site is 116m x 116m with an area of 13,456m^2 and has an approximate depth of 148m below lowest astronomical tide (Recfishwest Part III: 211). According to the Applicant this is one of the first projects of this nature in Australia and the southern hemisphere, and if successful, will be the first deep-water artificial reef in Australia.

The Nganhurra Riser Turret Mooring (RTM)

According to the applicant:

> The RTM is a steel structure comprised of 14 individual compartments separated by watertight bulk heads. The bottom compartment is filled with seawater and iron ore ballast. The topside structure of the RTM contains a range of equipment, materials and steel work. The upper most compartment (compartment #13) is filled with 65m^3 of polyurethane foam (now proposed to be removed). Hydraulic oil, paint coatings and anti-foul coatings are also found on the RTM. Prior to sinking, the RTM structure will undergo a series of works to ensure it is suitable for use within an artificial reef. This includes the removal of topside accessories, flushing of residual chemicals and the removal of the riser tail stubs and bend stiffeners. The sinking process involves flooding a series of compartments to create a controlled descent to the seafloor.
>
> Recfishwest's July 2021 Supporting Information Documentation states that the RTM structure is now proposed to be cut into separate sections by diamond wire saw, whilst stable on the seabed, allowing the removal by vessel crane of compartment #13. This section of the RTM contains polyurethane foam and weighs approximately 85 tonnes (Supporting Doc 2, 2021).
>
> The steel used in the construction of the RTM has no associated risks in seawater, similarly the iron ore used in the ballast has no identified risks in seawater (Recfishwest Part III: 197). Hydraulic oil contains components that may persist in the environment and components with the potential to accumulate and float on water (Recfishwest Part III: 199). Despite these components the potential risk to the environment is considered low given the small amount within the RTM overall (< 50L) (Recfishwest Part III: 199). An assessment was undertaken for paint coatings in their 'liquid' form, it suggests that the toxicity level may decrease once dried as solvents and other harmful contents within the paint evaporate once dried (Recfishwest Part III: 199). Paint coatings in their liquid forms can be considered toxic to marine biota to varying degrees, however the presence of marine growth already on the RTM provides evidence that the toxicity of the paint is below the levels that have substantially lethal impacts on marine organisms (Recfishwest Part III: 199). Based on the above factors, the risk posed by paint coatings has been deemed low (Recfishwest Part III: 199). The anti-foul paint has a service life of only 5 years however the RTM has been in the ocean for almost 15 years, so it is expected that most of the active ingredients within the anti-foul paint have already degraded away (Recfishwest Part III: 199).

Proposed duration of permit

The Applicant requests a 30-year permit stating that the artificial reef has an operational design life of 30 years, however it is likely that the structures would remain operational for several decades beyond the specified design life (Recfishwest Part I: 3).

The application also notes that:

- the RTM structure is expected to take **100-400 years** to fully degrade (RecfishWest Part III: 287), and
- there will be slow formation and release over extremely long timeframes (**hundred[s] to thousands of years**) of microplastics from residual polymers in the RTM (RecfishWest Part III: 277).

It will be important to consider the appropriate duration of the permit (if one is to be issued) and the length of time to monitor the impact of the artificial reef, and particularly the use to the RTM, on the Ningaloo Coast WHA, World Heritage values and integrity.

Nature and extent of impacts on heritage matters as a result of the proposed action

Heritage values and potential impacts posed by the action

The Ningaloo Coast has Outstanding Universal Value (OUV) due to its interconnected ocean and arid coastline, limestone karst system and extensive network of underground caves, terrestrial species endemism, high marine diversity and the largest aggregation of whale sharks in the world. The Ningaloo Coast is included on the World Heritage List for:

> **Criterion (vii): contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;**
> The landscapes and seascapes of the property are comprised of mostly intact and large-scale marine, coastal and terrestrial environments. The lush and colourful underwater scenery provides a stark and spectacular contrast with the arid and rugged land. The property supports rare and large aggregations of whale sharks (*Rhincodon typus*) along with important aggregations of other fish species and marine mammals. The aggregations in Ningaloo following the mass coral spawning and seasonal nutrient upwelling cause a peak in productivity that leads approximately 300-500 whale sharks to gather, making this the largest documented aggregation in the world (UNESCO 2020).

The attributes of OUV that were used to justify inclusion on the World Heritage List under Criterion (vii) that are likely to be relevant to the proposed action are the rare fish species, marine mammals and whale sharks.

> **Criterion (x): contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.**
> In addition to the remarkable aggregations of whale sharks the Ningaloo Reef harbours a high marine diversity of more than 300 documented coral species, over 700 reef fish species, roughly 650 mollusc species and around 600 crustacean species. The high numbers of 155 sponge species and 25 new species of echinoderms add to the significance of the area. On the ecotone, between tropical and temperate waters, the Ningaloo Coast hosts an unusual diversity of marine turtle species with an estimated 10,000 nests deposited along the coast annually. The majority of subterranean species on land, including aquatic species in the flooded caves are rare, taxonomically diverse and not found elsewhere in the southern hemisphere. The combination of relict rainforest fauna and small fully aquatic invertebrates within the same cave system is exceptional. The subterranean fauna of the peninsula is highly diverse and has the highest cave fauna (troglomorphic) diversity in Australia and one of the highest in the world. Above ground, the diversity of reptiles and vascular plants in the drylands is likewise noteworthy (UNESCO 2020).

The attributes of OUV or World Heritage values that were used to justify inclusion on the World Heritage List under Criterion (x) likely to be relevant to the proposed action are the marine diversity found within the Ningaloo Coast WHA including all the fish, mollusc, crustacean and turtle species.

Potential impacts to the OUV or World Heritage values of the Ningaloo Coast WHA posed by the proposed action include but are not limited to, release of plastics, leaching of chemicals and contaminants into the environment (including into the WHA, or being ingested by species that are listed as attributes of OUV and that move in and out of the WHA), increased vessel strikes to marine mammals, turtles and whale sharks, marine pollution including the

potential movement of some or parts of the artificial reef closer to or within the Ningaloo Coast WHA through storm surge and/or corrosion.

Details are provided below.

Heritage protection and Matters of National Environmental Significance

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) protects National Heritage places and World Heritage properties (such as the Ningaloo Coast WHA) as Matters of National Environmental Significance (MNES). A person must not take an action that has, will have or is likely to have a significant impact on the heritage values of a declared heritage place. This includes actions within or adjacent to the heritage place.

The EPBC Act policy statement *Matters of National Environmental Significance: Significant Impact Guidelines 1.1* provides overarching guidance on determining whether an action is likely to have a significant impact on a matter of National Environmental Significance (NES) (DoE MNES, 2013). The guidelines outline a 'self-assessment' process, including detailed criteria, to assist persons in deciding if an action is likely to have a significant impact upon any MNES and whether or not a referral under the EPBC Act should be submitted to the Australian Government for assessment.

The application includes some self-assessment for 'nationally threatened species and ecological communities' concluding that the proposed artificial reef would not have a significant impact on listed species:

> Overall, there are 46 EPBC-listed threatened and/or migratory species which may occur or have important habitat occur in the defined area, including 18 birds, 11 fishes, 11 marine mammals, and six marine reptiles. (Table 25). No listed threatened ecological communities occur near the proposed area. The proposed artificial reef is not considered to have a significant impact on any of these species through impacts to population size, population structure, critical habitat, breeding cycle, migratory behaviour, or any other aspects which may influence the population size or recovery of these species. In determining whether an action is likely to have a significant impact, all stages, components, related infrastructure, and related activities of the action were assessed based on the nature and magnitude of potential impacts. (Recfishwest Part III - Section 16, page 140).

The application also includes a risk assessment for potential impacts to physical environmental conditions from the proposed artificial reef (Recfishwest Part III: Table 20) and a risk assessment for potential biological impacts from the proposed artificial reef (Recfishwest Part III: Table 23). The environment risk assessment includes proposed mitigation of risks for aspects of 'nearshore coastal', 'local processes', 'benthos' and 'water and sediments' including leaching of contaminants. The biological risk assessment includes proposed mitigation of risks for cetaceans, marine reptiles, sharks, seabirds, fish, non-indigenous marine species, key threatening processes, marine protected areas and Biologically Important Areas (BIAs).

The assessment considers BIAs within the operational area and includes maps of each BIA within the region, however the maps do not show the location of the proposed artificial reef in relation to the BIAs (Recfishwest Part V: 109-134).

This information is provided in disparate sections of the application and does not clearly identify those species that are World Heritage values. This makes it difficult to properly assess potential impacts on the World Heritage property and its World Heritage values.

The assessment of potential impact on individual species in the application does not identify which of these species are World Heritage values of the Ningaloo Coast WHA, or how collectively any impacts on these species may affect the integrity of the World Heritage property. The application only provides short and cursory assessments of impact to World Heritage values, such as:

> The artificial reef is located approximately 18 km offshore, in 165 m water depth, and on relatively featureless seafloor characteristic of deeper waters of the continental shelf off the northwest of Australia. It should also be noted that the artificial reef will be located (at minimum) 1.7 km from the boundary of the NCWHA boundary. It is not considered a likely outcome that the artificial reef impacts on the superlative natural phenomena, exceptional natural beauty, and/or aesthetic importance of the NCWHA given its position on the seafloor (fish populations, boat traffic, and marine debris are considered in other sections of the permit application and Request for Further Information). The location, relatively small size, and function of the artificial reef makes impacts to geomorphic or physiographic landforms/features improbable. No significant impacts to threatened species or their associated habitats were identified in consideration of the proposed artificial reef (RecfishWest Part III: 276).

Although the proposed action is only 1.7km from the Ningaloo Coast WHA, the self-assessment under the EPBC Act, and the Biological and Environmental Risk Assessments in the application focus on individual listed and threatened species and do not sufficiently assess the proposed action in relation to the World Heritage values or integrity of the Ningaloo Coast WHA.

Ownership and Liability

The original application request stated that if the proposal was approved, the ownership and liability associated with the artificial reef would move to the State of WA, specifically to the Department of Primary Industries and Regional Development, once it had been placed on the sea floor (Recfishwest Part III: 11).

In their July 2021 Supporting Information Document, RecfishWest now understand (in reference to Western Australian policy under the *Fish Resources Management Act 1994*), that the structures of the IAR would be owned by the Commonwealth and all permit conditions attached to the Sea Dumping permit (if approved) would be the responsibility of the Applicant (Supporting Doc 1, 2021).

The RecfishWest July 2021 Supporting Information Document does not detail consultation with the Commonwealth on this issue, or approval by the Commonwealth Government for ownership or liability of the artificial reef once placed on the sea floor.

As far as Heritage Branch is aware, the proposed ownership and associated liability of the artificial reef, once placed on the sea floor is unresolved.

It is recommended the Applicant provide evidence for Commonwealth approval of ownership and liability arrangements before any further progress on this application occurs.

Complete removal of contaminants of concern

The original application proposed that approximately 12.4 tonnes of plastics confined within the RTM structure would enter the marine environment.

The Applicant has now indicated that the entirety of compartment #13, which contains the polyurethane foam, is proposed to be completely removed from the RTM structure (Supporting Doc 2, 2021). The Applicant states:

> Based on the potential presence of Polybrominated Di-phenyl Ethers (PBDEs) in the foam and concerns around plastics in the marine environment, Woodside is planning to remove all bulk plastics from the RTM, including complete removal of foam and transportation onshore for disposal, bend stiffeners and risers (total of approximately 30 tonnes of plastics). Less than 10 kg of plastics that are not practicable to remove due to access will remain in the RTM and are expected to degrade over hundreds to thousands of years.

According to the Applicant Compartment #13 can only be safely removed once the RTM is stable on the seafloor (Supporting Doc 2, 2021). Removal requires the compartment to be separated from the upper (compartment #14)

and lower (compartment #12) compartments by cutting through the steelwork with a Diamond Wire Saw. Compartment #13 will be removed from the ocean using a vessel crane, (Supporting Doc 2, 2021).

Concerns in regard to proposed operations in relation to compartment #13.

The additional information provided by the Applicant fails to address the potential risks of undertaking the removal of compartment #13 and associated works on the World Heritage values of the Ningaloo Coast, and more broadly the marine environment. The application does not estimate risks of the proposed removal methodology being unsuccessful. . RecfishWest's July 2021 Supporting Information Document states that the "*ability to achieve complete removal for the bend stiffeners and not leave any residual material is dependent on sea state for the activity*". The mitigation for this is to allow additional vessel time. However, if time became limited and these works were unsuccessful, there is potential for contaminants of concern and plastics (up to 30 tonnes) to enter the marine environment in proximity to the Ningaloo Coast WHA, causing irreversible damage.

New design of the proposed artificial reef

The additional information also fails to address the new design proposed for the artificial reef (incorporating the two remaining components of the RTM structure). The stability, functionality and safety of these components within the artificial reef is not described.

Impact of the release of plastics and microplastics (those remaining in the RTM and those potentially lost as a result of failure to remove component #13)

Threat Abatement Plan for the impacts of marine debris

Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris was listed as a key threatening process under the EPBC Act in August 2003. The *Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia's coasts and oceans* (TAP, 2018) addresses key threatening processes and harmful marine. Harmful marine debris includes land-sourced garbage, fishing gear from recreational and commercial fishing abandoned or lost to the sea, and vessel-sourced, solid, non-biodegradable floating materials disposed of or lost at sea. Most of these items are made of synthetic plastics. Harmful marine debris is recognised as a ubiquitous, global problem.

Although Threat Abatement Plans are not statutory, they provide for the research, management and other actions necessary to reduce the key threatening processes to an acceptable level in order to maximise the chances of the long-term survival in nature of native species and ecological communities affected by the process

The application references the Australian Government policy, *Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia's coasts and oceans* (TAP), but only in the context of the application's focus on derelict fishing gear. It should be noted that Objective 1 of the TAP is "Contribute to long-term prevention of marine debris". The potential release of quantities of plastics, microplastics, foam and other debris resulting from the inevitable degradation of the RTM, if deployed as part of the proposed artificial reef, should be discussed in the context of this objective of the TAP.

Amount of plastic expected to be released into the marine environment

The Applicant notes that:

> Any inputs of floating microplastics into waters offshore from North West Cape and the Ningaloo Coast from the RTM will be inconsequential compared to other inputs of plastics into the region. Woodside has developed and will be implementing a plastics offsets program that will result in the removal of an equivalent volume of plastics (i.e., a minimum of 12.4 tonnes) from the marine environment of Western Australia. (RecfishWest Part III: 277).

It is recommended that this application be assessed on its own merits. The amount of plastic that will enter the environment needs to assessed irrespective of the amount of plastics already present in the marine environment, as is argued by the Applicant.

Potential impacts of plastics on the Ningaloo Coast WHA

The Long Term Management Plan (LTMP) states that there will be no impact on any values of the Ningaloo Coast WHA from the release of residual plastics, primarily because plastics are likely to be released at a very slow rate and are not expected to result in any significant impacts.

> Slow formation and release over extremely long timeframes (hundred to thousands of years) of microplastics from residual polymers in the RTM will not significantly impact any ecosystems or habitats at or adjacent to the proposed IAR location (RecfishWest Part III: 277).

The LTMP concludes that ingestion of microplastics originating from residual PE and PP in the RTM by foraging **turtles** is not likely to occur in the waters at and surrounding the proposed Artificial Reef location, as turtles will not use these deep, offshore waters for foraging.

However the LTMP acknowledges there will be ingestion of microplastics by **fish** and **sharks**, noting that:

> .. there is the potential for whale sharks feeding within region to ingest microplastics from prey organisms. Globally, ingestion of microplastics has been identified as a threat to filter-feeding elasmobranchs, such as whale sharks, basking sharks and manta rays, in a number of locations (Germanov et al. 2018, 2019; Parton et al. 2020). (RecfishWest Part III: 277).

The Applicant also refers to potential ingestion of microplastics by **whales** as negligible with humpback whales not known to feed during their annual migration.

> Any ingestion of microplastics originating from residual PE and PP in the RTM by foraging pygmy blue whales is likely to be negligible, given the very small quantity of PE and PP potentially ending up as microplastics floating in the upper layers of the water column (worst-case quantity ~3.3 tonnes), and because this process will occur over an extremely long timeframe (hundreds to thousands of years) at a very slow rate. This input is not expected to result in any significant impacts to feeding pygmy blue whales in the region (RecfishWest Part III: 295).

For **seabirds**, the Applicant acknowledges that many species are contaminated by plastic, but assesses any impact as not being significant due to what they described as:

> the very small quantity of PE and PP potentially ending up as microplastics floating in the upper layers of the water column (worst-case quantity ~3.3 tonnes), and because this process will occur over an extremely long timeframe (hundreds to thousands of years) at a very slow rate (RecfishWest Part III: 296).

The Applicant concludes that:

> …any ingestion of microplastics via prey species is not likely to cause any significant impacts, given the given the [sic] very small quantities of residual polymers in the RTM, long degradation timeframes and release rates, and very low levels likely to be present in target prey species. (RecfishWest Part III: 277).

Monitoring

A Long Term Management Plan (LTMP) (RecfishWest Part III). has been developed for the proposed artificial reef and Recfishwest has committed to overseeing the monitoring of the artificial reef for a 30-year period post deployment (Supporting Doc 2, 2021). Woodside is planning to implement a Marine Debris Monitoring and

Management Program, which includes offsetting residual plastics from the RTM and AUD$300,000 funding for research and education programs on marine debris (Supporting Doc 2, 2021).

The LTMP is deficient as there is no mention of monitoring plastic and microplastic ingestion by marine species. This is particularly important to address the claims made by the Applicant that:

> … breakdown of the residual plastics within the RTM, and release of microplastics to the marine environment, will not result in an impact greater than a slight, short-term impact on species, habitats (but not affecting ecosystem function), physical or biological attributes. This impact will occur over extremely long timeframes (hundreds to thousands of years) and at a very slow rate. (RecfishWest Part III:297).

Plastics offset program

The proposal for a plastics offset program is questionable.

It is known that plastics and microplastics are a key and increasing threat to the marine environment (and are recognised as a key threatening process under the EPBC Act). Any program for removal of marine plastics should be encouraged.

However, with only scant information provided in the application, it is not possible to assess the merits of a proposal to remove an equivalent quantity of marine debris from the marine/ coastal environment (described as "beach clean up" presumably of drink bottles and other plastic containers and objects) compared to the large quantity of possibly contaminated plastics, foam and grout likely to degrade from the proposed disposal of the RTM.

From a policy perspective it is recommended that the Waste Taskforce be consulted on the proposed release of plastics to the environment and the proposed plastics offset program.

Leaching of chemicals and contaminants into the environment and physical ingestion by marine species

Under the new proposal, all of the polyurethane foam within the RTM is proposed to be removed. However approximately <10kgs of residual plastics (electrical cabling insultation, chemical lines, valves and gauges) is proposed to be retained in the RTM structure and the artificial reef (Supporting Doc 2, 2021).

Leaching of contaminants is considered within the environmental risk assessment (Recfishwest Part III, Table 20). Leaching of contaminants received a rating of D4, meaning "*unlikely and minor*" with a mitigation of "*Structures are built to Australian Standards for corrosion rates, and materials do not adversely affect the environment*". Once the mitigation was applied, leaching of contaminants was reduced to the lowest rating of E5, meaning "*Rare and Minimal*". The risk assessment has rated leaching of contaminants as the lowest rating, which seems very conservative considering the toxicity of chemicals and contaminants within the RTM structure.

If chemical or contaminants were to leach into the environment and be ingested by marine species it could have negative ecological and environmental impacts and a direct impact on the heritage values of the Ningaloo Coast WHA. There is potential for ingestion by species such as fish, turtles, sharks, whales, and whale sharks, all of which are listed as attributes of the Outstanding Universal Value (OUV) of the Ningaloo Coast WHA. The application does not provide an appropriate mitigation strategy for leaching of chemicals and contaminants into the environment.

It is recommended that specialist advice be sought on the potential for chemicals and contaminants to leach into the environment and their potential environmental impacts, especially on species that are World Heritage values of the Ningaloo Coast WHA.

Storm surge and corrosion

The new proposal involves cutting compartment #13 out of the RTM structure, leaving two separate structures that will be placed on the sea floor in the same positions as originally proposed (Supporting Doc 2, 2021). See figure below.

Compartment #13 original position

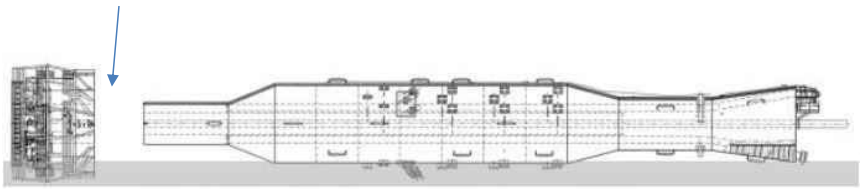


Figure 8 *Final RTM layout on seabed following compartment #13 recovery*

The RTM structure is cylindrical and is now proposed to be placed onto the sea floor as two separate structures, which may increase the potential to roll/move during storm events. Additionally, it has the potential to corrode and break up over time. Other than sinking the RTM to a desired "on bottom weight" (1040T) there is no indication in the application documentation of how the structure is going to be stabilised on the seabed or during the sinking process.

The new proposal fails to address the potential impact from storm surge and corrosion. This is particularly relevant as the RTM structure proposed to be used in the artificial reef has changed from the original application. It is recommended the Applicant undertake an assessment of potential risks for the newly proposed RTM structure.

The application states that:

> Storm surge is the major threat to the Ningaloo Coast during a cyclone event. Tropical cyclones may have direct effects on the artificial reef ecosystem through the destruction caused by storm waves and high winds, mixing of marine waters and strong currents. However, these impacts are expected to be rare and localised (approximately once every 25 years) (Recfishwest Part III).
>
> The concrete reef pyramids are designed to retain their functional characteristics for a period exceeding 30 years. The decommissioned oil and gas structures are not assessed for structural integrity as it is assumed they will corrode over time. Both the reef pyramids and the decommissioned oil and gas structure (RTM) are designed to be stable for a 1 in 10,000-year cyclonic event (Recfishwest Part III).

The application also states that the Applicant will not monitor the artificial reef after a storm event, instead adhering to predetermined monitoring rates, being a visual inspection annually in the first three years, and once every five years up until 20 years post deployment and a final monitoring trip on the last year (30th year).

There is potential for the RTM or components of the RTM to shift location during the sinking process and/or after a storm event and/or due to corrosion as the structure ages over time. Some or all of the RTM could potentially move closer to, or within the Ningaloo Coast WHA.

If relocation of the RTM was to occur closer or within the WHA, it could impact the integrity of the WHA, affecting its pristine environment. The application does not provide an appropriate mitigation strategy for corrosion/breakup/movement of the RTM or storm surge events.

Physical disturbance of natural communities at the proposed site

Damage to benthic marine communities from direct physical impact (including smothering) within the "drop zone" of the RTM and other structures proposed for the reef is possible and these communities could be of relevance to the World Heritage values of the Ningaloo Coast WHA. RecfishWest's July 2021 Supporting Information Document states that site survey found the proposed site was a featureless seafloor, with no surrounding reef structure and

less than 1% sessile filter feeding organisms. Detail on the site survey, including when it was conducted and by who, is lacking. Heritage Branch would appreciate further detail on this survey and its results.

Potential adverse changes in marine food-web dynamics and community structure

The potential for widespread, indirect ecological effects resulting from the placement of the artificial reef in proximity to the Ningaloo Coast WHA is not understood. RecfishWest's July 2021 Supporting Information Document 2 states that "*The artificial reef is expected to support a diverse fish assemblage, and the spill-over effect (through movement of juveniles, adults, larvae and gametes beyond the artificial reef) will be beneficial to adjacent areas including the NCWHP"*. Although this outcome may be desirable from a recreational fishery perspective, the impact on a marine ecosystems of relevance to the World Heritage values of the Ningaloo Coast WHA cannot be predicted and could be adverse.

Authoritative assessment of the possible the ecological outcomes of the artificial reef would help understand and manage this risk.

Marine pollution from increased fishing activities

In addition to the remarkable aggregations of whale sharks the Ningaloo Coast WHA harbours a high marine diversity of more than 300 documented coral species, over 700 reef fish species, roughly 650 mollusc species and around 600 crustacean species.

Increased recreational fishing at the proposed artificial reef could result in an increase in marine debris (plastics and discarded fishing gear). If not mitigated appropriately the increased marine debris could have a direct impact on the abundant marine species recognised as part of the OUV of the Ningaloo Coast WHA. The Applicant, Recfishwest, is the peak body representing the interests of 750,000 recreational fishers in Western Australia, are advocates for education on ways to minimise debris being left in the marine environment. Their application states that given the high level of stewardship for the marine environment and public fishing assets that recreational fishers generally uphold, any increase in marine debris from increased fishing activities at the site is expected to be minimal (Recfishwest Part II).

Vessel strikes

Vessel strikes are unlikely to increase as long as appropriate guidelines and procedures are put in place and adhered to.

The Ningaloo Coast WHA is a major migratory route for humpback whales, which take up residence in the Exmouth Gulf annually. Green turtles, flatback turtles, and hawksbill turtles all utilise the sandy beaches along the coast as nesting and rookery sites. Other marine megafauna can also be found in the area, including sharks, whale sharks, dolphins, dugongs, manta rays, and orcas.

Whale sharks are one of the key species listed as an attribute of the OUV of the Ningaloo Coast WHA and are prevalent in the vicinity of the location for the proposed artificial reef.

Whale sharks are vulnerable to vessel strike as they spend considerable periods of time at or close to the surface of the water. There is potential for the increased number of vessels at the artificial reef to increase the number of vessel strikes on whale sharks, turtles and whales. If appropriate guidelines and procedures are put in place for cetacean interactions, being no closer than 50m for a dolphin or 100m for a whale, and adhered to, increased vessel strike is unlikely to occur.

The application states that all vessels participating in the project must adhere to cetacean interaction regulations (State and Commonwealth) during all stages of the project (Recfishwest Part III).

Additionally, post deployment, if all vessels adhere to cetacean regulations (State and Commonwealth) in place to ensure minimal impact, it is unlikely vessel strikes would increase due to the placement artificial reef.

Recreational fishing

Some concerns have been raised by IUCN about the impacts of recreational fishing at and near the Ningaloo Coast WHA.

At the time of inscribing the Ningaloo Coast on the World Heritage List in 2011 the World Heritage Committee noted that there is a need for ongoing assessment of effects of recreational fisheries to ensure management frameworks remain effective to protect the values of the World Heritage property (World Heritage Committee, 2011).

The December 2020 IUCN Conservation Outlook Assessment for the Ningaloo Coast notes that recent research investigating the population status of important fish species in the Ningaloo Marine Park has indicated declining population trends for some species, including emperors, both inside and outside sanctuary zones. However, the degree to which this is attributable to fishing activities is not clear, with declines in targeted fish possibly influenced by additional factors such as large scale variation in climate (IUCN, 2020).

On the basis of the information provided in the application it is not possible to accurately predict the extent to which the proposed artificial reef will increase recreational fishing near the Ningaloo Coast WHA. If the artificial reef is approved for placement, it will be important to monitor and set appropriate limits for the catch of species such as emperors.

Other issues

Ningaloo Coast Strategic Management Framework and Draft Joint Management Plan - Nyinggulu (Ningaloo) Coastal Reserves, 2019

The Ningaloo Coast Strategic Management Framework (the framework) was published in 2010. The framework presents the overall planning regime for the Ningaloo Coast and provides direction and guidance to the managing agencies/owners in the formulation of their policies. The framework does not contain detailed management policies as these are included in the individual management plans for the area (Framework 2010). There is no reference or consideration of the placement of artificial reefs.

The draft joint management plan for the Nyinggulu (Ningaloo) Coastal Reserves 2019 (draft management plan) does not apply to the proposed location of the artificial reef (approximately 1.7km from the Ningaloo Coast WHA boundary). However, the draft management plan is relevant to the Ningaloo Coast WHA. The draft management plan provides direction for the proposed coastal conservation and recreation reserves along the Ningaloo Coast. It aims to conserve and protect the values of the area in the long-term and provides a summary of operations proposed to be undertaken in the area. The Western Australian Government are currently considering public comments submitted during the consultation period. The management plan will remain in draft until all submissions have been considered.

Artificial reefs are not discussed within the draft management plan and are not listed as one of the operations proposed to be undertaken within the planning area.

Ningaloo Coast World Heritage Advisory Committee (NCWHAC)

On 26 August 2020 the NCWHAC wrote to the Environment Approvals Division (WA Assessments) outlining their concerns about the disposal of decommissioned oil and gas infrastructure at sea, the proximity of the proposed artificial reef to the Ningaloo Coast WHA and the potential impact on OUV, pollution; stability; and detraction of fish species from the World Heritage Area.

The Applicant has consulted with the Ningaloo Coast World Heritage Advisory Committee (NCWHAC). The NCWHAC wrote to Woodside Energy Ltd on 23 November 2020 indicating that they do not support the re-purposing of decommissioned and surplus marine infrastructure as artificial reefs within or adjacent to the Ningaloo Coast WHA, given the likelihood for potentially significant ecological and habitat impacts within and adjacent to the Ningaloo Coast WHA.

The NCWHAC's preference is for any decommissioned and surplus marine structures to be removed to an onshore location. The NCWHAC have also expressed concern with the shift in responsibility for continual monitoring and remediation of values from the Applicant to the Western Australia Government (now potentially the Australian Government, based on RecfishWest's updated information), adding additional pressure to government resources.

On 10 February 2021 the NCWHAC wrote to the Environment Approvals Division (Sea Dumping Section) again outlining their concerns on the proposed artificial reef, these included the potential *waste disposal of decommissioned and surplus marine infrastructure*, the proximity to the NCWHA and the potential impact on the OUV pollution; stability; and detraction of fish species from the World Heritage Area. The NCWHAC reiterated that they do not support artificial reefs within the WHA, or within proximity to the WHA.

Quarterly reporting to the UNESCO World Heritage Centre

If it is considered that the proposed action may have a significant impact on the Ningaloo Coast WHA, it will be important to consider whether to inform the UNESCO World Heritage Centre of the proposed action in accordance with the World Heritage Operational Guidelines - 'before making any decisions that would be difficult to reverse'. This is particularly important to consider as the department has now received two letters from the NCWHAC outlining their concerns about the proposed artificial reef, its proximity to the WHA and the proposed use of decommissioned oil and gas infrastructure.

As a signatory to the *World Heritage Convention*, Australia has the responsibility to protect the Outstanding Universal Value (OUV) of its World Heritage properties. In particular, each State Party has a responsibility to advise the UNESCO World Heritage Centre of proposed actions that may impact OUV. Paragraph 172 of the *Operational Guidelines for the Implementation of the World Heritage Convention* (UNESCO, 2019) states that:

> *"The World Heritage Committee invites the States Parties to the Convention to inform the Committee, through the Secretariat, of their intention to undertake or to authorize in an area protected under the Convention major restorations or new constructions which may affect the Outstanding Universal Value of the property. Notice should be given as soon as possible (for instance, before drafting basic documents for specific projects) and before making any decisions that would be difficult to reverse, so that the Committee may assist in seeking appropriate solutions to ensure that the Outstanding Universal Value of the property is fully preserved*."

In accordance with Paragraph 172 of the *Operational Guidelines* the department informs the UNESCO World Heritage Centre of proposals in or near World Heritage properties considered to be a 'controlled action' (CA) under s.12 of the EPBC Act and key stages following the CA decision – i.e., if the action is approved, not approved or withdrawn.

A quarterly report is sent to the UNESCO World Heritage Centre informing them of proposals in or near a World Heritage property that have the potential to impact the OUV of that property. The quarterly report is made publicly available on DAWE's website.

The department also informs the UNESCO World Heritage Centre on proposals accepted for assessment by NOPSEMA.

Indigenous consultation

The application states the Thanardi Garrbu Aboriginal Corporation (NGTAC) were consulted on the location of the proposed action during the stakeholder consultation period. Information provided included a consultation letter, GPS coordinates of the artificial reef boundary and maps indicating the reef location. The NGTAC raised no objections to the project, their statement is as follows "We *see no harm in the Exmouth Deepwater Artificial Reef and that the proposed works are not within any boundaries of any Aboriginal Heritage Sites or Places. Fish for the future…*".

It would be advisable for the NGTAC to also be consulted on the potential impacts to heritage values of the Ningaloo Coast WHA, such as pollution, recreational fishing, leaching of chemicals into the environment and potential changes in location of artificial reef components due to storm surge events or corrosion.

When consulting it is recommended the Applicant refer to the Department of Agriculture, Water and the Environment's '*Engage early – best practise Indigenous engagement guideline for environmental* assessments' to ensure appropriate consultation has been undertaken with Indigenous peoples with rights and interests. These guidelines provide guidance on best practice Indigenous engagement for environmental assessments.

RecfishWest's July 2021 letter and Supporting Information Documents do not indicate that any further consultation with the NGTAC has occurred since that outlined in the original application.

It is recommended that the Traditional Owners (the NTGAC) are consulted on the potential impacts to the Ningaloo Coast WHA.

Summary of advice

Proposed duration of permit

- Given the varying lifespan of the concrete artificial reef modules (30 years), the RTM structure (100-400 years) and the release of plastic and microplastics (over hundreds to thousands of years), it will be important to consider the appropriate duration of the permit (if one is to be issued) and the length of time to monitor the impact of the artificial reef, and particularly the use to the RTM, on the Ningaloo Coast WHA, World Heritage values and integrity.

Heritage values and potential impacts posed by the action

- *Potential impacts to the OUV or World Heritage values of the Ningaloo Coast WHA posed by the proposed action include but are not limited to, release of plastics, leaching of chemicals and contaminants into the environment (including into the WHA, or being ingested by species that are listed as attributes of OUV and that move in and out of the WHA), increased vessel strikes to marine mammals, turtles and whale sharks, marine pollution including the potential movement of some or parts of the artificial reef closer to or within the Ningaloo Coast WHA through storm surge and/or corrosion.*

Heritage protection and Matters of National Environmental Significance

- The proposed action is only 1.7km from the Ningaloo Coast WHA, the self-assessment under the EPBC Act, and the Biological and Environmental Risk Assessments in the application focus on individual listed and threatened species but do not sufficiently assess the proposed action in relation to the World Heritage values or integrity of the Ningaloo Coast WHA.

Ownership and liability

- The updated application proposes that ownership and liability of the artificial reef once on the sea floor is to move to the Commonwealth government. However, the supporting documentation does not detail consultation with, or approval by the Commonwealth Government on the issue of ownership or liability. It is recommended the Applicant provide evidence of ownership and liability consent and take no further action until this matter is resolved.

Removal of contaminants of concern

- The additional information fails to address the potential risks on heritage values of the Ningaloo Coast, and more broadly the marine environment from the removal of compartment #13.
- It is recommended the Applicant provide a details assessment of the potential risks of undertaking these works.

Impact of the release of plastics and microplastics

- The application references the Australian Government policy, *Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia's coasts and oceans* (TAP), but only in the context of this application's focus on derelict fishing gear. It should be noted that Objective 1 of the TAP is "Contribute to long-

term prevention of marine debris". The potential release of quantities of plastics, microplastics, foam and other debris resulting from the inevitable degradation of the RTM, if deployed as part of the proposed artificial reef, should be discussed in the context of this objective of the TAP.
- Plastics will be released to the surrounding environment, over a timeframe extending up to thousands of years. The impacts of plastic entering the environment needs to assessed irrespective of the amount of plastics already present in the marine environment, as is argued by the Applicant.
- The Long Term Management Plan (LTMP) is deficient as there is no mention of monitoring of plastic and microplastic ingestion by marine species following the placement of the artificial reef.
- The proposal for a plastics offset program is questionable.
- From a policy perspective it is recommended that the Waste Taskforce be consulted on the proposed release of plastics to the environment and a plastics offset program.

Leaching of chemicals and contaminants into the environment and physical ingestion by marine species

- There is a possibility of chemicals and contaminants (including flushed chemicals and hydraulic oil) being released into waters within and adjacent to the Ningaloo Coast WHA during deployment and as the RTM ages. This could result in ingestion by marine species that are World Heritage values of the Ningaloo Coast WHA. This requires further specialist expert advice.

Storm surge and corrosion

- The new proposal fails to address the potential impact from storm surge and corrosion on the new proposed RTM structure. It is recommended the Applicant undertake an assessment of potential risks.
- The proposed location for placement of the artificial reef is in close proximity to the Ningaloo Coast WHA and there is a possibility for components of the RTM to move closer to, or within the WHA after storm events or over time due to age and corrosion. This would constitute pollution of the WHA.

Physical disturbance of natural communities at the proposed site

- The Applicant should provide detail on the proposed artificial reef site survey and its results

Potential adverse changes in marine food-web dynamics and community structure

- The Applicant should provide an authoritative assessment of the possible the ecological effects of the artificial reef.

Recreational fishing

- Some concerns have been raised by IUCN about the impacts of recreational fishing at and near the Ningaloo Coast WHA.
- If the artificial reef is approved, it will be important to monitor and set appropriate limits for the catch of species such as emperors.

Vessel strikes on cetaceans

- Vessel strikes are unlikely to increase as long as appropriate guidelines and procedures are put in place and state and Commonwealth cetacean regulations are adhered to.

Ningaloo Coast World Heritage Advisory Committee (NCWHAC)

- The Ningaloo Coast World Heritage Advisory Committee does not support the proposed artificial reef within or adjacent to the Ningaloo Coast WHA, given that they consider the use of the RTM as part of the artificial reef is inappropriate, and the ecological and habitat impacts to the Ningaloo Coast WHA are unacceptable.

Quarterly reporting to the UNESCO World Heritage Centre

- If it is considered that the proposed action may have a significant impact on the Ningaloo Coast WHA, it will be important to consider whether to inform the UNESCO World Heritage Centre of the proposed action in accordance with the World Heritage Operational Guidelines - 'before making any decisions that would be difficult to reverse.

Traditional Owner consultation

- It is recommended that the Traditional Owners (the NTGAC) are consulted on the potential impacts of the artificial reef to the Ningaloo Coast WHA.

Relevant Management Plans

Name, date and SPIRE Link	**Plans cover:** Not specific to National or World Heritage – covers a broader area than the Ningaloo Coast WHA.	**Advise whether the Action proposed may be consistent with this plan**
Draft Joint Management Plan - Nyinggulu (Ningaloo) coastal reserves, 2019,		Artificial reefs not referenced.
Ningaloo Coast Strategic Management Framework 2010		

Summary of Advice

Primary Heritage Contact Officer for ongoing contact through Assessment/Approval stages			**Cleared by**			
s.22(1)(a)(ii)	Heritage Officer	1/08/2021	s.22(1)(a)(ii)	Director – Natural Heritage	Click here to enter a date.	[signature]

Sources

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- Supporting Doc 1, 2021. Document 1, Additional information provided by the Applicant on 16 July 2021
- Supporting Doc 2, 2021. Document 2, Additional information provided by the Applicant on 16 July 2021

Dr Andrew Rowland
Chief Executive Officer
Recfishwest
45 Northside Drive
HILLARYS WA 6025

BY EMAIL: info@recfishwest.org.au

Dear Dr Rowland

I refer to:

- The application made by Recfishwest to the Minister for the Environment on 03 September 2020 for a permit under the *Environment Protection (Sea Dumping) Act 1981* (**Sea Dumping Act**) to place an artificial reef offshore of Exmouth, Western Australia (the Exmouth Deepwater Artificial Reef) (**the application**);
- The delegate of the Minister's notice dated 2 November 2020, under s 18(3) of the Sea Dumping Act requiring Recfishwest to provide certain information (**the notice**);
- The email from s. 47F(1) dated 15 December 2020, providing additional information in response to the notice (**Recfishwest's notice response**);
- The meeting between s. 22(1)(a)(ii) ; s. 22(1)(a)(ii) , s. 47F(1) and s. 47F(1) , on 11 March 2021 (**our meeting**).

The notice dated 2 November 2020

The Sea Dumping Act generally requires the Minister (or delegate) to decide whether or not to grant a permit within 90 days of an application being duly made. Where the Minister (or delegate) requires that additional information be provided under s 18(3) of the Sea Dumping Act to enable assessment of the application, an application will be deemed not to have been duly made until the required information has been provided. Consequently, the 90-day timeframe for making a decision on whether or not to grant a permit will not commence until that required information has been provided.

After careful consideration of Recfishwest's notice response, the department has determined that:

- the information identified in Attachment A, which was required by the notice (**outstanding information**), has not yet been provided by Recfishwest; and
- as such, the application is deemed not to have been duly made, and the 90-day timeframe for making a decision on whether or not to grant a permit has not commenced and will not commence until the outstanding information has been provided.

I request that Recfishwest provide the outstanding information.

Further information required

In addition to the outstanding information, the department requires further information identified below to properly assess the application.

I request that Recfishwest provide the further information identified below, together with the outstanding information by 26 June 2021. In the event the further information identified below is not provided together with the outstanding information, the Minister (or delegate) proposes to request that Recfishwest provide that information by notice under s18(3), or by requiring Recfishwest to enter into an agreement with the Commonwealth under s 18(4), of the Sea Dumping Act after Recfishwest have provided the outstanding information.

Contaminants of concern

Recfishwest's notice response advises that up to 118 kg of the persistent organic pollutant, polybrominated diphenyl ethers (**PBDEs**), may be present within the buoyancy foam in the Riser Turret Mooring (**RTM**).

Based on the department's investigations to date, the department agrees that it is likely that this chemical is present in the RTM given the age of the RTM.[1, 2] However, noting typical usage patterns of fire retardants in polyurethane foam of up to 5% PBDE,[3] the department considers that the application may have underestimated the quantities of PBDEs in the RTM.

The department also considers that the likely congener (type) of PDBE present is PentaBDE, which is toxic, persistent and bio-accumulative[4] and banned under the *Stockholm Convention on Persistent Organic Pollutants (POPs)* (**Stockholm Convention**). Based on experimental studies on animals, the toxicological endpoints of exposure to PBDEs are likely to be thyroid

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1 UNITAR, 2017. *Guidance for the Inventory of Polybrominated Diphenyl Ethers (PBDEs) Listed under the Stockholm Convention on Persistent Organic Pollutants*, United Nations Institute for Training Research, [accessed on 21 Jan 21 via http://chm.pops.int/Implementation/NIPs/Guidance/GuidancefortheinventoryofPBDEs/tabid/3171/Default.aspx]

2 UNEP, 2017. *Revised technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with hexabromodiphenyl ether and heptabromodiphenyl ether, or tetrabromodiphenyl ether and pentabromodiphenyl ether or decabromodiphenyl ether.* Basel Convention Secretariat, Internal draft (status 07.12.2017) based on the final version (15 May 2015). Access on 10 Feb 21 via: [http://www.basel.int/Implementation/POPsWastes/TechnicalGuidelines/TechnicalGuidelines(versionDec2017)/tabid/6304/Default.aspx]

3 UNEP, 2010. *Technical review of the implications of recycling commercial Penta and Octabromodiphenyl ethers.* Stockholm Convention document for 6th POP Reviewing Committee meeting (UNEP/POPS/POPRC.6/2) Geneva 11-15. October 2010. [accessed on 22 January 2021

4 Cooke, M., 2017. Polybrominated Diphenyl Ethers (PBDEs). Technical Fact Sheet, United States Environmental Protection Agency [accessed on 21 Jan 21 via https://www.epa.gov/sites/production/files/2014-03/documents/ffrrofactsheet_contaminant_perchlorate_january2014_final_0.pdf]

homeostasis disruption, neurodevelopmental deficits, reproductive changes, and even cancer[5].

In the absence of conclusive data to confirm the presence, type and quantity of PBDEs (or other chemical/s) within the buoyancy foam, the department will assume that PBDEs (likely PentaBDE), are present at least in the concentration and load specified in Recfishwest's notice response.

In the application, Recfishwest propose to grout the buoyancy foam within the RTM as a means of containing it and any PBDEs. Recfishwest's notice response states that the lifespan of the grout that is proposed to be used is 50 years. The department considers that this proposed approach creates a risk that PBDEs may be released into the marine environment in the future, including during the initial grouting process and at the end of the lifespan of the grout. Such release would pose potential risks to protected marine environments (including Ningaloo Marine Park, Gascoyne Marine Park, Muiron Islands Marine Management Area and Ningaloo Coast World Heritage Area) and human health through ingestion of fish caught at the proposed reef (noting the artificial reef is intended for recreational fishing purposes). To properly assess this risk, the department requires information on how the buoyancy foam and PBDEs may disperse into the marine environment.

We request that Recfishwest provide the following information:

1. Plume dispersal modelling of the buoyancy foam and PBDEs if released from the RTM; and
2. Information on:
    a. the likely impact of the buoyancy foam and PBDEs if released from the RTM on the marine environment and human health; and
    b. the long-term fate of the buoyancy foam and PBDEs if released from the RTM, including, but not limited to, the extent to which these are likely to bioaccumulate, persist, be toxic and likely timeframes.

Western Australian (WA) Government's commitment on ownership and liability

Recfishwest's notice response included a letter from the Western Australian Department of Primary Industries and Regional Development (**DPIRD**) as attachment SA3. In this letter, DPIRD states that once the artificial reef is successfully deployed, the ownership and liability of the habitat enhancement structure will be transferred to the State of Western Australia.

As noted during our meeting, DPIRD has confirmed to the department that the State of Western Australia will no longer assume ownership of artificial reefs placed in Commonwealth waters. This change in WA policy will affect the proposed role of the State of Western Australia and its ownership, responsibility and liability for the proposed artificial reef.

5 Linares V, Bellés M, Domingo JL. *Human exposure to PBDE and critical evaluation of health hazards.* Arch Toxicol. 2015 Mar;89(3):335-56. doi: 10.1007/s00204-015-1457-1. Epub 2015 Jan 31. PMID: 25637414.

Noting the above, we request that Recfishwest provide the following information:

1. Confirmation of the proposed ownership, responsibility and liability arrangements for the proposed artificial reef.

2. Evidence of the ability of Recfishwest to comply with permit conditions, including those requiring long-term rehabilitation and remediation works (including to deal with any chemicals released from the RTM), and comply with all applicable laws.

Due to the complexity of the application, following review of the information provided in response to this letter, a delegate of the Minister may seek additional information or clarification.

I look forward to receiving the information requested in this letter. I would be grateful if you could please confirm receipt of this letter and when Recfishwest will be able to provide the information requested in this letter. The department is unable to progress its assessment of the application and recommend a decision to the delegate until it has received the information.

If you wish to discuss this letter or the application generally, please contact s.22(1)(a)(ii) on s.22(1)(a)(ii) @awe.gov.au (copying seadumping@awe.gov.au).

Yours sincerely

s.22(1)(a)(ii)

Director
Sea Dumping Section

26 March 2021

Australian Government

Department of Agriculture, Water and the Environment

Attachment A: Outstanding information not provided on Sea Dumping Permit Application (SD2020/3998) Exmouth Deepwater Artificial Reef

#	Section of Recfishwest's notice response (on 15 December 2020)	The notice requirement on 2 November 2020	Issue	Department Comment	Recfishwest Response
1	14	Provide results of sediment pollution sampling at the proposed artificial reef location.	Sampling results not provided for the proposed reef location.	No comments.	
2	14	Provide modelling and commentary on any potential sediment plume from landing of the RTM on the seabed.	Modelling of the potential sediment plume from the landing of the RTM on the seabed was not provided.	No comments.	
3	35	Given the proximity to the Ningaloo Marine Park, Gascoyne Marine Park and Muiron Islands Marine Management Area, please provide	Details of consultation with Ningaloo Coast World Heritage Advisory	Recfishwest committed to undertaking this engagement during a meeting with the department 11 March 2021, participants included s. 47F(1) and s. 47F(1)	

#	Section of Recfishwest's notice response (on 15 December 2020)	The notice requirement on 2 November 2020	Issue	Department Comment	Recfishwest Response
		details of consultation with ...Ningaloo Coast World Heritage Advisory Committee addressing the reef placement.	Committee (NCWHAC) were not provided.		
4	15	Please provide maps of shipping channels local to the proposed artificial reef and the historic marine traffic in the area.	The attachment listed within the proponent's response 'Please see Attachment – Exmouth Deepwater Artificial Reef Shipping Density.' is not provided.	It is noted elsewhere in the revised application that shipping traffic from 2019 is provided, however this data set is not considered to be 'historic' data, as it contains only one year of data.	
5	20	Please identify contingency measures that will be implemented if the items specified in the comments section cannot be removed, noting that bend stiffeners have a grouting option, but no contingency measures have been provided for the risers and EHU.	Contingency measures for removal of the EHU have not been provided.	No comments.	

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WORLD HERITAGE ADVISORY COMMITTEE

s. 22(1)(a)(ii)

Projects Assessments West Section
Department of Agriculture, Water and Environment
John Gorton Building, King Edward Terrace, Parks
ACT 2600
s. 22(1)(a)(ii) @awe.gov.au

Dear Mr s. 22(1)(a)(ii)

RE-PURPOSING OF DECOMMISSIONED AND SURPLUS MARINE INFRASTRUCTURE AS ARTIFICIAL REEFS

The Ningaloo Coast World Heritage Advisory Committee recently provided advice to Woodside Energy Ltd. through stakeholder consultation for the *Nganhurra Operations Cessation Environment Plan Revision Exmouth Plateau Sub-Basin, North-West Australia* and the proposal to re-purpose the Riser Turret Mooring (RTM) as an integrated artificial reef.

The Committee would like to reiterate concerns for waste disposal and/or re-purposing of decommissioned and surplus marine infrastructure as integrated artificial reefs in close proximity to the Ningaloo Coast World Heritage Area (NCWHA). The Committee does not support this type of proposal either within or adjacent to the NCWHA, given the potential significant impact to the Outstanding Universal Value (OUV) of the NCWHA, particularly ecological and habitat impacts.

The Committee notes the current proposal to re-purpose the Riser Turret Mooring (RTM) as an integrated artificial reef is essentially waste disposal/sea dumping. The Committee notes the DAWE website, under sea dumpling permits states that "*Reefs may only be created for legitimate purposes (i.e. not waste disposal) and cannot pose a significant threat to users or surrounding environments*", (https://environment.gov.au/topics/marine/marine-pollution/sea-dumping/artificial-reefs).

The RTM decommissioned structure was originally planned for onshore disposal and not a structure that had been planned, designed and fabricated as a legitimate artificial reef. The Committee is concerned by the potentially significant impact the proposal poses to the OUV, due to its close proximity to the NCWHA boundary.

The Committee notes with concern an apparent lack of long-term planning and coordination with regard to the waste disposal of decommissioned and surplus marine infrastructure within and adjacent to the NCWHA and the significant potential cumulative impacts from this proposal and future proposals involving the re-purposing of decommissioned structures as integrated artificial reefs. The Committee notes this is one of several offshore industry projects with extensive equipment and structures on the seabed floor, located within both Commonwealth and State waters and nearby to the NCWHA. The Committee is not aware of any overarching strategy which demonstrates the avoidance of impacts to the OUV of the NCWHA from the decommissioning of this infrastructure.

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The Committee notes currently the proponent has an obligation to ensure continual monitoring and remediation of ecological and habitat values due to unforeseen pressures from decommissioned operations within the lease area. The Committee is concerned with the potential shift in responsibility for continual monitoring and remediation of values from the proponent, with the removal of equipment and structures from the lease/permit area to a new location.

The Committee will write to the State regulatory body responsible for assessing development proposals and offshore activities to advocate concerns with waste disposal and/or re-purposing of decommissioned and surplus marine infrastructure as integrated artificial reefs. The Committee will also provide a copy of the advice to State and Federal sea dumping permit divisions.

The Committee's feedback to Woodside Energy Ltd. in relation to the proposal to re-purpose the Riser Turret Mooring (RTM) as an integrated artificial reef is at Attachment 1, for your reference. The Committee's concerns, in this instance, relate to the proximity to the NCWHA and the potential impact on the OUV pollution; stability; and detraction of fish species from the World Heritage area.

Current Committee membership, responsibilities, and a summary of the OUV is provided for your reference at Attachment 2.

If you would like further information on the Committee's comments and recommendations please contact myself or s. 47F(1) , World Heritage Program Manager, Ningaloo Coast.

Yours sincerely,
s. 47F(1)

Ningaloo Coast World Heritage Advisory Committee

26 August 2020

Cc s. 22(1)(a)(ii) , Department of Agriculture, Water and the Environment
s. 22(1)(a)(ii) Parks Australia
s. 22(1)(a)(ii) Department of Biodiversity, Conservation and Attractions

Ningaloo Coast World Heritage Advisory Committee
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WORLD HERITAGE ADVISORY COMMITTEE

s. 22(1)(a)(ii)

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s. 22(1)(a)(ii)

Ningaloo Coast World Heritage Area 'Statement of Outstanding Universal Value'

Brief synthesis

The Ningaloo Coast is located on Western Australia's remote coast along the East Indian Ocean. The interconnected ocean and arid coast form aesthetically striking landscapes and seascapes. The coastal waters host a major near shore reef system and a directly adjacent limestone karst system and associated habitats and species along an arid coastline. The property holds a high level of terrestrial species endemism and high marine species diversity and abundance. An estimated 300 to 500 whale sharks aggregate annually coinciding with mass coral spawning events and seasonal localized increases in productivity. The marine portion of the nomination contains a high diversity of habitats that includes lagoon, reef, open ocean, the continental slope and the continental shelf. Intertidal systems such as rocky shores, sandy beaches, estuaries, and mangroves are also found within the property. The most dominant marine habitat is the Ningaloo reef, which sustains both tropical and temperate marine fauna and flora, including marine reptiles and mammals.

The main terrestrial feature of the Ningaloo Coast is the extensive karst system and network of underground caves and water courses of the Cape Range. The karst system includes hundreds of separate features such as caves, dolines and subterranean water bodies and supports a rich diversity of highly specialized subterranean species. Above ground, the Cape Range Peninsula belongs to an arid ecoregion recognized for its high levels of species richness and endemism, particularly for birds and reptiles.

Criterion (vii): The landscapes and seascapes of the property are comprised of mostly intact and large-scale marine, coastal and terrestrial environments. The lush and colourful underwater scenery provides a stark and spectacular contrast with the arid and

rugged land. The property supports rare and large aggregations of whale sharks (Rhincodon typus) along with important aggregations of other fish species and marine mammals. The aggregations in Ningaloo following the mass coral spawning and seasonal nutrient upwelling cause a peak in productivity that leads approximately 300-500 whale sharks to gather, making this the largest documented aggregation in the world.

Criterion (x): In addition to the remarkable aggregations of whale sharks the Ningaloo Reef harbours a high marine diversity of more than 300 documented coral species, over 700 reef fish species, roughly 650 mollusc species, as well as around 600 crustacean species and more than 1,000 species of marine algae. The high numbers of 155 sponge species and 25 new species of echinoderms add to the

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significance of the area. On the ecotone, between tropical and temperate waters, the Ningaloo Coast hosts an unusual diversity of marine turtle species with an estimated 10,000 nests deposited along the coast annually.

The majority of subterranean species on land, including aquatic species in the flooded caves are rare, taxonomically diverse and not found elsewhere in the southern hemisphere. The combination of relict rainforest fauna and small fully aquatic invertebrates within the same cave system is exceptional. The subterranean fauna of the peninsula is highly diverse and has the highest cave fauna (troglomorphic) diversity in Australia and one of the highest in the world. Above ground, the diversity of reptiles and vascular plants in the drylands is likewise noteworthy.

Integrity

The property is embedded into a comprehensive legal framework for the various protected areas and all other land. As a National Heritage area, it is subject to the federal *Environment Protection and Biodiversity Conservation Act of 1999* (EPBC) according to which all proposed activities with possible significant impacts on the values of the site require assessments. The EPBC is applicable to activities located outside of the boundaries of the property. While no formal buffer zones have been established for the property, the Act therefore serves as a legal buffer zone. The boundaries encompass the key marine and terrestrial values with the exclusions being small in size and not conflicting with the maintenance of the values if managed adequately.

Both the marine and the terrestrial areas may face a number of threats to the property's integrity. Learmonth Air Weapons Range Facility, located within the property, includes an ancient reef-complex and cave fauna of exceptional importance. It was one of Australia's most active bombing ranges until around 1990 and future bombing activities may pose a threat, in particular for the Bundera sinkhole which is located on Defence Land. Tourism is on the increase leading to associated threats such as damage to vegetation, illegal fishing, sewage and waste disposal and disturbance to wildlife. Comprehensive management programs and an overall tourism development strategy are functioning as well as appropriate responses which require consolidation in anticipation of further increasing visitation. Future concerns include increased water demand leading to water abstraction with potential effects on the groundwater systems as well documented in arid areas with abruptly increasing numbers of visitors.

Fire, historically part of local indigenous management, is a potential threat to the terrestrial vegetation and requires monitoring and control. Livestock raising on pastoral leases continues to be an important land use which is compatible with nature conservation when managed appropriately.

Potential offshore hydrocarbon extraction in the region surrounding the property requires careful consideration in order to prevent potential pollution and disturbance. The coastline's significant length and remoteness poses major challenges to responses to pollution incidents suggesting a need for further investments in emergency response.

Sea level rise and increases in seawater temperatures associated with climate change have had comparatively little effect on the property. The good overall integrity suggests a higher resilience that in disturbed systems under additional stress. Still, careful monitoring is highly recommended.

A concern affecting both marine and terrestrial parts of the property and requiring permanent monitoring and management are invasive alien species, most importantly foxes, cats, goats and weeds on land and some marine species.

Protection and management requirements

The Ningaloo Coast benefits from its remoteness and low population density affording it a high degree of natural protection. The entire, mostly state-owned property is comprehensively protected and managed, including by an overarching strategic management framework. Given the various governmental levels and agencies involved and the differentiation between terrestrial and marine parts of the property, effective coordination of the multiple plans in an overall management framework is critical. Full cooperation between agencies, including fisheries, are necessary to ensure management and law enforcement in the vast and remote marine and terrestrial areas. Funding from federal and state levels and staffing as of the time of inscription would benefit from increases.

There is a need for ongoing management of fisheries and careful planning of resource extraction and corresponding monitoring and disaster preparedness to protect the values of the property.

Communication, consultation and joint efforts with local and indigenous stakeholders, including negotiation of native title claims and pastoral leases, are indispensable elements of effective management and local acceptance of conservation efforts. Given the vastness of the area and the limited human and financial resources, co-management approaches with local stakeholders are a promising option. The establishment of a "Ningaloo Coast World Heritage Advisory Committee" or a similar body bringing together representatives from the traditional owners, local government, scientific experts and members of the community, has an important role to play in this regard.

Tourist numbers are expected to rise which will require additional management efforts. Increased water abstraction, including from demand from increased tourism, may affect fragile subterranean aquatic habitats and species communities will require constant monitoring and management.

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NINGALOO COAST
WORLD HERITAGE ADVISORY COMMITTEE

Andrew McNee
Acting First Assistant Secretary
Environment Approvals Division
Department of Agriculture, Water and the Environment
andrew.mcnee@awe.gov.au

Dear Mr McNee,

CONSULATION: RECFISHWEST EXMOUTH DEEPWATER ARTIFICIAL REEF PROPOSAL

I would like to thank the Department of Agriculture, Water and the Environment for providing the Ningaloo Coast World Heritage Advisory Committee (the Committee) an opportunity to provide advice on the Recfishwest Exmouth Deepwater Artificial Reef proposal (artificial reef proposal).

The Committee was established in 2013 by agreement between the Commonwealth and Western Australian governments. The role of the Committee is to provide advice to the Commonwealth and State Environment Ministers and management agencies on the protection, conservation, presentation and management of the outstanding universal value (OUV) of the Ningaloo Coast World Heritage Area (NCWHA). The Committee is concerned with any activity within or adjacent to the World Heritage area that may potentially impact the OUV (within and adjacent to the World Heritage area), ultimately impacting the integrity of the World Heritage property. The Committee is supported by the Department of Biodiversity, Conservation and Attractions, however, is not part of the department. Current membership and committee responsibilities are provided for your reference at Attachment 1.

I refer to previous committee correspondence to DAWE, August 2020 detailing concerns for waste disposal and/or proposals relating to the re-purposing of decommissioned and surplus marine infrastructure as integrated artificial reefs in close proximity to the NCWHA. The Committee, in principle, does not support this type of proposal, given the potential impacts to the OUV, in particular significant ecological and habitat impacts within and adjacent to the NCWHA.

The Committee notes the current Recfishwest artificial reef proposal to re-purpose the Riser Turret Mooring (RTM) as an integrated artificial reef is essentially waste disposal/sea dumping. The Committee notes and supports the requirement of a sea dumping permit for the creation of an artificial reef. The Committee refers to DAWE's statement that, *"Reefs may only be created for legitimate purposes (i.e. not waste disposal) and cannot pose a significant threat to users or surrounding environments."*[1] The Committee supports this statement.

The Committee has consulted with the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) in regard to the re-purposing of the RTM: Nganhurra Cessations of Operation Environment Plan Revision. The Committee has detailed concerns in relation to the potential impacts to the OUV from the re-purposing of the RTM. The Committee has also sought clarification from NOPSEMA on the Committee's role in regulatory assessments of EP's and offshore project proposals (OPP's) relevant to the NCWHA; and to better understand the most appropriate place within the assessment process for the Committee to provide advice in relation to the OUV. The

[1] https://environment.gov.au/topics/marine/marine-pollution/sea-dumping/artificial-reefs

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Committee is eager to identify a more streamlined process by which the Committee provides advice to NOPSEMA. The Committee is seeking similar clarification from DAWE.

Currently the Committee engages with proponents via the proponent's responsibility to consult with stakeholders. Nearly all consultation with proponents is done out-of-meeting session for which members volunteer their time. For the Committee to operate within the current committee Terms of Reference, the Committee provides advice direct to Environment Ministers and management agencies including regulatory bodies. The Committee welcomes early consultation by proponents which ensures potential impacts to the OUV are considered and addressed in the initial development and assessment phase of a proposal, ultimately delivering a better outcome for the OUV. The Committee would like to continue consultation with proponents while providing advice direct to management agencies and regulatory bodies. The Committee notes it was not considered a key stakeholder for consultation on the artificial reef proposal. The Committee will engage with Recfishwest to request recognition as a key stakeholder and in future consultation for activities and proposals relevant to the NCWHA.

The Committee notes NOPSEMA has recently accepted the Nganhurra Cessations of Operation Environment Plan Revision and commends NOPSEMA on the new regulatory policy and compliance plan for the removal of property. The Committee notes the RTM infrastructure which will form the basis of the artificial reef proposal is one of several offshore industry projects with extensive equipment and structures on the seabed floor, located within both Commonwealth and State waters and nearby to the NCWHA. The Committee remains concerned with the potential cumulative impacts from the artificial reef proposal and future proposals that may require re-purposing decommissioned infrastructure and sea dumping within and adjacent to the NCWHA. The Committee would like to better understand the strategies and policies DAWE has in place to mitigate cumulative impacts from proposals similar to the current artificial reef proposal.

The International Union for the Conservation of Nature (IUCN) adopts a statement of OUV for each World Heritage property, which is the key reference point for ongoing protection and management of the property (refer to Attachment 2). The Ningaloo Coast OUV comprises the following specific values as described by the IUCN (further details at Attachment 3): exceptional landscape combining arid terrestrial and marine features (mostly intact and large-scale marine, coastal and terrestrial environments); one of the largest documented aggregations of whale sharks in the world (along with important aggregations of other fish species and marine mammals); high diversity of marine fish (over 700 reef fish species and large number of marine pelagic species); high diversity of reptiles (unusual diversity of marine turtle species, high levels of terrestrial species richness and endemism; high diversity of marine mammals (twenty cetacean species); high diversity of cave fauna (troglomorphic) (highest cave fauna (troglomorphic) diversity in Australia); high diversity of marine invertebrates and algae (more than 50 per cent of Indian Ocean coral species, more than 1,000 species of marine algae); noteworthy arid-zone vascular flora; and noteworthy birds – protected migratory and wader species (with at least 200 bird species in the property, eleven of these are at the northern or southern limits of their range, or are otherwise isolated from their main populations).

The IUCN World Heritage Outlook assessment (2020)[2] downgrading of the Ningaloo Coast from "GOOD" to "GOOD WITH SOME CONCERNS" is related to several significant threats impacting the OUV: climate change; oil and gas exploration/development; increasing visitation and recreational fishing; and invasive species.

[2] https://worldheritageoutlook.iucn.org/explore-sites/wdpaid/555542338

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The Committee provides the following advice in relation to the artificial reef proposal with reference to the above-mentioned IUCN World Heritage values and threats currently impacting those values, for your consideration.

Threat to the OUV:	**Proximity to the NCWHA**
OUV value impacted:	Exceptional landscape combining arid terrestrial and marine features; high diversity of marine fish; high diversity of reptiles; high diversity of marine mammals; high diversity of marine invertebrates and algae.

- The Committee **notes** the close proximity of the artificial reef proposal to the NCWHA boundary (Commonwealth waters).
- The Committee, in recent advice to NOPSEMA in relation the re-purposing of the RTM: Nganhurra Cessations of Operation Environment Plan Revision, **recommended** any activity, that has the potential to impact the OUV (both within and adjacent to the NCWHA), be independently determined to be an appropriate distance from the NCWHA to ensure the integrity of the World Heritage property remains intact, with the approval decision remaining the responsibility of the regulator agency. Numerous sites more distant from the NCWHA are available, thereby minimising any potential unidentified risks.

Threat to the OUV:	**Pollution**
OUV value impacted:	Exceptional landscape combining arid terrestrial and marine features; one of the largest documented aggregations of whale sharks in the world; high diversity of marine fish; high diversity of reptiles; high diversity of marine mammals; high diversity of marine invertebrates and algae.

- The Committee **notes with concern** the residual contaminants within the RTM structure and the potential for release into waters within and adjacent to the NCWHA over time as the structure degrades and corrodes.
- The Committee **notes** there is no information with regard to cumulative impacts of other vessels, platforms or monopod structures in the area being dumped at the end of their lifespan.

Threat to the OUV:	**Potential structure encroachment into NCWHA**
OUV value impacted:	Exceptional landscape combining arid terrestrial and marine features; one of the largest documented aggregations of whale sharks in the world; high diversity of marine fish; high diversity of reptiles; high diversity of marine mammals; high diversity of marine invertebrates and algae.

- The Committee **notes** should there be a loss of control during deployment at the proposed artificial reef location, the RTM is expected to drift in a southerly direction to ground at the 80m contour within the NCWHA where it will drag along the seabed until retrieval. The Committee **notes** retrieval in this scenario is reliant on good weather conditions and the RTM structure being free from damage which may cause flooding and subsequent sinking within the NCWHA.

Threat to the OUV:	**Detraction of fish species from the NCWHA**
OUV value impacted:	Exceptional landscape combining arid terrestrial and marine features; one of the largest documented aggregations of whale sharks in the world; high diversity of marine fish; high diversity of reptiles; high diversity of marine mammals; high diversity of marine invertebrates and algae.

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NINGALOO COAST
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- The Committee **notes with concern** the proximity to the NCWHA may potentially impact the OUV, in particular certain fish species.
- The Committee **notes** the size of the artificial reef, the lack of other similar habitat in the area, and the potential for an increase in attraction of fish species from the NCWHA to the artificial reef structure, where fish will then be concentrated and potentially captured. The Committee **notes** the artificial reef proposal includes features designed to change localised water movement that would enhance fish concentration near the structure.

Should you require further information from the Committee please contact s. 47F(1) , World Heritage Program Manager, Ningaloo Coast.

Yours sincerelv.

s. 47F(1)

Ningaloo Coast World Heritage Advisory Committee

10 February 2021

Cc

s. 22(1)(a)(ii) ssistant Director, Sea Dumping Section, Environment Approvals Division, Department of Agriculture, Water and the Environment

Ningaloo Coast World Heritage Advisory Committee Chairperson
c/- Parks and Wildlife Service - Exmouth Office
Department of Biodiversity, Conservation and Attractions
PO Box 201, Exmouth, Western Australia 6707
Phone: s. 47F(1) Email: s. 47F(1) @dbca.wa.gov.au

United Nations Educational, Scientific and Cultural Organization

Ningaloo Coast inscribed on the World Heritage List in 2011

NINGALOO COAST
WORLD HERITAGE ADVISORY COMMITTEE

s. 22(1)(a)(ii)

Ningaloo Coast World Heritage Advisory Committee Chairperson
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Department of Biodiversity, Conservation and Attractions
PO Box 201, Exmouth, Western Australia 6707
Phone: s. 47F(1) Email: s. 47F(1) @dbca.wa.gov.au

Attachment 2
Ningaloo Coast World Heritage Area 'Statement of Outstanding Universal Value'

Brief synthesis

The Ningaloo Coast is located on Western Australia's remote coast along the East Indian Ocean. The interconnected ocean and arid coast form aesthetically striking landscapes and seascapes. The coastal waters host a major near shore reef system and a directly adjacent limestone karst system and associated habitats and species along an arid coastline. The property holds a high level of terrestrial species endemism and high marine species diversity and abundance. An estimated 300 to 500 whale sharks aggregate annually coinciding with mass coral spawning events and seasonal localized increases in productivity. The marine portion of the nomination contains a high diversity of habitats that includes lagoon, reef, open ocean, the continental slope and the continental shelf. Intertidal systems such as rocky shores, sandy beaches, estuaries, and mangroves are also found within the property. The most dominant marine habitat is the Ningaloo reef, which sustains both tropical and temperate marine fauna and flora, including marine reptiles and mammals.

The main terrestrial feature of the Ningaloo Coast is the extensive karst system and network of underground caves and water courses of the Cape Range. The karst system includes hundreds of separate features such as caves, dolines and subterranean water bodies and supports a rich diversity of highly specialized subterranean species. Above ground, the Cape Range Peninsula belongs to an arid ecoregion recognized for its high levels of species richness and endemism, particularly for birds and reptiles.

Criterion (vii): The landscapes and seascapes of the property are comprised of mostly intact and large-scale marine, coastal and terrestrial environments. The lush and colourful underwater scenery provides a stark and spectacular contrast with the arid and

rugged land. The property supports rare and large aggregations of whale sharks (Rhincodon typus) along with important aggregations of other fish species and marine mammals. The aggregations in Ningaloo following the mass coral spawning and seasonal nutrient upwelling cause a peak in productivity that leads approximately 300-500 whale sharks to gather, making this the largest documented aggregation in the world.

Criterion (x): In addition to the remarkable aggregations of whale sharks the Ningaloo Reef harbours a high marine diversity of more than 300 documented coral species, over 700 reef fish species, roughly 650 mollusc species, as well as around 600 crustacean species and more than 1,000 species of marine algae. The high numbers of 155 sponge species and 25 new species of echinoderms add to the significance of the area. On the ecotone, between tropical and temperate waters, the Ningaloo Coast hosts an unusual diversity of marine turtle species with an estimated 10,000 nests deposited along the coast annually.

The majority of subterranean species on land, including aquatic species in the flooded caves are rare, taxonomically diverse and not found elsewhere in the southern hemisphere. The combination of relict rainforest fauna and small fully aquatic invertebrates within the same cave system is exceptional. The subterranean fauna of the peninsula is highly diverse and has the highest cave fauna (troglomorphic) diversity in Australia and one of the highest in the world. Above ground, the diversity of reptiles and vascular plants in the drylands is likewise noteworthy.

Integrity

The property is embedded into a comprehensive legal framework for the various protected areas and all other land. As a National Heritage area, it is subject to the federal *Environment Protection and Biodiversity Conservation Act of 1999* (EPBC) according to which all proposed activities with possible significant impacts on the values of the site require assessments. The EPBC is applicable to activities located outside of the boundaries of the property. While no formal buffer zones have been established for the property, the Act therefore serves as a legal buffer zone. The boundaries encompass the key marine and terrestrial values with the exclusions being small in size and not conflicting with the maintenance of the values if managed adequately.

Both the marine and the terrestrial areas may face a number of threats to the property's integrity. Learmonth Air Weapons Range Facility, located within the property, includes an ancient reef-complex and cave fauna of exceptional importance. It was one of Australia's most active bombing ranges until around 1990 and future bombing activities may pose a threat, in particular for the Bundera sinkhole which is located on Defence Land. Tourism is on the increase leading to associated threats such as damage to vegetation, illegal fishing, sewage and waste disposal and disturbance to wildlife. Comprehensive management programs and an overall tourism development strategy are functioning as well as appropriate responses which require consolidation in anticipation of further

increasing visitation. Future concerns include increased water demand leading to water abstraction with potential effects on the groundwater systems as well documented in arid areas with abruptly increasing numbers of visitors.

Fire, historically part of local indigenous management, is a potential threat to the terrestrial vegetation and requires monitoring and control. Livestock raising on pastoral leases continues to be an important land use which is compatible with nature conservation when managed appropriately.

Potential off-shore hydrocarbon extraction in the region surrounding the property requires careful consideration in order to prevent potential pollution and disturbance. The coastline's significant length and remoteness poses major challenges to responses to pollution incidents suggesting a need for further investments in emergency response.

Sea level rise and increases in seawater temperatures associated with climate change have had comparatively little effect on the property. The good overall integrity suggests a higher resilience that in disturbed systems under additional stress. Still, careful monitoring is highly recommended.

A concern affecting both marine and terrestrial parts of the property and requiring permanent monitoring and management are invasive alien species, most importantly foxes, cats, goats and weeds on land and some marine species.

Protection and management requirements

The Ningaloo Coast benefits from its remoteness and low population density affording it a high degree of natural protection. The entire, mostly state-owned property is comprehensively protected and managed, including by an overarching strategic management framework. Given the various governmental levels and agencies involved and the differentiation between terrestrial and marine parts of the property, effective coordination of the multiple plans in an overall management framework is critical. Full cooperation between agencies, including fisheries, are necessary to ensure management and law enforcement in the vast and remote marine and terrestrial areas. Funding from federal and state levels and staffing as of the time of inscription would benefit from increases.

There is a need for ongoing management of fisheries and careful planning of resource extraction and corresponding monitoring and disaster preparedness to protect the values of the property.

Communication, consultation and joint efforts with local and indigenous stakeholders, including negotiation of native title claims and pastoral leases, are indispensable elements of effective management and local acceptance of conservation efforts. Given the vastness of the area and the limited human and financial resources, co-management approaches with local stakeholders are a promising option. The establishment of a "Ningaloo Coast World Heritage Advisory Committee" or a similar body bringing together representatives from the traditional owners, local government, scientific experts and members of the community, has an important role to play in this regard.

Tourist numbers are expected to rise which will require additional management efforts. Increased water abstraction, including from demand from increased tourism, may affect fragile subterranean aquatic habitats and species communities will require constant monitoring and management.

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NINGALOO COAST
WORLD HERITAGE ADVISORY COMMITTEE

Attachment 3
IUCN World Heritage values

Exceptional landscape combining arid terrestrial and marine features The landscapes and seascapes of the property are comprised of mostly intact and large-scale marine, coastal and terrestrial environments. The lush and colourful underwater scenery provides a stark and spectacular contrast with the arid and rugged land (World Heritage Committee, 2011; State Party of Australia, 2010; IUCN, 2011).	Criterion (vii)
One of the largest documented aggregation of whale sharks in the world The property supports rare and large aggregations of whale sharks (Rhincodon typus) along with important aggregations of other fish species and marine mammals. The mass coral spawning and seasonal nutrient upwelling cause a peak in productivity that leads to aggregations along the Ningaloo Coast of approximately 300-500 whale sharks, making this one of the largest documented aggregation in the world (World Heritage Committee, 2011; State Party of Australia, 2010; IUCN, 2011).	Criterion (vii)
High diversity of marine fish High marine diversity of more than over 700 reef fish species and large number of marine pelagic species including whale sharks (World Heritage Committee, 2011; State Party of Australia, 2010; IUCN, 2011). Manta rays are abundant in the reserve and are found on the outer reef and in the lagoon. Nineteen species of shark including the black-tip reef shark, white-tip reef shark, hammerhead shark, tawny nurse shark, oceanic white tip shark, tiger shark, blue shark- and grey reef shark - occur in the lagoon and deeper waters. The open ocean supports large aggregations of fish, including trevally, tuna, mackerel, marlin and sailfish, many of which are found much closer to shore than in other parts of the world due to the narrow continental shelf (State Party of Australia, 2010; IUCN, 2011).	Criterion (x)
High diversity of reptiles Situated at an ecotone between tropical and temperate waters, the Ningaloo Coast hosts an unusual diversity of marine turtle species with an estimated 10,000 nests deposited along the coast annually (World Heritage Committee, 2011; State Party of Australia, 2010; IUCN, 2011). Marine reptiles include six recorded marine turtle species (with 4 species recorded nesting, although only 3 species nest in significant numbers), and the olive sea snake. The Carnarvon Xeric Scrub ecoregion is recognized for its high levels of species richness and endemism, particularly for birds and reptiles (World Heritage Committee, 2011; State Party of Australia, 2010; IUCN, 2011).	Criterion (x)
High diversity of marine mammals Twenty cetacean species have been recorded in the property with frequent observations of dugong and dolphins (most commonly bottlenose and Australasian humpback dolphins) in the lagoons and other marine areas, and at least eight species of whales: Notable are the presence of humpback whales migrating through on their annual migration from feeding grounds in Antarctica to calving grounds along the Western Australian coast into the Kimberley. Blue and sperm whales have been observed in the offshore regions of the nominated area, as have minke, brydes, southern right and killer whales (State Party of Australia, 2010; IUCN, 2011).	Criterion (x)
High diversity of cave (troglomorphic) diversity	Criterion (x)

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The combination of relict rainforest fauna and small, fully aquatic invertebrates within the same cave system is exceptional. The subterranean fauna of the peninsula is highly diverse and has the highest cave fauna (troglomorphic) diversity in Australia and one of the highest in the world (World Heritage Committee, 2011; State Party of Australia, 2010; IUCN, 2011).	
High diversity of marine invertebrates and algae More than 50 per cent of Indian Ocean coral species (over 300 species in 54 genera), at least 650 mollusc species, 600 crustacean species, 155 sponge species and an undocumented number of echinoderms including 25 new to science together provide an exceptional diversity of marine invertebrates, supplemented by more than 1,000 species of marine algae (World Heritage Committee, 2011; State Party of Australia, 2010; IUCN, 2011).	Criterion (x)
Noteworthy arid-zone vascular flora Terrestrial arid-zone vascular plant diversity is noteworthy (World Heritage Committee, 2011; State Party of Australia, 2010).	Criterion (x)

Other important biodiversity values

Noteworthy birds With at least 200 bird species in the property, eleven of these are at the northern or southern limits of their range, or are otherwise isolated from their main populations. Examples include the western bowerbird (Chlamydera guttara), rufous-crowned emu-wren (Stipiturus ruficeps) and the painted firetail finch (Emblema picta) (State Party of Australia, 2010). The Cape Range Peninsula belongs to an arid ecoregion recognized for its high levels of species richness and endemism, particularly for birds and reptiles (World Heritage Committee, 2011; IUCN, 2011).

Australian Government
Department of Agriculture, Water and the Environment

Our reference: SD2020-3998

Dr Andrew Roland
Chief Executive Officer
Recfishwest
45 Northside Drive,
HILLARYS WA 6025

Dear Dr Rowland

Application for a permit for the placement of an artificial reef

I refer to:

1. the application made by Recfishwest to the Minister for the Environment on 3 September 2020 for a permit under the *Environment Protection (Sea Dumping) Act 1981* (**the Act**) to place an artificial reef offshore of Exmouth, Western Australia (the Exmouth Deepwater Artificial Reef (**EDAR**)) (**the application**);
2. the delegate of the minister's letter requiring information dated 2 November 2020, under section 18(3) of the Act (**RFI 1**);
3. the email and letter from s. 47F(1) to the Department of Agriculture, Water and the Environment (**department**) dated 15 December 2020, providing an updated application and information in response to the RFI 1 (**Recfishwest Response 1**);
4. the delegate of the minister's letter requiring information dated 26 March 2021 (**RFI 2**);
5. the delegate of the minister's letter dated 2 June 2021, providing a summary of the advice provided by the Ningaloo Coast World Heritage Advisory Committee (**NCWHAC**) on the proposed EDAR (**NCWHAC Advice)**; and
6. the letter from Recfishwest to the department dated 18 July 2021, providing information in response to RFI 2 and the NCWHAC Advice (**Recfishwest Response 2**).

The purpose of this letter is to give you the opportunity to respond to the information adverse to the interests of Recfishwest set out below, on the basis of which I am currently inclined to decide not to grant a permit for the EDAR.

Legislative framework

The application, made under section 18 of the Act, seeks a permit to place an artificial reef. Under section 19 of the Act, the minister, or a delegate, may, in their discretion but subject to the requirements of the Act, grant, or refuse to grant a permit to a person who has made an application under section 18.

The minister's delegate assesses applications made under the Act on merit, in accordance with the requirements of the Act and with reference to the *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other matter, 1972* (**the Protocol**), and the *UNEP Guidelines for the Placement of Artificial Reefs 2009* (**UNEP Guidelines**).

For an activity to constitute the placement of an artificial reef, and therefore potentially be authorised by an artificial reef permit, the placement of material must not be contrary to the aims of the Protocol. The overarching aims of the Protocol are to protect and preserve the marine environment from all sources of pollution. This requires the minister's delegate to consider whether the proposed placement, due to the materials of which it is made and/or its location, would result or be likely to result in deleterious effects such as harm to living resources and marine ecosystems, hazards to human health, hindrance to marine activities (including fishing and other legitimate uses of the sea), impairment of quality for use of sea water, and reduction of amenities. If the delegate's assessment is that a proposed placement would be likely to have any of these impacts, the placement is likely to be considered contrary to the aims of the Protocol and a permit would be unable to be granted under the Act.

Previous correspondence

To inform my assessment of the application, particularly the potential hazards to the environment which may result from the proposed EDAR, the minister's delegate has previously required information from you about the proposed EDAR. The following is a summary of correspondence on this issue:

1. In RFI 1, the minister's delegate required that you provide further information on multiple aspects of the application, including on:
    a. the ownership of the proposed EDAR post installation;
    b. contaminants of concern left both on and within the riser turret mooring (**RTM**) proposed to form part of the EDAR;
    c. the installation methodology/preparation of the RTM for the placement; and
    d. the impacts of the proposed EDAR to the adjacent Ningaloo Coast World Heritage Area (**NCWHA**).
2. In response, Recfishwest provided Recfishwest Response 1 (as above, providing an updated application and a document responding directly to the department's concerns).
3. In RFI 2, the minister's delegate required that you provide information required in RFI 1 but not provided in Recfishwest Response 1 as well as further additional information. This included information on:
    a. sediment pollution sampling and plume modelling at the proposed reef location;
    b. consultation with NCWHAC and other relevant stakeholders;
    c. contaminants of concern, plume dispersal modelling of these contaminants if released, and, if released, their long-term fate and likely impact on the marine environment, and contingency measures for the removal of these contaminants; and
    d. proposed ownership, responsibility and liability arrangements for the proposed EDAR and evidence of the ability of Recfishwest to comply with permit conditions, including those requiring long-term rehabilitation and remediation works (including to deal with any chemicals released from the RTM), and comply with all applicable laws.
4. On 2 June, the department provided Recfishwest the NCWHAC Advice.
5. In response to RFI 2 and the NCWHAC Advice, Recfishwest provided Recfishwest Response 2.

Preliminary view

Having considered the information held by the department on your application, including the information set out below, my preliminary view is that the proposed placement of the EDAR would be contrary to the aims of the Protocol. As such, I am presently inclined to refuse to grant you an artificial reef placement permit. However, this is only a preliminary view, and I am yet to make a final decision on your application.

Information that is adverse to the interest of Recfishwest

I have received information, set out in points 1-4 below, that appears to be credible, relevant and significant to your application. This information raises significant issues that have led me to form my preliminary view above.

1. Potential impacts on the NCWHA

As you are aware, the NCWHA is located less than 2km from the boundary of the proposed EDAR. In my view, a permit is unlikely to be granted for the proposed EDAR, given its proposed proximity to the NCWHA. This is due to the feedback raised by a key stakeholder, the NCWHAC:

a. The likely impacts of the proposed action on the outstanding universal value (OUV) and integrity of the NCWHA.

b. The risks of undertaking the removal of 'Compartment 13' and associated works, to the OUV of the NCWHA, and more broadly the marine environment.

c. The functionality and safety of the new design proposed for the EDAR (incorporating the two remaining components of the RTM structure).

d. The merits of the proposal to remove an equivalent quantity of marine debris from the marine/coastal environment (described as "beach clean-up" in the Recfishwest Response 2, presumably of drink bottles and other plastic containers and objects) compared to the quantity of plastics likely to be released from the proposed EDAR involving the re-use of the RTM. The amount of plastic that will enter the environment due to the proposed EDAR should be assessed irrespective of the amount of plastics already present in the marine environment. That is, regardless of the proposed offset program, plastics entering the marine environment should be avoided.

e. Due to the size of the proposed EDAR, its proximity to the NCWHA, the lack of other similar habitat in the area, and features designed to change localised water movement that may enhance fish concentration near the RTM structure, it is possible that fish species from the NCWHA will be attracted to the proposed EDAR, where fish will then be concentrated and potentially captured.

f. Noting the proposed removal and relocation of equipment and structures from the current title area, where Woodside Ltd. currently has an obligation to ensure continual monitoring and remediation of ecological and habitat values. The shift in location of the RTM will shift the current environmental protection responsibility to another party (Recfishwest). That is, concern lies around whether Recfishwest will have the same ability to be able to continue this ongoing monitoring and remediation of the new location, including the impact of the proposed EDAR on the OUV of the NCWHA.

g. Consultation has not included the views of the Thanardi Garrbu Aboriginal Corporation on the potential impacts to heritage value of the NCWHA, such as pollution, recreational fishing, leaching of chemicals into the environment and potential changes in location of artificial reef components due to storm surge events or corrosion.

2. Placement and then removal of contaminants

Within RFI 2, it was stated that the department will assume that polybrominated diphenyl ethers (**PBDEs**) are present at least in the concentration and load specified in Recfishwest's notice response (**Recfishwest Response 1)**. The PBDEs are assumed to be present within ~65m^3 of buoyancy foam contained in 'Compartment 13' of the RTM.

In Recfishwest Response 2, Recfishwest has proposed to change the EDAR by removing 'Compartment 13', after the RTM has been placed on the seabed. Based on the information provided by Recfishwest, a permit is unlikely to be granted for the placement of the RTM while it still contains contaminants such as buoyancy foam and PBDEs, as this presents a risk that these contaminants may be released into the marine environment following placement.

3. Ownership of the proposed EDAR following placement

Recfishwest Response 2 states that 'Recfishwest understands that the Commonwealth will have ownership of the proposed Integrated Artificial Reef (IAR) following successful installation, as the structure is proposed to be attached to the seafloor in Commonwealth waters'. A permit is unlikely to be granted for the proposed EDAR where ownership of the placed artificial reef is stated to be with the Commonwealth.

4. Additional issues of concern

The following additional issues are also of substantial concern and in my view a permit is unlikely to be granted for the proposed EDAR for these reasons:

a. the potential release of iron ore and other components of steel over time, and the likely impacts of such release on the marine environment. For example, iron is not inert in the marine environment and has been shown to cause a range of impacts including stimulating algae blooms, toxic algae blooms and phase shifts in benthic communities, including coral reefs;

b. the risk that during placement:

   i. the RTM lands outside the approved area;

   ii. the RTM does not land in the required position and alignment;

   iii. the RTM breaks up and components land on the seabed; and

   iv. contaminants, including foam and/or iron ore, escape from the RTM.

Invitation to comment

As stated above, the purpose of this letter is to give you the opportunity to respond to the information adverse to the interests of Recfishwest set out above, on the basis of which I am currently inclined to decide not to grant a permit for the EDAR.

If you wish to respond to the matters raised in this letter, please submit your response to the department at seadumping@awe.gov.au by **30 September 2021**.

Due to the complexity of the application, a delegate of the minister may seek additional information or clarification following review of any information provided in response to this letter.

Should detailed technical engineering analysis of the proposed EDAR, incorporating the changes proposed in the Recfishwest Response 2, be provided addressing engineering elements of the proposal, the department would need to seek further detailed and independent engineering advice to assess this information against the UNEP Guidelines. The department may also require Recfishwest to enter into an agreement (under section 18(4)(b) of the Act) requiring Recfishwest reimburse the Commonwealth for research and analysis, in order to determine the effect the proposed artificial reef placement may have on the marine environment.

Following the above deadline, I will proceed to determine whether to grant, or refuse to grant, a permit based on genuine consideration of the information before me, including any further information you provide in response to this letter.

If after consideration of this letter, you do not wish to proceed with the proposed EDAR, you may choose to withdraw your application by stating so in a return letter to seadumping@awe.gov.au.

s. 47F(1)

s. 47F(1)

Andrew McNee
Assistant Secretary
Assessments (Queensland) and Sea Dumping Branch
3 September 2021

s.22(1)(a)(ii)

From: s. 47F(1) @recfishwest.org.au>
Sent: Thursday, 9 September 2021 11:19 AM
To: Sea Dumping; s.22(1)(a)(ii)
Cc: s.22(1)(a)(ii) Andrew McNee; s.22(1)(a)(ii)
Subject: RE: Application for a permit for the placement of an artificial reef - Exmouth Deepwater Artificial Reef [SEC=OFFICIAL]

Hello s.22(1)(a)(ii) and Sea Dumping Team,

Thank you for your email and attached letter received 3/9/21 with regards to SD2020-3998.
Would the delegate and team be available for a meeting next week to discuss the contents of the letter?

Our current intention is to not proceed with the project and withdraw from assessment for a permit under the Act. However, we would like to discuss the letter in a meeting with DAWE and provide a response letter prior.

I would like to thank DAWE for your effort in assessing, reviewing and holding discussions with us for this unique project over a long time period.
Please indicate your availability and let me know if you have any questions or queries.

Best regards,

s. 47F(1)

recfishwest
fish today for tomorrow

REEF VISION

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Facebook:facebook.com/recfishwest
Linkedin: https://www.linkedin.com/in/s. 47F(1)
ResearchGate: https://www.researchgate.net/profiles. 47F(1)

From: Sea Dumping <Seadumping@awe.gov.au>
Sent: Friday, 3 September 2021 1:03 PM
To: Info <info@recfishwest.org.au>; s. 47F(1) @recfishwest.org.au>
Cc: s. 47F(1) @recfishwest.org.au>; s.22(1)(a)(ii) @environment.gov.au>; s.22(1)(a)(ii) @environment.gov.au>; Andrew McNee <Andrew.McNee@environment.gov.au>; seadumping@awe.gov.au
Subject: Application for a permit for the placement of an artificial reef - Exmouth Deepwater Artificial Reef [SEC=OFFICIAL]

Dear s. 47F(1)

Please see attached a letter from the delegate with regard to your application for a permit for the placement of an artificial reef - Exmouth Deepwater Artificial Reef (SD2020-3998).

The delegate would like to invite you and your team to discuss the letter if you would like, on Tuesday 7 September at 11am AEST, 9am WST. Please contact myself on the below number to organise.

Regards,

s.22(1)(a)(ii)
Assistant Director
Sea Dumping Section
Environment Assessments Queensland and Sea Dumping
Environment Approvals Division
Department of Agriculture, Water and the Environment
s.22(1)(a)(ii) @environment.gov.au

s.22(1)(a)(ii)

From: s. 47F(1) @recfishwest.org.au>
Sent: Tuesday, 28 September 2021 11:43 AM
To: s.22(1)(a)(ii) Sea Dumping
Cc: s.22(1)(a)(ii) Andrew McNee; s.22(1)(a)(ii)
Subject: Re: Application for a permit for the placement of an artificial reef - Exmouth Deepwater Artificial Reef
Attachments: Recfishwest Response - Application for a Permit for the Placement of an Artificial Reef.pdf; Supporting Information and Response Document.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hello s.22(1)(a)(ii) and Sea Dumping Team,

Please see attached letter with regards to Exmouth Deepwater Artificial Reef (SD2020-3998).
Recfishwest will not submit the artificial reef permit application for further assessment.

In addition to the letter, there is also a response document in relation to the issues raised by the Department from correspondence received 3 September 2021.
This email and attachments serve to complete the withdrawal process for SD2020-3998 by Recfishwest as the permit applicant.

We look forward to continuing to work with DAWE in other reef projects to benefit the WA community.
Thank you again for your assistance and efforts throughout this process.

Best regards,

s. 47F(1)

recfishwest
fish today for tomorrow

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ResearchGate: https://www.researchgate.net/profiles. 47F(1)

s.22(1)(a)(ii)

Director
Sea Dumping Section
Assessments (Queensland) and Sea Dumping Branch
Environment Approvals Division
Department of Agriculture, Water and the Environment
Your reference: SD2020-3998

Dear s.22(1)(a)(ii)

RE: APPLICATION FOR A PERMIT FOR THE PLACEMENT OF AN ARTIFICIAL REEF

Thank you for the Department of Agriculture, Water and the Environment's (the Department) correspondence dated 3 September 2021 with regard to Recfishwest's application for an Artificial Reef Permit for the proposed Exmouth Deepwater Artificial Reef (SD2020-3998) (Artificial Reef Permit).

Following review of the preliminary advice from the delegate of the Minister contained in the correspondence, Recfishwest will not submit its Artificial Reef Permit application for assessment. Recfishwest's decision to withdraw from the assessment process also has due regard to the following factors:

1. The method of rendering the mooring suitable was becoming increasingly complex and not without some residual risk.
2. Lack of clarity around government policy, process and legislation for such a complex project was likely to create some major challenges to navigate to a timely outcome.
3. Issues raised by the Ningaloo Coast World Heritage Advisory Committee around proximity of the project to the Ningaloo World Heritage Area were unlikely to be resolved in a timely manner.

Recfishwest also wishes to respond to a number of issues raised by the Department. In this regard, refer to further technical and other information provided in response to the Department's correspondence attached.

As the Department is aware, Woodside Energy Ltd (Woodside) is a project partner. Woodside, together with its fellow joint venture participant Mitsui E&P Australia Pty Ltd is the owner of the Nganhurra Riser Turret Mooring infrastructure that was planned to be repurposed to create the Exmouth Deepwater Artificial Reef. Woodside accepts Recfishwest's decision to not submit the artificial reef permit application for assessment.

Recfishwest looks forward to continuing to work with the Department to progress its other reef projects, such as the s. 47G(1)(a) , Dampier Integrated Artificial Reef and Saladin Integrated Artificial Reef off Onslow.

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Tel: (08) 9246 3366 Email: recfish@recfishwest.org.au Web: recfishwest.org.au facebook.com/recfishwest
Western Australian Recreational and Sportfishing Council trading as Recfishwest ABN: 77 922 817 608

We thank the Department for its offer to engage with Recfishwest on its development of an artificial reef guideline/policy with the aim of ensuring it is practical and fit for purpose.

On behalf of Recfishwest and Woodside, I thank the Department for its work throughout the project. If the Department has any further questions or queries, please don't hesitate to contact me.

Best regards,

s. 47F(1)

s. 47F(1)

Recfishwest

28 September 2021

Suite 3, 45 Northside Drive, Hillarys WA 6025
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Western Australian Recreational and Sportfishing Council trading as Recfishwest ABN: 77 922 817 608

SEPARATE ATTACHMENT – SUPPORTING INFORMATION AND RESPONSE DOCUMENT

DAWE Comment	Response
1. Potential Impacts on the NCWHA a) The likely impacts of the proposed action on the outstanding universal value (OUV) and integrity of the NCWHA.	The proposed Exmouth Deepwater Artificial Reef (EDAR) was planned to be located a minimum of 1.7 km from the Ningaloo Coast World Heritage Area and approximately 16 km from the nearest hard coral associated with Ningaloo Reef. In the submission provided on 17 July 2021, an assessment was provided to demonstrate that the EDAR is not expected to impact on the outstanding universal values or the integrity of the Ningaloo Coast World Heritage Area (NCWHA). The specific concerns of Ningaloo Coast World Heritage Advisory Committee (NCWHAC) are not clear from the letter. In addition, there was no guidance from the stakeholder or the regulator with regard to the specific details, limitations and/or parameters of these values.
b) The risks of undertaking the removal of 'Compartment 13' and associated works, to the OUV of the NCWHA, and more broadly the marine environment.	Removal of the foam on the seabed by cutting either side of compartment 13 (maintaining compartment 13 as a whole uncompromised section) from the RTM using a diamond wire saw was the only practicable option identified to remove the foam. Impacts and risks of this activity would have been planned to be managed to ensure no impacts to the OUV of the NCWHA.
c) The functionality and safety of the new design proposed for the EDAR (incorporating the two remaining components of the RTM structure).	The removal of compartment 13 does not impact the functionality or safety of the EDAR. The surface area of compartment 13 is a very small percentage of the overall surface area of the proposed EDAR and is not expected to impact the reef design. The stability of the two pieces of RTM remaining after compartment 13 is removed has been modelled and confirmed to be stable to a 1 in 10,000 year weather event. It's unclear whether the assessment of engineering aspects with regard to functionality and safety are within the remit of the NCWHAC.
d) The merits of the proposal to remove an equivalent quantity of marine debris from the marine/coastal environment (described as "beach clean-up" in the Recfishwest Response 2, presumably of drink bottles and other plastic containers and objects) compared to the quantity of plastics likely to be released from the proposed EDAR involving the re-use of the RTM. The amount of plastic that will enter the environment due to the proposed EDAR should be assessed irrespective of the amount of plastics already present in the marine environment. That is, regardless of the proposed offset program,	We are committed to avoiding plastics entering the marine environment. Woodside, using a suitably qualified contractor, was planning to remove all bulk plastics from the RTM as part of the project, including complete removal of the foam, bend stiffeners, and risers (total of approximately 30 tonnes of plastics) for onshore recycling or disposal. Less than 10kg of plastics that are not practicable to remove due to access will remain in the RTM and are expected to degrade in the marine environment over hundreds to thousands of years. The remaining plastic (<10kg) was also planned to be offset consistent with the Marine Debris Threat Abatement Plan.

plastics entering the marine environment should be avoided.	
e) Due to the size of the proposed EDAR, its proximity to the NCWHA, the lack of other similar habitat in the area, and features designed to change localised water movement that may enhance fish concentration near the RTM structure, it is possible that fish species from the NCWHA will be attracted to the proposed EDAR, where fish will then be concentrated and potentially captured.	The proposed artificial reef had been designed to develop into a productive ecosystem. Installation of the EDAR is not expected to increase recreational fishing or visitation to the NCWHA and may play a role in managing this opportunity in combination with appropriate fisheries management. The information in the response provided to DAWE is scientifically accurate and has been provided to the NCWHAC by both parties' multiple times. The size of the reef is aligned with majority of scientific literature with regards to fish production.
f) Noting the proposed removal and relocation of equipment and structures from the current title area, where Woodside Ltd. currently has an obligation to ensure continual monitoring and remediation of ecological and habitat values. The shift in location of the RTM will shift the current environmental protection responsibility to another party (Recfishwest). That is, concern lies around whether Recfishwest will have the same ability to be able to continue this ongoing monitoring and remediation of the new location, including the impact of the proposed EDAR on the OUV of the NCWHA.	Recfishwest has the capacity to be responsible for discharge of, and ensuring compliance with, all permit conditions through its proposed arrangements with Woodside (contracting installation works), adequate resources for monitoring activities, organisational longevity, WA State Government support and commitment to artificial reefs in WA, as well as its track record in respect of previous artificial reef permit conditions.
g) s. 47G(1)(a)	s. 47G(1)(a)
2. Placement and then removal of contaminants Within RFI 2, it was stated that the department will assume that polybrominated diphenyl ethers (PBDEs) are present at least in the concentration and load specified in	There are potentially PBDEs in the foam in the RTM, however that has not yet been confirmed. The technical data sheet indicates that the foam contains a flame retardant, with no information as to what chemical the flame retardant is. Given PBDEs were often used as flame retardants in the manufacture of rigid polyurethane foam, the foam has been conservatively assumed to contain PBDEs.

Recfishwest's notice response (Recfishwest Response 1). The PBDEs are assumed to be present within ~65m3 of buoyancy foam contained in 'Compartment 13' of the RTM. In Recfishwest Response 2, Recfishwest has proposed to change the EDAR by removing 'Compartment 13', after the RTM has been placed on the seabed. Based on the information provided by Recfishwest, a permit is unlikely to be granted for the placement of the RTM while it still contains contaminants such as buoyancy foam and PBDEs, as this presents a risk that these contaminants may be released into the marine environment following placement.	Removal of the foam on the seabed by cutting either side of compartment 13 (maintaining compartment 13 as a whole uncompromised section) from the RTM using a diamond wire saw is the only practicable option identified to remove the foam. Compartment 13 was planned to be removed within a short duration of the RTM being placed on the seabed. The compartment was planned to be removed in one piece and the foam is contained within the steel compartment. Studies were carried out by the University of Western Australia on an analogue foam which indicated that when exposed to water at the same hydrostatic pressure as seen at the proposed EDAR location, the foam does not break up.
3. Ownership of the proposed EDAR following placement Recfishwest Response 2 states that 'Recfishwest understands that the Commonwealth will have ownership of the proposed Integrated Artificial Reef (IAR) following successful installation, as the structure is proposed to be attached to the seafloor in Commonwealth waters'. A permit is unlikely to be granted for the proposed EDAR where ownership of the placed artificial reef is stated to be with the Commonwealth.	There isn't a clear policy around ownership of artificial reefs in Commonwealth waters. This point needs further clarification with DAWE and national alignment.
4. Additional issues of concern The following additional issues are also of substantial concern and in my view a permit is unlikely to be granted for the proposed EDAR for these reasons: a. the potential release of iron ore and other components of steel over time, and the likely impacts of such release on the marine environment. For example, iron is not inert in the marine environment and has been shown to cause a range of impacts including stimulating algae blooms, toxic algae blooms and phase shifts in benthic communities, including coral reefs; b. the risk that during placement: i. the RTM lands outside the approved area;	The release of iron ore and steel components will occur gradually over a period of at least 100 years. This is similar to the degradation of any steel structure in the marine environment (including some of the 1,500+ shipwrecks around the coast of WA). The EDAR was proposed to be installed in water depths of approximately 160 m where there is very little light to support any photosynthetic organisms, such as phytoplanktonic algae. It is not credible that the slow release of relatively insoluble Fe(III) at the seabed could result in sufficient quantities of more soluble Fe(II) in surface waters that could be taken up by bacteria and phytoplankton and result in harmful algal blooms. The nearest hard coral community is approximately 16 km away so there would not be expected to be any significant increase in iron concentrations in the water at this location. Once at the reef site, two anchor handling vessels were planned to position the RTM above the installation location, till onset of the sinking process to ensure the RTM stays within the allowable limits of the reef boundary. As the sinking duration is less than 2 minutes the RTM has insufficient time to drift outside the installation location during sinking. The RTM

ii. the RTM does not land in the required position and alignment; iii. the RTM breaks up and components land on the seabed; and iv. contaminants, including foam and/or iron ore, escape from the RTM.	was planned to be ballasted by placing a number of penetrations into compartments of the RTM to allow the structure to flood. An ROV was planned to be deployed from the installation vessel and use a cutting tool to place holes in the pre-determined RTM compartments. The number and order of the compartments that are flooded was determined by the installation contractor to ensure the structure descends in a controlled way and to ensure the RTM has enough on-bottom weight to be stable for the cyclonic conditions. Once the bottom of the RTM landed on the seabed the tow rigging was planned to be used to pull and angle the RTM toppling such that it would have guided the RTM into the preferred heading. A study of the sinking of the RTM was completed and it has been confirmed that for water depths <170m the RTM would have remained structurally intact and the outer shell would not rupture, given this foam and iron ore was not expected to be released.

Australian Government
Department of Agriculture, Water and the Environment

Ref: SD2020/3998

s. 47F(1)

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Sea Dumping Permit Application – Exmouth Deepwater Artificial Reef, North West Cape Western Australia

Dear s. 47F(1)

I refer to:

- The application and related documentation received by the Department of Agriculture, Water and the Environment (the department) on 3 September 2020 and 15 December 2020 for a permit under the *Environment Protection (Sea Dumping) Act 1981* (Sea Dumping Act) to place an artificial reef offshore of Exmouth, Western Australia (the Exmouth Deepwater Artificial Reef) (the application).
- The delegate of the Minister's notice dated 26 March 2021, under s 18(3) of the Sea Dumping Act requiring Recfishwest to provide certain information (the second notice).

The Ningaloo Coast World Heritage Advisory Committee (NCWHAC) contacted the department 26 August 2020 and 10 February 2021 in relation to the application, noting that they had earlier been contacted by Recfishwest as part of the stakeholder consultation process.

On 12 May 2021, NCWHAC advised that their terms of reference do not allow them to provide advice directly to proponents. Under their terms of reference, they provide advice directly to regulatory agencies. As such they have left it to the discretion of the department to provide a summary of their advice regarding the application. This letter provides that summary and, as required by the second notice, Attachment A, point 3, this letter is consultation with the NCWHAC.

Letter to the department 10 February 2021

General

The role of the NCWHAC is to provide advice to the Commonwealth and State Environment Ministers and management agencies on the protection, conservation, presentation and management of the outstanding universal value (OUV) of the Ningaloo Coast World Heritage Area (NCWHA). The International Union for the Conservation of Nature (IUCN) adopts a statement of OUV for each World Heritage property, which is the key reference point for ongoing protection and management of the property. The Ningaloo Coast OUV comprises eight specific values under two of the four natural criterion for selection as a World Heritage

Area as described by the IUCN, including an exceptional landscape combining arid terrestrial and marine features, and one of the largest documented aggregations of whale sharks in the world along with important aggregations of other fish species and marine mammals.

In 2020 the IUCN World Heritage Outlook assessment downgraded the Ningaloo Coast from "GOOD" to "GOOD WITH SOME CONCERNS". This is related to several significant threats impacting the OUV. These include climate change; oil and gas exploration/development; increasing visitation and recreational fishing; and invasive species.

The NCWHAC notes that it

> *'…*in principle, does not support this type of proposal, given the potential impacts to the outstanding universal value (OUV) of the Ningaloo Coast World Heritage Area (NCWHA), in particular significant ecological and habitat impacts within and adjacent to the NCWHA.'

The NCWHAC describes Recfishwest's proposal to re-purpose the Riser Turret Mooring (RTM) as an integrated artificial reef, as *'…essentially waste disposal/sea dumping'.*

Meetings and Advice to NOPSEMA

The NCWHAC has met multiple times with the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA). In recent advice to NOPSEMA in relation to the re-purposing of the RTM: Nganhurra Cessations of Operation Environment Plan Revision, the NCWHAC recommended that any activity that has the potential to impact the OUV (both within and adjacent to the NCWHA) be independently determined to be an appropriate distance from the NCWHA to ensure the integrity of the World Heritage property remains intact, with the approval decision remaining the responsibility of the regulator agency. The NCWHAC notes that numerous sites more distant from the NCWHA are available, thereby minimising any potential unidentified risks.

Engagement as a Stakeholder

The NCWHAC notes it was not considered a key stakeholder for consultation on the Exmouth Deepwater Artificial Reef proposal and will engage directly with Recfishwest to request recognition as a key stakeholder and in future consultation for activities and proposals relevant to the NCWHA.

Cumulative Impacts

The NCWHAC remains concerned with the potential cumulative impacts from this and future proposals that may require re-purposing decommissioned infrastructure and sea dumping within and adjacent to the NCWHA.

The NCWHAC notes there is no information with regard to any cumulative impacts of other vessels, platforms or monopod structures in the area being dumped at the end of their lifespan.

Contaminants within the RTM

The NCWHAC notes with concern the residual contaminants within the RTM structure and the potential for release into waters within and adjacent to the NCWHA over time as the structure degrades and corrodes.

Deployment

The NCWHAC notes that should there be a loss of control during deployment at the proposed artificial reef location, the RTM is expected to drift in a southerly direction to ground at the 80m contour within the NCWHA where it will drag along the seabed until retrieval. The NCWHAC notes retrieval in this scenario is reliant on good weather conditions and the RTM structure being free from damage which may cause flooding and subsequent sinking within the NCWHA.

Biota

The NCWHAC notes the size of the artificial reef, the lack of other similar habitat in the area, and the potential for an increase in attraction of fish species from the NCWHA to the artificial reef structure, where fish will then be concentrated and potentially captured. The NCWHAC notes the proposal includes features designed to change localised water movement that would enhance fish concentration near the structure.

Letter to DAWE 26 August 2020

General

The Committee:

> 'would like to reiterate concerns for waste disposal and/or re-purposing of decommissioned and surplus marine infrastructure as integrated artificial reefs in close proximity to the Ningaloo Coast World Heritage Area (NCWHA). The NCWHAC does not support this type of proposal either within or adjacent to the NCWHA, given the potential significant impact to the Outstanding Universal Value (OUV) of the NCWHA, particularly ecological and habitat impacts'.

NCWHAC see the current proposal to re-purpose RTM as an integrated artificial reef as *'…essentially waste disposal/sea dumping'*.

The NCWHAC is concerned with the potential shift in responsibility for continual monitoring and remediation of values from the proponent, with the removal of equipment and structures from the lease/permit area to a new location. They note that currently the proponent has an obligation to ensure continual monitoring and remediation of ecological and habitat values due to unforeseen pressures from decommissioned operations within the lease area.

Finally, The NCWHAC notes with concern:

> 'an apparent lack of long-term planning and coordination with regard to the waste disposal of decommissioned and surplus marine infrastructure within and adjacent to the NCWHA and the significant potential cumulative impacts from this proposal and future proposals involving the re-purposing of decommissioned structures as integrated artificial reefs. The NCWHAC is not aware of any overarching strategy which demonstrates the avoidance of impacts to the OUV of the NCWHA from the decommissioning of this infrastructure'.

If you have any questions concerning this letter, please contact s.22(1)(a)(ii) at s.22(1)(a)(ii) @awe.gov.au (cc seadumping@environment.gov.au).

Yours sincerely

s.22(1)(a)(ii)

Director
Sea Dumping Section
Assessments (Queensland) and Sea Dumping Branch
Environment Approvals Division

02 June 2021

s. 47C(1)