GOVERNMENT OF WESTERN AUSTRALIA

Environmental Protection Authority

Ningaloo Lighthouse Resort

Z1Z Resorts Pty Ltd

Report 1737

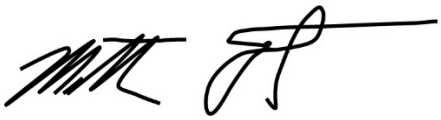
March 2023

This assessment report has been prepared by the Environmental Protection Authority (EPA) under s. 44 of the *Environmental Protection Act 1986* (WA). It describes the outcomes of the EPA's assessment of the Ningaloo Lighthouse Resort proposal by Z1Z Resorts Pty Ltd.

The Ningaloo Lighthouse Resort proposal was determined under the Commonwealth *Environment Protection and Biodiversity Act 1999* to be a controlled action and to be assessed by the EPA under an accredited process. This document is also the result of the EPA's accredited assessment process.

This assessment report is for the Western Australian and Commonwealth Ministers for Environment and sets out:

- what the EPA considers to be the key environmental factors identified in the course of the assessment
- an assessment of the matters of national environmental significance
- the EPA's recommendations as to whether or not the proposal may be implemented and, if it recommends that implementation be allowed, the conditions and procedures, if any, to which implementation should be subject
- other information, advice and recommendations as the EPA thinks fit.



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27 March 2023

ISSN 1836-0491 (Online)
Assessment No. 2301

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Proposal

The Ningaloo Lighthouse Resort is a proposal to redevelop the former Ningaloo Lighthouse Caravan Park, on Lot 2 and Lot 557 Yardie Creek Road, North West Cape. The redevelopment, the Ningaloo Lighthouse Resort Project (the proposal), is located approximately 18 kilometres north west of the town of Exmouth towards the northern tip of the Cape Range Peninsula, in the Gascoyne region of Western Australia.

The proponent for the proposal is Z1Z Resorts Pty Ltd.

The proposal comprises the construction of new visitor accommodation; the construction of associated ancillary facilities (that is, staff accommodation, power supply infrastructure, water supply and treatment, wastewater treatment and reuse, and replacement service station (vehicle refuelling) etc.); refurbishment of the Vlamingh Head Lighthouse Quarters (part of a State Heritage Place); and minor works outside of the accommodation areas, including pathways, vehicle access, shades structures and service corridors and enclosures.

Context

The proposal is located within or adjacent to areas of state, national and international significance. It is within the Ningaloo Coast National Heritage Place and adjacent to the Ningaloo Coast World Heritage Area, Ningaloo Marine Park and Jurabi Coastal Park. Within a short distance from the proposal is the Cape Range National Park and Bundegi Coastal Park.

The proposal is within the area considered in the EPA's strategic advice under section 16(e) of the *Environmental Protection Act 1986* to the Minister for Environment regarding cumulative impacts within Exmouth Gulf and its surrounds. The proponent considered how the proposal is compatible with the protection of the key values of the globally significant area, including turtles, subterranean fauna, dark and clear sky values and Aboriginal heritage and culture.

Environmental values

Flora and vegetation, subterranean fauna, inland waters, marine fauna and social surroundings are the key environmental factors that may be impacted by the proposal.

Consultation

The EPA published the proponent's referral information for the proposal on its website for 7 days public comment. The EPA also published the proponent's environmental review document on its website for public review for 3 weeks (from 20 May to 10 June 2022). The EPA considered the comments received during these public consultation periods in its assessment.

Mitigation hierarchy

The mitigation hierarchy is a sequence of proposed actions to reduce adverse environmental impacts. The sequence commences with avoidance, then moves to minimisation, rehabilitation, and offsets are considered as the last step in the sequence.

The proponent considered the mitigation hierarchy in the development and assessment of its proposal, and as a result:

- has avoided an area of locally significant *Banksia ashbyi* and *Daviesia pleurophylla* shrubland located in the east of development envelope, which also is considered an area of cultural importance to the Yinggarda, Baiyungu and Thalanyji Traditional Owners
- has utilised all existing disturbed areas to limit both the amount of clearing and the amount of potential disturbance to heritage sites
- will minimise changes in the extent and quality of subterranean fauna habitat through:
    - screening the groundwater production bores to only allow abstraction within the first 3–4 meters of the water table and thereby avoiding up-coning of the more saline groundwater into the brackish lens
    - designing the groundwater bores as ‘sipping bores’ to limit the rate and volume, and treatment required for resort use
    - ensuring the tertiary treatment of wastewater, which includes the removal of nutrients and pathogens prior to disposal and irrigation
- will implement lighting principles in accordance with the national guidelines to reduce the light emissions from the resort to as low as reasonably practicable to minimise impacts to marine turtles, seabirds and dark and clear sky values
- will implement a visitor management plan and education programs to educate resorts guests on appropriate and best practice behaviour.

Assessment of key environmental factors

The EPA has identified the key environmental factors (listed below) in the course of the assessment. For each factor, the EPA has assessed the residual impacts of the proposal on the environmental values and considered whether the environmental outcomes are likely to be consistent with the EPA environmental factor objectives.

Flora and vegetation

Residual impact or risk to environmental value	Assessment finding
Clearing of 3.98 ha of vegetation, including 3.28 ha of *Banksia ashbyi* and *Daviesia pleurophylla* shrubland.	The proposal will result in the loss of vegetation, including a locally significant vegetation community restricted to the northern red dune landform. However, the EPA advises that in considering cumulative impacts, and the proportion of the landform outside the development envelope and the proportion of

Residual impact or risk to environmental value	Assessment finding
	vegetation association remaining, the loss resulting from this proposal is unlikely to significantly impact this community. The EPA advises that this residual impact should be subject to reasonable implementation conditions (recommended condition A1) to ensure the environmental outcome is consistent with the EPA objective for flora and vegetation.
Indirect impacts associated with the introduction and spread of weeds.	The proposal has the potential to result in indirect impacts, including the spread of weeds, as resort guests move from the development envelope into the adjacent conservation estate. Active weed management is required to mitigate this impact. The EPA advises this residual impact should be subject to reasonable implementation conditions (recommended condition B1) to ensure the environmental outcome is consistent with the EPA objective for flora and vegetation.

Subterranean fauna and inland waters

Residual impact or risk to environmental value	Assessment finding
Groundwater abstraction and reinjection.	Groundwater abstraction will result in seasonal changes to the extent of groundwater within the bore field, with both abstraction and reinjection also having the potential to impact salinity. Both have the potential to affect the extent of subterranean fauna habitat. The proponent has prepared an Inland Water Quality Management Plan to monitor and mitigate impacts resulting from both abstraction and reinjection. The EPA considers, given the extent of drawdown and the likely changes to salinity, the proposal is unlikely to have a significant residual impact on inland waters. The EPA also considers, given the extent of predicted impacts and the availability of habitat remaining, the proposal is unlikely to have a significant residual impact on subterranean fauna. The EPA advises this residual impact should be subject to reasonable implementation conditions (recommended condition B2) to ensure the environmental outcome is consistent with the EPA objective for subterranean fauna and inland waters.
Irrigation of treated wastewater.	Increased nutrients in groundwater have the potential to impact subterranean fauna. The proponent has predicted the impacts to groundwater quality over 50 years, using a worst case scenario. The outcome of this modelling is there is no nitrogen leaching into

Residual impact or risk to environmental value	Assessment finding
	groundwater nor saturated phosphorous levels in the soil profile. The EPA advises this residual impact should be subject to reasonable implementation conditions (recommended condition B2) to ensure the environmental outcome is consistent with the EPA objective for subterranean fauna and inland waters. The EPA also notes that a works approval and licence under Part V of the *Environmental Protection Act 1986* for the wastewater treatment plant can apply conditions regarding wastewater quality and monitoring to ensure the environmental outcome will be consistent with the EPA factor objectives for subterranean fauna and inland waters.

Marine fauna

Residual impact or risk to environmental value	Assessment finding
Operational lighting has the potential to impact: • nesting adult turtle and turtle hatchling orientation and sea finding success • adult turtle nesting beach utilisation • nesting sea and shorebirds.	Unmitigated resort lighting has the potential to impact both nesting success of turtles as well as nesting sea and shorebirds. It may also affect beach utilisation of adult turtles. The proponent has applied the national guidelines for minimising light impacts and will conduct pre and post operational monitoring, which will include further mitigation measures if required, to ensure adult turtle and turtle hatchings are not significantly impacted. These measures will also mitigate impacts to nesting sea and shorebirds. The EPA advises that this residual impact should be subject to reasonable implementation conditions (recommended condition B3) to ensure that the proponent mitigates impacts through the implementation of an Artificial Light Management Plan and Turtle Management Plan. This ensures consistency with the EPA objective for marine fauna.

Social surroundings

Residual impact or risk to environmental value	Assessment finding
Potential direct and indirect impacts to Aboriginal cultural and ethnographic values.	The development envelope and surrounds have significant cultural and ethnographic values. The proponent has committed to avoiding one site considered significant to the Traditional Owners, and has undertaken further consultation regarding the proposal's potential impact to groundwater and subsequent impacts to the Traditional Owner's

Residual impact or risk to environmental value	Assessment finding
	spiritual and cultural wellbeing and the Warnangura dreaming story. The proponent has updated the Inland Water Quality Management Plan in response to concerns raised and has committed to preparing a Cultural Heritage Management Plan. The EPA advises that this residual impact should be subject to reasonable implementation conditions (recommended condition B4 and condition B2-2) to ensure that the proponent mitigates impacts through the implementation of an Aboriginal Cultural Heritage Plan and Inland Water Quality Management Plan to ensure consistency with the EPA objective for social surroundings.
Increased light and atmospheric pollution and interference affecting dark sky values and the operation of the Space Surveillance Telescope.	Proposal lighting will be visible at the Space Surveillance Telescope and will increase sky glow in a previously dark area, however, modelled predictions is that background zenith light levels will remain unchanged. To manage and mitigate impacts the proponent has prepared an Artificial Light Management Plan. This includes light monitoring post construction and the application the national light guidelines with the aim of ensuring no change in dark sky quality. The EPA advises that this residual impact should be subject to reasonable implementation conditions (recommended condition B4 and condition B3-3) to ensure that the proponent mitigates impacts through the implementation of an Artificial Light Management Plan to ensures consistency with the EPA objective for social surroundings.

Holistic assessment

The EPA considered the connections and interactions between relevant environmental factors and values to inform a holistic view of impacts to the whole environment. The EPA formed the view that the holistic impacts would not alter the EPA's conclusions about consistency with the EPA factor objectives.

Conclusion and recommendations

The EPA has taken the following into account in its assessment of the proposal:

- environmental values which may be significantly affected by the proposal
- assessment of key environmental factors, separately and holistically (this has included considering cumulative impacts of the proposal where relevant)
- likely environmental outcomes which can be achieved with the imposition of conditions

- consistency of environmental outcomes with the EPA's objectives for the key environmental factors
- EPA's confidence in the proponent's proposed mitigation measures
- whether other statutory decision-making processes can mitigate the potential impacts of the proposal on the environment
- principles of the *Environmental Protection Act 1986*.

The EPA has recommended that the proposal may be implemented subject to conditions recommended in Appendix A.

Other advice

The EPA has provided other advice regarding the potential for the proposal to have indirect impacts to the adjacent conservation estate and to terrestrial fauna, including marine turtles. The EPA recognises that while the proponent can ensure educational and interpretative materials are available to visitors to influence behaviours and minimise impacts, visitor interactions are beyond the ability of the proponent to control once they leave the development envelope. The EPA has had consideration for the responsibility and ability of other decision makers, namely the Department of Biodiversity, Conservation and Attractions and the Shire of Exmouth, to manage indirect impacts. The EPA has therefore provided advice to the Minister, the other decision-making authorities and the proponent regarding ensuring these indirect impacts are managed to be consistent with the EPA objectives.

1 Proposal

The Ningaloo Lighthouse Resort is a proposal to redevelop the former Ningaloo Lighthouse Caravan Park, on Lot 2 and Lot 557 Yardie Creek Road, North West Cape. The redevelopment, the Ningaloo Lighthouse Resort Project (the proposal), is located approximately 18 kilometres (km) north west of the town of Exmouth towards the northern tip of the Cape Range peninsula, in the Gascoyne region of Western Australia.

The proponent for the proposal is Z1Z Resorts Pty Ltd.

The proposal comprises the construction of new visitor accommodation; the construction of associated ancillary facilities (that is, staff accommodation, power supply infrastructure, water supply and treatment, wastewater treatment and reuse, and replacement service station (vehicle refuelling) etc.); refurbishment of the Vlamingh Head Lighthouse Quarters (a part of State Heritage Place ID: 00837); and minor works outside of the accommodation areas, including pathways, vehicle access, shades structures and service corridors and enclosures (see Figure 1). The redevelopment is not proposing to increase visitor capacity, rather improve and replace the facilities of the previous Ningaloo Lighthouse Caravan Park; a caravan park has been in operation at this site for over 30 years.

The proponent referred the proposal to the Environmental Protection Authority (EPA) on 1 April 2021. The referral information was published on the EPA website for seven days public comment. On 30 June 2021, the EPA decided to assess the proposal at the level Public Environmental Review. The EPA also published the environmental review document (ERD) (Strategen JBS&G 2022) on its website for public review for 3 weeks (from 20 May to 10 June 2022).

The proposal was determined under the *Environment Protection and Biodiversity Conservation Act 1999* to be a controlled action and to be assessed by the EPA under an accredited process.

The proposal is set out in the proposal content document (Revision 1, Strategen JBS&G 2021a). The proponent advised that a typographical error was contained in the proposal content document received at referral and provided a corrected version in November 2021. The updated version is available on the EPA website.

The elements of the proposal which have been subject to the EPA's assessment are included in Table 1.

Table 1: Proposal content document (Strategen JBS&G 2021a)

Proposal element	Location	Maximum extent or range
Physical elements		
Resort and caravan park facilities and associated service infrastructure	Figure 1	Clearing of up to 3.98 ha of native vegetation within a 45.34 ha development envelope, with a total disturbance

Proposal element	Location	Maximum extent or range
		footprint, including the existing facility, of up to 13.63 ha.
Operational elements		
Treated wastewater irrigation	-	Irrigation of up to 40,000 kL/year of treated wastewater to landscaped areas (open space, gardens) within the resort footprint.
Groundwater abstraction	-	Groundwater abstraction of up to 72 ML/year.
Timing elements		
Maximum project life	-	55 years.
Construction phase		Approximately 2 years.
Operations phase		50 years.
Decommissioning phase		Approximately 2 years post operations.

Units and abbreviations
ha – hectare
kL/a – kilolitres per annum
ML/year – megalitres per year

Proposal alternatives

The proponent considered the reinstatement of the existing approved caravan park and facilities as an alternative proposal (Strategen JBS&G 2022). The proponent, however, considered the current facilities to be unsuitable for long-term continued use without a significant site upgrade. The proponent therefore referred the proposal which the EPA has assessed.

Proposal context

The proposal is located within the Gascoyne planning region. The proposal is also within the Ningaloo Coast National Heritage Place (National Heritage Place) and adjacent to the Ningaloo Coast World Heritage Area (World Heritage Area), Ningaloo Marine Park and Jurabi Coastal Park. Within a short distance from the proposal is the Cape Range National Park and Bundegi Coastal Park. A number of these conservation listings overlap. Figure 2 shows the location of the World Heritage Area and Jurabi Coastal Park as it relates to the proposal.

The proposal is located approximately 10 km from the Naval Communications Station Harold E Holt. The station provides very low frequency radio transmission to the United States Navy and Royal Australian Navy ships and submarines in the western Pacific Ocean and the eastern Indian Ocean. The proposal is also located approximately 10 km from the Department of Defence's Space Surveillance Telescope.

In July 2021, Main Roads WA referred a proposal to realign Yardie Creek Road to support the Ningaloo Lighthouse Resort. In January 2023, Main Roads WA advised

that, due to constraints with the proposed realignment including the significant heritage values, it no longer wished to proceed with the proposal. The Yardie Creek Road Realignment Project was terminated on 18 January 2023.

Following the EPA's strategic advice under section 16(e) of the EP Act to the Minister for Environment, the State Government made a decision to protect the unique values of Exmouth Gulf and its surrounds. The State Government has committed to establishing a marine park for the eastern and southern portions of Exmouth Gulf, and Class A reserves for other local areas of significance. The new high level of protection means future activities and developments such as the proposal will need to demonstrate that they are compatible with the protection of the key values of the globally significant area. The proponent considered the s16(e) as part of the ERD, although this proposal is considered outside the Exmouth Gulf. The key values from the s16(e) relevant to the proposal are turtle nesting in Lighthouse Bay, subterranean fauna, dark and clear sky values and Aboriginal heritage and culture.

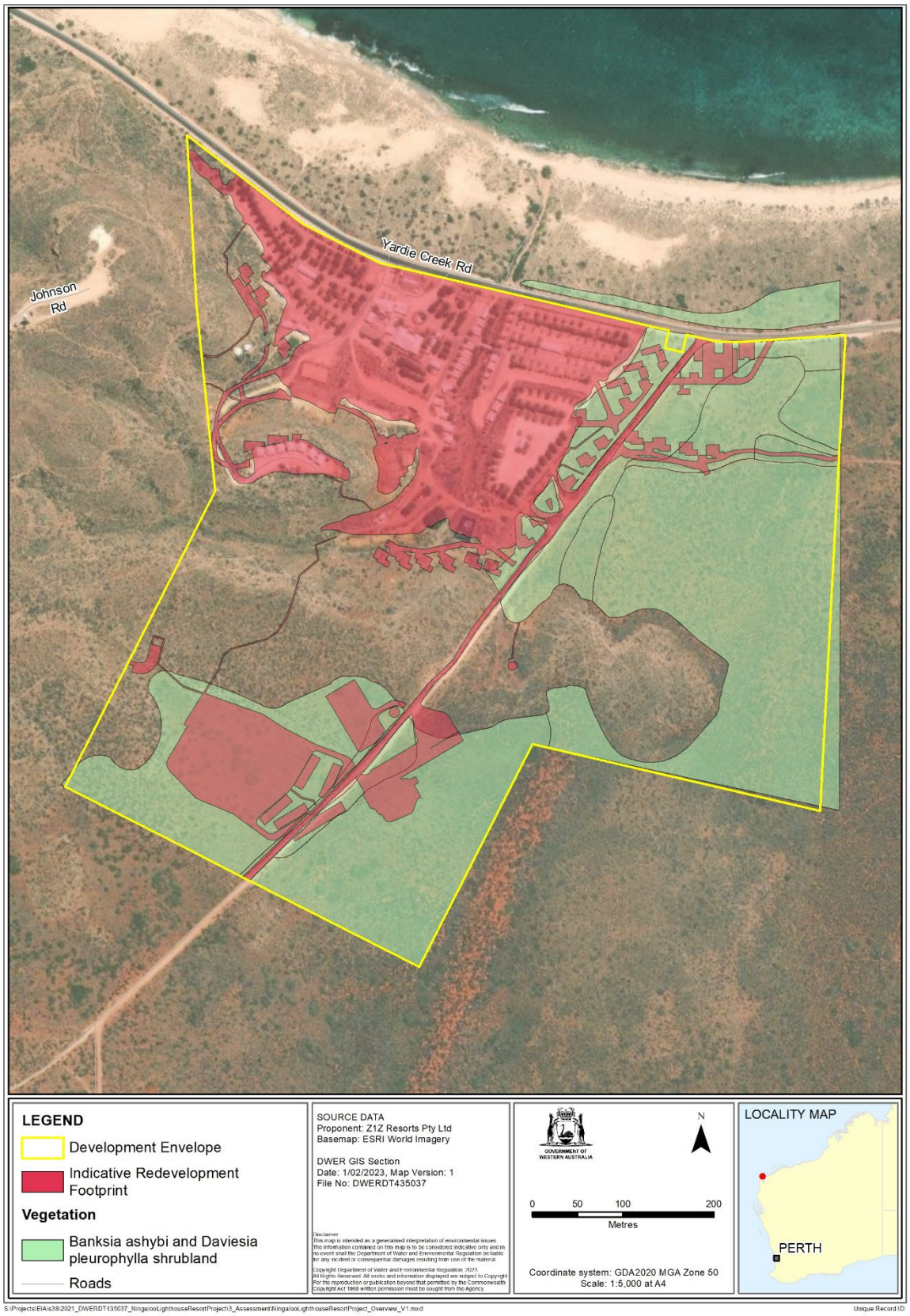

Figure 1: Development envelope, indicative redevelopment footprint and local extent of *Banksia ashybi* and *Daviesia pleurophylla* shrubland

Figure 2: Proposal location in context of World Heritage Area and coastal parks

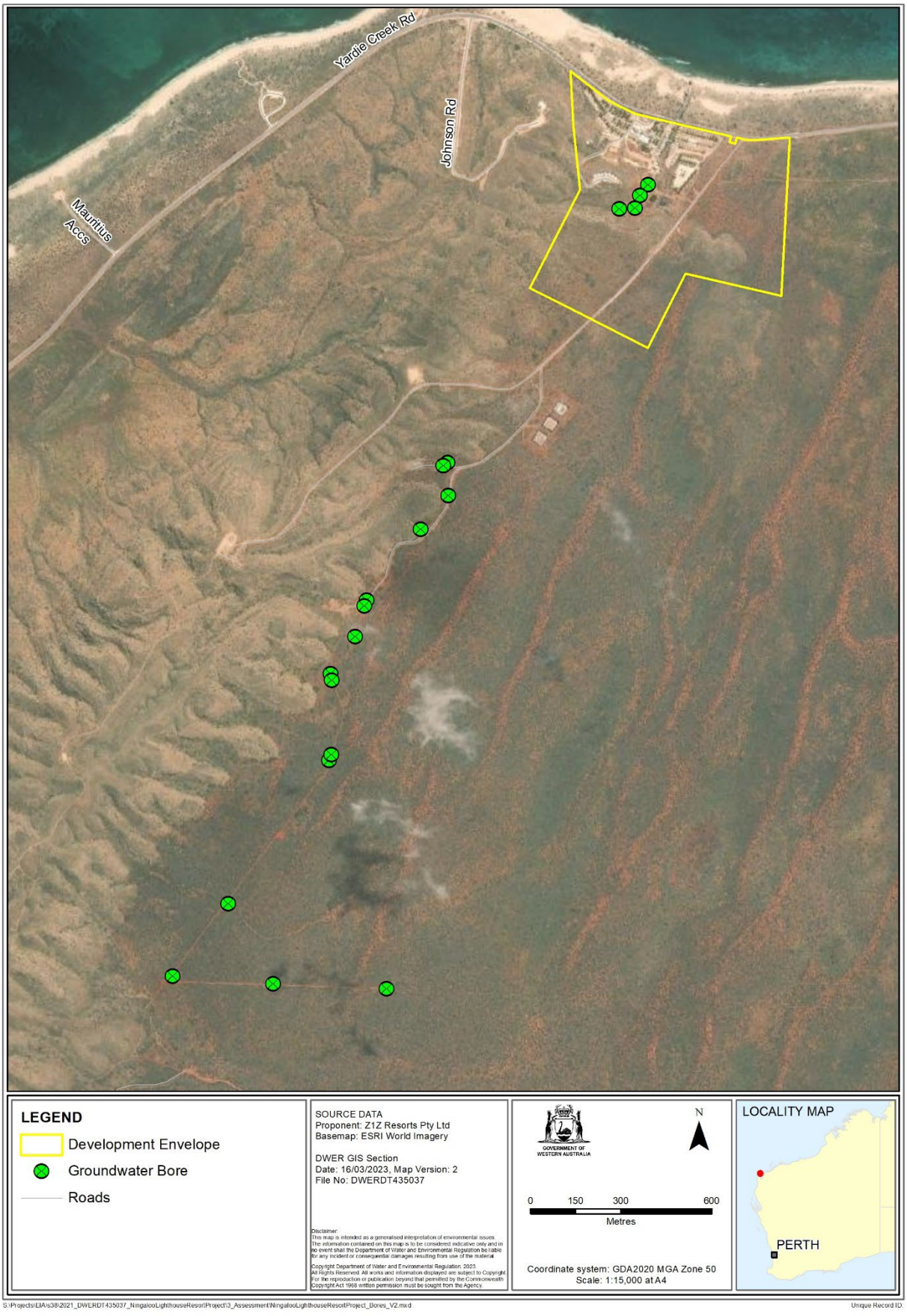

Figure 3: Groundwater bores for the proposal

2 Assessment of key environmental factors

This section includes the EPA's assessment of the key environmental factors. The EPA also evaluated the impacts of the proposal on other environmental factors and concluded these were not key factors for the assessment. This evaluation is included in Appendix D.

2.1 Flora and vegetation

2.1.1 Environmental objective

The EPA environmental objective for flora and vegetation is *to protect flora and vegetation so that biological diversity and ecological integrity are maintained* (EPA 2021c).

2.1.2 Investigations and surveys

The EPA advises the following surveys were used to inform the assessment of the potential impacts to flora and vegetation:

- Ningaloo Lighthouse Development Environmental Surveys (appendix A of the ERD) (Ecoscape 2018)
- Ningaloo Lighthouse Resort Project – Targeted Flora Survey (appendix B of the ERD) (Strategen JBS&G 2021b)
- Exmouth Lighthouse Resort Bore field – Ecological Survey Report (Strategen JBS&G 2020).

The original surveys were not consistent with the *Technical Guidance – Flora and vegetation surveys for environmental impact assessment* (EPA 2016f) as it was undertaken outside the optimal survey period.

The EPA determined it could proceed with its assessment despite this as a subsequent targeted flora survey was undertaken. The primary survey was undertaken approximately 5 weeks following significant rainfall and was optimal for identifying ephemeral species such as shrubs. A follow up targeted flora survey was undertaken during the optimal period consistent with the guidance. The EPA notes that it is unlikely that any annual threatened flora species would occur within 50 km of the development envelope.

2.1.3 Assessment context – existing environment

The proposal occurs within the Carnarvon Botanical District of the Eremaean Province which is characterised by Acacia scrub and low woodland moving to tree and shrub steppe in the north.

Within the development envelope, most of the vegetation is already cleared. The redevelopment of the existing site will impact up to 3.98 ha of vegetation within the 45.34 ha development envelope (Strategen JBS&G 2022).

The vegetation condition of the development envelope ranged from 'Excellent' to 'Degraded', with the better condition vegetation (Very Good and Excellent) being associated with the limestone soils of the Cape Range and the red Pindan dunes east and south of the resort. Areas in poorer condition were generally invaded by buffel grass (Ecoscape 2018).

Four vegetation types have been identified and recorded within the development envelope. One of these, the '*Banksia ashbyi* and *Daviesia pleurophylla* shrubland', is considered of local conservation significance as it is confined to the red Pindan dunes. In addition, *Daviesia pleurophylla* is listed by Department of Biodiversity, Conservation and Attractions (DBCA) as a Priority 2 species, although the EPA notes that this species was not found within the proposed footprint.

A targeted flora survey conducted over the entire proposed impact area recorded 7 Priority flora species, with one species (*Stackhousia umbellata,* Priority 3) present within the proposed footprint. There were 19 individuals present, representing 3% of the population within the local survey area. The remaining 97% (640 individuals) are outside the proposed footprint.

2.1.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the proponent's response to submissions document (Strategen JBS&G 2023b). Public consultation on the proposal raised concerns about the conservation value of '*Banksia ashbyi* and *Daviesia pleurophylla* shrubland' on red Pindan dunes, impacts to priority flora, indirect impacts, and the timing of the flora and vegetation surveys.

The key issues raised during the public consultation on the proposal and how they have been considered in the assessment are described in sections 2.1.5, 2.16, 2.1.7, 2.1.8 and 2.1.9.

2.1.5 Potential impacts from the proposal

The proposal has the potential to significantly impact on flora and vegetation from:

- clearing of up to 3.98 ha of native vegetation, including 3.28 ha *Banksia ashbyi* and *Daviesia pleurophylla* shrubland, within a 45.34 ha development envelope
- indirect impacts to adjacent native vegetation, resulting in habitat loss, degradation or fragmentation.

The issue raised during consultation about potential survey timings is considered unlikely to be material because of the follow up survey, as described in section 2.1.2. The potential impacts to *Stackhousia umbellata* are also unlikely to material given the small proportion of individuals found within the development footprint and the size of the remaining population found within the survey area. Therefore, this issue was not considered further in the assessment.

2.1.6 Avoidance measures

The proponent has designed the proposal to avoid impacts to flora and vegetation by avoiding an area of *Banksia ashbyi* and *Daviesia pleurophylla* shrubland located in the east of development envelope as it coincides with the 'sensitive dune area' which is of cultural importance to the Yinggarda, Baiyungu and Thalanyji Traditional Owners.

2.1.7 Minimisation measures

The proponent has proposed measures to minimise impacts to flora and vegetation:

1. utilisation of all existing disturbed areas for planning and design of buildings and associated infrastructure to limit the amount of clearing required for new facilities
2. active weed management throughout construction and operation phases.

2.1.8 Rehabilitation measures

The proponent has proposed revegetation of cleared and degraded areas through landscaping around the development, utilising native grassland and shrub mixes and sparse trees to blend with the surrounding vegetation.

The issue raised during the public consultation about potential impacts from clearing flora and vegetation has been considered through the implementation of the proposed revegetation measures described above.

2.1.9 Assessment of impacts to environmental values

The EPA considered that the key environmental values for flora and vegetation likely to be impacted by the proposal is the clearing of *Banksia ashbyi* and *Daviesia pleurophylla* shrubland and indirect impacts to adjacent native vegetation within the Jurabi Coastal Park.

Direct impacts to vegetation, including *Banksia ashybi* and *Daviesia pleurophylla* shrubland

The proposal will impact up to 3.98 ha of vegetation. This includes the loss of up to 3.28 ha of the *Banksia ashybi* and *Daviesia pleurophylla* shrubland vegetation type, which is considered locally significant as it is confined to the northern red dunes (Strategen JBS&G 2022).

These northern red dunes occur east of Cape Range and cover an area of approximately 3,000 ha with most of the landform located within unallocated crown land. Approximately 50 ha of the landform is within the Jurabi Coastal Park managed by the DBCA (Department of Environment and Conservation nd). Vegetation associated with this landform is Cape Range 662, and approximately 68% remains within the Shire of Exmouth. The EPA notes that criteria (x) of the World Heritage Area identifies the diversity of vascular plants as part of the Outstanding Universal Value.

The survey area intersects the western edge of the northern red dune landform, and approximately 21 ha of the *Banksia ashbyi* and *Daviesia pleurophylla* shrubland was recorded (refer Figure 1). The majority of the 21 ha occurs in the eastern portion of the development envelope, which also overlaps the 'sensitive dune area' considered of cultural significance to the Yinggarda, Baiyungu and Thalanyji Traditional Owners. There will be no impact to the 'sensitive dune area' as discussed further in section 2.4 social surroundings.

The proponent considered the cumulative impacts of this proposal with other reasonably foreseeable projects, consistent with the EPA's section 16(e) advice on the cumulative impacts in Exmouth Gulf (EPA 2021b). Projects considered included the Yardie Creek Road Realignment, the Single Jetty Deep Water Port and Renewable Hub, and clearing undertaken to construct the southern bore field. Of these 3 other proposals, the EPA notes that Yardie Creek Road Realignment Project has been terminated, and the Port and Renewable Hub proposal does not impact the same vegetation communities as this proposal (Strategen JBS&G 2022). The EPA is not aware of any other reasonably foreseeable proposals that may also impact this vegetation community.

Clearing for the southern bore field impacted 2.3 ha of this community. The EPA advises that cumulatively, the total area of the community impacted is 5.58 ha. The EPA recognises that the shrubland has a restricted distribution given it is confined to the northern red dune landform and that only a small percentage of the landform is within the conservation estate. However, considering the extent of the landform outside the development envelope, and the percentage of the vegetation association remaining, the EPA consider it is likely the EPA objective for flora and vegetation can be met.

The EPA advises that the residual impact to *Banksia ashbyi* and *Daviesia pleurophylla* shrubland should be subject to implementation conditions (recommended conditions A1) to limit the loss of this community and ensure the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation. Condition B4-1(3) has also been recommended requiring no disturbance to the 'sensitive dune area' as discussed in section 2.4 social surroundings.

The EPA also recommends that a total clearing limit is included in condition A1.

Indirect impacts to adjacent vegetation

The EPA has considered the likely residual impacts to be the introduction and spread of weeds to the adjacent vegetation.

These potential indirect impacts need to be actively managed to ensure the adjacent conservation estate managed by the DBCA (Jurabi Coastal Park and associated Unallocated Crown Land) and the World Heritage Area is not adversely impacted by implementation of the proposal. The EPA considers that the spread of weeds is likely, particularly as resort guests will move from the proposal site through the Jurabi Coastal Park and World Heritage Area to access the adjacent Lighthouse Bay beach. The EPA notes that the proposal is not proposing to increase visitor capacity, rather improve and replace the facilities of the previous Ningaloo Lighthouse

Caravan Park, and a caravan park has been in operation at this site for over 30 years.

The EPA advises that the proponent has committed to managing indirect impacts from weeds during both construction and operation, an issue that was also raised by the DBCA as part of its submission. The EPA considers this issue can be readily managed, and notes that other assessed proposals adjacent to the conservation estate include conditions requiring the management of potential indirect impacts within 50 m (metres) of the development envelope.

The EPA has therefore recommended condition B1 which requires the proponent to ensure no adverse impacts within 50 m outside of the development envelope, as well as undertake weed control and management during proposal implementation.

2.1.10 Summary of key factor assessment and recommended regulation

The EPA has considered the likely residual impacts of the proposal on flora and vegetation environmental values. In doing so, the EPA has considered whether reasonable conditions could be imposed, or other decision-making processes can ensure consistency with the EPA factor objective. The EPA assessment findings are presented in Table 2.

The EPA has also considered the principles of the *Environmental Protection Act 1986* (see Appendix C) in assessing whether the residual impacts will be consistent with its environmental factor objective and whether reasonable conditions can be imposed (see Appendix A).

Table 2: Summary of assessment for flora and vegetation

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
Clearing of 3.98 ha of vegetation, including 3.28 ha of *Banksia ashbyi* and *Daviesia pleurophylla* shrubland.	The proposal will result in the loss of vegetation, including a locally significant vegetation community restricted to the northern red dune landform. However, the EPA advises that in considering cumulative impacts, and the proportion of the landform outside the development envelope and the proportion of vegetation association remaining, the loss resulting from this proposal is unlikely to significantly impact this community. The EPA advises that, subject to the recommended limitations on clearing, the environmental outcome is likely to be consistent with the EPA	**Condition A1 (Limitations and extent of proposal)** Disturbance limit for total clearing and a sub-limit for the *Banksia ashbyi* and *Daviesia pleurophylla* shrubland.

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
	objective for flora and vegetation.	
Indirect impacts associated with the introduction and spread of weeds.	The proposal has the potential to result in indirect impacts including the spread of weeds, particularly as resort guests move from the development envelope into the adjacent conservation estate. The EPA advises that, subject to the recommended outcome and requirement for active weed management, the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.	**Condition B1 (Flora and vegetation)** • Environmental outcome ensuring there are no adverse impacts within 50 metres outside of the development envelope • Requirement to undertake weed control and management during construction and operation.

2.2 Subterranean fauna and inland waters

2.2.1 Environmental objectives

The EPA environmental objective for subterranean fauna *to protect subterranean fauna so that biological diversity and ecological integrity are maintained* (EPA 2021c).

The EPA environmental objective for inland waters is *to maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected* (EPA 2021c).

2.2.2 Investigations and surveys

The EPA advises the following investigations and surveys were used to inform the assessment of the potential impacts to subterranean fauna:

- Ningaloo Lighthouse Resort: Subterranean Fauna Desktop Assessment (appendix D of the ERD) (Bennelongia 2020)
- Ningaloo Lighthouse Resort: Stygofauna Survey Report (appendix D of the ERD) (Bennelongia 2021).

The surveys were consistent with the *Technical Guidance – Subterranean fauna surveys for environmental impact assessment* (EPA 2021d).

The EPA advises the following investigation and surveys were used to inform the assessment of the potential impacts to inland waters:

- H2 Hydrogeological Report, Lighthouse Holiday Park Redevelopment (appendix E of the ERD) (Pennington Scott 2021)
- Recycled water reuse assessment (appendix P of the ERD) (Permeate Partners 2021)

2.2.3 Assessment context – existing environment

Subterranean fauna

The development envelope overlies the Cape Range Subterranean Waterways, which is listed as a wetland of national importance principally for its subterranean fauna. This system occupies the entire coastal plain and lower foothills of the Cape Range Peninsula and extends inland at the base of the peninsula at Norwegian Bay on the west cost to the Bay of Rest on Exmouth Gulf, covering an area of approximately 175,000 ha (Department of Climate Change, Energy, the Environment and Water 2023). The subterranean ecosystem values of the region are the key component of the natural values criteria for the National Heritage Place and are part of the listing criteria for the World Heritage Area.

The majority of the records are of endemic troglofauna located specifically in the caves of the karst system, developed in the Tulki and Trealla Limestones, with the cave system located primarily on the crest of the range. No karst was identified

within the development envelope or bore field, therefore no suitable troglofaunal habitat will be impacted as a result of the proposal (Bennelongia 2021).

Stygofauna within the Cape Range Subterranean Waterway occur primarily within the coastal plain system within the Tulki limestone and deeper Mandu limestones, which includes the subterranean environment within the development envelope. The main determinants for the presence of stygofauna are depth to groundwater, salinity and suitability of habitat. Depth to groundwater is important as it affects groundwater recharge washing nutrients and carbon into the aquifer after rainfall (Bennelongia 2021).

Two rounds of sampling from the new bore field were undertaken, with 41 specimens collected (30 samples from 17 bores), representing 4 stygofauna species. This represents a relatively depauperate community, as regional sampling undertaken during the same period collected 436 specimens from 10 bores, representing 11 species (Bennelongia 2021). The low diversity and occurrence of stygofauna is likely due to the geology of the bore field as it generally lacked the spaces between particles suitable for subterranean fauna.

No conservation listed subterranean fauna species were collected from the proposal area, although based on habitat requirements and the relatively short distances between other known locations, 2 threatened species, the blind gudgeon (*Milyeringa veritas)* and the blind cave eel (*Ophisternon candidum*) can be inferred to occur in the area (Bennelongia 2021).

Groundwater

The proposal is located within the Exmouth Groundwater Subarea, which comprises unconfined and confined aquifers. The Cape Range Group unconfined aquifer has a thin fresh to brackish water lens that sits above more saline groundwater.

Groundwater is recharged via infiltration of rainfall and runoff occurring from heavy rainfall events, principally over the Cape Range and fringing deposits. Recharge has been estimated to be about 10% of average rainfall, with the highest recharge occurring towards Exmouth where the recharge area is much larger at 15 km wide (Strategen JBS&G 2022).

In the vicinity of the proposal, the lens is poorly developed with the water quality tending towards brackish to saline (3,000 mg/L to 14,000 mg/L) with salinity increasing with depth. The highest measured salinity within the development envelope was 24,000 mg/L from about 30 m below the water table. The salinity profile of the development envelope can be characterised as a transition zone between brackish water and seawater (Pennington Scott 2021).

Background nutrient levels in the groundwater are consistent with values found elsewhere in the Exmouth peninsula. However, one bore in the vicinity of the effluent evaporation pond had very high nitrite levels, indicating a potential historical leak in the ponds (Strategen JBS&G 2022).

2.2.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the proponent's response to submissions document (Strategen JBS&G 2023b). Public consultation on the proposal raised concerns about changes to extent and quality of habitat for stygofauna in the Cape Range Subterranean Waterway.

The key issues raised during the public consultation on the proposal and how they have been considered in the assessment are described in sections 2.2.6, 2.2.7 and 2.2.8.

2.2.5 Potential impacts from the proposal

The proposal has the potential to significantly impact on subterranean fauna and inland water from:

- groundwater abstraction lowering the water table and reducing the extent of the brackish lens
- groundwater abstraction changing groundwater quality (salinity)
- reinjection of saline wastewater from the reverse osmosis plant impacting the brackish lens and impacting the salinity profile
- irrigation of treated wastewater causing changes to groundwater quality.

The above changes to the extent and quality of the groundwater have the potential to have consequential impacts to the extent and quality of subterranean fauna habitat.

2.2.6 Avoidance measures

The proponent has designed the proposal to minimise impacts to subterranean fauna habitat and inland water by screening the groundwater production bores to only allow abstraction within the first 2–4 meters of the water table and thereby avoiding the rise (up-coning) of the more saline groundwater into the brackish lens.

2.2.7 Minimisation measures (including regulation by other DMAs)

The proponent has proposed measures to minimise impacts to subterranean fauna and inland water by:

1. gravity feeding the hypersaline brine reject water, and plugging the reinjection bore below the brackish lens, to prevent up-coning of the reinjected water
2. designing the groundwater bores as 'sipping bores' to limit the volume and treatment required for resort use
3. tertiary treatment of wastewater and the removal of nutrients and pathogens prior to disposal and irrigation
4. management of groundwater abstraction in accordance with a licence and associated operating strategy under the *Rights in Water and Irrigation Act 1914*
5. management of the wastewater treatment plant (WWTP) and associated irrigation of wastewater as a prescribed premise and in accordance with licence conditions under Part V of the EP Act.

The issues raised during the public consultation about potential impacts to the Cape Range Subterranean Waterways has been considered through all the minimisation measures above.

2.2.8 Assessment of impacts to environmental values

The EPA considered that the key environmental values of subterranean fauna and inland waters are likely to be impacted by the proposal from groundwater abstraction and reinjection, and wastewater irrigation.

Groundwater abstraction and reinjection

The proposal includes the abstraction of up to 72 ML/year of groundwater to supply water for the resort. This will produce 50 ML/year of potable water via treatment in a reverse osmosis plant and a hypersaline brine which will require treatment and disposal.

To supply sufficient water for the proposal, the proponent applied for and received approval under the *Rights in Water and Irrigation Act 1914* to construct additional groundwater bores and to increase the allocation of groundwater. Approval was granted prior to the referral of the proposal to the EPA. Drinking water is supplied from the 'new bore field' located south of the development envelope, with the 'old bore field' located within the development envelope being used for reinjection of hypersaline groundwater and for monitoring (Strategen JBS&G 2022).

Groundwater abstraction

To minimise both the abstraction volumes and treatment required, the groundwater bores in the new bore field have been designed to extract water from the brackish lens only (groundwater 'sipping'). Groundwater bores have therefore been screened between 2–4 metres below the water table, which prevents the extraction of the deeper, more saline water and also prevents the deeper saline water from up-coning into the brackish lens (Strategen JBS&G 2023b).

To predict the impacts from groundwater abstraction, the proponent conducted pump tests to estimate the geographic extent and level of groundwater drawdown in each bore during peak tourist season. The proponent has calculated that the maximum possible drawdown will extend 370 m from the bores, with a maximum drawdown in any one individual bore ranging from 0.4–0.6 m (Pennington Scott 2021). The EPA notes that the extent of the brackish lens is likely to change seasonally, with peak usage and therefore drawdown of the lens being greater during winter, and recharge of the lens occurring during summer when visitation is generally lower, and rainfall is highest.

Groundwater drawdown, and changes in groundwater salinity, can reduce the area available for subterranean fauna. The proponent has predicted, based on the extent of drawdown, that the overall reduction in stygofauna habitat is no more 6 km^2, or no more than 0.5% (Strategen JBS&G 2022). The EPA is unaware of other any

reasonably foreseeable proposals that will, from a cumulative impact perspective, increase the likely impact to subterranean fauna habitat.

To monitor impacts from groundwater drawdown, the proponent has prepared an Inland Water Quality Management Plan (IWQMP). The IWQMP proposes specific triggers and thresholds regarding groundwater drawdown and changes in salinity to ensure that groundwater abstraction does not have a significant impact on inland waters or subterranean fauna. The EPA also notes that groundwater drawdown, and a reduction in extent of the brackish lens, is an issue of concern for the Yinggarda, Baiyungu and Thalanyji Traditional Owners (who are represented by the Nganhurra Thanardi Garrbu Aboriginal Corporation). This issue is discussed further in section 2.4 social surroundings.

The EPA notes that, of the species found during the subterranean fauna surveys, only one species, a copepod, was not found outside the bore field. Copepods are not generally known to have restricted spatial distributions in the type of open landscapes such as those found within the area of the bore field. The EPA therefore considers, based on the small extent of habitat impacted when considering the amount of habitat remaining, and the relatively depauperate nature of the stygofaunal community, that subterranean fauna are unlikely to significantly impacted by the proposal.

The EPA notes that neither the blind gudgeon (*Milyeringa veritas*) or blind cave eel (*Ophisternon candidum*) were found during stygofaunal sampling in the bore field. While the proponent acknowledges that the habitat within the bore field is suitable, previous records of the species is primarily coastal. The EPA considers it is unlikely the proposal would have a significant impact on these species. The EPA also considers that the natural values of either the National Heritage Place or World Heritage Area that relate to subterranean fauna are also unlikely to be significantly impacted.

The EPA considers that, with the mitigation and monitoring measures proposed, the environmental outcome is likely to be consistent with the EPA objectives for subterranean fauna and inland waters. The EPA has therefore recommended that groundwater abstraction should be subject to implementation conditions that limits the extent of groundwater drawdown and changes to salinity profiles (recommended conditions B2-1(2) and B2-1(3)). Noting the cultural value and importance of groundwater to the Traditional Owners, the EPA recommends the IWQMP be updated following further consultation with the Nganhurra Thanardi Garrbu Aboriginal Corporation (recommended condition B2-2).

Groundwater reinjection

Treatment of this brackish water through the reverse osmosis plant will result in a hypersaline brine, although the EPA notes that no additional chemicals will be within this brine. Since the release of the ERD, the proponent has confirmed the method of brine disposal, which is via a dedicated reinjection bore located within the development envelope (Strategen JBS&G 2023b).

As described above, up-coning of saline water has the potential to impact the quality of the brackish lens. To prevent this from occurring, the reinjection bore has been screened 12 m below the water table (where the brackish lens occurs). Above this point, the bore contains a concrete plug to prevent the brine from moving back up into the brackish lens. In addition, reinjection is proposed to be gravity fed rather than pumped, which also reduces the risk that the hypersaline reinjection brine will up-cone into the brackish lens (Strategen JBS&G 2023b).

In regard to groundwater reinjection, the proponent has advised that the original abstraction bore will be utilised as a monitoring bore, with salinity profiles to be recorded at varying depths. The proposed triggers within the IWQMP are designed to capture early signs of salinity changes beyond the tidal and seasonal fluctuations to ensure that groundwater reinjection is unlikely to have a significant impact on inland waters or subterranean fauna.

The EPA notes that sampling of the stygofauna community from the old bore field was not undertaken. However, the EPA notes that the shallow areas of the unconfined aquifer, where salinity is lower, is likely to have a higher prospectivity for stygofauna. The EPA also notes that, given its proximity to the coast, the saltwater interface is much shallower that the old bore field, and has been calculated to be between 11 and 32 m below ground level (Strategen JBS&G 2023b). The EPA expects the hypersaline brine, being denser than the saline groundwater, is also unlikely to mix with the area considered of higher prospectivity for stygofauna.

The EPA advises that the proposal is likely to result in a local reduction in extent of stygofaunal habitat within the vicinity of the development envelope. However, the EPA is unaware of other any reasonably foreseeable proposals that will, from a cumulative impact perspective, increase this likely reduction. The EPA also advises that the Cape Range Subterranean Waterway, as described above, covers an area of about 175,000 ha and a significant portion of it is protected in the conservation estate. Given the likely impacts in context with both the local and regional extents, the EPA considers the proposal is unlikely to have a significant impact on the Cape Range Subterranean Waterway, the World Heritage Area or the National Heritage Place.

The EPA considers that, with the mitigation and monitoring measures proposed, the environmental outcome is unlikely to be inconsistent with the EPA objective for subterranean fauna and inland waters. The EPA has therefore recommended that groundwater reinjection should be subject to implementation conditions that ensures any brine reinjection program does not result in a change to the salinity of the brackish lens (recommended conditions B2-1(4)) and recommends the IWQMP be updated following further consultation with the Nganhurra Thanardi Garrbu Aboriginal Corporation (recommended condition B2-2).

The EPA notes that predicted capacity of the reverse osmosis plant required for the proposal is below the threshold requiring either a works approval or licence under Part V of the EP Act.

Wastewater irrigation

The proposal includes a new WWTP, which requires the disposal of up to 40,000 kL/year of treated wastewater. The proposed WWTP will be designed to achieve high levels of nutrient (nitrogen and phosphorus) and pathogen removal, producing a tertiary treated effluent suitable for landscape irrigation. The proponent advises that similar treatment plants have been used for other sensitive locations, including at Monkey Mia and Rottnest Island. Treated wastewater is proposed to be discharged to a dedicated tank, capable of holding 4–5 days of supply at peak season. The proponent has also advised that the existing lined evaporation ponds will be retained (and upgraded if required) to provide stand-by storage and/or disposal capacity (Strategen JBS&G 2022).

Changes to groundwater quality has the potential to affect stygofauna communities. Increased nutrients, particularly nitrites, are known to affect both the species diversity and abundance of communities. Within the region, concentrations of nitrogen in vicinity of the old Exmouth WWTP are up to 35 mg/L, compared to local background levels of 1 mg/L. A review of the stygofauna occurrence in this area suggests that nitrogen levels had little effect on stygofauna at concentrations of up to 15 mg/L, although some species were only found where the concentrations were considered low (Bennelongia 2021).

The proponent used a water and mass balance model to predict impacts from nutrient irrigation over a 50-year period. The model used a worst-case scenario, for example, predicting impacts where the nitrogen levels in the wastewater stream were 15 mg/L, rather than a more likely level of <6 mg/L. After 50 years, the model predicted that, with established vegetation, there is no nutrient leaching into the groundwater and that generally there is a nitrogen deficit (that is, a plant could take more nitrogen if available) and no saturation of phosphorous in the soil profile. The model used also accounts for weather and climatic fluctuations and predicts no overflow of the recycled water from the evaporation ponds (Strategen JBS&G 2022).

The EPA considers that, based on this assessment, the risk of nutrient enrichment of groundwater is low. The EPA also considers, noting the relatively depauperate stygofauna community of the local area, the likelihood of nutrient irrigation to have a significant effect on the community is also low.

The EPA also notes that the proponent has undertaken a coastal hazard and risk assessment, consistent with the requirements of *State Planning Policy 2.6: State Coastal Planning Policy*. This assessment concludes that the wastewater treatment plan and ponds are unlikely to be affected by inundated or costal erosion within 100 years (m p rogers and associates pl 2020).

Treatment and discharge of sewage to land are activities consistent with the description of a category 54 sewage facility under Schedule 1 of the EP Regulations. Given the peak design capacity required for the proposal, the WWTP will be considered a prescribed premises and subject to works approval and licensing requirements under Part V of the EP Act. The Department of Water and Environment and Regulation (DWER) have advised that conditions can be placed on the works approval and/or licence that can specify discharge criteria and monitoring of both the

discharge volume and quality and the groundwater. Monitoring results would usually be required to be reported to the DWER annually.

The EPA considers that conditions can be applied under the works approval and licence to ensure that the irrigation of wastewater can be managed to be consistent with the EPA objective for subterranean fauna and inland waters. The EPA expects that the DWER would place conditions that would specify relevant matters including monitoring frequency, locations and parameters that should be monitored in both the wastewater stream and groundwater. The DWER have also advised that, in assessing a works approval and licence for the WWTP, they will take into account any conditions recommended by the EPA when determining the conditions that will be applied under Part V.

The EPA considers that, given the ability of the DWER to place licence conditions on the premise, inclusion of specific details are not required in the Inland Water Quality Environmental Management Plan. The EPA, however, still recommends an outcome-based condition (recommended condition B2-1(1)) regarding a standard of groundwater quality to be met in the area affected by nutrient irrigation. The outcome recommended by the EPA requires the proponent to meet the 80th percentile for nutrients consistent with the National Water Quality guidelines for *slightly to moderately disturbed ecosystems.* The EPA considers this approach is appropriate considering baseline conditions and that a caravan park has been operating in this location for over 30 years. The outcome also considers that methodology for deriving the 80th percentile should also be consistent with the National Water Quality Guidelines. This outcome is to protect groundwater quality and ensure the environmental outcome is consistent with the EPA objective for subterranean fauna and inland waters.

2.2.9 Summary of key factor assessment and recommended regulation

The EPA has considered the likely residual impacts of the proposal on subterranean fauna and inland waters environmental values. In doing so, the EPA has considered whether reasonable conditions could be imposed, or other decision-making processes can ensure consistency with the EPA factor objectives. The EPA assessment findings are presented in Table 3.

The EPA has also considered the principles of the *Environmental Protection Act 1986* (see Appendix C) in assessing whether the residual impacts will be consistent with its environmental factor objectives and whether reasonable conditions can be imposed (see Appendix A).

Table 3: Summary of assessment for subterranean fauna and inland waters

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
Groundwater abstraction and reinjection.	Groundwater abstraction will result in seasonal changes to the extent of groundwater within the bore field, with both abstraction and reinjection also	**Condition A1 (Limitations and extent of proposal)**

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
	have the potential to impact salinity and therefore the extent of subterranean fauna habitat. The proponent has prepared a IWQMP to monitor and mitigate impacts resulting from both abstraction and reinjection. The EPA considers, given the extent of drawdown and the likely changes to salinity, the proposal is unlikely to have a significant residual impact on inland waters. The EPA also considers, given the extent of predicted impacts, and the availability of habitat remaining, the proposal is unlikely to have a significant residual impact on subterranean fauna. Environmental outcome likely to be consistent with the EPA factor objectives for subterranean fauna and inland waters if subject to recommended conditions.	Total volume of abstraction limited to 72 ML/year. **Condition B2 Subterranean fauna and inland waters** Outcomes to: • limit groundwater drawdown • ensure salinity profiles do not significantly deviate from suitable reference sites • no change to the salinity of the brackish lens within the development envelope as a result of any brine reinjection program.
Irrigation of treated wastewater	Increased nutrients in groundwater have the potential to impact subterranean fauna. The proponent has predicted the impacts to groundwater quality over 50 years, using a worst-case scenario. The outcome of this modelling is there is no nitrogen leaching into groundwater nor saturated phosphorous levels in the soil profile. The EPA considers that a works approval and licence for the WWTP can apply conditions regarding wastewater quality and monitoring to ensure the environmental outcome will be consistent with the EPA factor objectives for subterranean fauna and inland waters. Implementation conditions are also recommended to ensure the outcome is consistent with the factor objectives.	**Condition A1 (Limitations and extent of proposal)** Total volume of irrigation limited to 40,000 kL/year. **Condition B2 Subterranean fauna and inland waters** Outcome specified regarding groundwater quality in the area affected by irrigation from the WWTP. **DMA legislation** Works approval and licence for a WWTP under Part V of the EP Act.

2.3 Marine fauna

2.3.1 Environmental objective

The EPA environmental objective for marine fauna is *to protect marine fauna so that biological diversity and ecological integrity are maintained* (EPA 2021c).

2.3.2 Investigations and surveys

The EPA advises the following investigations and surveys were used to inform the assessment of the potential impacts to marine fauna:

- Marine turtle and light monitoring program (appendix I of the ERD) (Pendoley Environmental Pty Ltd 2021a)
- Seabird and shorebird review and artificial light assessment (appendix O of the ERD) (Pendoley Environmental Pty Ltd 2022a)
- DBCA Ningaloo turtle program data review: technical note (attachment 6 of the Response to Submissions) (Pendoley Environmental Pty Ltd 2022b)

2.3.3 Assessment context – existing environment

The Ningaloo coast is a significant area for marine turtles, with three of the seven species nesting on mainland beaches and islands. All the beaches of the North West Cape in the vicinity of the proposal are considered nesting beaches for green turtles (*Chelonia mydas*), loggerhead turtles (*Caretta caretta*) and hawksbill turtles (*Eretmochelys imbricata).* Flatback turtles (*Natator depressus*) also occasionally nest in this area (DBCA 2021). The diversity and abundance of marine turtles (including nesting activities) is one of the listing criteria for the World Heritage Area (IUCN 2011). The area is also considered a Biologically Important Area for marine turtles, and includes habitat deemed critical for survival.

The Ningaloo Turtle Program was established in 2002 with the purpose of predicting long-term trends in marine turtle populations along the Ningaloo coast. The proposal is located within the North West Cape division of the program, with green turtles (*Chelonia mydas*) being the predominate species utilising these beaches (approximately 90%). The area of highest density nesting in the North West Cape division is located on the Ningaloo Coast West Area (Graveyard Beach north to Hunters Beach), with the Lighthouse Bay Area (Hunters Beach east to Mildura Wreck East) immediately adjacent to the proposal usually having the lowest number of green turtle nests. During the 2020-21 season, turtle nesting activity was the highest since the program began for all 3 species, with green turtle nesting activity being approximately 11 times greater than other seasons. However, nesting success was well below average for all 3 species, with nesting success for green turtles (approximately 17%) being the lowest since the program began (DBCA 2021).

The Ningaloo coast and Exmouth Gulf region are known to be of significance for numerous sea and shorebirds species, including species listed under the *Biodiversity Conservation Act 2016*, EPBC Act and international migratory bird agreements. Within the vicinity of the proposal, nesting and foraging occurs on adjacent beaches

by both resident and migratory species of sea and shorebird (refer section 6.3.3 Strategen JBS&G 2022).

2.3.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the proponent's response to submissions document (Strategen JBS&G 2023b). Public consultation on the proposal raised concerns about disturbance to nesting turtles and shorebirds from visitors and from artificial light.

The key issues raised during the public consultation on the proposal and how they have been considered in the assessment are described in sections 2.4.6 and 2.4.7.

2.3.5 Potential impacts from the proposal

The proposal has the potential to significantly impact on marine fauna from:

- indirect impact of lighting from the proposal on marine fauna, particularly turtle nesting and hatchling behaviour on the adjacent beaches
- indirect impact of tourists from the resort interacting with marine fauna, particularly marine turtles at the adjacent nesting beaches.

2.3.6 Minimisation measures (including regulation by other DMAs)

The proponent has proposed measures to minimise impacts to marine fauna:

1. implementation of the lighting principles from the national guidelines to reduce the light emissions from the resort to as low as reasonably practicable
2. implementation of an Artificial Light Management Plan (ALMP) and Marine Turtle Plan (MTP) during construction and operations
3. implementation of a visitor management plan and education programs to educate resorts guests on appropriate and best practice behaviour during turtle breeding season
4. formalised beach access points to manage and control beach access and minimise dune degradation and trampling, in consultation with the Shire of Exmouth and DBCA.

The issue raised during the public consultation about potential impacts to marine fauna has been considered through all the minimisation measures above.

2.3.7 Assessment of impacts to environmental values

The EPA considered that the key environmental values for marine fauna likely to be impacted by the proposal are marine turtle and seabirds from artificial light during operations and indirect impacts from visitors, particularly during breeding season.

Artificial Light

Artificial light has the potential to have a significant impact on marine turtles as it can disrupt key critical behaviours. Both adult female marine turtles and recently emerged turtle hatchlings use light to orientate towards the ocean, and artificial light

has the potential to cause misorientation and/or disorientation. This can result in turtles moving away from the ocean and cause increased mortality from predation and/or becoming trapped in dunes and vegetation. Disorientated hatchlings that do reach the ocean may have also used valuable energy reserves need to reach offshore feeding areas. Wedge-tail shearwaters (*Ardenna pacifica*) and night-migrating shorebirds particularly can also be attracted to artificial lights, with impacts occurring through collision or influencing both migration and foraging behaviours (Strategen JBS&G 2022).

The proponent conducted an artificial light assessment to determine baseline levels of sky brightness for nesting beaches on both the Ningaloo Coast West Area and the Lighthouse Bay Area (and at the Space Surveillance Telescope (SST)), and how those light levels are currently affecting marine turtle nestling orientation. Analysis of both these baseline assessments showed that while light glow from Exmouth and the Defence facilities was visible at all locations, turtle hatchlings orientated seawards and not towards these light glows (Pendoley Environmental Pty Ltd 2021a).

Light modelling predicts that the proposal will increase sky glow to varying degrees at most beaches in the Lighthouse Bay Area, with some beaches potentially having a direct line of site visibility to the resort. Cape Range and tall sand dunes provide some shielding of light impacts, depending on the location. The predicted increase in skyglow equates to about 1% of full moon brightness. The light modelling predicts that the proposal is likely to have less impact that the previous Ningaloo Lighthouse Caravan Park (Pendoley Environmental Pty Ltd 2021a).

To manage and mitigate the potential impacts from artificial light, the proponent has prepared an Artificial Light Management Plan (ALMP) (Revision 5, Strategen JBS&G 2023a) and Turtle Management Plan (TMP) (Revision 2, Strategen JBS&G 2023d). The plans apply the best practice lighting design principles to minimise the impacts of lighting visibility and sky glow. The plans also include monitoring of lighting and the application of further mitigation measures to reduce the lighting levels. These measures are consistent with the *National Light Pollution Guidelines for Wildlife including Marine Turtles, Seabirds and Migratory Shorebirds* (Commonwealth of Australia 2020). The EPA considers that the measures proposed to minimise impacts to marine turtles will also minimise impacts to nesting and foraging sea and shorebirds.

The EPA considers that the predicted increase in sky glow is relatively small when compared to full moon brightness. The EPA also considers that the ALMP and TMP applies suitable measures to measure and then minimise impacts to marine fauna, including post construction surveys of turtle tracks (both adult tracks and hatchling ‘fans’) to measure whether lighting used for the proposal is causing misorientation and/or disorientation and therefore affecting sea finding ability when compared to baseline. The ALMP and TMP contains further measures that can be implemented if light pollution is having a detectable impact on adults or turtle hatchlings.

The EPA has recommended both outcomes and objectives regarding misorientation and disorientation, standings and mortality, and nesting beach utilisation (conditions B3-1 and B3-2).

The EPA has also recommended that the ALMP and TMP be updated, in consultation with DBCA, prior to the commencement of operations (recommended condition B3-3). The EPA considers these conditions are likely to ensure the environmental outcome is consistent with the EPA objective for marine fauna.

Indirect impacts from visitation

Female turtles are sensitive to disturbance at all stages during the nesting process. While false crawls (female coming to shore without successfully laying eggs) can occur for a variety of reasons, human-caused disturbance is one of the primary reasons and nature-based tourism in the Cape Range is specifically identified as a threat in the marine turtle recovery plan (Department of the Environment and Energy 2017). Seabirds also nest on beaches in the Cape Range area and can be disturbed by visitor proximity.

Impacts to nesting turtles and seabirds are an ongoing and region wide issue, and DBCA have produced visitor guides outlining ways to minimise impacts. The proponent has also prepared a Visitor Management Plan (VMP) that outlines how resort guests will be provided with relevant educational and interpretative material (Pentium Water Pty Ltd 2023). The EPA notes that the redevelopment is not proposing to increase visitor capacity from what was previously approved, rather improve and replace the facilities of the previous Ningaloo Lighthouse Caravan Park. The EPA notes that a caravan park has been in operation at this site for over 30 years.

The resort will facilitate access to turtle nesting beaches within the Jurabi Coastal Park, particularly the adjacent Lighthouse Bay Area. Visitors to the previous caravan park accessed Lighthouse Bay via an informal path through the dunes, potentially resulting in increased dune erosion and weed incursion due to the lack of formalised access. While not part of this proposal, the proponent intends to construct formalised access to the beach in consultation with DBCA and the Shire of Exmouth, in which the adjacent reserves are vested. Noting that the impacts of resort guests are beyond the ability of the proponent to control outside of the development envelope, the EPA has provided Other Advice on this matter in section 6.

2.3.8 Summary of key factor assessment and recommended regulation

The EPA has considered the likely residual impacts of the proposal on marine fauna environmental values. In doing so, the EPA has considered whether reasonable conditions could be imposed to ensure consistency with the EPA factor objective. The EPA assessment findings are presented in Table 4.

The EPA has also considered the principles of the *Environmental Protection Act 1986* (see Appendix C) in assessing whether the residual impacts will be consistent with its environmental factor objective and whether reasonable conditions can be imposed (see Appendix A).

Table 4: Summary of assessment for marine fauna

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
Operational lighting has the potential to impact: • nesting adult turtle and turtle hatchling orientation and sea finding success • adult turtle nesting beach utilisation • nesting sea and shorebirds.	Proposal lighting will be visible at adjacent nesting beaches, and sky glow will also increase. The proponent has prepared an ALMP and TMP to manage and mitigate the impacts from artificial light at relevant impacted nesting beaches. This includes applying the national light pollution guidelines with the aim of ensuring that the impact to nesting turtles is unlikely to have a significant impact. These measures will also mitigate impacts to nesting sea and shorebirds. The proposed management plans include monitoring of both adult and emergent nestlings to ensure the modelled prediction regarding impacts is accurate and that no significant difference in hatchling or adult orientation results from operational lighting. Environmental outcome consistent with the EPA factor objective for marine fauna if subject to recommended conditions.	**Condition B3 (Marine fauna)** Outcome and objectives requiring: • no detectable difference in adult marine turtle and marine turtle hatchling misorientation or disorientation • no increase in strandings or mortality rate • no adverse impact to adult marine turtle nesting utilisation, in the Lighthouse Bay Area. Review the ALMP and TMP in consultation with the DBCA.

2.4 Social surroundings

2.4.1 Environmental objective

The EPA environmental objective for social surroundings is *to protect social surroundings from significant harm* (EPA 2021c).

2.4.2 Investigations and surveys

The EPA advises the following investigations and surveys were used to inform the assessment of the potential impacts to social surroundings:

- Marine turtle and light monitoring program (appendix I of the ERD) (Pendoley Environmental Pty Ltd 2021a)
- Cultural Heritage Management Plan, which includes heritage and ethnographic surveys (attachment 5 of the ERD) (North West Resorts Pty Ltd 2020)
- Heritage Impact Assessment (appendix H of the ERD) (Griffiths Architects 2019)
- Visual Impact Assessment (appendix M of the ERD) (Kerry Hill Architects 2020)
- Ningaloo Lighthouse Tourist Park, Landscape and Visual Impact Assessment (unpublished report prepared for fiveight, 360 Environmental 2022).

2.4.3 Assessment context: existing environment

Aboriginal heritage

The proposal is within the Gnulli (Yinggarda, Baiyungu and Thalanyji) native title claim area (WC1997/028), which is represented by the Nganhurra Thanardi Garrbu Aboriginal Corporation. There is one Registered Aboriginal Site, Vlamingh Head (DPLH 10381), within the development envelope and its vicinity. This site is listed as a place of scared importance for its mythological, ceremonial and ritual elements. Specific locations within this site are not identified due to cultural sensitivity (Strategen JBS&G 2022).

During the cultural heritage surveys of the development envelope, another site of cultural sensitivity was recorded. This site was an area of red sand dunes (‘sensitive dune area’) which potentially could have been a focal point of human activity in the past. It was also acknowledged that the area could potentially be the location of undiscovered remains. This site is within the boundary of the Vlamingh Head site. A second site was recorded during surveys for the bore field (‘Section 91 Water Bores Avoidance Area One’). This site is an artefact scatter and was recorded in an area considered uncommon in the Exmouth region (Strategen JBS&G 2022), however, this is outside the development envelope.

In addition to specific archaeological sites, the Yinggarda, Baiyungu and Thalanyji Traditional Owners also raised the importance of groundwater. Water has an important role in the sacred narratives of the region and is of particular ethnographic significance (Strategen JBS&G 2022). This was also discussed above in section 2.2. The significant indigenous values of the region are one of the listing criteria for the

National Heritage Place, although it is noted that these values are not definitively mapped.

Dark and clear skies

Dark and clear skies is a sky that is free from nighttime light pollution, has a clear atmosphere and low levels of electromagnetic interference. With the region, specific defence equities rely on dark and clear skies and include:

- the Space Surveillance Telescope (SST)
- the Naval Communication Station Harold E Holt – Areas A, B and C
- RAAF Base Learmonth (combined RAAF Air Base/ civilian airport)
- Learmonth Solar Observatory.

Astrotourism is also an emerging product in the tourism sector and the Exmouth region has particular value for dark and clear sky values given its location. This was also raised as an issue in the EPA's section 16(e) advice regarding the cumulative impacts in Exmouth Gulf.

Of the above Defence equities, the EPA considers the SST is the most sensitive socioeconomic receptor given the likely impacts of the proposal. The quality of the dark and clear sky values were key considerations in the determining the appropriate location for the SST (Strategen JBS&G 2022).

Regarding the RAAF Base Learmonth, the Learmonth Solar Observatory and Naval Communication Station Harold E Holt Area C, the EPA notes these are located over 50 km south of the proposal. Given the predicted impacts of the proposal from light and dust, the EPA consider these Defence equities are unlikely to be significantly impacted and are therefore not discussed further.

Regarding Naval Communication Station Harold E Holt Areas A and B, the likely impact pathway will be through airborne dust generated, particularly during construction activities. The EPA notes that impacts are likely to be temporary and localised, and the proponent has proposed mitigation measures such as water-based dust suppression. During operation, dust generation is likely to be low as paths, access ways and roads will be sealed and remaining cleared areas landscaped. The EPA considers impacts to these Defence equities are unlikely to be significant and are therefore not discussed further.

Natural and historic heritage

As described in section 1 proposal context, the proposal is within, adjacent to or in proximity to state, national and internationally important conservation areas that have natural, biological and historic values. Most of these values are addressed under the other key environmental factors, with this section addressing the remaining potential impacts to natural and historic heritage.

The listing criteria for the World Heritage Area includes the superlative land and seascapes of the area arising from the interconnected ocean and arid environments.

Visual impact of the proposed resort is therefore a relevant consideration for the assessment. In addition, increased visitation, recreational use and associated pressure on both the marine and terrestrial habitats within and adjacent to the site are major threats to the World Heritage Area (IUCN 2021). The proposal will facilitate access from the proposed resort into the conservation estate and the World Heritage Area.

The Vlamingh Head Lighthouse is adjacent to the development envelope, however, a pair of light keeper's cottages forms part of the resort site. It is listed on the State Register as part of the Vlamingh Head Lighthouse Group (Heritage Place no 00837). These buildings were utilised as part of the previous caravan park, and the proponent intends to undertake heritage works to enhance its present deteriorated state and utilise the buildings as part of the new development (Strategen JBS&G 2022).

2.4.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the proponent's response to submissions document (Strategen JBS&G 2023b). Public consultation on the proposal raised concerns about impacts to the visual amenity and natural values of World Heritage area and the National Heritage Place, the historic heritage including the Vlamingh Head light station, indirect impacts from visitors, and the significant Aboriginal culture and heritage of the Yinggarda, Baiyungu and Thalanyji Traditional Owners.

The key issues raised during the public consultation on the proposal and how they have been considered in the assessment are described in sections 2.4.5, 2.4.6, 2.4.7 and 2.4.8.

2.4.5 Potential impacts from the proposal

The proposal has the potential to significantly impact on social surroundings from:

- direct and indirect disturbance to Aboriginal heritage sites and ethnographic values
- increased light and atmospheric pollution and interference affecting dark and clear sky values and the operation of the SST
- recreational use and pressure from visitor access on the Lighthouse Bay Area, particularly to nesting turtles and seabirds, and to the conservation estate more generally.

The proposal has the potential to impact the heritage values of the light keeper's cottages as some structural changes are proposed, for example removal of some of the internal dividing walls. However, considering that the overall works will retain the core heritage values, with changes limited to those considered necessary for a reception, the EPA considers these impacts are unlikely to be considered significant and the EPA objective for social surroundings will be met. The EPA notes that these heritage works form part of the development application under the *Planning and Development Act 2005*, and conditions from the State Heritage Office regarding the heritage works may be applied through this process.

2.4.6 Avoidance measures

The proponent has designed the proposal to avoid impacts to social surroundings by excluding resort infrastructure and disturbance within the 'sensitive dune area' site of potential significance for Aboriginal cultural heritage.

2.4.7 Minimisation measures (including regulation by other DMAs)

The proponent outlined the following minimisation measures to reduce both direct and indirect impacts to social surroundings:

1. utilisation of all existing disturbed areas for buildings and associated infrastructure to limit the potential disturbance of heritage sites
2. designing and installing access tracks leading away from the Vlamingh Head site to minimise the risk of tourist activity impacting the cultural and spiritual values of the site
3. groundwater 'sipping', managed abstraction and tertiary treatment of wastewater from the WWTP to minimise impacts to the cultural heritage values associated with groundwater
4. shielding and redirection of artificial light, use of lights with suitable wavelength and managing the timing and use of service facilities to minimise impacts to dark and clear sky values
5. minimal alteration of natural topography of the site and utilisation of existing landforms, visual integration of buildings into the landscape, and tree planting and revegetation to minimise impacts to land and seascapes and the amenity values of the World Heritage Area
6. preparation of environmental management plans for aboriginal cultural heritage, artificial light and for visitor management
7. management of heritage works to the light keeper's cottages through conditions (if required) on the development application under the *Planning and Development Act 2005*.

The issue raised during the public consultation about potential impacts social surroundings has been considered through all the minimisation measures above.

2.4.8 Assessment of impacts to environmental values

The EPA considered that the key social surroundings values likely to be impacted by the proposal are Aboriginal Heritage, natural and historic heritage, and dark and clear sky values.

Aboriginal heritage

The EPA has considered the likely residual impacts of the proposal on Aboriginal heritage is direct and indirect impacts to cultural heritage, and loss of access or restriction of access to country.

The EPA notes that the proponent undertook anthropological and ethnographic surveys with the full involvement of traditional owner representatives, and at the request of the Traditional Owners, have modified the development footprint to avoid an area of potential significance, the 'sensitive dune area'. The EPA notes that the proponent has been granted a permit under section 18 of the *Aboriginal Heritage Act 1972* to disturb the current proposed footprint of the resort, and that this area does not include the 'sensitive dune area'.

During the assessment process, the EPA advises that the Nganhurra Thanardi Garrbu Aboriginal Corporation raised a number of concerns regarding the consultation process and the significant cultural values of Cape Range. This included the potential impacts that the drawing of groundwater may have on the Traditional Owner's spiritual and cultural wellbeing and the Warnangura dreaming story. In response to these concerns, the proponent undertook further consultation with the Traditional Owners, which included developing and discussing other water supply options designed to minimise impacts to the cultural values. This further engagement culminated in a 2-day workshop in November 2022, which included provision of technical support for the Traditional Owners to facilitate informed decision making regarding how the options presented would minimise impacts to cultural values and spiritual wellbeing. The proponent also committed to preparing a Cultural Heritage Management Plan in consultation with the Nganhurra Thanardi Garrbu Aboriginal Corporation.

The Nganhurra Thanardi Garrbu Aboriginal Corporation provided advice to the EPA in December 2022 regarding the outcomes of the November workshop and recommended measures and actions to minimise impacts to Aboriginal cultural heritage, including specific advice regarding the protection of groundwater and the brackish lens.

The EPA has considered this advice, and has recommended the following conditions:

- limitations on the clearing extent of *Banksia ashybi* and *Daviesia pleurophylla* shrubland (condition A1)
- no disturbance to the 'sensitive dune area' site identified in the anthropological and ethnographic survey (condition B4-1(3))
- preparation of a Cultural Heritage Management Plan (condition B4-3) prior to groundwater abstraction, which is to include consultation regarding the measures proposed to mitigate risks to marine turtles
- the IWQMP is to be reviewed and updated in consultation with the Nganhurra Thanardi Garrbu Aboriginal Corporation (condition B2-2).

The EPA also requested the proponent to update the IWQMP to address the specific items raised, which included baseline salinity profiles and triggers, groundwater sipping and screening depth in a specific bore and ongoing monitoring requirements to demonstrate the replenishment of the brackish lens.

The EPA considers that with the above conditions, including further consultation, the environmental outcome is likely to be consistent with the EPA objective for social

surroundings. The EPA also considers that with the above recommended conditions, impacts to the cultural values of the National Heritage Place are unlikely to be significant.

The EPA notes that the proposed Yardie Creek Road Realignment project had the potential to have significant impacts on Aboriginal cultural heritage, including the 'sensitive dune area' and the Traditional Owner's spiritual and cultural wellbeing and the Warnangura dreaming story. Main Roads advised the EPA in January 2023 that they no longer wished to proceed with this project, noting the significant heritage values present in the proposed alignment corridor. This project was terminated by the EPA in January 2023.

Dark and clear skies

The EPA has considered the likely residual impacts of the proposal on dark and clear sky values is associated with artificial lighting during operations. As discussed in section 2.3 marine fauna, the proponent conducted an artificial light assessment to determine baseline levels of sky brightness. The baseline assessment indicated that all current regional light sources (Exmouth townsite, Harold E Holt base and the antenna array) are visible from the SST (Pendoley Environmental Pty Ltd 2021a).

Modelling undertaken to predict resort lighting indicates that it would be visible from the SST and would introduce sky glow into a region of the SST monitoring horizon that is currently dark. However, the modelled outputs indicate that the proposal will not impact on sky brightness overhead at the SST, and the predicated natural background zenith light levels remaining unchanged (Pendoley Environmental Pty Ltd 2021a).

The proponent has prepared an ALMP to manage and mitigate impacts from light pollution (Revision 5 Strategen JBS&G 2023a). The plan includes conducting light emission monitoring following the commencement of operations to determine whether a change in dark sky quality is detected at the SST. The plan also applies both the lighting design principles and measures from the *National Light Pollution Guidelines for Wildlife including Marine Turtles, Seabirds and Migratory Shorebirds* (Commonwealth of Australia 2020), which includes mechanisms such as shielding and directing light downwards to minimise light spill. The EPA considers these measures are also likely to minimise impacts to dark sky and clear values and the potential impact to the SST.

Noting the modelled predictions regarding background zenith light levels remaining unchanged and the commitment to consult with the Department of Defence regarding any detected change in sky quality at the SST, the EPA considers that the environmental outcome is likely to be consistent with the EPA objective for social surroundings. The EPA has recommended that the proposal be subject to implementation conditions regarding ensuring no change to dark and clear sky quality (condition B4-1(1)) and condition B3-3 requiring the implementation of the ALMP.

The EPA also recommends condition B4-4 requiring the proponent to conduct ongoing consultation for the life of the proposal with the Department of Defence regarding the achievement of this outcome.

Natural and historic heritage

The EPA has considered the likely residual impacts of the proposal is to visual amenity and from visitor access.

Visual amenity

The Outstanding Universal Value (OUV) of the World Heritage Area includes the landscape and seascape values, and the proponent prepared a preliminary Visual Impact Assessment to inform resort design (Kerry Hill Architects 2020). Since the release of the ERD, the proponent has undertaken a more detailed landscape and visual impact assessment that assesses how the proposal may impact individual landscape and seascape units and the OUV. This assessment determined that of five assessed local vantage points, the Dune and the Lighthouse vantage points have the potential to be the most impacted due to their elevation with largely uninterrupted views of the proposal. The analysis of other receptor sites shows minor or no impacts, as the visual impact of the proposal is limited in most instances by the existing topography and vegetation (360 Environmental 2022).

The proponent has proposed mitigation measures such as screening vegetation and utilisation of materials and colours that are consistent with the existing landscape. The EPA recognises that a caravan park has been operating in this location for over 30 years and impacts to the OUV are existing. The EPA also considers that through the mitigation measures proposed, the proposal may result in an improved environmental outcome through incorporation of more sensitive landscape design. Considering the scale of the potential impacts to the OUV and the mitigation measures proposed, the EPA considers that the proposal is consistent with the EPA objective for social surroundings.

The EPA also notes that the Yardie Creek Road Realignment project has been terminated and therefore there are no visual impacts from this proposal.

Visitor access

The World Heritage Area and National Heritage Place, including the associated DBCA managed conservation estate (the adjacent marine, national and coastal parks), will be a focus of visitors to the resort. The EPA advises that while the proposal will update the quality and standard of the resort facilities, the proposal will not increase the visitor capacity that has operating from this location for over 30 years. The EPA considers that this proposal will not introduce new issues or impacts at this location.

The EPA notes that managing visitor impacts is an ongoing and region wide issue, and forms part of the overall management program of DBCA. The proponent has prepared a VMP which provides a framework to address visitor behaviour through education, which also integrates visitor activities and education with DBCA’s visitor

management framework (Pentium Water Pty Ltd 2023). The VMP outlines education programs around both the biological and cultural values of the area, but also provides education regarding the threats to those values. The EPA considers this will provide an opportunity to potentially minimise indirect impacts including from weeds, inappropriate turtle watching behaviours and wildlife provisioning.

Visitors to the previous caravan park accessed Lighthouse Bay and the Vlamingh Head Lighthouse via informal pathways, potentially resulting in increased erosion and weed incursion due to the lack of formalised and maintained access. The VMP includes actions to establish formalised pathways to the beach and Lighthouse, maintenance and compliance of those pathways and closure of other informal pathways. The EPA notes that these actions are outside the development envelope, however, will require an appropriate permit and consultation with DBCA and the Shire of Exmouth. The EPA considers this is likely to result in an improved environmental outcome as it is likely to minimise indirect impacts and also provides an opportunity for visitor education about the biological, social and cultural values of the World Heritage Area, National Heritage Place and other associated conservation reserves.

Noting that the limited ability by the proponent to control behaviours of resort guests outside of the development envelope, the EPA has provided Other Advice on this matter in section 6.

2.4.9 Summary of key factor assessment and recommended regulation

Table 5: Summary of assessment for social surroundings

Residual impact	Assessment finding	Recommended conditions and DMA regulation
Potential direct and indirect impacts to Aboriginal cultural and ethnographic values.	The development envelope and surrounds have significant cultural and ethnographic values. The proponent has committed to avoiding one site considered significant to the Traditional Owners and has undertaken further consultation regarding the proposal's potential impact to groundwater and subsequent impacts to the traditional owner's spiritual and cultural wellbeing and the Warnangura dreaming story. The proponent has updated the IWQMP in response to concerns raised and has committed to preparing a Cultural Heritage Management Plan. Environmental outcome is likely to be consistent with the EPA factor objective for social	**Condition B4 (Social surroundings)** No disturbance to the 'sensitive dune area'. Preparation of a Cultural Heritage Management Plan. Consultation with the Nganhurra Thanardi Garrbu Aboriginal Corporation regarding the revised IWQMP.

Residual impact	Assessment finding	Recommended conditions and DMA regulation
	surroundings if subject to recommended conditions.	
Increased light and atmospheric pollution and interference affecting dark and clear sky values and the operation of the SST.	Proposal lighting will be visible at the SST and will increase sky glow in a previously dark area, however modelled predictions is that background zenith light levels will remain unchanged. To manage and mitigate impacts the proponent has prepared an ALMP. This includes light monitoring post construction and the application the national light pollution guidelines with the aim of ensuring no change in dark and clear sky quality. Environmental outcome is likely to be consistent with the EPA factor objective for social surroundings if subject to recommended conditions.	**Condition B4 (Social surroundings)** Outcome requiring no change to dark and clear sky quality at the SST and condition requiring the implementation of the ALMP (condition B3-2). Condition requiring ongoing consultation with the Department of Defence regarding dark and clear sky quality.

3 Holistic assessment

While the EPA assessed the impacts of the proposal against the key environmental factors and environmental values individually in the key factor assessments above, given the link between all these factors, the EPA also considered connections and interactions between them to inform a holistic view of impacts to the whole environment.

Figure 4 illustrates the connections and interactions between the key environmental factors to inform the EPA's holistic assessment.

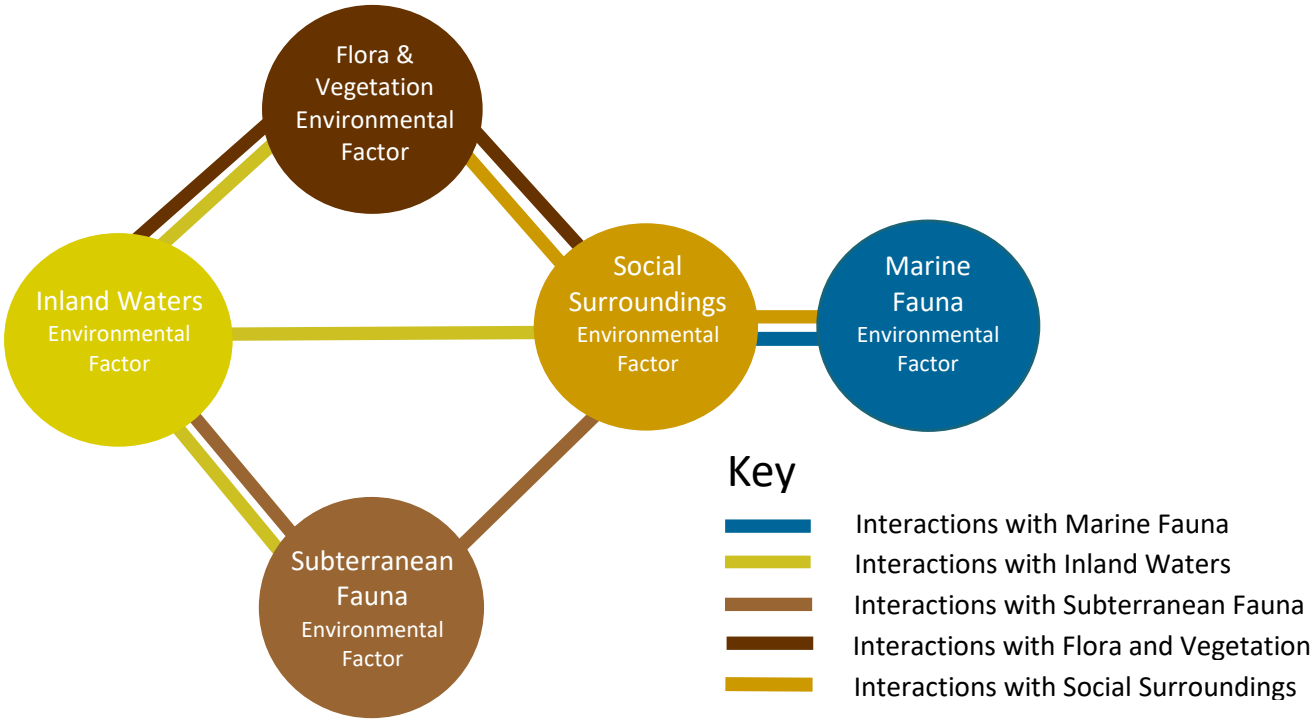

Figure 4: Intrinsic interactions between environmental factors

Social surroundings – Marine fauna

Marine fauna, particularly marine turtles, are values of significant importance to people, both to the Yinggarda, Baiyungu and Thalanyji Traditional Owners but also to visitors and the general public. Marine turtles are also a key value of the World Heritage Area and the conservation estate. Inappropriate visitor behaviours can have a significant impact on the viability and success of marine turtles nesting.

The EPA considers that the proposed mitigation and management measures, and recommended conditions for impacts to marine fauna, will also mean the inter-related impacts to the health of social surroundings including the values associated with Aboriginal cultural heritage and the World Heritage Area are likely to be consistent with the EPA environmental factor objectives.

Social surroundings – flora and vegetation – inland waters – subterranean fauna

The surface water catchments and groundwater aquifers of the proposal area support subterranean fauna and vegetation, which are an important environmental and cultural asset. The EPA recognises that there are inherent links between the factor inland waters and other environmental factors. For example, changes to the quality or quantity of inland waters can affect subterranean fauna within the conservation significant Cape Range Subterranean Waterways, and social surroundings. Flora and vegetation is also of importance to the Traditional Owners. The ecosystem health values related to inland waters generally include ability to sustain vegetation and subterranean fauna and the ecological processes that support them.

The beneficial uses include cultural and ethnographic values of the Yinggarda, Baiyungu and Thalanyji Traditional Owners and the National Heritage Place, and the natural and aesthetic values of the World Heritage Area. Inland waters was identified as important in the sacred narratives of Traditional Owners. The EPA considers that the recommended conditions and the proposed mitigation and management measures for impacts to inland waters, subterranean fauna and flora and vegetation will also mean the interrelated impacts to the health of social surroundings are likely to be consistent with the EPAs environmental factor objectives.

Summary of holistic assessment

When the separate environmental factors and values affected by the proposal were considered together in a holistic assessment, the EPA formed the view that the impacts from the proposal would not alter the EPA's views about consistency with the EPA's factor objectives as assessed in section 2.

4 Matters of national environmental significance

The Commonwealth Minister for the Environment has determined that the proposal is a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as it is likely to have a significant impact on one or more Matters of National Environmental Significance (MNES). It was determined that the proposed action is likely to have a significant impact on the following matters protected by the EPBC Act:

- listed threatened species and communities (s. 18 and s. 18A)
- listed migratory species (s. 20 and s. 20A)
- World Heritage properties (s. 12 and s. 15A)
- National Heritage places (s. 15B and s. 15C)
- Commonwealth land (s. 26 and s. 27A).

The EPA has assessed the controlled action on behalf of the Commonwealth as an accredited assessment under the EPBC Act.

This assessment report is provided to the Commonwealth Minister for Environment who will decide whether or not to approve the proposal under the EPBC Act. This is separate from any Western Australian approval that may be required.

Commonwealth policy and guidance

The EPA had regard to the following relevant Commonwealth guidelines, policies and plans during its assessment:

- World Heritage List – Ningaloo Coast (IUCN 2011)
- *Australian Heritage Database – The Ningaloo Coast* (Department of Agriculture, Water and the Environment 2010)
- *Marine bioregional plan for the North-west Marine Region* (Department of Sustainability, Environment, Water Population and Communities 2012).
- *Recovery Plan for Marine Turtles in Australia* (Department of the Environment and Energy 2017)
- *National Light Pollution Guidelines for Wildlife including Marine Turtles, Seabirds and Migratory Shorebirds* (Commonwealth of Australia 2020)
- Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia's coasts and oceans (Department of the Environment and Energy 2018)
- Conservation Advice *Petrogale lateralis lateralis* black-flanked rock-wallaby (Threatened Species Scientific Committee 2016).
- *Recovery plan for five species of rock wallabies: Black-footed rock wallaby (Petrogale lateralis), Rothschild rock wallaby (Petrogale rothschildi), Short-eared*

rock wallaby (Petrogale brachyotis), Monjon (Petrogale burbidgei) and Nabarlek (Petrogale concinna) (Pearson 2013)

- *Threat abatement plan for competition and land degradation by rabbits* (Department of the Environment and Energy 2016)
- *Threat abatement plan for predation by the European red fox* (Department of the Environment, Water, Heritage and the Arts 2008a)
- *Threat abatement plan for competition and land degradation by unmanaged goats* (Department of the Environment, Water, Heritage and the Arts 2008b).

EPA assessment

Listed threatened species and communities and listed migratory species

Listed threatened species and listed migratory species that occur or may occur in the proposal area include:

- marine turtles (loggerhead, green, hawksbill, flatback and leatherback turtles) – listed as threatened and/or migratory
- black-flanked rock wallaby (*Petrogale lateralis*) – listed as threatened
- Australian fairy tern (*Sternula nereis nereis*) – listed as threatened
- subterranean fauna – listed as threatened (cave gudgeon (*Milyeringa veritas*) and blind cave eel (*Ophisternon candidum))*
- osprey (*Pandion haliaetus)* – listed as migratory.

Table 13-2 of the proponent's ERD identifies all species listed under the EPBC Act that may occur in the proposal area.

Potential impacts to marine turtles, birds and the black-flanked rock wallaby are primarily due to increased artificial light. These impacts will be mitigated by applying the *National Light Pollution Guidelines for Wildlife including Marine Turtles, Seabirds and Migratory Shorebirds* (Commonwealth of Australia 2020) through an environmental management plan to ensure no detectable impact on nesting turtles, and to minimise impacts to birds and black-flanked rock wallaby. These mitigation measures are consistent with the requirements of the policy and guidance documents listed above.

The potential impacts to subterranean fauna are primarily a result of groundwater drawdown, reinjection of saline reject water from the reverse osmosis plant and irrigation of nutrient rich wastewater from the wastewater treatment plant. These have been mitigated by limiting the volume of groundwater drawdown, ensuring saline reinjection will not intrude in the brackish lens, and ensuring salinity profiles and treated wastewater will have no adverse impacts on groundwater quality when compared to baseline.

The assessment of the potential impacts to the listed and migratory species is discussed in section 2.2 subterranean fauna and inland waters, section 2.3 marine fauna, and in section 4 of this report.

World Heritage property

The World Heritage Area was inscribed onto the World Heritage List in 2011 as it met two of the listing criteria:

- Criterion (vii) contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance.
- 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 proposal is adjacent to the World Heritage Area, which includes the Lighthouse Bay Area. The proposal may impact the OUV of the World Heritage Area and impacts have been mitigated through:

- ensuring resort lighting does not have a detectable impact on marine turtle nesting
- minimising the amount of groundwater drawdown and impacts to groundwater quality and availability to ensure that impacts to subterranean fauna are unlikely to be significant
- minimising indirect impacts of resort visitors, particularly during turtle breeding, through visitor education and interpretation
- ensuring the resort's visual impact is appropriately designed to ensure there is unlikely to be an impact to the land and seascapes.

The assessment of impacts to the World Heritage Area is discussed in section 2.2 subterranean fauna and inland waters factor (as it relates to criterion (x)), section 2.3 marine fauna (as it relates to criterion (x)), and section 2.4 social surroundings (as it relates to criterion (vii)), and in section 4 of this report.

National Heritage Place

The Ningaloo Coast was listed a National Heritage Place in 2010 as it met five of the nine listing criteria. These criteria related to events and processes, rarity, research, principal character of a place, and creative or technical achievement. The Ningaloo Coast met the criteria based in a large part of the area's geological history, the significance of subterranean karst system and Indigenous Values.

The proposal lies within the National Heritage Place. The proposal may impact the listed values of the property and impacts have been mitigated through:

- minimising the extent of groundwater drawdown and impacts to groundwater quality and availability to ensure that impacts to subterranean fauna are unlikely to be significant
- excluding resort infrastructure and disturbance from a site of potential significance for Aboriginal cultural heritage

- developing a cultural heritage management plan to ensure that the proposal is unlikely to have a significant impact on the cultural and ethnographic values of the Traditional Owners.

The assessment of the potential impacts to the National Heritage Place is discussed in section 2.2 subterranean fauna and inland waters, section 2.4 social surroundings, and in section 4 of this report.

Commonwealth land

The proposal will not have a direct impact on Commonwealth land, however, it may impact elements of the environment of nearby Commonwealth land, being Defence equities. For the purposes of this assessment, defence equities are:

- the Naval Communication Station Harold E Holt- Areas A, B and C
- the SST
- RAAF Base Learmonth (combined RAAF Air Base/ civilian airport)
- Learmonth Solar Observatory.

As identified in correspondence with the Department of Climate Change, Energy, the Environment and Water regarding an assessment approach, the potential impacts to defence equities which would be assessed were the values associated with dark and clear skies.

The proposal has the potential to impact dark and clear skies through artificial lighting used in the resort and dust generation, particularly during construction. The proponent has applied the *National Light Pollution Guidelines for Wildlife including Marine Turtles, Seabirds and Migratory Shorebirds* (Commonwealth of Australia 2020), which the EPA considers is also likely to mitigate impacts to dark and clear sky values. The proponent has also prepared an environmental management plan to ensure no change to dark and clear sky quality at the SST.

The assessment of the potential impacts to the Commonwealth Land is discussed in section 2.4 social surroundings under the heading dark and clear skies, and in section 4 of this report.

Summary

The EPA recommends the following environmental conditions to minimise impacts on MNES:

- condition B2-1 which requires the proponent to implement the proposal to meet outcomes related to groundwater abstraction and wastewater disposal to avoid impacts to subterranean fauna (MNES values: National Heritage Place, World Heritage property and listed threatened species).
- condition B2-2 which requires the proponent to update the IWQMP in consultation with Nganhurra Thanardi Garrbu Aboriginal Corporation to minimise impacts to cultural and spiritual values (MNES value: National Heritage Place)

- condition B3-1 and B3-2 which requires the proponent to implement the proposal such that no detectable difference in adult marine turtle and marine turtle hatchling orientation (misorientation or disorientation), no increase in stranding or mortality rate of adult marine turtles or marine turtle hatchlings, and no adverse impact to adult marine turtle nesting utilisation (MNES values: listed species and World Heritage property)
- condition B3-3 which requires the implementation of the ALMP and TMP to marine turtles following further consultation with DBCA (MNES values: listed species and World Heritage property)
- conditions B3-3, B4-1(1) and B4-4 which requires the proponent implement the proposal to ensure no change to dark sky quality at the SST and the implementation of the ALMP to avoid impacts to defence equities, and to conduct ongoing consultation with the Department of Defence (MNES value: Commonwealth land)
- conditions B4-1(2), B4-1(3) and B4-2 which requires the proponent to implement the proposal to ensure no interruption of access and to avoid and minimise impacts to cultural heritage of the Yinggarda, Baiyungu and Thalanyji Traditional Owners, and the implementation of cultural heritage management plan to avoid and minimise impacts on Aboriginal cultural heritage (MNES value: National Heritage Place).

The EPA's view is that the impacts from the proposal on the above-listed MNES are therefore not expected to result in an unacceptable or unsustainable impact on any matters of MNES.

5 Recommendations

The EPA has taken the following into account in its assessment of the proposal:

- environmental values which may be significantly affected by the proposal
- assessment of key environmental factors, separately and holistically (this has included considering cumulative impacts of the proposal where relevant)
- likely environmental outcomes which can be achieved with the imposition of conditions
- consistency of environmental outcomes with the EPA's objectives for the key environmental factors
- EPA's confidence in the proponent's proposed mitigation measures
- whether other statutory decision-making processes can mitigate the potential impacts of the proposal on the environment
- principles of the EP Act.

The EPA recommends that the proposal may be implemented subject to the conditions recommended in Appendix A.

6 Other advice

The EPA may, if it sees fit, include other information, advice or recommendations relevant to the environment in its assessment reports, even if that information has not been taken into account by the EPA in its assessment of a proposal.

The EPA provides the following information for consideration by the Minister.

- The EPA notes that the proponent is not proposing to increase visitor capacity of the resort, but rather replace and redevelop the existing facilities. The EPA also notes that visitor accommodation facilities have been in operation in this location for over 30 years.
- However, inappropriate visitor behaviour and interactions (more generally) can have direct and indirect impacts on the natural values of adjacent areas such as the Jurabi Coastal Park and the North West Cape, including for nesting turtles and turtle hatchlings and for nesting seabirds. This is an ongoing and cumulative impact, an existing threat and pressure, and forms part of the visitor management framework managed by the DBCA and the Shire of Exmouth.
- The EPA recognises that while the proponent can ensure educational and interpretive materials are available to visitors of the resort to minimise impacts to adjacent areas, visitor interactions are beyond the ability of the proponent to control once they leave the development envelope. There is, however, potential to improve access management to sites adjacent to the development, noting these would require separate assessment and approval. Improved access management may reduce some of these indirect impacts, such as ensuring that the introduction of weeds and the degradation of vegetation are minimised and managed.
- In assessing the indirect impacts that visitor pressure from the proposal may have on Jurabi Coastal Park, the EPA has had regard to the responsibility of the DBCA to protect areas most susceptible to human disturbance (DPAW, 2009). This includes the DBCA's responsibility to restrict public access and wildlife interactions where necessary so that conservation values are protected. The EPA expects the DBCA and the Shire of Exmouth's management will remain adequately resourced and they are commensurate with the level of visitation from this proposal. If they are not, then the EPA recommends that the Minister ensures that DBCA are adequately resourced to ensure that management and surveillance are provided to address the visitor pressures on conservation values, including threatened species such as marine turtles and black-flanked rock wallaby, and the significant natural values of the World Heritage Area. In summary, the EPA has had regard to the regulatory responsibility of the DBCA and the Shire of Exmouth in managing visitor pressures in the Jurabi Coastal Park and other nearby sensitive areas.
- In this particular circumstance, and given the values of the adjacent areas, the EPA strongly recommends that the proponent's draft VMP (Pentium Water 2023), particularly the sections referring to management outside the development envelope, be further refined in consultation with the DBCA, the Shire of Exmouthand the Nganhurra Thanardi Garrbu Aboriginal Corporation to ensure:

  - it is consistent with the *Jurabi and Bundegi Coastal Parks and Muiron Islands Management Plan* (that is, formalised access points/ pathways and foreshore), contains measurable targets and protects the World Heritage Area values. The EPA recommends this should occur prior to the commencement of operations when visitor pressures commence
  - information about nearby reserve values be considered for inclusion in the VMP, including, but not limited to, the zoning scheme of the Ningaloo Marine Park and permitted uses
  - guest education on appropriate interactions with the local dingo population are included as it is considered especially important, noting that habituated animals may become aggressive towards people.
- DBCA has recommended that detailed concept designs for access paths are submitted for consideration by the relevant agencies as soon as practicable, and that consideration be given to their inclusion in the VMP. In this regard, the EPA recommends ongoing and continual engagement between the proponent and adjacent land managers (DBCA and the Shire of Exmouth) on ways to coordinate management and ongoing surveillance to minimise and mitigate impacts to ensure the values of the World Heritage Area, marine park and coastal parks are not adversely impacted.
- The EPA notes that the Yardie Creek Realignment Project has been terminated, and direct beach access is no longer being proposed. The EPA expects that any other development that may provide direct connection (for example a pedestrian bridge over the road) will need to be referred to the EPA for consideration.

Appendix A: Recommended conditions

Section 44(2)(b) of *Environmental Protection Act 1986* specifies that the EPA's report must set out (if it recommends that implementation be allowed) the conditions and procedures, if any, to which implementation should be subject. This appendix contains the EPA's recommended conditions and procedures.

Recommended Environmental Conditions

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED
***(Environmental Protection Act 1986*)**

NINGALOO LIGHTHOUSE RESORT PROJECT

Proposal:	Proposed redevelopment of the Ningaloo Lighthouse Holiday Park, within Lot 2 and Lot 557 Yardie Creek Road, North West Cape, and includes associated infrastructure (including the borefield). The proposal comprises the construction of new visitor accommodation; the construction of associated ancillary facilities (i.e., staff accommodation, power supply infrastructure, water supply and treatment, wastewater treatment and reuse, and replacement service station (vehicle refuelling) etc.); refurbishment of the Vlamingh Head Lighthouse Quarters (a part of State Heritage Place ID: 00837); and minor works outside of the accommodation areas, including pathways, vehicle access, shades structures and service corridors and enclosures.
Proponent:	Z1Z Resorts Pty Ltd Australian Company Number 618 479 593
Proponent address:	171-173 Mounts Bay Road PERTH WA 6000
Assessment number:	2301

Report of the Environmental Protection Authority: 1737

Introduction: Pursuant to section 45 of the *Environmental Protection Act 1986,* it has been agreed that the proposal entitled Ningaloo Lighthouse Resort Project described in the 'Proposal Content Document, Revision 1' of November 2021, may be implemented and that the implementation of the proposal is subject to the following implementation conditions and procedures:

Conditions and procedures:

Part A: Proposal extent

Part B: Environmental outcomes, prescriptions and objectives

Part C: Environmental management plans and monitoring

Part D: Compliance and other conditions

PART A: PROPOSAL EXTENT

A1 Limitations and Extent of Proposal

A1-1 The proponent must ensure that the proposal is implemented in such a manner that the following limitations or maximum extents / capacities / ranges are not exceeded:

Proposal element	Location	Maximum extent
Physical elements		
Development envelope and disturbance footprint	Figure 1	Total disturbance footprint, including the existing facility, of up to 13.63 hectares within a 45.34 hectare development envelope.
Direct disturbance of native vegetation	Figure 1	3.98 hectares, including up to 3.28 hectares of ***Banksia ashybi* and *Daviesia pleurophylla* shrubland**
Operational elements		
Groundwater abstraction	-	Groundwater abstraction of up to 72 **ML/year**.
Treated wastewater irrigation	-	Irrigation of up to 40,000 **kL/year** of tertiary treated wastewater to landscaped areas (open space, gardens) within the development envelope.
Proposal life	-	55 years

PART B – ENVIRONMENTAL OUTCOMES, PRESCRIPTIONS AND OBJECTIVES

B1 Flora and Vegetation

B1-1 The proponent must ensure the implementation of the proposal does not result in:

(1) **adverse impacts** to native vegetation within 50 metres outside of the development envelope.

B1-2 The proponent shall undertake weed control and management during construction and operations to prevent the introduction or spread of **environmental weeds**.

B2 Subterranean Fauna and Inland Waters

B2-1 The proponent must ensure the implementation of the proposal achieves the following environmental outcomes:

(1) **groundwater quality** affected by the irrigation of wastewater from the wastewater treatment plant shall not exceed the 80th percentile of **suitable baseline data**, derived consistent with the methodology in the **National Water Quality Guidelines**;

(2) **groundwater drawdown** at any one individual **groundwater monitoring bore** should be no more than 0.6 metres or more than the predicted extents demonstrated in the Inland Water Quality Management Plan (Version 2, Reference number: 60294/142,836);

(3) the **salinity profiles** measured at any individual **groundwater monitoring bore** does not significantly deviate from the **salinity profiles** measured at suitable reference sites for the same period; and

(4) no change to the salinity of the brackish lens within the development envelope as a result of any brine reinjection program.

B2-2 The proponent must review and update the Inland Water Quality Management Plan (Version 2, Reference number: 60294/142,836), in consultation with the Nganhurra Thanardi Garrbu Aboriginal Corporation, to satisfy the requirements of condition C4 and demonstrate how achievement of the environmental outcomes in condition B2-1(2), condition B2-1(3) and condition B2-1(4) will be monitored and substantiated, and submit it to the **CEO**.

B3 Marine Fauna

B3-1 The proponent must ensure the implementation of the proposal achieves the following environmental outcome:

(1) no **detectable** difference in adult marine turtle or marine turtle hatchling orientation (no misorientation or disorientation) in the **Lighthouse Bay Area** compared to baseline.

B3-2 The proponent must ensure the implementation of the proposal achieves the following environmental objectives:

(1) no increase in **strandings** or mortality rate of adult marine turtles or marine turtle hatchlings in the **Lighthouse Bay Area** compared to baseline; and

(2) no **adverse impacts** to adult marine turtle **nesting utilisation** in the **Lighthouse Bay Area** compared to baseline.

B3-3 The proponent must review and update, in consultation with the Department of Biodiversity, Conservation and Attractions, the Ningaloo Lighthouse Resort Project Artificial Light Management Plan (Rev 5, Document reference 60294) and the Ningaloo Lighthouse Resort Project Turtle Management Plan (Rev 2, Document reference 60294/148,970), to demonstrate how the marine fauna outcome in condition B3-1 will be monitored and substantiated, how the marine fauna environmental objectives in condition B3-2 will be achieved, and satisfies the requirements of conditions C4 and condition C5, and submit it to the **CEO**.

B4 Social Surroundings

B4-1 The proponent must ensure the implementation of the proposal achieves the following environmental outcomes:

(1) no change to **dark and clear sky quality** detected at the Space Surveillance Telescope;

(2) subject to reasonable health and safety requirements, no interruption of ongoing access to land utilised for traditional use or custom by the Yinggarda, Baiyungu and Thalanyji People; and

(3) no disturbance to the **sensitive dune area**.

B4-2 The proponent must implement the proposal to meet the following environmental objectives:

(1) avoid, where practical and otherwise minimise direct disturbance to **Aboriginal cultural heritage** sites;

(2) avoid, where practical and otherwise minimise indirect impacts to **Aboriginal cultural heritage**, including to the cultural values associated with groundwater, within and surrounding the development envelope; and

(3) ongoing consultation and engagement with Traditional Owners about achievement of the outcomes in condition B4-1(2) and condition B4-1(3), and objectives in condition B4-2 for the life of the proposal.

B4-3 The proponent must, in consultation with Nganhurra Thanardi Garrbu Aboriginal Corporation, prepare an environmental management plan that demonstrates how achievement of the social surroundings environmental outcomes in

condition B4-1(2) and condition B4-1(3) will be monitored and substantiated, how the social surroundings objective in condition B4-2 will be achieved, and satisfies the requirements of conditions C4 and C5, and submit it to the **CEO**.

B4-4 The proponent must undertake ongoing consultation for the life of the proposal with the Department of Defence regarding the achievement the environmental outcome in condition B4-1(1).

PART C – ENVIRONMENTAL MANAGEMENT PLANS AND MONITORING

C1 Environmental Management Plans: Conditions Related to Commencement of Implementation of the Proposal

C1-1 The proponent must not undertake:

(1) **groundwater abstraction** until the **CEO** has confirmed in writing that the environmental management plan required by condition B2-2 meets the requirements of that condition and condition C4;

(2) **commencement of operations** until the **CEO** has confirmed in writing that the environmental management plans required by condition B3-3 meets the requirements of that condition and condition C4 and condition C5; and

(3) **groundwater abstraction** until the **CEO** has confirmed in writing that the environmental management plan required by condition B4-3 meets the requirements of that condition and condition C4 and condition C5.

C2 Environmental Management Plans: Conditions Relating to Approval, Implementation, Review and Publication

C2-1 Upon being required to implement an environmental management plan under Part B, or after receiving notice in writing from the **CEO** under condition C1-1 that the environmental management plan(s) required in Part B satisfies the relevant requirements, the proponent must:

(1) implement the most recent version of the **confirmed** environmental management plan; and

(2) continue to implement the **confirmed** environmental management plan referred to in condition C2-1(1), other than for any period which the **CEO** confirms by notice in writing that it has been demonstrated that the relevant requirements for the environmental management plan have been met, or are able to be met under another statutory decision-making process, in which case the implementation of the environmental management plan is no longer required for that period.

C2-2 The proponent:

(1) may review and revise a **confirmed** environmental management plan provided it meets the relevant requirements of that environmental management plan, including any consultation that may be required when preparing the environmental management plan; and

(2) must review and revise a **confirmed** environmental management plan and ensure it meets the relevant requirements of that environmental management plan, including any consultation that may be required when preparing the environmental management plan, as and when directed by the **CEO**.

C2-3 Despite condition C2-1, but subject to conditions C2-4 and C2-5, the proponent may implement minor revisions to an environmental management plan if the revisions will not result in new or increased **adverse impacts** to the environment or result in a risk to the achievement of the limits, outcomes or objectives which the environmental management plan is required to achieve.

C2-4 If the proponent is to implement minor revisions to an environmental management plan under condition C2-3, the proponent must provide the **CEO** with the following at least twenty (20) business days before it implements the revisions:

(1) the revised environmental management plan clearly showing the minor revisions;

(2) an explanation of and justification for the minor revisions; and

(3) an explanation of why the minor revisions will not result in new or increased **adverse impacts** to the environment or result in a risk to the achievement of the limits, outcomes or objectives which the environmental management plan is required to achieve.

C2-5 The proponent must cease to implement any revisions which the **CEO** notifies the proponent (at any time) in writing may not be implemented.

C2-6 **Confirmed** environmental management plans, and any revised environmental management plans under condition C2-4(1), must be published on the proponent's website and provided to the **CEO** in electronic form suitable for on-line publication by the Department of Water and Environmental Regulation within twenty (20) business days of being implemented, or being required to be implemented (whichever is earlier).

C3 Conditions Related to Monitoring

C3-1 The proponent must undertake monitoring capable of:

(1) substantiating whether the proposal limitations and extents in Part A are exceeded; and

(2) **detecting** and substantiating whether the environmental outcomes identified in Part B are achieved (excluding any environmental outcomes in Part B where an environmental management plan is expressly required to monitor achievement of that outcome).

C3-2 The proponent must submit as part of the Compliance Assessment Report required by condition D2, a compliance monitoring report that:

(1) outlines the monitoring that was undertaken during the implementation of the proposal;

(2) identifies why the monitoring was capable of substantiating whether the proposal limitation and extents in Part A are exceeded;

(3) for any environmental outcomes to which condition C3-1(2) applies, identifies why the monitoring was scientifically robust and capable of **detecting** whether the environmental outcomes in Part B are met;

(4) outlines the results of the monitoring;

(5) reports whether the proposal limitations and extents in Part A were exceeded and (for any environmental outcomes to which condition C3-1(2) applies) whether the environmental outcomes in Part B were achieved, based on analysis of the results of the monitoring; and

(6) reports any actions taken by the proponent to remediate any potential non-compliance.

C4 Environmental Management Plans: Conditions Relating to Monitoring and Adaptive Management for Outcomes Based Conditions

C4-1 The environmental management plans required under condition B2-2, condition B3-3 and condition B4-3 must contain provisions which enable the substantiation of whether the relevant outcomes of those conditions are met, and must include:

(1) **threshold criteria** that provide a limit beyond which the environmental outcomes are not achieved;

(2) **trigger criteria** that will provide an early warning that the environmental outcomes are not likely to be met;

(3) monitoring parameters, sites, control/reference sites, methodology, timing and frequencies which will be used to measure **threshold criteria** and **trigger criteria**. Include methodology for determining alternate monitoring sites as a contingency if proposed sites are not suitable in the future;

(4) baseline data;

(5) data collection and analysis methodologies;

(6) adaptive management methodology;

(7) **contingency measures** which will be implemented if **threshold criteria** or **trigger criteria** are not met; and

(8) reporting requirements.

C4-2 The environmental management plan required under condition B2-2 is also required to include:

(1) ongoing monitoring of **salinity profiles**; and

(2) timing the monitoring of **groundwater drawdown** and **salinity profiles** to occur at the end of peak visitation and after recharge events.

C4-3 The environmental management plans required under condition B3-3 is also required to include:

(1) submission of the monitoring results to the Department of Biodiversity, Conservation and Attractions.

C4-4 Without limiting condition C3-1, failure to achieve an environmental outcome, or the exceedance of a **threshold criteria**, regardless of whether threshold **contingency measures** have been or are being implemented, represents a non-compliance with these conditions.

C5 Environmental Management Plans: Conditions Related to Management Actions and Targets for Objective Based Conditions

C5-1 The environmental management plans required under condition B3-3 and condition B4-3 must contain provisions which enable the achievement of the relevant objectives of those conditions and substantiation of whether the objectives are reasonably likely to be met, and must include:

(1) **management actions**;

(2) **management targets**;

(3) **contingency measures** if **management targets** are not met; and

(4) reporting requirements.

C5-2 The environmental management plan required under condition B4-3 is also required to include:

(1) consultation regarding the risks and mitigation measures required for marine turtles.

C5-3 Without limiting condition C2-1, the failure to achieve an environmental objective, or implement a **management action**, regardless of whether **contingency measures** have been or are being implemented, represents a non-compliance with these conditions.

PART D – COMPLIANCE, TIME LIMITS, AUDITS AND OTHER CONDITIONS

D1 Non-compliance Reporting

D1-1 If the proponent becomes aware of a potential non-compliance, the proponent must:

(1) report this to the **CEO** within seven (7) days;

(2) implement **contingency measures**;

(3) investigate the cause;

(4) investigate environmental impacts;

(5) advise rectification measures to be implemented;

(6) advise any other measures to be implemented to ensure no further impact; and

(7) provide a report to the **CEO** within twenty-one (21) days of being aware of the potential non-compliance, detailing the measures required in conditions D1-1(2) to D1-1(6) above.

D1-2 Failure to comply with the requirements of a condition, or with the content of an environmental management required under a condition, constitutes a non-compliance with these conditions, regardless of whether the **contingency measures**, rectification or other measures in condition D1-1 above have been or are being implemented.

D2 Compliance Reporting

D2-1 The proponent must provide an annual Compliance Assessment Report to the **CEO** for the purpose of determining whether the implementation conditions are being complied with.

D2-2 Unless a different date or frequency is approved by the **CEO**, the first annual Compliance Assessment Report must be submitted within fifteen (15) months of the date of this Statement, and subsequent plans must be submitted annually from that date.

D2-3 Each annual Compliance Assessment Report must be endorsed by the proponent's Chief Executive Officer, or a person approved by proponent's Chief Executive Officer to be delegated to sign on the Chief Executive Officer's behalf.

D2-4 Each annual Compliance Assessment Report must:

(1) state whether each condition of this Statement has been complied with, including:

(a) exceedance of any proposal limits and extents;

(b) achievement of environmental outcomes;

(c) achievement of environmental objectives;

(d) requirements to implement the content of environmental management plans;

(e) monitoring requirements;

(f) implement **contingency measures**;

(g) requirements to implement adaptive management; and

(h) reporting requirements;

(2) include the results of any monitoring (inclusive of any raw data) that has been required under Part C in order to demonstrate that the limits in Part A, and any outcomes or any objectives are being met;

(3) provide evidence to substantiate statements of compliance, or details of where there has been a non-compliance;

(4) include the corrective, remedial and preventative actions taken in response to any potential non-compliance;

(5) be provided in a form suitable for publication on the proponent's website and online by the Department of Water and Environmental Regulation; and

(6) be prepared and published consistent with the latest version of the Compliance Assessment Plan required by condition D2-5 which the **CEO** has confirmed by notice in writing satisfies the relevant requirements of Part C and Part D.

D2-5 The proponent must prepare a Compliance Assessment Plan which is submitted to the **CEO** at least six (6) months prior to the first Compliance Assessment Report required by condition D2-2, or prior to implementation of the proposal, whichever is sooner.

D2-6 The Compliance Assessment Plan must include:

(1) what, when and how information will be collected and recorded to assess compliance;

(2) the methods which will be used to assess compliance;

(3) the methods which will be used to validate the adequacy of the compliance assessment to determine whether the implementation conditions are being complied with;

(4) the retention of compliance assessments;

(5) the table of contents of Compliance Assessment Reports, including audit tables; and

(6) how and when Compliance Assessment Reports will be made publicly available, including usually being published on the proponent's website within sixty (60) days of being provided to the **CEO**.

D3 Contact Details

D3-1 The proponent must notify the **CEO** of any change of its name, physical address or postal address for the serving of notices or other correspondence within twenty-eight (28) days of such change. Where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State.

D4 Time Limit for Proposal Implementation

D4-1 The proposal must be substantially commenced within five (5) years from the date of this Statement.

D4-2 The proponent must provide to the **CEO** documentary evidence demonstrating that they have complied with condition D4-1 no later than fourteen (14) days after the expiration of period specified in condition D4-1.

D4-3 If the proposal has not been substantially commenced within the period specified in condition D4-1, implementation of the proposal must not be commenced or continued after the expiration of that period.

D5 Public Availability of Data

D5-1 Subject to condition D5-2, within a reasonable time period approved by the **CEO** upon the issue of this Statement and for the remainder of the life of the proposal, the proponent must make publicly available, in a manner approved by the **CEO**, all validated environmental data collected before and after the date of this Statement relevant to the proposal (including sampling design, sampling methodologies, monitoring and other empirical data and derived information products (e.g. maps)), environmental management plans and reports relevant to the assessment of this proposal and implementation of this Statement.

D5-2 If:

(1) any data referred to in condition D6-1 contains trade secrets; or

(2) any data referred to in condition D6-1 contains particulars of confidential information (other than trade secrets) that has commercial value to a person that would be, or could reasonably be expected to be, destroyed or diminished if the confidential information were published,

the proponent may submit a request for approval from the **CEO** to not make this data publicly available and the **CEO** may agree to such a request if the **CEO** is satisfied that the data meets the above criteria.

D5-3 In making such a request the proponent must provide the **CEO** with an explanation and reasons why the data should not be made publicly available.

D6 Independent Audit

D6-1 The proponent must arrange for an independent audit of compliance with the conditions of this statement, including achievement of the environmental outcomes and/or the environmental objectives and/or environmental performance with the conditions of this statement, as and when directed by the **CEO**.

D6-2 The independent audit must be carried out by a person with appropriate qualifications who is nominated or approved by the **CEO** to undertake the audit under condition D6-1.

D6-3 The proponent must submit the independent audit report with the Compliance Assessment Report required by condition D2, or at any time as and when directed in writing by the **CEO**. The audit report is to be supported by credible evidence to substantiate its findings.

D6-4 The independent audit report required by condition D6-1 is to be made publicly available in the same timeframe, manner and form as a Compliance Assessment Report, or as otherwise directed by the **CEO**.

Table 1: Abbreviations and definitions

Acronym or abbreviation	Definition or term
Aboriginal cultural heritage	Means the tangible and intangible elements that are important to the Aboriginal people of the State, and are recognised through social, spiritual, historical, scientific or aesthetic values, as part of Aboriginal tradition to the extent they directly affect or are affected by physical or biological surroundings.
Adverse impact / adversely impacted	Negative change that is neither trivial nor negligible that could result in a reduction in health, diversity or abundance of the receptor/s being impacted, or a reduction in environmental value. Adverse impacts can arise from direct or indirect disturbance. Impacts from the proposal can include (but not limited to) hydrological change, spread or introduction of **environmental weeds**, altered fire regimes, introduction or spread of disease, artificial light, changes in erosion/deposition/accretion including from dust and edge effects.
***Banksia ashybi* and *Daviesia pleurophylla* shrubland**	The area shown on Figure 1 as this community and as defined by spatial data in Schedule 1.
CEO	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the *Environmental Protection Act 1986*, or the **CEO's** delegate.
Clearing	Death, destruction, removal, severing or doing substantial damage to native vegetation considered in 'Good', 'Very Good' or 'Excellent' condition as identified in Ecoscape 2018, *Ningaloo Lighthouse Development Environmental Surveys*, North Fremantle, WA.
Commencement of operations	The point in time where the resort is utilising artificial lights and/or accepts guests and involves artificial lighting.
Confirmed	In relation to a plan required to be made and submitted to the **CEO**, means, at the relevant time, the plan that the **CEO** confirmed, by notice in writing, meets the requirements of the relevant condition. In relation to a plan required to be implemented without the need to be first submitted to the **CEO**, means that plan until it is revised, and then means, at the relevant time, the plan that the **CEO** confirmed, by notice in writing, meets the requirements of the relevant condition.
Contingency measures	Planned actions for implementation if it is identified that an environmental outcome, environmental objective, threshold criteria or management target are likely to be, or are being, exceeded. Contingency measures include changes to operations

Acronym or abbreviation	Definition or term
	or reductions in disturbance to reduce impacts and must be decisive actions that will quickly bring the impact to below any relevant threshold, management target and to ensure that the environmental outcome and/or objective can be met.
Dark and clear sky quality	Sky quality required for effective operation of the Space Surveillance Telescope, which may be affected by artificial light and atmospheric pollution from impacts including dust.
Detecting/ Detectable	The smallest statistically discernible effect size that can be achieved with a monitoring strategy designed to achieve a statistical power value of at least 0.8 or an alternative value as determined by the **CEO**.
Environmental weeds	Any plant declared under section 22(2) of the *Biosecurity and Agriculture Management Act 2007*, any plant listed on the Weeds of National Significance List and any weeds listed on the Department of Biodiversity, Conservation and Attractions' Pilbara Impact and Invasiveness Ratings list, as amended or replaced from time to time.
Groundwater abstraction	The extraction of groundwater for operational activities.
Groundwater drawdown	Lowering of the baseline water table as a result of groundwater abstraction, as measured by standing water level in metres Australian Height Datum.
Groundwater monitoring bore	A bore utilised for monitoring of groundwater, as identified in the **confirmed** Inland Water Quality Management Plan required by condition B2-2, or at any other bore required by the **CEO**.
Groundwater recharge	The period of time where, following seasonal rain, the extent of the brackish lens is likely to be largest.
Groundwater quality	Nutrient parameters in groundwater that maybe affected by irrigation of wastewater from the wastewater treatment plant (as measured by Total Phosphorous, Total Nitrogen, and oxides of nitrogen and ammonium)
kL/year	Kilo litres per year
Lighthouse Bay Area	The area defined by the Department of Biodiversity, Conservation and Attractions for the Ningaloo Turtle Program, which can be described as beaches located between Hunters and Mildura Wreck East.
Management action	The identified actions implemented with the intent of to achieving the environmental objective.
Management target	A type of indicator to evaluate whether an environmental objective is being achieved.
ML/year	Mega litres per year

Acronym or abbreviation	Definition or term
National Water Quality Guidelines	Guidelines for water quality management, available at www.waterquality.gov.au/guidelines, as amended or updated from time to time.
Nesting utilisation	The distribution, relative abundance and density of each species of the nesting effort and nesting success within the **Lighthouse Bay Area** for each species of adult marine turtle.
Salinity profile	The range or gradient of salinity within a groundwater bore.
Sensitive dune area	Area identified as the 'sensitive dune' in the *Final report regarding the archaeological and ethnographic site identification heritage survey of the proposed Ningaloo Lighthouse Holiday Park expansion undertaken by the Gnulli representatives and Yamatji Marlpa Aboriginal Corporation for Northwest Resorts* December 2019.
Strandings	A marine turtle that is alive on the nesting beach or areas adjacent to the nesting beach and that has been unable to return to the water.
Suitable baseline data	Data collected prior to the implementation of the proposal that can be justified as representing an unimpacted environmental state.
Trigger criteria	Indicators that have been selected for monitoring to provide a warning that if exceeded the environmental outcome may not be achieved. They are intended to forewarn of the approach of the threshold criteria and trigger response actions.
Threshold criteria	The indicators that have been selected to represent limits of impact beyond which the environmental outcome is not being met.

Figures (attached)

Figure 1 Ningaloo Lighthouse Resort development envelope and location of *Banksia ashybi* and *Daviesia pleurophylla* shrubland (This map is a representation of the co-ordinates referenced in Schedule 1)

Figure 2 Groundwater bores for the proposal

Figure 1 Ningaloo Lighthouse Resort development envelope and location of *Banksia ashybi* and *Daviesia pleurophylla* shrubland

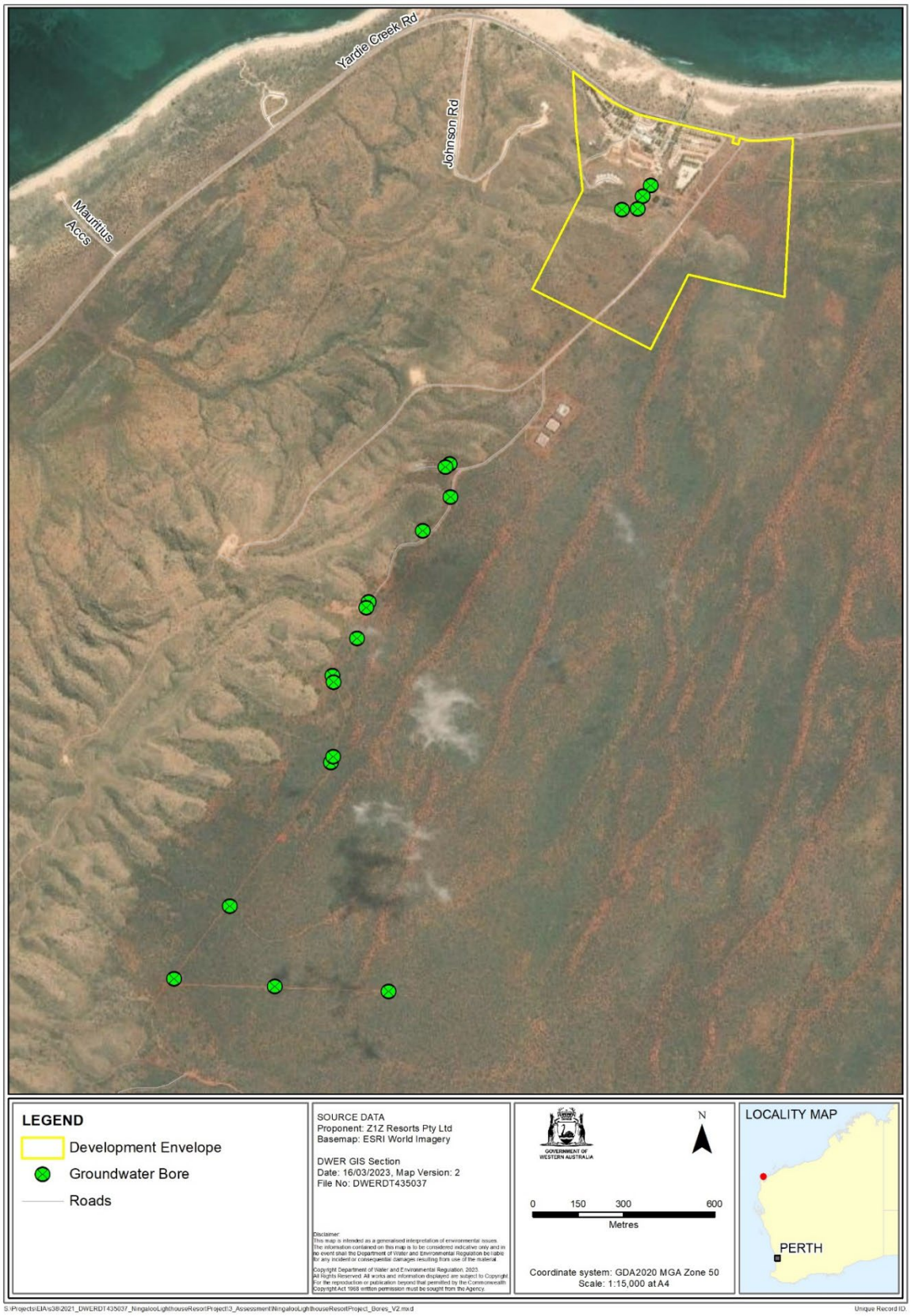

Figure 2 Groundwater bores for the proposal

Schedule 1

All coordinates are in metres, listed in Map Grid of Australia Zone 50 (MGA Zone 50), datum of Geocentric Datum of Australia 2020 (GDA20).

Spatial data depicting the figures are held by the Department of Water and Environmental regulation. Record no. DWERDT50916.

Appendix B: Decision-making authorities

Table B1: Identified relevant decision-making authorities for the proposal

Decision-Making Authority	Legislation (and approval)
1. Minister for Aboriginal Affairs	*Aboriginal Heritage Act 1972* - section 18 consent to impact a registered Aboriginal heritage site)
2. Minister for Environment	*Biodiversity Conservation Act 2016* - section 40 authority to take or disturb threatened species and - section 45 authority to modify occurrence of a threatened ecological community
3. Minister for Lands	*Land Administration Act 1997* - section 91 licence to access crown land - creation of easements and other land access for proposal
4. Minister for Water	*Rights in Water and Irrigation Act 1914* - permit to take water - groundwater abstraction licence - licence to construct bores
5. Chief Dangerous Goods Officer Department of Mines, Industry Regulation and Safety	*Dangerous Goods Safety Act 2004*- storage and handling of dangerous goods
6. Presiding Member, Regional Development Assessment Panel	*Planning and Development Act 2005* - development application
7. Chief Executive Officer, Department of Water and Environmental Regulation	*Environmental Protection Act 1986* - part V works approval and licence - part V clearing permit
8. Chief Executive Officer Shire of Exmouth	*Building Act 2011* - demolition approval/ building permit

Appendix C: Environmental Protection Act principles

Table C1: Consideration of principles of the *Environmental Protection Act 1986*

EP Act principle	Consideration
1. The precautionary principle *Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.* *In application of this precautionary principle, decisions should be guided by –* *(a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and* *(b) an assessment of the risk-weighted consequences of various options.*	This principle was considered by the EPA when assessing the impacts of the proposal on marine fauna and subterranean fauna. The EPA notes that the proponent took actions to avoid and minimise impacts of the proposal. This includes ensuring light spill from the resort is as low as practicable to minimise impacts on marine turtles and the values of the World Heritage Area. The proponent has also proposed measures to ensure that impacts to subterranean fauna are unlikely to be considered significant. The EPA has recommended conditions to ensure that environmental outcomes are achieved, and that monitoring is conducted during implementation of the proposal. From its assessment of this proposal the EPA has concluded that there is no threat of serious or irreversible harm.
2. The principle of intergenerational equity *The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.*	The EPA has considered the principle of intergenerational equity in its assessment and has had particular regard to this principle in its assessment of flora and vegetation, subterranean fauna, inland waters, marine fauna and social surroundings. The EPA notes that the proponent has identified measures to avoid and minimise impacts to the key environmental factors. The EPA has considered these measures during its assessment and has recommended conditions to ensure that appropriate measures are implemented. The EPA has concluded that the environmental values will be protected, and the health, diversity and productivity of the environment will be maintained for the benefit of future generations.
3. The principles of the conservation of biological diversity and ecological integrity *Conservation of biological diversity and ecological integrity should be a fundamental consideration.*	The EPA has considered the principle of conservation of biological diversity and ecological integrity in its assessment and has had particular regard to this principle in its assessment of flora and vegetation, subterranean fauna and marine fauna, and considering the potential impacts on the World Heritage Area. The EPA has considered to what extent the potential impacts from the proposal to these environmental factors can be ameliorated, to ensure consistency with this principle. The EPA has concluded that the actions to avoid and minimise impact to flora and vegetation, subterranean fauna and marine fauna, which are also

EP Act principle	Consideration
	recommended as conditions, will likely conserve biological diversity and ecological integrity, so that environmental outcomes are achieved.
4. Principles relating to improved valuation, pricing and incentive mechanisms *(1) Environmental factors should be included in the valuation of assets and services.* *(2) The polluter pays principle — those who generate pollution and waste should bear the cost of containment, avoidance or abatement.* *(3) The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any wastes.* *(4) Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solutions and responses to environmental problems.*	In considering this principle, the EPA notes that the proponent will bear the costs relating to implementing the proposal to achieve environmental outcomes and management and monitoring of environmental impacts during construction, operation and decommissioning of the proposal. The EPA has had particular regard to this principle in considering flora and vegetation, marine fauna, inland waters and subterranean fauna.
5. The principle of waste minimisation *All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.*	The EPA has considered the principle of waste minimisation in its assessment and has had particular regard to this principle in its assessment of inland waters. The EPA notes that the proponent commits to efficiently utilising natural resources such as energy and water and minimise emissions to air including dust pollution and greenhouse gases. The EPA notes that the proponent proposes to implement an 'avoid, re-use, recycle, and safe disposal' hierarchy of waste management across all phases of the project. This includes proposed re-use of treated wastewater for toilet flushing and site irrigation to minimise the use of the limited freshwater.

Appendix D: Other environmental factors

Table D1: Evaluation of other environmental factors

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
Land			
Terrestrial fauna	• Loss of 3.98 ha of fauna habitat from clearing. • Potential indirect impacts from habitat fragmentation, weeds, altered fire regime and visitor disturbance. • Potential impacts from artificial lighting, including to black-flanked rock wallaby.	<u>Public comments</u> • survey timing was not appropriate, and additional conservation significant species would have been expected to be found • black-flanked rock wallabies have been found within closer proximity to the resort than stated in the ERD, and this proposal may affect this local population. <u>DBCA comments</u> • potential impacts to black-flanked rock wallabies, noting updated information regarding proximity and that human activities doesn't preclude use of suitable habitat by the species • cumulative impacts to black-flanked rock wallaby particularly from the Yardie Creek Road Realignment • additional fauna surveys may be warranted given the suboptimal timing of Ecoscape 2018 survey • potential indirect impacts on native fauna from the used of rodenticide for baiting rats and mice	Terrestrial fauna was identified as potential key environmental factor in the Environmental Scoping Document. However, in considering the potential impacts to terrestrial fauna, the EPA had regard to the following: • no threatened fauna were found within the development envelope • blank-flanked wallabies located in proximity to the development envelope are in areas unlikely to be accessed by resort visitors • while the Ecoscape 2018 survey was conducted in a suboptimal time of year for reptiles and a number of species considered likely to occur were not recorded, fauna habitats for conservation significant species (Priority 2 and 3 reptiles) is widespread and these species are not likely to be restricted to the development envelope or likely to be significantly impacted by the small loss of habitat • a caravan park has been operating in this location for over 30 years, and the additional loss of fauna habitat represents a small increase in a largely vegetated area • the proponent has committed to not using rodenticide, as requested by DBCA • the proponent has prepared a Visitor Management Plan, with measures to prevent inappropriate access

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
		• potential indirect impacts from the resort, such as inappropriate access to food and water sources, and from visitors to ensure appropriate visitor interactions with wildlife (e.g. no feeding, risks from dingoes etc.).	to food and water sources and a visitor education program to address potential indirect impacts, as raised by DBCA • the proposal may present an opportunity to improve potential interactions with fauna through improved education and upgrades to the facilities. Given the scale of the proposal and the extent of surrounding habitats remaining, accordingly, the EPA did not consider terrestrial fauna to be a key environmental factor at the conclusion of its assessment.
Air			
Greenhouse gas (GHG) emissions	Emissions released to the atmosphere have the potential to contribute to GHG emissions. Estimated GHG emission have been modelled as: Scope 1: 173 t CO2-e (total) Scope 2: 911 tCO2-e (annual).	Public comments • The resort should incorporate mitigation measures such as solar power and battery storage and move away from gas and electricity to minimise GHG emissions • further sustainability measures should be included. Agency comments • Nil	GHG emissions was not identified as a preliminary key environmental factor when the EPA set the level of assessment as it was considered unlikely the proposal would emit significant GHG emissions. Having regard to: • the scope 1 emissions are below the threshold for the factor guideline of 100,000 tCO2-e • the *Environmental factor guideline – Greenhouse gas emissions* (EPA 2020a) which details that GHG from a proposal will be assessed where it exceeds 100,000 tonnes of scope 1 emissions each year measured in carbon dioxide equivalents (CO2-e). The EPA considers it unlikely that the proposal would have a significant impact on GHG emissions and that the impacts to this factor are manageable. Accordingly, the EPA did not consider GHG emissions to be a key environmental factor at the conclusion of its assessment.

Appendix E: Relevant policy, guidance and procedures

The EPA had particular regard to the policies, guidelines and procedures listed below in the assessment of the proposal.

- *Environmental factor guideline – Flora and vegetation* (EPA 2016)
- *Environmental factor guideline – Greenhouse gas emissions* (EPA 2020)
- *Environmental factor guideline – Inland waters* (EPA 2018)
- *Environmental factor guideline – Marine fauna* (EPA 2016)
- *Environmental factor guideline – Social surroundings* (EPA 2016)
- *Environmental factor guideline – Subterranean fauna* (EPA 2016)
- *Environmental factor guideline – Terrestrial fauna* (EPA 2016)
- *Environmental impact assessment (Part IV Divisions 1 and 2) procedures manual* (EPA 2021a)
- *Statement of environmental principles, factors, objectives and aims of EIA* (EPA 2021c)
- *Environmental impact assessment (Part IV Divisions 1 and 2) administrative procedures 2021* (State of Western Australia 2021)
- *Technical guidance – Flora and vegetation surveys for environmental impact assessment* (EPA 2016)
- *Technical guidance – Sampling of short-range endemic invertebrate fauna* (EPA 2016)
- *Technical guidance – Subterranean fauna surveys for environmental impact assessment* (EPA 2021d)
- *Technical guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020).

Appendix F: List of submitters

7-day comment on referral

Organisations and public

- 46 public submissions were received from individuals
- 4 public submissions were received from organisations.

Government agencies

- 1 submission from a government agency was received.

Public review of proponent information

Organisations and public

- 9 public submissions were received from individuals
- 4 public submissions were received from organisations.

Government agencies

- 2 submissions from government agencies were received.

Appendix G: Assessment timeline

Date	Progress stages	Time (weeks)
30 June 2021	EPA decided to assess – level of assessment set	
14 December 2021	EPA approved Environmental Scoping Document	24
17 May 2022	EPA accepted Environmental Review Document	22
20 May 2022	Environmental Review Document released for public review	1
10 June 2022	Public review period for Environmental Review Document closed	3
8 February 2023	EPA accepted proponent's Response to Submissions	35
16 February 2023	EPA completed its assessment (s. 44(2b))	1
30 March 2023	EPA provided report to the Minister for Environment	6
4 April 2023	EPA report published	3 days
26 April 2023	Appeals period closed	3

Timelines for an assessment may vary according to the complexity of the proposal and are usually agreed with the proponent soon after the EPA decides to assess the proposal and records the level of assessment.

In this case, the EPA met its timeline objective to complete its assessment and provide a report to the Minister.

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