Murchison Hydrogen Renewables Project

Application Number: **01012** Commencement Date: **06/04/2022** Status: **Locked**

1. About the project

1.1 Project details

Project title *

Murchison Hydrogen Renewables Project

Project industry type *

Energy Generation and Supply (renewable)

Project industry sub-type

—

Estimated start date *

1/01/2025

Estimated end date *

31/12/2060

1.2 Proposed Action details

Provide an overview of the proposed action, including all proposed activities. *

Murchison Hydrogen Renewables Pty Ltd (Murchison Hydrogen Renewables) is seeking approval to develop the Murchison Hydrogen Renewables Project (the Proposal). The Proposal will use combined onshore wind and solar energy of approximately 5.2 gigawatt (GW) capacity to produce green hydrogen which will be converted to an estimated 2 Million tonnes per annum (Mtpa) of green ammonia for export to emerging green energy markets.

The Proposal comprises the following major components:

- A wind and solar farm with a combined installed capacity of up to ~5.2 GW
- A Power-to-X (PtX) facility that will use the produced green energy to create ~2 Mtpa of green ammonia
- Ammonia export facility including pipeline and export vessel mooring and product transfer infrastructure

The Proposal, when constructed, will comprise the following infrastructure components:

- Approximately 700 wind turbines with an estimated 3.7 GW installed capacity
- Approximately 10,000 ha of solar panels with an estimated 1.5 GW installed capacity
- Battery storage and transformer station
- Substation
- Desalination plant with seawater intake and brine discharge pipes
- Electrolyser
- Hydrogen storage
- Ammonia production plant (including Air separation unit)
- Ammonia chiller and storage tanks
- Cooling units
- Transmission pipework
- Marine export terminal

- Support craft facility
- Interconnection power and piping infrastructure
- Communications systems
- Civil and associated roads infrastructure
- Maintenance and support services
- Admin, control rooms and security
- Backup power and safety systems
- Water supply and distribution.
- Plant utilities

For more information, refer to Att 1-Supporting document-2022-14042022, Section 2.3, page 6.

The onshore components of the project will involve clearing of vegetation, construction of access roads and infrastructure and operation of the Power to X (PtX) plant, wind farm and solar farm. Offshore and estuarine components of the project will involve dredging, construction of marine infrastructure and operations including vessel movements. There are two site options for the Support Craft Facility - Option 1 which is coastal, within the marine environment in the Development Envelope, and Option 2 which is within the Murchison River estuary, in Kalbarri. Only one of these options will be taken forward to be developed.

Marine and estuarine construction and operational activities have the potential to both directly (through dredging and other direct disturbance) and indirectly (for example through construction and operational underwater noise, and possible sediment plumes) impact benthic communities and habitats (See Att 1-Supporting document-2022-14042022, Section 4.2.3, page 29), marine fauna (See Att 1-Supporting document-2022-14042022, Section 4.3.3, page 33), marine environmental quality (See Att 1-Supporting document-2022-14042022, Section 4.4.3, page 34), and coastal processes (See Att 1-Supporting document-2022-14042022, Section 4.5.3, page 35).

Onshore construction and operational activities has the potential to directly (through vegetation clearing and other direct disturbance) or indirectly (for example through construction and operational noise) impact flora and vegetation (See Att 1-Supporting document-2022-14042022, Section 4.6.3, page 44) and fauna (See Att 1-Supporting document-2022-14042022, Section 4.7.3, page 65).

For information on total vegetation clearing, please see Att 1-Supporting document-2022-14042022, Section 2.3.10, page 22.

For information on total benthic habitat clearing and dredging, please see Att 1-Supporting document-2022-14042022, Section 2.3.10, page 22.

Is the project action part of a staged development or related to other actions or proposals in the region?

No

What Commonwealth or state legislation, planning frameworks or policy documents are relevant to the proposed action, and how are they relevant? *

Refer to Sections 1.3, 1.5, 1.6 and 1.7 of Att 1-Supporting document-2022-14042022.

The development of the Proposed Action will require approval under the following State Legislation:

- Part IV of the Environmental Protection Act 1986 (EP Act): Murchison Hydrogen Renewables is simultaneously referring the Proposed Action to the Environmental Protection Authority (EPA) under section 38 of the EP Act.
- The Project will require a Development Approval under the local Town Planning Scheme, administered by the Shire of Northampton.

Describe any public consultation that has been, is being or will be undertaken regarding the project area, including with Indigenous stakeholders. Attach any completed consultation documentations, if relevant. *

Commencing in 2019, engagement with community members and other key stakeholders occurs via a range of channels. This has included:

- Hon Minister Alannah MacTiernan, Minister for Hydrogen Industry, and forums run by her office to provide information on the project, discuss hydrogen land tenure and undertake early consultation prior to initiating the approvals processes, through meetings, telephone discussions, emails and letters

- Government departments and decision making agencies including the EPA, Commonwealth Department of Agriculture, Water and the Environment, Department of Water and Environmental Regulation, Department of Mines, Industry Regulation and Safety, the Department of Biodiversity, Conservation and Attractions, Department of Transport – Marine, Department of Planning, Lands and Heritage, Development WA and the Department of Jobs, Tourism, Science and Innovation to provide information on the project and undertake early consultation prior to initiating the approvals processes
- The Shire of Northampton to provide information and explore planning approval requirements
- The Mid West Ports Authority to provide information and explore export facility options
- The pastoral leases of Murchison River Station to provide information on the project and seek access to land for ecological surveys as part of the environmental assessment
- Stakeholder briefings - with local, state and federal government representatives and other stakeholders occur on a regular basis. The meetings provide an opportunity for Murchison Hydrogen Renewables to update on business developments and for questions and concerns to be raised by stakeholders
- Community engagement – on-going community engagement, inviting a two-way discussion between the Proponent and local stakeholders (including Traditional Owners, local businesses)
- Dedicated working groups – run and organised by Murchison Hydrogen Renewables to inform stakeholders of project updates
- Regional stakeholders including the Mid West Chamber of Commerce and Industry, the Mid West Development Commission and Tourism WA – Geraldton to provide information on the project and undertake early consultation prior to initiating the approvals processes
- Aboriginal corporations to develop an ongoing relationship, provide project information and progress the development of an ILUA
- Kalbarri Community public information sessions to provide early project information
- Recfishwest to provide project information prior to initiating the formal approvals process
- Department of Primary Industries and Regional Development (DPIRD) – request for fisheries information in order to undertake engagement.

The Traditional Owners and determined native title holders for the area, have provided their in-principle support for the Proposal. Murchison Hydrogen Renewables and the Traditional Owners have a well-established relationship and have been engaging now for more than two years in respect of the Proposal. Murchison Hydrogen Renewables and the Traditional Owners are well progressed in their engagement with the support of the Traditional Owners' legal and other advisors, including negotiating for an Indigenous Land Use Agreement (ILUA) expected to be finalised and registered by mid-2022. The ILUA will include business, employment and training opportunities for the aboriginal groups relevant to the project area.

An Aboriginal Heritage Agreement was signed with the Traditional Owners in November 2019 (Att 4-Aboriginal Heritage Agreement-CONFIDENTIAL will not be made publicly available due to cultural sensitivity reasons.). This Agreement sets out the management of Aboriginal heritage surveys, sites, objects and other matters for the early access and studied undertaken pursuant to the section 91 licence tenure.

Murchison Hydrogen Renewables will continue to engage with relevant stakeholders throughout the environmental approval process to ensure that all concerns are addressed. This includes decision making authorities, other relevant government authorities, the local community, and environmental non-government organisations. Murchison Hydrogen Renewables is committed to building effective relationships and working transparently with all stakeholders.

For more information, refer to Att 1-Supporting document-2022-14042022, Section 3, page 23.

Murchison Hydrogen Renewables will refer an equivalent Proposal to the Environmental Protection Authority (EPA) for assessment under Part IV of the EP Act.

Should the proposed action be determined a controlled action, Murchison Hydrogen Renewables will apply for the assessment of MNES to be undertaken as part of the EPA's assessment. The EPA's assessment under the EP Act will then inform a decision by the Federal Minister for the Environment and conditions for the Action under the EPBC Act.

1.3 Identity - Referring party

Privacy Notice:

Personal information means information or an opinion about an identified individual, or an individual who is reasonably identifiable.

By completing and submitting this form, you consent to the collection of all personal information contained in this form. If you are providing the personal information of other individuals in this form, please ensure you have their consent before doing so.

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Is Referring party an organisation or business? *

Yes

Referring party organisation details

ABN	650922062
Organisation name	Murchison Hydrogen Renewables Pty Ltd as trustee for Murchison Hydrogen Renewables Project Trust
Organisation address	Level 45, 108 St Georges Terrace, Perth, 6000, Western Australia, Australia

Referring party details

Name	Amanda Le Moine
Job title	Manager, Permitting & Approvals
Phone	+61 488 022 396
Email	amm@cisc.dk
Address	Level 45, 108 St Georges Terrace, Perth, WA 6000

1.3 Identity - Person proposing to take the action

Are the Person proposing to take the action details the same as the Referring party details? *

No

Is Person proposing to take the action an organisation or business? *

Yes

Person proposing to take the action organisation details

ABN	650922062
Organisation name	Murchison Hydrogen Renewables Pty Ltd as trustee for Murchison Hydrogen Renewables Project Trust
Organisation address	Level 45, 108 St Georges Terrace, Perth, 6000, Western Australia, Australia

Person proposing to take the action details

Name	Shohan Seneviratne
Job title	CEO
Phone	+61 438 017 947
Email	sas@cisc.dk
Address	Level 45, 108 St Georges Terrace, Perth, 6000, Western Australia, Australia

Are you proposing the action as part of a Joint Venture? *

No

Are you proposing the action as part of a Trust? *

Yes

Describe the nature of the trust arrangement in relation to the proposed action. *

The proponent for this proposal is Murchison Hydrogen Renewables Pty Ltd as trustee for Murchison Hydrogen Renewables Project Trust.

Describe the Person proposing the action's history of responsible environmental management including details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the Person proposing to take the action. *

Murchison Hydrogen Renewables and CIP has a satisfactory record of responsible environmental management. CIP, the parent company of Murchison Hydrogen Renewables, has been responsible for the planning, construction and operation of renewable energy projects within their global renewable portfolio (Att 1-Supporting document-2022-14042022, Section 1.2, page 1). When developing and operating these similar projects, CIP is committed to following guiding principles from its Corporate Plan, which incorporates the mitigation hierarchy to primarily avoid and minimise environmental harm. Projects of this calibre within CIP's portfolio have/will be implemented globally, as such, they have been subject to other well established EIA processes in Europe and the Americas. CIP commits to operating under best practice principles, taking experience from each relevant EIA and transferring it to the next project.

There has been no past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the person proposing the action or the person making the application.

Murchison Hydrogen Renewables will follow the environmental policy framework of it's parent company, CIP. CIP is a financial sponsor with a Responsible Investment Policy (Att 3 - CIP Responsible Investment Policy) covering environmental topics, and the selected supplier who will construct the project (procurement not yet completed) is expected to have such policy/planning framework.

The Responsible Investment Policy involves following three key environmental guidelines:

- Properly observe relevant legal and regulatory obligations to assess and identify environmental consequences and issues
- Minimize, in accordance with good industry practice, the environmental consequences related to the construction and operations phases of underlying assets, specifically regarding the use of hazardous materials, and

- Assess the environmental impact of the project including adherence to all relevant legal and regulatory requirements as well as observance of good industry practice.

1.3 Identity - Proposed designated proponent

Are the Proposed designated proponent details the same as the Person proposing to take the action? *

Yes

Proposed designated proponent organisation details

ABN	650922062
Organisation name	Murchison Hydrogen Renewables Pty Ltd as trustee for Murchison Hydrogen Renewables Project Trust
Organisation address	Level 45, 108 St Georges Terrace, Perth, 6000, Western Australia, Australia

Proposed designated proponent details

Name	Shohan Seneviratne
Job title	CEO
Phone	+61 438 017 947
Email	sas@cisc.dk
Address	Level 45, 108 St Georges Terrace, Perth, 6000, Western Australia, Australia

1.3 Identity - Summary of allocation

Confirmed Referring party's identity

The Referring party is the person preparing the information in this referral.

ABN	650922062
Organisation name	Murchison Hydrogen Renewables Pty Ltd as trustee for Murchison Hydrogen Renewables Project Trust
Organisation address	Level 45, 108 St Georges Terrace, Perth, 6000, Western Australia, Australia
Representative's name	Amanda Le Moine
Representative's job title	Manager, Permitting & Approvals
Phone	+61 488 022 396
Email	amm@cisc.dk
Address	Level 45, 108 St Georges Terrace, Perth, WA 6000

Confirmed Person proposing to take the action's identity

The Person proposing to take the action is the individual, business, government agency or trustee that will be responsible for the proposed action.

ABN	650922062
Organisation name	Murchison Hydrogen Renewables Pty Ltd as trustee for Murchison Hydrogen Renewables Project Trust
Organisation address	Level 45, 108 St Georges Terrace, Perth, 6000, Western Australia, Australia
Representative's name	Shohan Seneviratne
Representative's job title	CEO
Phone	+61 438 017 947
Email	sas@cisc.dk
Address	Level 45, 108 St Georges Terrace, Perth, 6000, Western Australia, Australia

Confirmed Proposed designated proponent's identity

The Person proposing to take the action is the individual or organisation proposed to be responsible for meeting the requirements of the EPBC Act during the assessment process, if the Minister decides that this project is a controlled action.

Same as Person proposing to take the action information.

1.4 Payment details - Payment exemption and fee waiver

Do you qualify for an exemption from fees under EPBC Regulation 5.23 (1) (a)? *

No

Has the department issued you with a credit note? *

No

Have you applied for or been granted a waiver for full or partial fees under Regulation 5.21A? *

No

Are you going to apply for a waiver of full or partial fees under EPBC Regulation 5.21A? *

No

Would you like to add a purchase order number to your invoice? *

No

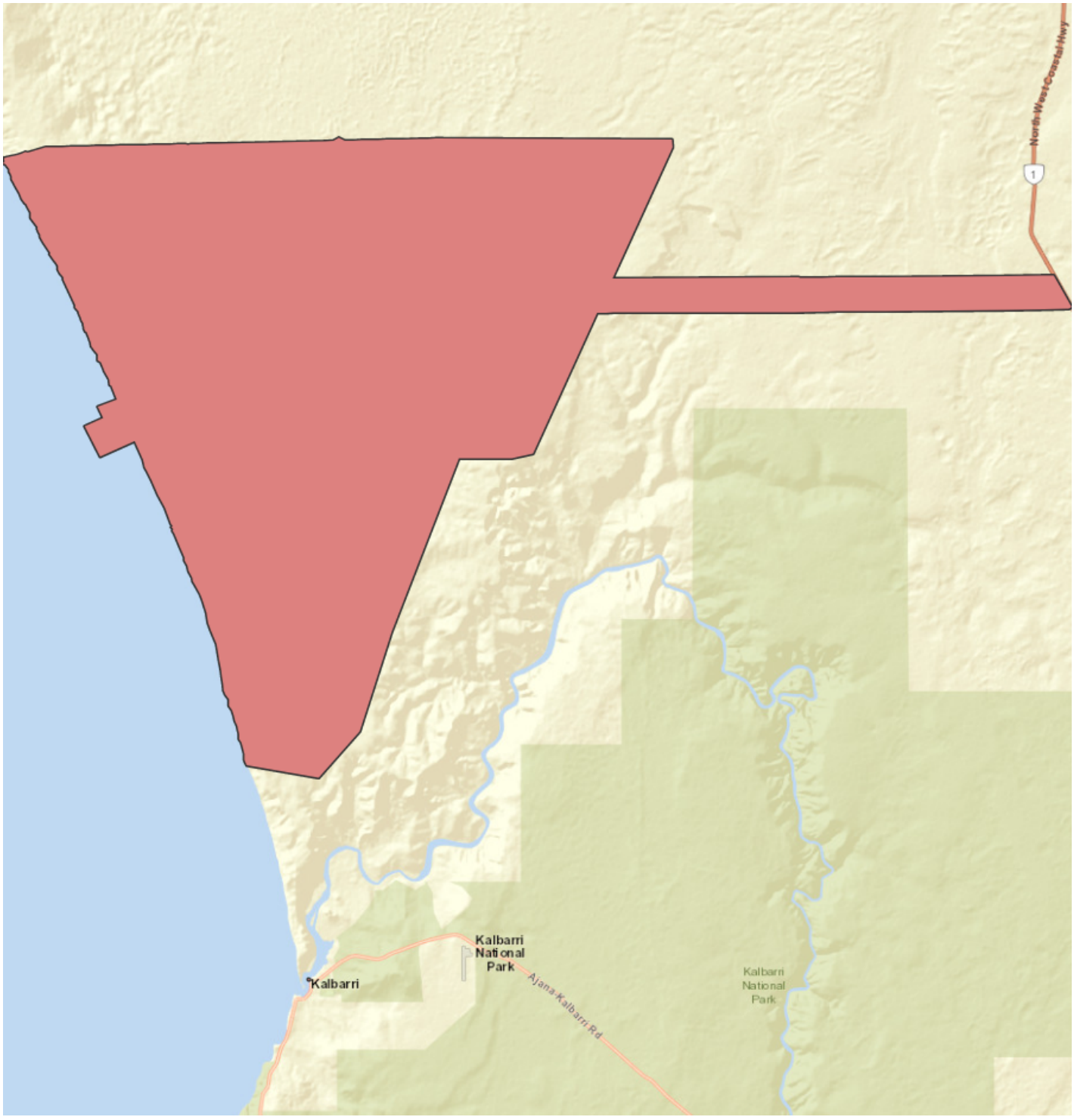
1.4 Payment details - Payment allocation

Who would you like to allocate as the entity responsible for payment? *

Proposed designated proponent

2. Location

2.1 Project footprint



2.2 Footprint details

What is the address of the proposed action? *

5618 Ajana-Kalbarri Road, Kalbarri. See Att 1-Supporting document-2022-14042022, Section 2.3.1.

Where is the primary jurisdiction of the proposed action? *

Western Australia

Is there a secondary jurisdiction for this proposed action? *

No

What is the tenure of the action area relevant to the project area? *

The DE lies predominantly within Pastoral Lease (Murchison House Station [registered number N050525]). Additionally, there are several areas of Unallocated Crown Land and a small reserve within the wind farm area.

For further information, refer to Section 1.4, Table 1-1 and Figure 1-2 of Att 1-Supporting document-2022-14042022.

3. Existing environment

3.1 Physical description

Describe the current condition of the project area's environment.

Land:

The current land use has exposed the DE to impacts from goat grazing and associated pastoral station management activities including vehicle movement and minor clearing, though the DE consist largely of uncleared remnant native vegetation. Currently, vegetation is predominantly in Very Good to Excellent condition, with areas of degraded vegetation. As baseline surveys are not yet completed, information is derived from desk-based studies and a small ecological reconnaissance survey completed in 2021. Baseline surveys of the DE are taking place throughout 2022 which will enable a description of the current condition of the environment relevant to the project area.

Broad scale (1:250,000) pre-European vegetation mapping of the area was completed by Beard (1976) at an association level. Mapping indicates eight vegetation associations are present within the DE:

- Shrublands tree-heath between sandhills; *Banksia ashbyi, Grevillea gordoniana*, Acacia spp., Melaleuca and mallee (association 368)
- Shrublands; heath on coastal limestone (association 402)
- Shrublands; scrub-heath on sandplain (association 380)
- Shrublands; *Acacia rostellifera* thicket (association 17)
- Shrublands; *Melaleuca cardiophylla* thicket (association 387)
- Shrublands; scrub-heath on coastal association, yellow sandplain (association 408)
- Mosaic: Shrublands; scrub-heath on coastal association on yellow sandplain / Shrublands; acacia patchy scrub (association 401)
- Shrublands; *Acacia ligulata* scrub-heath (association 403)

See Att 1-Supporting document-2022-14042022, Section 4.6.2.2 and Table 4-10, page 37 for a description of presence and extent of native vegetation relevant to the project area. Refer to Att 1-Supporting document-2022-14042022, Section 4.7, page 44 for a description of the fauna relevant to the project area.

Marine:

The DE is bounded by beaches and rocky ledges along the coast. Support Craft Facility Option Two is situated within the Murchison River estuary. Recreational and commercial fishing is undertaken in the area. Baseline water quality monitoring is being undertaken both within the estuary and in the vicinity of the proposed marine infrastructure to establish an understanding of the baseline conditions in the receiving environment.

Describe any existing or proposed uses for the project area.

The current predominant land use of the DE is pastoral station management, including the grazing of goats. The indicative development area relevant to Support Craft Facility Option Two is subject to tourism, commercial fishery, and recreation.

Refer to Section 1.4 and Section 2.3.1 of Att 1-Supporting document-2022-14042022.

Describe any outstanding natural features and/or any other important or unique values that applies to the project area.

The DE is located in the South West of Australia which is recognised for its biodiversity values. It lies predominantly on Pastoral lease areas, which are currently managed mainly for grazing of goats. Adjacent to the North of the DE is land reserved for conservation. To the southeast lies Kalbarri National Park (approximately 7.5 km southeast of the DE), and to the north lies Zuytdorp Nature Reserve (approximately 6 km north of the DE) and the Shark Bay World Heritage Area (approximately 3 km north of the DE).

Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area.

Topographically, the terrestrial DE varies from sea level to 200 m above sea level. Within the marine portion of the DE, depth ranges from 0 m to - 25 m.

For more information on topography and bathymetry, refer to Section 4.9.2.2 and Figure 2-1 of Att 1-Supporting document-2022-14042022.

3.2 Flora and fauna

Describe the flora and fauna within the affected area and attach any investigations of surveys if applicable.

The NatureMap database identified 478 species of fauna previously recorded within a 40 km radius from the centre of the Development Envelope (DE) (114º 10’ 40” E, 27º 22’ 43” S), forming a study area encompassing the DE and the surrounding area (Att 1-Supporting document-2022-14042022, Appendix D). This total comprised nine amphibians, 153 bird, 91 fish, 133 invertebrate, 18 mammal and 74 reptile species. Of these species recorded, 472 are native and six are naturalised (introduced) species.

The NatureMap database and the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Protected Matters Search Tool (PMST), considering the DE and a 40 km buffer, identified the presence/potential presence of 73 conservation significant fauna. The desktop assessment identified:

- 30 species listed as Threatened under the EPBC Act and/or BC Act
- Four species listed at Priority 3 under the BC Act
- Four species listed at Priority 4 under the BC Act
- 25 species protected under international agreement
- One species specially protected.

A likelihood of occurrence assessment was conducted for the conservation significant fauna identified above in the desktop assessments. The likelihood of occurrence assessment concluded that 36 species are likely or known to occur, and the remaining species are highly unlikely to occur within the DE.

Refer to Att 1-Supporting document-2022-14042022, Section 4.7 for a description of the fauna relevant to the project area.

The NatureMap database identified 1084 flora taxa previously recorded within a 40 km radius from the centre of the DE (114º 10’ 40” E, 27º 22’ 43” S), forming a study area encompassing the DE and the surrounding area. This total comprised of 1020 native taxa and 64 naturalised (introduced) taxa. Dominant families recorded included Myrtaceae (179 taxa), Fabaceae (102 taxa) and Proteaceae (75 taxa). The EPBC Act PMST and NatureMap database identified the presence/potential presence of 105 conservation significant flora within a 40 km radius of the DE. This included:

- 10 Threatened taxa
- 10 Priority 1 taxa
- 38 Priority 2 taxa
- 37 Priority 3 taxa
- 16 Priority 4 taxa.

Within the DE, two Threatened flora listed under the EPBC Act and BC Act and 30 Priority flora as listed by DBCA have previously been recorded. A further three Threatened and 17 Priority flora have potential to occur in the DE based on the likelihood assessment

The EPBC Act PMST did not identify any Weeds of National Significance (WoNS) occurring within the DE or within a 5 km radius of the DE.

Refer Att 1-Supporting document-2022-14042022, Section 4.6 for a description of the flora relevant to the project area.

The EPBC Act Protected Matters Report listed 38 marine bird species – many of which are migratory – as potentially occurring within 40 km of the DE (Att 1-Supporting document-2022-14042022, Appendix C, Table 4.3). While all listed bird species may fly over or utilise habitats within or near the DE, the DE is not known to encompass waters or habitats that are critical for the survival of any of these species. Refer Att 1-Supporting document-2022-14042022, Section 4.3.2.1 for a list of marine birds with potential to occur within 40 km of the DE.

The EPBC Act Protected Matters Report listed nine marine mammal species as potentially occurring within 40 km of the DE (Att 1-Supporting document-2022-14042022, Appendix C). Of these, five were considered as known or likely to occur within 40 km of the DE. Of these, all are mobile species and therefore capable of avoiding the areas during construction activities. Refer Att 1-Supporting document-2022-14042022, Section 4.3.2.2 for a list of marine mammals with potential to occur within 40 km of the DE.

The EPBC Act Protected Matters Report listed 12 marine reptiles as potentially occurring within 40 km of the DE (Att 1-Supporting document-2022-14042022, Appendix C). Of these, five were considered as known or likely to occur within 40km of the DE. Of these, all are mobile species and therefore capable of avoiding the areas during construction activities. Refer Att 1-Supporting document-2022-14042022, Section 4.3.2.3 for a list of marine reptiles with potential to occur within 40 km of the DE.

The EPBC Act Protected Matters Report listed 10 finfish as potentially occurring within 40 km of the DE (Att 1-Supporting document-2022-14042022, Appendix C; Table 4 6). Of these, eight were considered as known or likely to occur within 40 km of the DE. Of these, all are mobile species and therefore capable of avoiding the areas during construction activities. Refer Att 1-Supporting document-2022-14042022, Section 4.3.2.4 for a list of finfish with potential to occur within 40 km of the DE.

Describe the vegetation (including the status of native vegetation and soil) within the project area.

Broad scale (1:250,000) pre-European vegetation mapping of the area was completed by Beard (1976) at an association level. Mapping indicates eight vegetation associations are present within the DE:

- Shrublands tree-heath between sandhills; *Banksia ashbyi, Grevillea gordoniana*, Acacia spp., Melaleuca and mallee (association 368)
- Shrublands; heath on coastal limestone (association 402)

- Shrublands; scrub-heath on sandplain (association 380)
- Shrublands; *Acacia rostellifera* thicket (association 17)
- Shrublands; *Melaleuca cardiophylla* thicket (association 387)
- Shrublands; scrub-heath on coastal association, yellow sandplain (association 408)
- Mosaic: Shrublands; scrub-heath on coastal association on yellow sandplain / Shrublands; acacia patchy scrub (association 401)
- Shrublands; *Acacia ligulata* scrub-heath (association 403)

The extent of vegetation associations have been determined by the state-wide vegetation remaining extent calculations maintained by DBCA.

Refer to Att 1-Supporting document-2022-14042022, Section 4.6.2.2, page 36 and Table 4-10 for a description of the vegetation complexes present in the project area.

The Proposal site is in the Gascoyne Sub-basin of the Carnarvon Basin, which comprises a substantial thickness of sedimentary rocks, potentially about 4 km thick, overlying Precambrian basement rocks. The sedimentary rocks comprise Silurian Tumblagooda Sandstone over which there is a westwards-thickening Cretaceous veneer of marine sediments, including Birdrong Sandstone, Windalia Radiolarite (siltstone), Alinga Formation (clayey siltstone to greensand) and Toolonga Calcilutite (chalky calcilutite to calcisiltite). These are in turn overlain by Tertiary sediments (Pindilya Formation – sandstone and conglomerate) and Quaternary sediments (calcrete, Tamala Limestone, colluvium and eolian and residual sands). There is considerable calcareous coastal-dune build-up along the coastal strip that is indurated, forming the Tamala Limestone.

The soil landscape changes from calcrete plateaux, mesas, hills and footslopes supporting annual grasslands, herbfields and degraded chenopod shrublands in the east through to elevated undulating limestone plains within thin sand cover, sea cliffs and low hills supporting low heath, mallee shrublands and paper bark thickets in the western coastal section.

Throughout the mid-section, undulating sand plains and occasional dunes supporting shrub heath and tree heath vegetation is common.

3.3 Heritage

Describe any Commonwealth heritage places overseas or other places recognised as having heritage values that apply to the project area.

Located north of the Proposal area is the Shark Bay World/National Heritage Area. Shark Bay's waters, islands and peninsulas cover a large area of approximately 2.2 million ha, 70% of which are marine waters. Existing here are a number of exceptional natural features, including one of the largest and most diverse seagrass beds in the world, ancient stromatolites and rich marine life. At it's closest point, the northern boundary of the DE lies approximately 3 km south of the southern boundary of the Shark Bay World Heritage area.

Refer to Section 6.2 of Att 1-Supporting document-2022-14042022, Table 6-2.

Describe any Indigenous heritage values that apply to the project area.

The proposed action is located on Nanda Country. There are a total of 43 registered Aboriginal heritage sites listed in the Murchison House Station area, as listed on the DPLH-001 Aboriginal Heritage Places register. Of these 43, 11 registered sites are within the Development Envelope.

Refer to Att 1-Supporting document-2022-14042022, Section 4.11.2.1, page 72 for a description of indigenous heritage values relevant to the project area.

3.4 Hydrology

Describe the hydrology characteristics that apply to the project area and attach any hydrological investigations or surveys if applicable. *

The closest river to the DE is the Murchison River, which is approximately 4km south of the DE. Support Craft Facility Option 2 is located near the mouth of the Murchison River.

No rivers under the RIWI Act, intercept or are within the vicinity of the DE. Additionally, no RIWI Act protected surface waters or management areas are found within 20 km of the DE.

There may be perched water at or near surface at isolated locations in interdunal depressions or low-lying areas where surficial colluvium or sheetwash materials include relatively low permeability fine grained soils (e.g. surficial clayey sand layer).

The Water Information Reporting (WIR) system is an online database published by the Western Australian Department of Water and Environmental Regulation (DWER). The database has records for nine historical water bores drilled within the Project site area. There are also records for one bore drilled relatively nearby, to the north of the proposed action. Each of the bores is reported with a date that varies during the period 1935 to 1938.

The reported ground levels at the ten bore locations were in the range RL+85.3 m AHD to RL+182.9 m AHD, and the drilled bore depths were in the range 93.3 m to 163.1 m below ground level. Drilling notes are provided in the database, which in some cases provide general indications regarding depth to water, or zones in the profile where water was encountered. For some bores there are also records of water pumping tests and groundwater salinity.

Depths to water are indicated for seven of the ten bores as occurring at the time of drilling below depths in the range 79 m to 139 m. There are indications in the drilling notes that water was only recovered from isolated zones in the ground profile at some of the bore locations. Two of the other three boreholes for which water depths are not provided do have indications that water was encountered at an unreported depth. The drilling notes explicitly state that water was not encountered within one of the bores, which was drilled to 102 m depth.

For those bores for which water quality observations were recorded, the water was generally reported to be “too salty” for human consumption or for other uses such as irrigation.

4. Impacts and mitigation

4.1 Impact details

Potential Matters of National Environmental Significance (MNES) relevant to your proposed action area.

EPBC Act section	Controlling provision	Impacted	Reviewed
S12	World Heritage	Yes	Yes
S15B	National Heritage	Yes	Yes
S16	Ramsar Wetland	No	Yes
S18	Threatened Species and Ecological Communities	Yes	Yes
S20	Migratory Species	Yes	Yes
S21	Nuclear	No	Yes
S23	Commonwealth Marine Area	No	Yes
S24B	Great Barrier Reef	No	Yes
S24D	Water resource in relation to large coal mining development or coal seam gas	No	Yes
S26	Commonwealth Land	No	Yes
S27B	Commonwealth heritage places overseas	No	Yes

EPBC Act section	Controlling provision	Impacted	Reviewed
S28	Commonwealth or Commonwealth Agency	No	Yes

World Heritage

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

Yes

Briefly describe why your action has a direct and/or indirect impact on these protected matters. *

No direct impact. The World Heritage property is an area of 2.2 million hectares, with the southern border of the property approximately 3 km north of the Proposal Development Envelope and 16 km north of the PtX plant.

All activity relevant to the Proposal will be south of the State Barrier Fence Reserve, maintaining the distance from the Heritage Place, therefore not having a direct impact.

There is a potential for indirect impacts to Shark Bay world heritage property as a result of construction of the Proposal, such as construction noise and other indirect disturbance to terrestrial fauna relevant to Shark Bay . An assessment on the likelihood and severity of this impact will be undertaken.

Do you consider this likely direct and/or indirect impact to be a Significant Impact? *

No

Describe why you do not consider this to be a Significant Impact. *

Shark Bay is listed as a World Heritage property due to the following criteria:

- contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance
- outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features
- outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals
- 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

Shark Bay meets these criteria due to the presence of ancient stromatolites, diverse seagrass beds, hypersaline marine waters and being the transition zone between two of Western Australia's main botanical provinces, the arid Eremaean, dominated by *Acacia* species and the temperate South West, dominated by *Eucalyptus* species, and thus contains a mixture of two biotas, many at the limit of their southern or northern range.

The development envelope sits 3 km south of the most southerly extent of the World Heritage property and, at a minimum, 75 km south of the protected, hypersaline waters of Shark Bay where the stromatolites and seagrass beds are found. Due to this distance, it is considered that the proposal will not have an affect on the criteria associated with the waters of Shark Bay. The Proposal is unlikely to disrupt the transition zone between the two botanical provinces, the Proposal does not suggest the implementation of a hard boundary within the DE and clearing will be sparse across the DE with direct clearing only occurring to 15% of the DE. This will allow for movement of species north and south through the DE.

Do you think your proposed action is a controlled action? *

No

Please elaborate why you do not think your proposed action is a controlled action. *

As mentioned above, it is not considered that the proposed action will have a significant impact on the Shark Bay World Heritage property. The characteristics that give value to Shark Bay, such as the stromatolites, seagrasses and hypersaline waters, are a significant distance from the proposed action. The nature of the proposed action is also highly unlikely to be able to have direct or indirect impacts on Shark Bay.

Following construction of the proposed action, an area of up to 1701.5 ha which was used as temporary construction and laydown will be rehabilitated, restoring fauna habitat across the DE, further decreasing any boundary posed to the movement of flora and fauna through the area.

Please describe any avoidance or mitigation measures proposed for this action and attach any supporting documentation for these avoidance and mitigation measures. *

All activity relevant to the Proposal will not got north of the State Barrier Fence Reserve, maintaining an approximate 3 km distance from the World Heritage property, therefore not having a direct or significant impact.

Please describe any proposed offsets and attach any supporting documentation relevant to these measures. *

No offsets proposed in relation to this matter as impacts are highly unlikely.

National Heritage

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

Yes

Briefly describe why your action has a direct and/or indirect impact on these protected matters. *

No direct impact. The National Heritage property is an area of 2.2 million hectares, with the southern border of the property approximately 3 km north of the Proposal Development Envelope and 16 km north of the PtX plant.

All activity relevant to the Proposal will be south of the State Barrier Fence Reserve, maintaining the distance from the Heritage Place, therefore not having a direct impact.

There is a potential for indirect impacts to Shark Bay National Heritage property as a result of construction of the Proposal, such as construction noise and other indirect disturbance to terrestrial fauna relevant to Shark Bay . An assessment on the likelihood and severity of this impact will be undertaken.

Do you consider this likely direct and/or indirect impact to be a Significant Impact? *

No

Describe why you do not consider this to be a Significant Impact. *

Shark Bay is listed as a World Heritage property due to the following criteria:

- contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance
- outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features
- outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals
- 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

Shark Bay meets these criteria due to the presence of ancient stromatolites, diverse seagrass beds, hypersaline marine waters and being the transition zone between two of Western Australia's main botanical provinces, the arid Eremaean, dominated by *Acacia* species and the temperate South West, dominated by *Eucalyptus* species, and thus contains a mixture of two biotas, many at the limit of their southern or northern range.

The development envelope sits 3 km south of the most southerly extent of the World Heritage property and, at a minimum, 75 km south of the protected, hypersaline waters of Shark Bay where the stromatolites and seagrass beds are found. Due to this distance, it is considered that the proposal will not have an affect on the criteria associated with the waters of Shark Bay. The Proposal is unlikely to disrupt the transition zone between the two botanical provinces, the Proposal does not suggest the implementation of a hard boundary within the DE and clearing will be sparse across the DE with direct clearing only occurring to 15% of the DE. This will allow for movement of species north and south through the DE.

Do you think your proposed action is a controlled action? *

No

Please elaborate why you do not think your proposed action is a controlled action. *

As mentioned above, it is not considered that the proposed action will have a significant impact on the Shark Bay World Heritage property. The characteristics that give value to Shark Bay, such as the stromatolites, seagrasses and hypersaline waters, are a significant distance from the proposed action. The nature of the proposed action is also highly unlikely to be able to have direct or indirect affects on Shark Bay.

Following construction of the proposed action, an area of up to 1701.5 ha which was used as temporary construction and laydown will be rehabilitated, restoring fauna habitat across the DE, further decreasing any boundary posed to the movement of flora and fauna through the area.

Please describe any avoidance or mitigation measures proposed for this action and attach any supporting documentation for these avoidance and mitigation measures. *

All activity relevant to the Proposal will not got north of the State Barrier Fence Reserve, maintaining an approximate 3 km distance from the World Heritage property, therefore not having a direct or significant impact.

Please describe any proposed offsets and attach any supporting documentation relevant to these measures. *

No offsets proposed in relation to this matter as impacts are highly unlikely.

Ramsar Wetland

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

No Ramsar Wetlands are in proximity to the proposed action.

Threatened Species and Ecological Communities

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Threatened species

Direct impact	Indirect impact	Species
Yes		Aipysurus foliosquama
Yes		Aipysurus foliosquama
Yes		Aipysurus foliosquama
Yes		Aipysurus foliosquama
Yes		Aipysurus foliosquama
Yes		Aipysurus foliosquama
Yes		Androcalva bivillosa
Yes		Androcalva bivillosa
Yes		Androcalva bivillosa
Yes		Androcalva bivillosa
Yes		Androcalva bivillosa
Yes		Anous tenuirostris melanops
Yes		Anous tenuirostris melanops
Yes		Anous tenuirostris melanops
Yes		Anous tenuirostris melanops
Yes		Anous tenuirostris melanops
Yes		Balaenoptera borealis
Yes		Balaenoptera musculus
Yes		Balaenoptera musculus
Yes		Balaenoptera musculus
Yes		Balaenoptera musculus
Yes		Balaenoptera musculus
Yes		Balaenoptera musculus
Yes		Balaenoptera physalus
Yes		Caladenia barbarella
Yes		Caladenia barbarella
Yes		Caladenia barbarella

Direct impact	Indirect impact	Species
Yes		Caladenia barbarella
Yes		Caladenia barbarella
Yes		Caladenia barbarella
Yes		Caladenia bryceana subsp. cracens
Yes		Caladenia bryceana subsp. cracens
Yes		Caladenia bryceana subsp. cracens
Yes		Caladenia bryceana subsp. cracens
Yes		Caladenia bryceana subsp. cracens
Yes		Caladenia bryceana subsp. cracens
Yes		Caladenia elegans
Yes		Caladenia elegans
Yes		Caladenia elegans
Yes		Caladenia elegans
Yes		Caladenia elegans
Yes		Caladenia hoffmanii
Yes		Caladenia hoffmanii
Yes		Caladenia hoffmanii
Yes		Caladenia hoffmanii
Yes		Caladenia hoffmanii
Yes		Calidris canutus
Yes		Calidris canutus
Yes		Calidris canutus
Yes		Calidris canutus
Yes		Calidris canutus
Yes		Calidris canutus
Yes		Calidris ferruginea
Yes		Calidris ferruginea
Yes		Calidris ferruginea
Yes		Calidris ferruginea
Yes		Calidris ferruginea
Yes		Calidris ferruginea
Yes		Calyptorhynchus latirostris
Yes		Carcharias taurus
Yes		Carcharias taurus (west coast population)
Yes		Carcharias taurus (west coast population)

Direct impact	Indirect impact	Species
Yes		Carcharias taurus (west coast population)
Yes		Carcharias taurus (west coast population)
Yes		Carcharias taurus (west coast population)
Yes		Carcharodon carcharias
Yes		Carcharodon carcharias
Yes		Carcharodon carcharias
Yes		Carcharodon carcharias
Yes		Carcharodon carcharias
Yes		Carcharodon carcharias
Yes		Caretta caretta
Yes		Caretta caretta
Yes		Caretta caretta
Yes		Caretta caretta
Yes		Caretta caretta
Yes		Caretta caretta
Yes		Charadrius mongolus
Yes		Chelonia mydas
Yes		Chelonia mydas
Yes		Chelonia mydas
Yes		Chelonia mydas
Yes		Chelonia mydas
Yes		Chelonia mydas
Yes		Cyclodomorphus branchialis
Yes		Dasyurus geoffroii
Yes		Dasyurus geoffroii
Yes		Dasyurus geoffroii
Yes		Dasyurus geoffroii
Yes		Dasyurus geoffroii
Yes		Dasyurus geoffroii
Yes		Dermochelys coriacea
Yes		Dermochelys coriacea
Yes		Dermochelys coriacea
Yes		Dermochelys coriacea
Yes		Dermochelys coriacea
Yes		Dermochelys coriacea

Direct impact	Indirect impact	Species
Yes		Diomedea amsterdamensis
Yes		Diomedea amsterdamensis
Yes		Diomedea amsterdamensis
Yes		Diomedea amsterdamensis
Yes		Diomedea amsterdamensis
Yes		Diomedea exulans
Yes		Diomedea exulans
Yes		Diomedea exulans
Yes		Diomedea exulans
Yes		Diomedea exulans
Yes		Drakaea concolor
Yes		Egernia stokesii badia
Yes		Egernia stokesii badia
Yes		Egernia stokesii badia
Yes		Egernia stokesii badia
Yes		Egernia stokesii badia
Yes		Egernia stokesii badia
Yes		Eubalaena australis
Yes		Eubalaena australis
Yes		Eubalaena australis
Yes		Eubalaena australis
Yes		Eubalaena australis
Yes		Eubalaena australis
Yes		Eucalyptus beardiana
Yes		Eucalyptus beardiana
Yes		Eucalyptus beardiana
Yes		Eucalyptus beardiana
Yes		Eucalyptus beardiana
Yes		Eucalyptus beardiana
Yes		Eucalyptus cuprea
Yes		Eucalyptus cuprea
Yes		Eucalyptus cuprea
Yes		Eucalyptus cuprea
Yes		Eucalyptus cuprea
Yes		Falco hypoleucos

Direct impact	Indirect impact	Species
Yes		Falco hypoleucos
Yes		Falco hypoleucos
Yes		Falco hypoleucos
Yes		Falco hypoleucos
Yes		Hypocalymma longifolium
Yes		Hypocalymma longifolium
Yes		Hypocalymma longifolium
Yes		Hypocalymma longifolium
Yes		Hypocalymma longifolium
Yes		Hypocalymma longifolium
Yes		Idiosoma nigrum
Yes		Idiosoma nigrum
Yes		Idiosoma nigrum
Yes		Idiosoma nigrum
Yes		Idiosoma nigrum
Yes		Leipoa ocellata
Yes		Leipoa ocellata
Yes		Leipoa ocellata
Yes		Leipoa ocellata
Yes		Leipoa ocellata
Yes		Limosa lapponica menzbieri
Yes		Limosa lapponica menzbieri
Yes		Limosa lapponica menzbieri
Yes		Limosa lapponica menzbieri
Yes		Macroderma gigas
Yes		Macroderma gigas
Yes		Macroderma gigas
Yes		Macroderma gigas
Yes		Macroderma gigas
Yes		Macronectes giganteus
Yes		Macronectes giganteus
Yes		Macronectes giganteus

Direct impact	Indirect impact	Species
Yes		Macronectes giganteus
Yes		Macronectes giganteus
Yes		Macronectes halli
Yes		Macronectes halli
Yes		Macronectes halli
Yes		Macronectes halli
Yes		Macronectes halli
Yes		Megaptera novaeangliae
Yes		Natator depressus
Yes		Natator depressus
Yes		Natator depressus
Yes		Natator depressus
Yes		Natator depressus
Yes		Natator depressus
Yes		Neophoca cinerea
Yes		Neophoca cinerea
Yes		Neophoca cinerea
Yes		Neophoca cinerea
Yes		Neophoca cinerea
Yes		Numenius madagascariensis
Yes		Numenius madagascariensis
Yes		Numenius madagascariensis
Yes		Numenius madagascariensis
Yes		Numenius madagascariensis
Yes		Numenius madagascariensis
Yes		Pristis pristis
Yes		Pristis pristis
Yes		Pristis pristis
Yes		Pristis pristis
Yes		Pristis pristis
Yes		Rhincodon typus
Yes		Rhincodon typus
Yes		Rhincodon typus
Yes		Rhincodon typus
Yes		Rhincodon typus

Direct impact	Indirect impact	Species
Yes		Rostratula australis
Yes		Rostratula australis
Yes		Rostratula australis
Yes		Rostratula australis
Yes		Rostratula australis
Yes		Sphyrna lewini
Yes		Sphyrna lewini
Yes		Sphyrna lewini
Yes		Sphyrna lewini
Yes		Sphyrna lewini
Yes		Sphyrna lewini
Yes		Stachystemon nematophorus
Yes		Stachystemon nematophorus
Yes		Stachystemon nematophorus
Yes		Stachystemon nematophorus
Yes		Stachystemon nematophorus
Yes		Sternula nereis nereis
Yes		Sternula nereis nereis
Yes		Sternula nereis nereis
Yes		Sternula nereis nereis
Yes		Sternula nereis nereis
Yes		Sternula nereis nereis
Yes		Thalassarche carteri
Yes		Thalassarche carteri
Yes		Thalassarche carteri
Yes		Thalassarche carteri
Yes		Thalassarche carteri
Yes		Thalassarche cauta
Yes		Thalassarche cauta
Yes		Thalassarche cauta
Yes		Thalassarche cauta
Yes		Thalassarche cauta
Yes		Thalassarche impavida
Yes		Thalassarche impavida
Yes		Thalassarche impavida

Direct impact	Indirect impact	Species
Yes		Thalassarche impavida
Yes		Thalassarche impavida
Yes		Thalassarche melanophris
Yes		Thalassarche melanophris
Yes		Thalassarche melanophris
Yes		Thalassarche melanophris
Yes		Thalassarche melanophris
Yes		Thalassarche steadi
Yes		Thalassarche steadi
Yes		Thalassarche steadi
Yes		Thalassarche steadi
Yes		Thalassarche steadi
Yes		Thunnus maccoyii
Yes		Thunnus maccoyii
Yes		Thunnus maccoyii
Yes		Thunnus maccoyii
Yes		Thunnus maccoyii
Yes		Zanda latirostris
Yes		Zanda latirostris
Yes		Zanda latirostris
Yes		Zanda latirostris
Yes		Zanda latirostris

Ecological communities

—

Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

Yes

Briefly describe why your action has a direct and/or indirect impact on these protected matters. *

The Proposal will result in the clearing of up to:

- 13,055 ha of native terrestrial vegetation, of which approximately 1701.5 ha will be temporarily cleared during construction and rehabilitated
- 17.1 ha of marine benthic communities
- 0.4 ha of estuarine benthic communities

Direct/indirect impacts to flora:

- Introduction and/or spread of weeds
- Introduction and/or increased prevalence of feral herbivores
- Spills and/or leaks from storage and handling of hazardous materials and waste.

See Att 1-Supporting document-2022-14042022, Section 4.6.2.5, Table 4-11, page 39 for a list of conservation significant flora and likelihood of occurrence within the DE.

Direct/indirect impacts to terrestrial fauna:

- Direct loss or displacement of individuals as a result of operational vehicle movements
- Weed introduction and spread during construction activities, modifying fauna habitats with potential indirect impacts to fauna community structure
- Direct loss or displacement of migratory shorebirds or other avifauna individuals as a result of operation of Wind Farm
- Indirect loss or displacement of individuals as a result of construction and operation activities.

See Att 1-Supporting document-2022-14042022, Section 4.7.2.2, Table 4-13, page 46 for a list of conservation significant fauna and likelihood of occurrence within the DE.

Direct/indirect impacts to marine fauna:

- Disturbance from increased vessel movements (collisions/noise) in the region, both in relation to international shipping for the Proposal during operations and marine infrastructure installation and maintenance vessels
- Direct impacts on marine fauna include vessel strike or entanglement in equipment such as dredges
- Behaviour modification from artificial lighting associated with offshore infrastructure, vessels and behind-dune infrastructure
- Underwater noise
- Construction, operation, decommissioning and maintenance works may result in the introduction of non-indigenous marine species to the area in vessel ballast water and on vessel hulls
- Impacts to benthic communities affecting marine fauna
- Changes in marine environmental quality (brine discharge, turbidity, release of contaminants during construction/operation) impacting marine fauna
- Introduced marine species from vessel biofouling or ballast water during construction or operations
- Unplanned spill of hazardous chemicals (e.g. hydrocarbons).

See Att 1-Supporting document-2022-14042022, Section 4.3.2.2, Table 4-4, page 31 for a list of conservation significant marine fauna and likelihood of occurrence within the DE.

Do you consider this likely direct and/or indirect impact to be a Significant Impact? *

Yes

Describe why you consider this to be a Significant Impact. *

The above impacts to the terrestrial environment are likely to be significant due to the scale of clearing and current high quality of the vegetation. The ongoing impacts of wind turbine and solar farm operation may also permanently displace or affect the listed Threatened species. The clearing of benthic communities for marine infrastructure may impact on Threatened marine species, however the full scale of the impacts will be unknown until further proposed studies are undertaken (as mentioned in Att 1-Supporting document-2022-14042022, Section 4.2.4, page 29).

Do you think your proposed action is a controlled action? *

Yes

Please elaborate why you think your proposed action is a controlled action. *

The proposed action will result in clearing of areas, both terrestrial and marine, that have been identified as supporting 29 listed Threatened species. Terrestrial clearing is currently within a large footprint of 13,055 ha and despite current plans to revegetate 1701.5 ha post-construction, remaining impacts may have ongoing significant negative impacts to listed species.

Please describe any avoidance or mitigation measures proposed for this action and attach any supporting documentation for these avoidance and mitigation measures. *

Refer to Att 1-Supporting document-2022-14042022, Section 6.3, page 77.

Please describe any proposed offsets and attach any supporting documentation relevant to these measures. *

Murchison Hydrogen Renewables propose to counterbalance the significant impacts to EPBC Act listed species through an Offset Strategy, a draft for which will be created during the impact assessment process.

Migratory Species

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Direct impact	Indirect impact	Species
Yes		Actitis hypoleucos
Yes		Anous stolidus
Yes		Apus pacificus
Yes		Ardenna carneipes
Yes		Balaenoptera edeni
Yes		Balaenoptera musculus

Direct impact	Indirect impact	Species
Yes		Calidris acuminata
Yes		Calidris canutus
Yes		Calidris ferruginea
Yes		Calidris melanotos
Yes		Carcharhinus longimanus
Yes		Carcharodon carcharias
Yes		Caretta caretta
Yes		Chelonia mydas
Yes		Dermochelys coriacea
Yes		Diomedea amsterdamensis
Yes		Diomedea exulans
Yes		Eubalaena australis
Yes		Fregata ariel
Yes		Hydroprogne caspia
Yes		Lamna nasus
Yes		Limosa lapponica
Yes		Macronectes giganteus
Yes		Macronectes halli
Yes		Megaptera novaeangliae
Yes		Mobula alfredi
Yes		Mobula birostris
Yes		Motacilla cinerea
Yes		Natator depressus
Yes		Numenius madagascariensis
Yes		Onychoprion anaethetus
Yes		Orcinus orca
Yes		Pandion haliaetus
Yes		Phaethon lepturus
Yes		Pristis pristis
Yes		Rhincodon typus
Yes		Sternula albifrons
Yes		Thalassarche carteri
Yes		Thalassarche cauta
Yes		Thalassarche impavida
Yes		Thalassarche melanophris

Direct impact	Indirect impact	Species
Yes		Thalassarche steadi

Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

Yes

Briefly describe why your action has a direct and/or indirect impact on these protected matters. *

The Proposal will result in the clearing of up to:

- 13,055 ha of native terrestrial vegetation, of which approximately 1701.5 ha will be temporarily cleared during construction and rehabilitated
- 17.1 ha of marine benthic communities
- 0.4 ha of estuarine benthic communities

Direct/indirect impacts to flora:

- Introduction and/or spread of weeds
- Introduction and/or increased prevalence of feral herbivores
- Spills and/or leaks from storage and handling of hazardous materials and waste.

See Att 1-Supporting document-2022-14042022, Section 4.6.2.5, Table 4-11, page 39 for a list of conservation significant flora and likelihood of occurrence within the DE.

Direct/indirect impacts to migratory terrestrial fauna:

- Direct loss or displacement of individuals as a result of operational vehicle movements
- Weed introduction and spread during construction activities, modifying fauna habitats with potential indirect impacts to fauna community structure
- Direct loss or displacement of migratory shorebirds or other avifauna individuals as a result of operation of Wind Farm
- Indirect loss or displacement of individuals as a result of construction and operation activities.

See Att 1-Supporting document-2022-14042022, Section 4.7.2.2, Table 4-13, page 46 for a list of conservation significant fauna and likelihood of occurrence within the DE.

Direct/indirect impacts to migratory marine fauna:

- Disturbance from increased vessel movements (collisions/noise) in the region, both in relation to international shipping for the Proposal during operations and marine infrastructure installation and maintenance vessels
- Direct impacts on marine fauna include vessel strike or entanglement in equipment such as dredges
- Behaviour modification from artificial lighting associated with offshore infrastructure, vessels and behind-dune infrastructure
- Underwater noise
- Construction, operation, decommissioning and maintenance works may result in the introduction of non-indigenous marine species to the area in vessel ballast water and on vessel hulls
- Impacts to benthic communities affecting marine fauna
- Changes in marine environmental quality (brine discharge, turbidity, release of contaminants during construction/operation) impacting marine fauna
- Introduced marine species from vessel biofouling or ballast water during construction or operations
- Unplanned spill of hazardous chemicals (e.g. hydrocarbons).

See Att 1-Supporting document-2022-14042022, Section 4.3.2.2, Table 4-4, page 31 for a list of conservation significant marine fauna and likelihood of occurrence within the DE.

Do you consider this likely direct and/or indirect impact to be a Significant Impact? *

Yes

Describe why you consider this to be a Significant Impact. *

The above impacts to the terrestrial environment are likely to be significant due to the scale of clearing and current high quality of the vegetation. The ongoing impacts of wind farm and solar farm operation may also permanently displace or impact the listed Threatened species. The clearing of benthic communities for marine infrastructure may impact on Threatened marine species, however the full scale of the impacts will be unknown until further proposed studies are undertaken (as mentioned in Att 1-Supporting document-2022-14042022, Section 4.2.4, page 29).

Do you think your proposed action is a controlled action? *

Yes

Please elaborate why you think your proposed action is a controlled action. *

The proposed action will result in clearing of areas, both terrestrial and marine, that have been identified as supporting 29 listed Threatened species. Terrestrial clearing is currently within a large footprint of 13,055 ha and despite current plans to revegetate 1701.5 ha post-construction, remaining impacts may have ongoing significant negative impacts to listed species.

Please describe any avoidance or mitigation measures proposed for this action and attach any supporting documentation for these avoidance and mitigation measures. *

Refer to Att 1-Supporting document-2022-14042022, Section 6.3, page 77.

Please describe any proposed offsets and attach any supporting documentation relevant to these measures. *

Murchison Hydrogen Renewables propose to counterbalance the significant impacts to EPBC Act listed species through an Offset Strategy, a draft for which will be created during the impact assessment process.

Nuclear

Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

This is not a nuclear action.

Commonwealth Marine Area

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

Proposed action is located nearshore within the State water boundary.

Great Barrier Reef

Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

Proposed action is on the west coast of Australia.

Water resource in relation to large coal mining development or coal seam gas

Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

Proposed action does not involve coal seam gas or coal mine development.

Commonwealth Land

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

Proposed action does not involve Commonwealth Land.

Commonwealth heritage places overseas

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

Proposed action does not involve Commonwealth heritage places overseas.

Commonwealth or Commonwealth Agency

Is the proposed action to be taken by the Commonwealth or a Commonwealth Agency? *

No

4.2 Impact summary

Conclusion on the likelihood of significant impacts

You have indicated that the proposed action will likely have a significant impact on the following Matters of National Environmental Significance:

- Threatened Species and Ecological Communities (S18)
- Migratory Species (S20)

Conclusion on the likelihood of unlikely significant impacts

You have indicated that the proposed action will unlikely have a significant impact on the following Matters of National Environmental Significance:

- World Heritage (S12)
- National Heritage (S15B)
- Ramsar Wetland (S16)

- Nuclear (S21)
- Commonwealth Marine Area (S23)
- Great Barrier Reef (S24B)
- Water resource in relation to large coal mining development or coal seam gas (S24D)
- Commonwealth Land (S26)
- Commonwealth heritage places overseas (S27B)
- Commonwealth or Commonwealth Agency (S28)

4.3 Alternatives

Do you have any possible alternatives for your proposed action to be considered as part of your referral? *

No

Describe why alternatives for your proposed action was not possible. *

Multiple site selection studies have been undertaken across Australia and Western Australia to determine the optimal site for the location of the Project. The following four key elements were considered in these studies:

1. Weather conditions: Complementary solar and wind conditions for the production of green energy in an area not prevalent to cyclones.
2. Approvals: Avoidance of social, environmental and culturally sensitive areas.
3. Access to land: Availability of a large land parcel capable of generating the necessary power requirements.
4. Proximity to market: Close proximity to existing or potential port options and distance to emerging markets in Asia.

A port options study was undertaken to determine the most viable location for an ammonia export facility. The study considered multiple port locations including Oakajee, Geraldton, Cape Cuvier and an offtake facility adjacent the project site. Based on multiple criteria, including environmental considerations, access to deep water, avoidance of populated areas and land side impacts, the project proposes to undertake the development of the offtake facility immediately adjacent the process plant at the project site.

5. Lodgement

5.1 Attachments

1.2 Overview of the proposed action

#1.	Att 1-Supporting document-2022-14042022	Document	Environmental referral supporting document

1.2 Public consultation regarding the project area

#1.	Att 4-Aboriginal Heritage Agreement-CONFIDENTIAL	Document	Aboriginal Heritage Agreement

1.3 (Proposer's identity) Nature of the trust arrangement in relation to the proposed action

#1.	Att 2 - Murchison Project Trust Deed	Document	

1.3 (Proposer's identity) Proposer's history of responsible environmental management

#1.	Att 3 - CIP Responsible Investment Policy	Document	CIP Responsible Investment Policy

5.2 Declarations

Completed Referring party's declaration

The Referring party is the person preparing the information in this referral.

ABN	650922062
Organisation name	Murchison Hydrogen Renewables Pty Ltd as trustee for Murchison Hydrogen Renewables Project Trust
Organisation address	Level 45, 108 St Georges Terrace, Perth, 6000, Western Australia, Australia
Representative's name	Amanda Le Moine
Representative's job title	Manager, Permitting & Approvals
Phone	+61 488 022 396
Email	amm@cisc.dk
Address	Level 45, 108 St Georges Terrace, Perth, WA 6000

☑ Check this box to indicate you have read the referral form. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

☑ By checking this box, I, **Amanda Le Moine of Murchison Hydrogen Renewables Pty Ltd as trustee for Murchison Hydrogen Renewables Project Trust**, declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

Completed Person proposing to take the action's declaration

The Person proposing to take the action is the individual, business, government agency or trustee that will be responsible for the proposed action.

ABN	650922062
Organisation name	Murchison Hydrogen Renewables Pty Ltd as trustee for Murchison Hydrogen Renewables Project Trust
Organisation address	Level 45, 108 St Georges Terrace, Perth, 6000, Western Australia, Australia
Representative's name	Shohan Seneviratne
Representative's job title	CEO
Phone	+61 438 017 947
Email	sas@cisc.dk
Address	Level 45, 108 St Georges Terrace, Perth, 6000, Western Australia, Australia

Check this box to indicate you have read the referral form. *

I would like to receive notifications and track the referral progress through the EPBC portal. *

I, **Shohan Seneviratne of Murchison Hydrogen Renewables Pty Ltd as trustee for Murchison Hydrogen Renewables Project Trust**, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf or for the benefit of any other person or entity. *

I would like to receive notifications and track the referral progress through the EPBC portal. *

Completed Proposed designated proponent's declaration

The Proposed designated proponent is the individual or organisation proposed to be responsible for meeting the requirements of the EPBC Act during the assessment process, if the Minister decides that this project is a controlled action.

Same as Person proposing to take the action information.

Check this box to indicate you have read the referral form. *

I would like to receive notifications and track the referral progress through the EPBC portal. *

I, **Shohan Seneviratne of Murchison Hydrogen Renewables Pty Ltd as trustee for Murchison Hydrogen Renewables Project Trust**, the Proposed designated proponent, consent to the designation of myself as the Proposed designated proponent for the purposes of the action described in this EPBC Act Referral. *

I would like to receive notifications and track the referral progress through the EPBC portal. *