



Australian Government

Department of the Environment, Water, Heritage and the Arts

Referral of Proposed Action

Oakajee Deepwater Port and Associated Facilities

Oakajee, Western Australia

November 2010



Government of Western Australia
Department of State Development

eco
logical
AUSTRALIA

Project title:

Oakajee Deepwater Port Facility, Western Australia

1 Summary of proposed action

1.1 Short description

The Department of State Development (DSD) are pursuing the development of a new deepwater port at Oakajee, 24 km north of Geraldton, for the purposes of exporting iron ore (**Figure 1 – Attachment 1**).

In accordance with the State Development Agreement between the State of Western Australia and Oakajee Port and Rail (OPR), OPR has the rights to develop and operate the new deepwater port. The port will be supported by a rail network linking the port to iron ore mines to the east. The port will comprise a large breakwater sheltering two Cape size berths, a tug and work boat harbour and associated land based facilities including ship loaders, conveyors, stockpile yard, stackers and reclaimers (**Figure 3 – Attachment 1**).

Construction of the port is scheduled to commence in 2011 with current forecasts having the port operational by 2014. Iron ore exports for the foundation development of Oakajee Port are expected to be up to 45 million tonnes per annum.

1.2 Latitude and longitude

location point	Latitude			Longitude		
	degrees	minutes	seconds	degrees	minutes	seconds
NE	-28	34	0.21	114	34	16.41
NW	-28	34	23.35	114	33	14.78
SW	-28	36	32.25	114	34	16.78
SE	-28	36	33.87	114	35	46.92

1.3 Locality

The Oakajee Deepwater Port (the Project) – is located 24 km north of Geraldton.

Refer to **Figure 1 - Attachment 1** for a map showing the location of the proposed port.

1.4 Size of the development footprint or work area (hectares)

170 ha Marine area
Approx 81 ha Terrestrial area

1.5 Street address of the site

North West Coastal Highway, Oakajee, WA.

1.6 **Lot description**
The works are located within Reserve 25300 vested in the Geraldton Port Authority.

1.7 **Local Government Area and Council contact (if known)**
The proposed development site is located within the Shire of Chapman Valley

Shire of Chapman Valley
Lot 7 Chapman Valley Road
NABAWA WA
Ph: 9920 5011
President: Cr John Collingwood
Chief Executive Officer: Mr Dirk Sellenger
Manager Planning and Development: Mr Simon Lancaster

1.8 **Timeframe**
Works are scheduled to commence in early 2011. **Table 1** provides a summary of the currently proposed construction schedule for the Project.

Table 1: Project Schedule

Activity	Timeframe
Project Implementation	
Early works (incl. quarry development)	February 2011
Commence main construction	August 2011
Breakwater Construction	August 2011 to July 2013
Dredging activities	April 2013 to Jan 2014
Commissioning	Mid 2014

1.9 **Alternatives**

		No
	X	<p>Yes, a number of alternative port locations have been considered to meet the needs of a mid-west export port. Options considered have included:</p> <ul style="list-style-type: none"> • Expansion of the existing Geraldton Port – this was not preferred due to the requirement to dredge a very hard seabed in the Champion Bay area, the impacts of the construction and operation on the Geraldton townsite and infrastructure and the still limited shipping capacities that would be offered compared to other options. • Consideration of several alternative Mid-West port locations, including; Oakajee (the EP Act Approved Port), north of Oakajee River, Georgina, Bradley and Bookara (to the south of the Greenough River), Bonniefield (north of Dongara) and Point Moore (near the existing Geraldton Port). <p>Section 2.2 provides further detail.</p>

1.10	State assessment		No.
		X	Yes, The proposal has been previously approved under the <i>Environmental Protection Act 1986</i> (Ministerial Statement 469 February 1998)
1.11	Component of larger action	X	No
			Yes, you must also complete Section 2.6
1.12	Related actions/proposals		No
		X	<p>Yes. The proponent for the port is the Minister for State Development in Western Australia. A privately owned company, OPR are currently proposing additional iron-ore material handling facilities at the port, including port rail delivery facilities, stockpiles, access roads, service corridors, etc and will manage these facilities in line with the State's third party access regime requirements. A quarry, to source breakwater materials, is also anticipated but does not form part of this referral.</p> <p>The port will service the Oakajee Industrial Estate (OIE) and iron-ore mining operations in the mid-west region of Western Australia.</p> <p>The adjacent OIE is being developed by LandCorp on largely agricultural land adjacent to the port.</p> <p>The mining operations will be serviced by a proposed 550km rail line constructed and operated by OPR (on behalf of the WA Public Transport Authority). The rail line has been referred separately (EPBC Reference Number: 2010/5500) for which OPR is the proponent.</p> <p>The individual mines that may utilise the rail and port facilities to export product will be subject to their own environmental approvals.</p>
1.13	Australian Government funding		No
		X	Yes. Funding for Common Use Infrastructure (CUI) associated with the Project has been announced by both the Commonwealth (\$339 Million) and the Western Australian State Governments (\$339 Million). In total \$678 million has been pledged for CUI facilities, including the channel, breakwater, turning basin, navigational aids, provision for tug and pilot boat pens, port administration offices, and roads and utilities.
1.14	Great Barrier Reef Marine Park	X	No
			Yes

2 Detailed description of proposed action

2.1 Description of proposed action

On the 20th March 2009 the State Government of Western Australia and Oakajee Port and Rail Pty Ltd (OPR) entered into a State Development Agreement (SDA). This SDA provided OPR with the rights to develop and operate from a new deepwater port at Oakajee, 24 km north of Geraldton on Western Australia's mid west coastline (**Figure 1 – Attachment 1**).

Construction of the port is scheduled to commence in 2011 with current forecasts having the port operational by 2014. Iron ore exports for the foundation development of Oakajee Port are expected to be up to 45 million tonnes per annum.

The deepwater port proposal includes both marine and terrestrial components, with the key infrastructure items as follows:

- breakwater;
- harbour basin;
- berths;
- approach channel;
- reclamation areas;
- onshore storage area; and
- service corridor linking to the Oakajee Industrial Estate (OIE).

A temporary construction accommodation village and administration offices will be constructed on cleared land adjacent to the Port area within the OIE. This village will not require the clearing of any native vegetation. Once operational all personnel working at the Port will be self accommodated within normal housing in and around Geraldton. No specific Port related housing is planned. The temporary construction accommodation village and administration offices do not form part of this proposal.

The general arrangement of the current proposed marine port and associated facilities includes:

- A southern breakwater to service two Cape-class berths and one further Cape-class (up to 210,000dwt fully laden) or Panamax (up to 65,000dwt fully laden) berth. The current breakwater design is for an Icelandic (statically stable non-reshaping) breakwater consisting of up to 3Mt of rock, 2.5km long and extending 1.9km off-shore.
- Storage areas – 50ha of terrestrial area adjacent to the port will be utilised for the lay down of materials and equipment during port construction and operations;
- Service corridor – from the port to the Oakajee Industrial Estate. The service corridor will be 31 ha in area, accommodating conveyor belts, access roads, pipe racks and other facilities;
- The port will import/export iron ore product and other non-hazardous products.

The marine elements of the proposed port development will require three major actions, being:

- Breakwater Construction – To protect the Oakajee Port harbour waters from prevailing seas and swell, a 2.4 kilometre long rock breakwater (the tip of the breakwater being 1.9 km offshore) will be constructed. The breakwater will provide sheltered internal water allowing dredging, pile driving and

general berth construction to then occur. At the same time a reclamation area abutting the shoreline will also be constructed. A total of 290 piles will be required for construction of the two wharfs.

The breakwater will be constructed from granulite rock, sourced from nearby quarry materials. It is expected that rock placement will occur from both land (using excavators) and sea (using barges).

- An approach channel and swing basin (to a maximum depth of -23mCD) within an area of not greater than 170 ha. All material from dredging shall be used to create a reclamation area for port activities and fill for the stockpile yard. A large cutter suction dredger (CSD) will be used to dredge the seabed material, which will be piped directly to reclamation areas for sediment settling and the return waters shall be discharged to the ocean.
 - Up to 3.5Mm³ of material will be generated by the dredging operation of which:
 - approximately 2Mm³ will be utilised as fill for the stockpile yards; and
 - approximately 1.5Mm³ will be utilised as fill in the reclamation area associated with the port facilities.
- Piling & Wharf - approximately 290 piles will be required for the marine infrastructure at Oakajee Port. Due to substrate hardness of the seabed the piles are most likely to be drilled and then driven. Blasting will not be necessary; however, pile driving is expected to be required for a period of approximately 7 months.

The expected areas of impact from the proposed works are detailed in **Table 2** and **Figure 2 (Attachment 1)**.

Table 2: Project elements

Project Element	Scope
Breakwater	2.5km long standing 1.9km off-shore
Breakwater fill	3Mt
Dredge spoil volume	3.5Mm ³
Channel and swing basin dredge depth	to -23mCD
Wharf and Piling	290 piles
Storage Area	50ha
Service corridor	31ha
Marine area affected	up to 170ha

It is noted that the proposed action does not include the following activities:

- bankable feasibility investigative works including geotechnical and groundwater drilling
- early start infrastructure (i.e. quarry, construction accommodation village, construction roads and site offices located on cleared land within the OIE)
- small scale construction desalination plant

These works are small in nature and avoid matters of national environmental significance. These works are also able to be controlled and approved by State-based approval processes.

2.2 Alternative locations, time frames or activities that form part of the referred action

Planning for further development of the Mid-West region has included consideration of various options for enhancing capacity for the movement and export of bulk commodities through Geraldton. Initially, proposals centred on the expansion of ship loading facilities at the existing Geraldton Port. However, the growth of Geraldton as a regional residential centre around the existing port, and associated infrastructure, constrains opportunities for future expansion of bulk export facilities at the port. This, combined with difficulties associated with deepening of the existing port to accommodate larger vessels, has led to recognition of the need to develop alternative facilities to service the growing needs of the Mid-West region for additional port capacity.

The overall development proposed by DSD represents a combined Government and private sector commitment to satisfying this need.

Oakajee has been identified for approximately 30 years as a potential site for a deep water port and industrial estate. Successive studies undertaken by the State Government, Murchison Metals Limited (MML) and others have confirmed this view.

The port location options to date have included (Tingay and Welker, 1997):

- Expansion of the existing Geraldton Port – this was not preferred due to the requirement to dredge a very hard seabed in the Champion Bay area, the impacts of the construction and operation on the Geraldton townsite and infrastructure and the still limited shipping capacities that would be offered compared to other options.
- Consideration of several alternative Mid-West port locations, including: north of Oakajee River, Georgina, Bradley and Bookara (to the south of the Greenough River), Bonniefield (north of Dongara) and Point Moore (near the existing Geraldton Port).

The Oakajee site (northern sector) was identified by government as the preferred location for development of a deepwater port to service the Mid-West, due to its naturally occurring deepwater close to shore (minimal dredging required) and because of its earlier Government support for this locality as a strategic location for the Oakajee Industrial Estate (OIE) to support mines and industry in the Mid-West. In addition, given the distance from major urban nodes (particularly Geraldton), transport and other industrial activities associated with the OIE and port would not cause significant social nuisance issues.

Conceptual design which was approved in 1998 under the EP Act included options to locate the port at either a north, central or southern location. The final design proposal at the site is to develop the deepwater port facility in the locality referred to as the “Northern Sector” of the “Port Location Area”. The Northern Sector locality is preferred for the following reasons:

- locate dredging to take advantage of the generally softer material in the palaeochannel and avoid the need for blasting of the seabed prior to dredging of the inner port and shipping channels;
- Deep water is located closer to the shore in this sector;
- To reduce impacts on Benthic Primary Producer Habitat resulting from the port development; and
- The location provides for closer proximity to the proposed rail infrastructure, including the car dumper.

2.3 Context, planning framework and state/local government requirements

The key environmental legislation relevant to the project is outlined in **Table 3** below.

Table 3: Relevant legislation

Legislation	Responsible Government Authority	Aspect
Commonwealth Legislation		
<i>Environmental Protection and Biodiversity Conservation Act 1999</i>	Department of Sustainability, Environment, Water, Population and Communities	Matters of National Environmental Significance
<i>Environmental Protection (Sea Dumping) Act 1981</i>	Department of Sustainability, Environment, Water, Population	Prevention of marine pollution

Legislation	Responsible Government Authority	Aspect
	and Communities	
<i>Historic Shipwrecks Act 1976</i>	Department of Sustainability, Environment, Water, Population and Communities	Shipwrecks
<i>National Greenhouse and Energy Reporting Act 2007</i>	Department of Climate Change	Greenhouse gas
<i>Native Title Act 1993</i>	National Native Title Tribunal	Community, group or individual rights and interests of Aboriginal people or Torres Strait Islanders in relation to land or waters
<i>Protection of Moveable Cultural Heritage Act 1986</i>	Department of Sustainability, Environment, Water, Population and Communities	Protection of moveable cultural artefacts
State Government Legislation		
<i>Aboriginal Heritage Act 1972</i>	Department of Indigenous Affairs	Archaeological and ethnographic heritage
<i>Conservation and Land Management Act 1984</i>	Department of Environment and Conservation	Conservation reserves
<i>Contaminated Sites Act 2003</i>	Department of Environment and Conservation	Management of contaminated lands
<i>Dangerous Goods Safety Act 2004</i>	Department of Mines and Petroleum	Explosives and dangerous goods, transport and management
<i>Environmental Protection Act 1986</i>	Office of the Environmental Protection Authority and the Department of Environment and Conservation	Environmental impact assessment and management
<i>Heritage of Western Australia Act 1990</i>	Heritage Council of Western Australia	European heritage management
<i>Local Government Act 1995</i>	Department of Local Government and Regional Development	Development, building and health approvals
<i>Maritime Archaeology Act 1973</i>	Department of Maritime Archaeology	Maritime Archaeology
<i>Occupational Safety and Health Act 1984</i>	Department of Consumer and Employment Protection	Occupational Safety and Health
<i>Western Australian Marine Act 1982</i>	Department for Planning and Infrastructure	Survey manning and operation of vessels
<i>Wildlife Conservation Act 1950</i>	Department of Environment and Conservation	Protection of indigenous wildlife, including items of state significance
<i>Planning and Development Act 2005</i>	Department of Planning	Principal Town Planning Legislation
Local Government Legislation		
Shire of Chapman Valley Town Planning Scheme No 1 District Zoning Scheme	Shire of Chapman Valley	Provision of zones and other provisions to ensure orderly development of the Shire.

2.4 Environmental impact assessments under Commonwealth, State or Territory legislation

The assessment and approval status at the State level for the marine and terrestrial components is as follows.

In accordance with the requirements of the Western Australian *Environmental Protection Act 1986* the DSD referred the proposal to develop the Oakajee Port to the EPA. The EPA determined that the proposal should be subject to a Public Environment Review. The EPA's assessment advice and recommendations in relation to the proposal were provided to the Minister for the Environment via Bulletin 866 (refer to **Attachment 3**). This Bulletin outlined the conditions relevant to the environmental factors and procedures proposed for the works.

An initial approval was granted subject to conditions by the Western Australian Minister for the Environment, via Ministerial Statement 469 (refer to **Attachment 2**), on 25 February 1998. The approval allowed for the construction of a deepwater port at one of three locations between the Oakajee to Buller River mouths. Subsequently, section 45C of the Western Australian *Environmental Protection Act 1986* was used to confirm the selection of the northern option by the proponent. The Chairman of the Environmental Protection Authority granted approval for the selected option under the *Environmental Protection Act 1986* on 2 September 2009.

A request for an extension to the substantial commencement date from 25 February 2010 to 25 February 2013 for the approved Port marine project was approved under Section 46 of the Western Australian *Environmental Protection Act 1986* by the Minister for the Environment and Youth, on 25 November 2009.

The conditions and proponent commitments (pertaining to marine and coastal issues) included the development of a number of management plans and programs, these are:

- Marine Flora and Fauna Management Plan;
- Construction Management Plan;
- Dredging and Dredge Spoil Management Plan;
- Dredging, Breakwater Construction and Land Reclamation Management Plan;
- Water and Sediment Quality Monitoring and Management Program;
- Underwater Noise Management Plan;
- Coastal Sand Monitoring and Management Program;
- Introduced Marine Organisms Management Plan;
- Accidental Spillage Management Plan;
- Oil Spill Contingency Plan;
- Flora and Vegetation Management Plan;
- Beach Wrack Management Plan;
- Shoreline Stability Management Plan;
- Port Waste Management Plan;
- Air Quality Management Plan;
- Noise Management Plan;
- Recreation and Fishing access management Plan; and
- Heritage Management Plan.

Current draft versions of these Plans and Programs that are not already provided as attachments to this referral can be provided upon request.

2.5 Consultation with Indigenous stakeholders

The Proposal is located within areas of interests for three native title claimant groups, being:

- Naaguja Peoples (Claim WC97/73);
- Amangu People (Claim WC04/02); and
- Mullewa Wadjari Community (Claim WC96/93).

OPR has signed a Heritage Protocol with each of the groups and have commenced survey work. A Heritage Management Plan has been prepared and heritage surveys for the whole proposal area have commenced.

In addition, OPR intends to negotiate a Comprehensive Agreement with each of the groups. Such agreement will outline opportunities for indigenous involvement in the Proposal, including employment, training and contractual arrangements.

2.6 A staged development or component of a larger project

The proposal is not a component of a larger action.

The port marine/terrestrial area is expected however to service a number of other existing and future projects and industries, including the Oakajee Industrial Estate (OIE) and a number of iron-ore mining operations in the mid-west region of Western Australia.

A privately owned company, OPR are currently proposing additional iron-ore material handling facilities to be located adjacent to the port, including port rail delivery facilities, stockpiles, access roads, service corridors. OPR will manage these facilities in line with the State's third party access regime requirements. These facilities will be the subject of a separate referral under the EPBC Act for Which OPR will be the proponent.

The OIE is being developed by LandCorp on largely cleared agricultural land adjacent to the port.

The mining operations will be serviced by a proposed 550km rail line constructed and operated by OPR (on behalf of the WA Public Transport Authority). The rail line has been referred separately (EPBC Reference Number: 2010/5500) for which OPR is the proponent.

The individual mines and land uses within the OIE that may utilise the port facilities to export product will be subject to their own environmental approvals.

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

3.1 (a) World Heritage Properties

Description

No World Heritage Properties are known to occur within the vicinity of the site.

Nature and extent of likely impact

N/A

3.1 (b) National Heritage Places

Description

No National Heritage Properties are known to occur within the vicinity of the site.

Nature and extent of likely impact

N/A

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

No Wetlands of international importance are known to occur within the vicinity of the site.

Nature and extent of likely impact

N/A

3.1 (d) Listed threatened species and ecological communities

Description

A total of twenty one (21) listed threatened species were identified from the search undertaken using the DSEWPC online EPBC Act Protected Matters Search Tool (23 August 2010), no ecological communities were identified. A full listing of these species is provided below.

Nature and extent of likely impact

An assessment of the impacts on listed species and ecological communities has been undertaken in the development of this referral. Information used to inform this assessment has included:

- Baseline flora and fauna surveys and analysis,
- DSEWPC and DEC online databases
- review of literature, data audit and consultation.

Using this information the presence or absence of suitable habitat and the likelihood of occurrence of listed species and communities has been determined and is presented in the tables below. Five terms for the likelihood of occurrence of species and communities are used and are defined as follows:

“Known” = the species was or has been observed in the immediate vicinity of the site.

“Likely” = a medium to high probability that a species uses the site. The species has been recorded within the local area and habitat within the site is considered to be highly suitable.

“Potential” = potentially suitable habitat for the species occurs on the site, and the site is located within the known geographic range of the species, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur. This may be due to insufficient detail known about the species ecology and/or details about habitat characteristics of the site and surrounding area.

“Unlikely” = a very low to low probability that a species uses the site. The species may or may not occur locally or regionally, however based on the known habitat requirements of the species, and habitat available within the site, the site is considered unlikely to be suitable or marginal at best.

“No” = habitat on site and in the vicinity is highly unsuitable for the species. Based on the distribution and known habitat requirements of the species, the species does not occur on site.

An analysis of the likely level of impact from the proposed project on species and communities with a likelihood of occurrence of “Potential”, “likely” and “known” (highlighted in **blue**) is provided.

Birds

Scientific name	Common name	EPBC listing status	Likelihood of Occurrence
<i>Anous tenuirostris melanops</i>	Australian Lesser Noddy	Vulnerable	Unlikely
<i>Calyptorhynchus latirostris</i>	Carnaby's Black-Cockatoo	Endangered	Potential
<i>Diomedea exulans exulans</i>	Tristan Albatross	Endangered	Unlikely
<i>Macronectes giganteus</i>	Southern Giant-Petrel	Endangered	Known
<i>Macronectes halli</i>	Northern Giant-Petrel	Vulnerable	Unlikely

<i>Pterodroma mollis</i>	Soft Plumed Petrel	Vulnerable	Unlikely
<i>Thalassarche carteri</i>	Indian Yellow nosed Albatross	Vulnerable	Unlikely
<i>Thalassarche cauta cauta</i>	Tasmanian Shy Albatross	Vulnerable	Unlikely

Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*)

Carnaby's Black-Cockatoo is endemic to the south-west of Western Australia ranging from the lower Murchison River in the north, throughout the south-west corner and east to Cape Arid. Their primary feeding habitat is Banksia woodland pine plantations on the Northern Swan Coastal Plain (Johnstone et al. 2007). Carnaby's cockatoo breeds almost exclusively in the wheatbelt, in large hollows in eucalypt trees (Johnstone and Storr 1998; Shah 2006). The majority of suitable feeding habitat remaining for this species is fragmented, and is often degraded by soil salinity and weed invasion. Breeding habitat has also been destroyed by removal of old, hollow-bearing trees.

Carnaby's Black-Cockatoo has been recorded near Oakajee, from Howatharra (15 km east of Oakajee in 1983) and was observed south of Geraldton during the 2006 ecologia survey (ecologia 2010 – **Attachment 4**). Other records for this species close to Oakajee come from Geraldton, Moresby Ranges, Dongara and the Murchison River near Kalbarri (www.birddata.com.au). Despite several ecological surveys over a thirteen year period, the species has not been recorded in the Proposal Area.

This species may periodically utilise the Banksia woodland in the Oakajee Port project area, however, these habitats are of generally low quality for feeding and do not represent important habitat for the species. Areas of Banksia woodland within the Port marine (terrestrial) area will not be impacted by the project, accordingly significant impacts on this species are highly unlikely.

No nesting or breeding habitat is available within the proposal area; however, some secondary/supplementary foraging habitat is available and will be impacted by the terrestrial component of the marine port proposal, for the construction of the haul road (see **Attachment 10**). Ecologia (2010 – **Attachment 10**) determined that Carnaby's Black Cockatoo could potentially use some species from four of the vegetation sub associations mapped within the project boundary. These sub associations are shown mapped in **Attachment 10**.

Three (3) species, *Grevillea argyrophylla*, *Casuarina obesa* and *Eucalyptus camaldulensis* from the four vegetation sub associations are considered as possible (supplementary) foraging habitat. Carnaby's have not previously been observed feeding on these specific species; however they are known to feed on the nuts and flowers of a variety of *Casuarina*, *Eucalyptus* and *Grevillea* species. Vegetation quality was observed to be in good to degraded condition, with the vegetation structure significantly impacted by disturbance due to grazing, clearing and weed invasion. Overall, the proposed works will impact a total of 0.77 ha of potential supplementary foraging habitat for Carnaby's Black-Cockatoo. This habitat is expected to be of low quality as a food source due to its degraded condition and/or small size of the remnant patch (Ecologia 2010 – **Attachment 10**).

Accordingly, given the works are expected to impact less than 1 ha of possible supplementary habitat, the proposal is not considered to have a significant impact on any important population of Carnaby's Black Cockatoo.

Southern Giant-Petrel (*Macronectes giganteus*)

The Southern Giant Petrel is a visitor to the Western Australian coastline, especially during winter, with most visiting birds being immature individuals. The species is common close to the south-west coast (east to Albany) and lower west coast (north to Fremantle), and scarce to moderately common further north and east (Johnstone et al. 1998). The species nests in small colonies on islands. Immature Southern Giant-Petrels then disperse widely across its range (Johnstone et al. 1998). Southern Giant-Petrels are significantly threatened by longline fishing, predation from feral cats and black rats, and by habitat degradation from introduced sheep and rabbits on their breeding islands.

This species has been recorded from the Abrolhos Islands, 70 km west of Oakajee (DEH 2005). During project baseline surveys (ecologia 2009) a single Southern Giant-Petrel was observed flying along the coastline north of

the Oakajee River. While this species is an occasional aerial visitor to the project area for opportunistic foraging, the area does not provide the food resources to be important feeding habitat; as the species spends the vast majority of its time feeding offshore and breeds on islands. The presence of an operating port in this area will not impact on the species.

Mammals

Scientific name	Common name	EPBC listing status	Likelihood of Occurrence
<i>Balaenoptera musculus</i>	Blue Whale	Endangered	Known
<i>Eubalaena australis</i>	Southern Right Whale	Endangered	Known
<i>Megaptera novaeangliae</i>	Humpback Whale	Vulnerable	Known
<i>Neophoca cinerea</i>	Australian Sea-lion	Vulnerable	Known

Marine Monitoring

In order to determine the habitat significance of the marine area surrounding the port, OPR has undertaken a comprehensive monitoring programme, consisting of a pilot survey in October to December 2007, followed by a fourteen month survey from November 2008 to December 2009 (Oceanica 2010b). Types and distribution of marine habitat can be seen at **Figure 4 – Attachment 1**. The baseline investigation is ongoing, with aerial surveys of the Oakajee monitoring area continuing up to construction. The baseline investigation has provided data on marine fauna species diversity, relative abundance and distribution in space and time in the vicinity of the Oakajee Port (Oceanica 2010b).

The baseline investigation was developed in close consultation with Curt Jenner (Director, Centre for Whale Research) and Chris Burton (Director, Western Whale Research). **Attachment 5** includes several maps which provide an overview of marine mammals sighted during surveys.

The marine mammal monitoring programme has provided behavioural information on whales, which has shown that Oakajee is not used as a feeding, resting, breeding or calving area (Oceanica 2010b). However, humpback whales were observed swimming past Oakajee during their northern migration (winter – typically June to August) and were more frequently seen on their southern migration (spring – typically September to November). There was a considerable difference in the number of whales sighted during the northern migration compared to the southern migration, which may indicate that the northward migrating whales may be located further offshore, with a large proportion travelling outside the Abrolhos Islands. The majority of the southern migrating humpback whales appeared to travel between the coast and the Abrolhos Islands, with the greatest proportion of animals located between 10 km and 30 km of the Oakajee shoreline (Oceanica 2010b).

Blue Whale (*Balaenoptera musculus*)

Blue Whale sightings in Australian waters have been widespread, and it is likely that the whales occur right around the continent at various times of the year. However, much of the Australian continental shelf and coastal waters have no particular significance to the whales and are used only for migration and opportunistic feeding. The only known areas of significance to Blue Whales are feeding areas around the southern continental shelf, notably the Perth Canyon, in Western Australia, and the Bonney Upwelling and adjacent upwelling areas of South Australia and Victoria (DEH 2005).

During the thirty-three aerial surveys (Oceanica 2010, refer **Attachment 5**) conducted from 5 November 2008- 29 January 2010, only four adult Blue Whales were recorded in the study area. Three of these animals were recorded south-west of Pelsaert Island over 80km from the project site. One animal was recorded east of the Abrolhos Island group approximately 40km from the project site. The area does not represent an important aggregation area.

The very low density of Blue whales combined with the mitigation and protection measures to be employed (refer to section 4) will ensure that there are no significant impacts to this species.

The Southern Right Whale (*Eubalaena australis*)

Southern Right Whales are seasonally present on the south-west Australian coast between May and November.

The Southern Right Whale is experiencing sound recovery rates in line with the theorised maximum biological rate of increase across a wide proportion of its known range (IWC 2001). The security of the species is not yet assured as numbers remain at likely less than 10% of pre-exploitation abundance (IWC 2001). In addition, fitness in severely and rapidly depleted populations is reduced due to a loss of genetic diversity.

The Southern Right Whale was not frequently observed in the surveys, with confirmed sightings of only nine individuals during the baseline studies (Oceanica 2010). These nine animals were widely spread in their distribution, with no trends or aggregation behaviour evident. The nearest of these animals was over 10km from the project site.

The very low density of Southern right whales combined with the mitigation and protection measures to be employed (refer to section 4) will ensure that there are no significant impacts to this species.

Humpback Whale (*Megaptera novaeangliae*)

The west and north-west coast of Australia is particularly important for humpback whales whose known breeding and calving grounds are between Broome and the northern end of Camden Sound. There is a migration path between Point Cloates and North West Cape (DEWHA 2008b) leading to the Southern Ocean. Humpback whales migrate north from their Antarctic feeding grounds around May each year, reaching the waters of the North-west Marine Region in early June. Breeding and calving takes place between mid-August and early September. From September to November humpback whales make their way south again with females with calves being the last to leave the breeding grounds stopping to rest in Exmouth Gulf and Shark Bay.

The population estimate for the Australian west coast humpback whale population was 8207–13,640 in 1999 (Bannister & Hedley 2001). There have been wide point estimate variations in growth rates of the two Australian populations of Humpback Whales but it is generally recognised that the Australian west coast and east coast populations appear to be growing consistently at approximately 10% per annum (Bannister & Hedley 2001; Bryden et al. 1990; Chaloupka & Osmond 1999; Paterson et al. 2001). This growth equates to a much larger migrating body, which can mean a considerably greater chance of natural mortality during migration for the humpback whale.

Humpback whales were frequently observed in the surveys (**Attachment 5**) and formed the majority of all marine mammal sightings during the baseline studies (Oceanica 2010b). The peak of the northward humpback whale migration occurred during late June and early August, whereas the peak of the southern migration occurred during mid September and late November. Observations of whale behaviour during the baseline studies support the view that Oakajee is not a resting or aggregation area for whales. There were no observations of whales breeding or calving in the data set. The proportion of whales observed from land surveys, which can only capture whale data within ~3-5 km of the observation site) compared to whales observed during aerial surveys was variable and did not support the view that humpbacks were swimming closer to shore during the southern migration. Full details of the baseline surveys and Humpback whale presence in the Oakajee region are contained in the *Marine Mammal Baseline Investigation* (Oceanica 2010b) – which is at **Attachment 5**.

Australian Sea-lion (*Neophoca cinerea*)

The Australian sea lion is not a frequent visitor to Oakajee. A breeding colony is located approximately 55 km west of Oakajee on the Abrolhos Islands and a small, non-breeding haul-out colony of approximately 10-15 sub-adult males and occasional females are known to use the breakwater at Geraldton Port, 24 km south of Oakajee.

Two Australian Sea-lion were observed swimming in the Oakajee region during the baseline marine mammal studies. There is no indication that the Oakajee area is used by sea-lions to 'haul-out' or rest.

The impacts to sea-lions were considered during recent port upgrade construction at the nearby Geraldton Port; however, there was no evidence that sea-lions were impacted by the work. In fact, Australian Sea-lions were

observed in close proximity (<100 m) to the dredge when it was in full operation (M. Mulligan, Geraldton Port Authority, pers. comm.). Considering the low frequency of sightings and apparent insignificant impact of construction activities on Australian Sea-lions, they are not expected to be impacted by the proposal. Notwithstanding the modelling, risk assessment and the Underwater Noise Management Plan (UNMP, **Attachment 6**) has considered Sea-lions and developed management zones and management measures should they be encountered during the construction.

Impacts on Marine Mammals

The potential impacts of the proposed Oakajee port development on marine mammals and especially whale populations is considered to primarily come from noise during construction and vessel strike.

Noise during construction will be generated from activities associated with pile driving, dredging, breakwater construction and land reclamation. It should be noted that blasting will not be required for construction of the proposed port. The port construction plans include sinking approximately 290 piles. It is most likely that the proposed piling will be undertaken using pile driving.

The development of port infrastructure at Oakajee will involve a combination of noise-intensive activities, including:

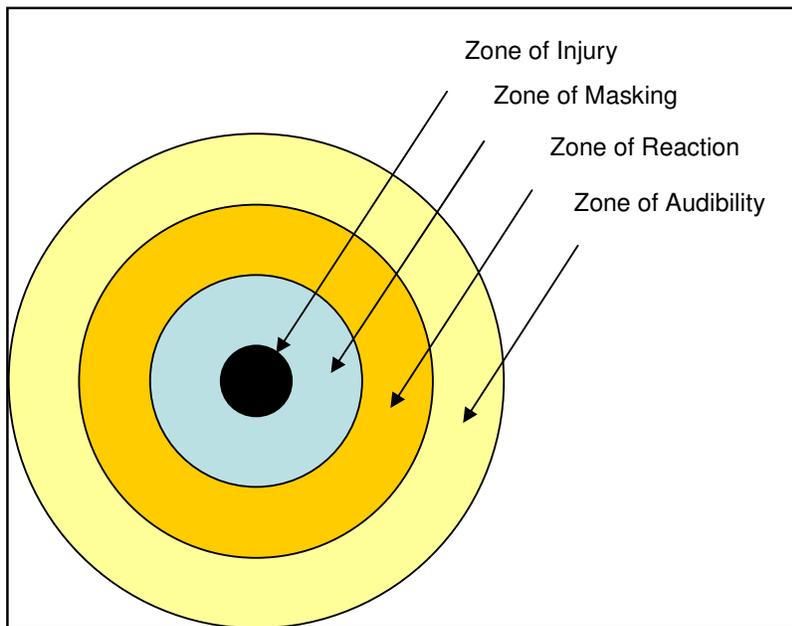
- Sources of low acoustic disturbance are those which are expected to have a source level of less than 160 dB re 1 μPa^2 :
 - Dredging – the dredging program at Oakajee is expected to occur for up to 12 months. A large cutter suction dredge will be used and the dredged material will be collected and pumped onshore for land reclamation and disposal;
 - Rock dumping – rock dumping (end tipping) and barge dumping will be utilised during the construction of Oakajee port as the primary mechanism for breakwater construction. Rock dumping is expected to progress over a 12 to 18 month period;
 - Vessels - noise generated by vessel traffic will mainly be associated with construction vessels, such as barges and tugs; and
 - Piling – 290 piles are required for the marine infrastructure at Oakajee Port. Due to the hardness of the seabed the piles are most likely to be drilled and then driven.
- Sources of potentially elevated acoustic disturbance are those which are expected to have a source level in excess of 160 dB re 1 μPa^2 .
 - The only construction activity at the proposed port likely to fall into this category is pile driving.
 - Operations are likely to occur 24 hours a day, 7 days a week; and
 - No blasting will be required for the development.

The impact of noise on marine fauna depends on the level and frequency of the source, the attenuation of sound by the surrounding environment, and the sensitivity and proximity of the fauna to the source.

The zone of influence of a sound source is the range at which noise will be detectable by the receiving fauna. The size of the zone of influence is defined by the intensity and temporal characteristics of the source and environmental conditions such as water depth, benthic substrate, salinity and temperature among others (RPS Energy, 2006). RPS Energy (2006) and Richardson et al. (1995) identify several direct effects within the zone of influence (Figure 3-1), namely:

- A zone of injury is the area in which permanent or temporary hearing impairment, permanent hearing damage or death is likely to occur;
- A zone of responsiveness, comprising:
 - A zone of masking in which the sound levels interfere with detection of other sounds, presumably

- on which the animal in question depends;
- A zone of reaction, either behavioural or physiological; and,
- A zone of audibility in which the animal can hear the source above background noise.



Conceptual zones of influence of noise on marine fauna (adapted from RPS Energy, 2006)

Underwater noise modelling was completed for the proposed pile driving activities at Oakajee Port by Professor Rob McCauley (Curtin University, Centre for Marine Science and Technology; CMST). The underwater noise model revealed that the breakwater, which will be constructed prior to piling activities, will attenuate noise to the south and west, whereas the land will attenuate noise to the east (McCauley *et al.* 2010). Consequently, it was demonstrated that piling noise will only propagate in the direction 310-360°.

While research into the hearing sensitivities and response actions of marine fauna is not extensive, a set of impact criteria has been generated based on those results available, with a focus on the fauna that may be present at Oakajee. The impact criteria have been separated into impact severities varying from simple behavioural responses (avoidance, repulsion/attraction, minor deviation from migration paths) to mortality. These are documented in detail in McCauley *et al.* (2010) and listed in the Table below.

Noise level impacts on marine fauna (data from McCauley et al. 2010)

Species	Species Significance	Behavioural response	Temporary threshold shift (TTS)	Permanent threshold shift (PTS)	Mortality
Whales	Very High	140-160 or 120 dB (SEL) when migrating	180 dB (SEL)	178-198 dB (SEL)	>200 dB (RMS)
Dolphins	High	120-180 dB (SEL)	183 dB (SEL)	178-198 dB (SEL)	>200 dB (RMS)
Sea Lions	Very High	120-150 dB (SEL)	183 dB (SEL)	178-198 dB (SEL)	>200 dB (RMS)
Fish (inc. Sharks)	Low	120-150 dB (RMS)	180 -190 dB (RMS)	190 dB (RMS)	>200 dB (RMS)
Western Rock Lobster	High (Fisheries)	Insufficient Information (less sensitive to underwater noise than others [R. McCauley <i>pers com</i>])			

Note: TTS equates to temporary hearing damage, whereas PTS equates to permanent hearing damage.

RMS = root mean square. SEL = sound exposure level

Based on the noise level impacts on marine fauna and estimates of the propagation of underwater noise from pile driving activities derived from underwater noise modelling an Underwater Noise Management Plan (UNMP, **Attachment 6**) has been developed to reduce the risk of acoustic injury to marine mammals. This will be achieved by reducing/stopping noise-generating activities when marine mammals are approaching a pre-defined area where they may be at risk. This is discussed in greater detail in **Section 4**.

Marine mammal **vessel strike** has historically been considered a low risk impact in Australian waters, primarily due to the large marine area and relatively low levels of shipping movement. Increasing ship traffic combined with recovering whale populations may lead to an increase in vessel strike incidents. At Oakajee the highest risk of marine mammal vessel strike is considered to be during the Humpback whale migration period, i.e. July to November. Measures to avoid and reduce the risk of vessel strike will be implemented during both the construction and operation of the port. Details of the measures to be employed are outlined in **Section 4** below.

Reptiles

Scientific name	Common name	EPBC listing status	Likelihood of Occurrence
<i>Caretta caretta</i>	Loggerhead Turtle	Endangered	Potential
<i>Chelonia myda</i>	Green Turtle	Vulnerable	Potential
<i>Dermochelys coriacea</i>	Leatherback Turtle	Endangered	Potential

Turtles

Of the six species of sea turtle that occur in Western Australian waters, three of these are considered 'potential' visitors to the Oakajee area including the loggerhead turtle (*Caretta caretta*), green turtle (*Chelonia mydas*) and leatherback turtle (*Dermochelys coriacea*). Leatherbacks have the greatest worldwide distribution but occur at low densities throughout their range and rarely breed in Australia. Green turtles are the most common species found worldwide and breed extensively in northern Western Australia. The southern limit of their breeding range is probably the North West Cape while green turtles are found using waters as far south as Rottnest Island to forage (DEWHA, 2008). The North West Shelf region contains globally important breeding beaches for hawksbills which have a southern nesting range limit of Exmouth Gulf.

The Loggerhead has a temperate distribution and has the most southerly nesting range of all species nesting in Western Australia (Shark Bay). It is also the most commonly observed marine turtle species in South Western Australia, but has not been sighted at the site during baseline studies.

Loggerhead and Leatherback are not known to occur in the area, although the Loggerhead has been recorded further south in waters off Perth. Green Turtles (*Chelonia mydas*) are rarely seen in the Geraldton region but may use the area periodically for foraging (Tingay and Associates, 1997).

No turtles have been observed during the OPR commissioned baseline surveys and there are no known nesting sites located in the region, accordingly likely impacts on any turtle species from the proposal is considered highly unlikely.

Sharks

Scientific name	Common name	EPBC listing status	Likelihood of Occurrence
<i>Carcharias taurus (west coast population)</i>	Grey Nurse Shark (west coast population)	Vulnerable	Unlikely
<i>Carcharodon carcharias</i>	Great White Shark	Vulnerable	Unlikely
<i>Rhincodon typus</i>	Whale Shark	Vulnerable	Unlikely

Plants

Scientific name	Common name	EPBC listing status	Likelihood of Occurrence
<i>Eucalyptus blaxellii</i>	Howatharra Mallee	Vulnerable	No
<i>Eucalyptus cuprea</i>	Mallee Box	Endangered	No
<i>Hypocalymma longifolium</i>	--	Endangered	No

3.1 (e) Listed migratory species

Description

A total of twenty five (25) listed migratory species were identified from the search undertaken using the DSEWPC online EPBC Act Protected Matters Search Tool (PMST). A full listing of these species is provided below.

Nature and extent of likely impact

Again, the likelihood of occurrence was determined and expressed using the five terms as defined in section 3.1(d). It was found to be unlikely that any of the listed migratory species identified in the Protected Matters search report would occur on site in densities likely to constitute a significant proportion of the Australia population. Each of the species considered have large natural distributions and are found in a variety of areas throughout Australia. Consequently, there is unlikely to be any impact on these migratory species as a result of the proposed project.

Migratory Terrestrial Species

Birds

Scientific name	Common name	EPBC listing status	Likelihood of Occurrence
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	Migratory	Known
<i>Merops ornatus</i>	Rainbow Bee-eater	Migratory	Potential
<i>Pandion cristatus</i>	Eastern Osprey	Migratory	Potential
<i>Pluvialis squatarola</i>	Grey Plover	Migratory	Potential

White-bellied Sea-Eagle occurs in coastal and near-coastal areas across Australia inhabiting most types of habitats except closed forest. It feeds mainly on aquatic animals, and breeds almost wholly on islands (Johnstone and Storr 1998). This species is considered moderately common in the Houtman Abrolhos Islands off Geraldton and has also been recorded in Horrocks (30 km north-north-west) and Drummond Cove (10 km south) (Birddata, EPBC Database).

The White-bellied Sea-eagle was recorded once during the May survey (Ecologia 2010) when it was observed flying along the coastline, north of the Oakajee River within the Project area. The White-bellied Sea-eagle may utilise the Project area for roosting and occasionally hunting, but breeds almost wholly on islands (Johnstone and Storr 1998). Because similar habitats and adjacent oceanic fishing areas suitable for the species occur to the north and south, the Project area is not considered to be 'critical' hunting habitat for local birds (Ecologia 2010) and the footprint of the proposed action is minor compared to its available habitat locally and regionally. The species is therefore unlikely to be significantly impacted by the proposal.

Rainbow Bee-eater

The Rainbow Bee-eater lives almost anywhere suitable for hawking insects. Part of the population migrates between Australia and Indonesia, moving south over summer and breeding in Australia (Johnstone and Storr, 1998). In the region, this species occurs as a breeding visitor during summer. They are scarce to very common throughout much of Western Australia, except for the arid interior, preferring lightly-wooded, preferably sandy country near water (Johnstone and Storr, 1998).

Rainbow Bee-eaters were recorded during the summer survey within the Project area, commonly near the Oakajee River and adjacent woodland and may breed in the area from October to mid December, during which time impacts to individuals (nestlings) are possible (Ecologia 2010a). However possible impacts to individuals within the Project area are unlikely to cause significant declines in the local or regional population of this species as the species is commonly recorded in the surrounding region from September to March (Birds Australia 2009). Additionally, sandy banks and cuttings of the riverine areas, which are favoured by breeding Rainbow Bee-eaters, will largely be unaffected by the Project.

Worth noting also is the fact that, although trends in the extent of occurrence have not been quantified, records indicate that the distribution of the species (and, hence, the extent of occurrence) has expanded in south-western Australia. The Rainbow Bee-eater was rare around Perth during the 19th century, and was recorded only infrequently before the 1920s. However, the bird had begun to visit Perth regularly and in larger numbers by the late 1970s, and it colonised Rottnest Island in 1977. Therefore it is considered the species is unlikely to be significantly impacted by the Project.

Osprey

The Eastern Osprey is a large, water-dependent bird of prey. In Australia the total range of the Eastern Osprey extends around the northern coast, extending from Esperance in WA to south-eastern NSW and the distribution around the coast appears to be continuous (Barrett *et al* 2003 and Johnstone & Storr 1998). The species is most abundant in northern Australia. The Eastern Osprey is rare to uncommon in southern Western Australia and small fragmented breeding populations exist in South Australia (Dennis 2007a). The species favours mangroves, rivers and estuaries, inshore seas and coastal islands and feeding on fish, sea snakes, seabirds and large lizards (Johnstone and Storr 1998).

The EPBC Protected Matters Search Tool did not indicate the presence of the species or its habitat within the Project area; however, Eastern Ospreys were observed during both the December and May surveying of the Project area. In December, a single osprey was observed south of Coronation Beach (7 km to the northwest). During the May survey, an osprey was observed flying above a local Limestone Ridge. Ospreys were also observed at Oakajee perched on high coastal dunes and foraging in near shore coastal waters. The species may roost in the local area, hunting in adjacent oceanic and coastal areas. No breeding activity or nests were found within the Project area and the birds are thought to nest predominantly on islands (particularly the Houtman Abrolhos Islands) from late July to mid-October in the region (Johnstone and Storr 1998). Additionally, similar

habitats to the north and south are present, with the Project area not expected to be a critical hunting area for the species.

The species is generally uncommon on mainland coasts preferring offshore islands and therefore, the coast associated with the Project area was not considered critical hunting habitat for the local population. Consequently, the proposed action is not expected to significantly impact the local individual(s) observed.

Grey Plover

The Grey Plover is a medium sized Plover which occurs along all coastal areas of Australia, and in Western Australia on some west-coast islands and near-coastal salt-lakes (Johnstone and Storr, 1998). It is a migratory visitor to Western Australia, breeding in arctic Europe, Asia, and North America and wintering mainly south of the tropic of Cancer. In southern Western Australia, the Grey Plover is uncommon to moderately common and occurs mostly from September to April (Johnstone and Storr, 1998).

The EPBC Protected Matters Search Tool did not indicate the presence of the species or its habitat within the Project area; however, the Grey Plover was recorded during the December 2006 survey, outside of the Project area, feeding and roosting on the beach between the Oakajee and Buller Rivers. The coastal habitats required by the Grey Plover are commonly found throughout Australia, including areas adjacent to the proposed development. The species is unlikely to utilise the terrestrial habitats within the Project area and therefore the proposal is not expected to significantly impact the species.

Migratory Wetland Species

Birds

Scientific name	Common name	EPBC listing status	Likelihood of Occurrence
<i>Ardea alba</i>	Great Egret, White Egret	Migratory	Unlikely
<i>Ardea ibis</i>	Cattle Egret	Migratory	Unlikely

Migratory Marine Species

Birds

Scientific name	Common name	EPBC listing status	Likelihood of Occurrence
<i>Apus pacificus</i>	Fork-tailed Swift	Migratory	Known
<i>Ardea alba</i>	Great Egret	Migratory	Unlikely
<i>Ardea ibis</i>	Cattle Egret	Migratory	Unlikely
<i>Diomedea exulans exulans</i>	Tristan Albatross	Migratory	Unlikely
<i>Macronectes giganteus</i>	Southern Giant-Petrel	Migratory	Known
<i>Macronectes halli</i>	Northern Giant-Petrel	Migratory	Unlikely
<i>Thalassarche carteri</i>	Indian Yellow nosed Albatross	Migratory	Unlikely
<i>Thalassarche cauta cauta</i>	Tasmanian Shy Albatross	Migratory	Unlikely
<i>Thalassarche chlororhynchus</i>	Atlantic Yellow Nosed Albatross	Migratory	Unlikely

Fork-tailed Swift (*Apus pacificus*)

The Fork-tailed Swift is a wide-ranging migratory species found throughout most of Australia. Given its wide distribution, it is found in a variety of habitats with a possible tendency to more arid areas but also over coasts and urban areas (Simpson & Day 1999). Little information regarding the ecology of the species is available.

The Fork-tailed Swift may occasionally transit through the study area. No habitat critical to the survival of this migratory species is known to occur within the proposal site, nor is this area known to support an ecologically significant proportion of their population. As such, it is unlikely that the Fork-tailed Swift will be significantly impacted by the proposed development, should it occur in the port area.

Southern Giant Petrel

Refer to 3.1 (d) above

Mammals

Scientific name	Common name	EPBC listing status	Likelihood of Occurrence
<i>Balaenoptera edeni</i>	Bryde's Whale	Migratory	Unlikely
<i>Balaenoptera musculus</i>	Blue Whale	Migratory	Known
<i>Dugong dugon</i>	Dugong	Migratory	Potential
<i>Eubalaena australis</i>	Southern Right Whale	Migratory	Known
<i>Lagenorhynchus obscurus</i>	Dusky Dolphin	Migratory	Unlikely
<i>Megaptera novaeangliae</i>	Humpback Whale	Migratory	Known
<i>Orcinus orca</i>	Killer Whale, Orca	Migratory	Unlikely

Whales

See section 3.1(d)

Dugong (*Dugong dugon*)

Dugongs are rarely seen in the Oakajee region (Tingay and Associates, 1997). During recent Baseline Marine Mammal Survey, two dugongs were sighted at Horrocks on 4 July 2009, at the most northern extent of the aerial survey area, ~55 km north of the proposed port location. Another solitary dugong was seen at Horrocks on 13 July 2009. There were no other Dugong sightings during the baseline investigation and no dugongs were observed in the Oakajee Port project area (Oceanica 2010 - **Attachment 5**).

Dugongs are known to have very sensitive hearing, particularly to low frequency sounds (Hodgson et al, 2007). and therefore may be very susceptible to loud noise. However, they are also known to react to underwater noise by fleeing the area in response to faint unfamiliar sounds and have exhibited aversion responses to divers and boats (Anderson 1982). Considering that Oakajee is likely to be the most southern extent of their habitat range, and that their preferred seagrass (*Halodule* and *Halophila*) food is not prevalent at Oakajee, it is unlikely that dugongs will be located in the construction area or will be impacted by the proposal.

Reptiles

Scientific name	Common name	EPBC listing status	Likelihood of Occurrence
<i>Caretta caretta</i>	Loggerhead Turtle	Migratory	Potential
<i>Chelonia myda</i>	Green Turtle	Migratory	Likely
<i>Dermochelys coriacea</i>	Leatherback Turtle	Migratory	Potential

Green Turtle

Refer to 3.1 (d) above.

Sharks

Scientific name	Common name	EPBC listing status	Likelihood of Occurrence
<i>Carcharodon carcharias</i>	Great White Shark	Migratory	Unlikely
<i>Rhincodon typus</i>	Whale Shark	Migratory	Unlikely

3.1 (f) Commonwealth marine area

Description

No Commonwealth marine areas occur within the vicinity of the project area. The boundary of the Commonwealth marine area in this area of the Australia coast is located to the west of the Abrolhos Islands, over 70 km distant from the project site.

Nature and extent of likely impact

N/A

3.1 (g) Commonwealth land

Description

The project site is not Commonwealth land.

Nature and extent of likely impact

N/A

3.1 (h) The Great Barrier Reef Marine Park

Description

N/A

Nature and extent of likely impact

N/A

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park

3.2 (a)	Is the proposed action a nuclear action?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (b)	Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (c)	Is the proposed action to be taken in a Commonwealth marine area?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))

3.2 (d)	Is the proposed action to be taken on Commonwealth land?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))

3.2 (e)	Is the proposed action to be taken in the Great Barrier Reef Marine Park?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))

3.3 Other important features of the environment

3.3 (a) Soil and vegetation characteristics

The following section describes the general terrestrial environment relevant to the proposal area. The Proposal lies on the coastal belt of limestone and sand dunes which have developed along the coast north and south of Geraldton. The coastal limestone belt forms hills up to 130 m high and extends up to 8 km inland. The overlying podsolised sand may contain some acidity; however, the underlying limestone and dune sands have a neutralizing capacity, therefore, the site has low potential for acid sulfate soils. A maximum of 81 ha of native vegetation is to be disturbed for the Proposal. Topsoil will be stockpiled as construction progresses.

3.3 (b) Water flows, including rivers, creeks and impoundments

The project is bounded in the north and south by two minor water courses; being the Oakajee River and the Buller River respectively. The rivers have quite small catchment areas, in the order of 10km² or less and are ephemeral in nature, flowing from the east following extended rain periods. During rains, water generally infiltrates the site; however, where very high levels of surface water runoff does occur, the Oakajee and Buller Rivers may flood, breach the restraining sandbar at the coast and discharge to the Indian Ocean for a brief period.

3.3 (c) Outstanding natural features, including caves

There are no outstanding natural features on site.

3.3 (d) Gradient

The proposed port will be located on the continental shelf from the shoreline to a depth of -21mCD. The proposed port channel will be dredged to a depth of between up to -23mCD.

3.3 (e) Buildings or other infrastructure

N/A

3.3 (f) Marine areas

Marine habitat surveys have been conducted by Oceanica to describe the existing marine habitats and health in the vicinity of the proposed Oakajee Port and the surrounding region to support assessment of environmental impact following port development (Oceanica (2010) Benthic Habitat Monitoring Report).

The following surveys have been undertaken:

- Broad-scale mapping (80km²) of the Oakajee Region using remote imagery and underwater video footage – October 2006 and February and March 2007;
- Seagrass and cover transects and seagrass health surveys were undertaken by divers in summer 2006/07, summer 2007/08, summer 2008/09 and summer 2009/10; and
- Algal cover transects and algal health surveys were undertaken by divers in summer 2007/08, summer 2008/09 and summer 2009/10.

The surveys have identified the following marine habitat classifications that are considered to exist in the Oakajee region:

- Sand with seagrass;
- Reef with algae;
- Reef with algae and seagrass;
- Inshore reef with algae; and
- Sand.

3.3 (g) Kinds of fauna & flora

The following section describes the general marine flora and fauna relevant to the proposal area (**Figure 4 – Attachment 1**). Further details about species of national environmental significance are provided in Sections 3.1 (d) and (e).

Flora

The marine benthic habitats in the region surrounding the Oakajee project were predominantly composed of high relief reef, low relief reef and unvegetated sand. However, within these broad habitat types, a number of marine flora and habitat types have been distinguished, as follows:

Unvegetated sand

- Occurring as inshore, shallow (<15 m depth) sand occurring along majority of the shoreline, as a veneer over pavement reef or within more sheltered areas (for example within river channels); or
- Offshore, deep (>15 m depth) sand occurring offshore of main reef features.

High relief reef

High relief (rising >1 m above surrounding seabed) reef units exhibiting vertical and overhanging surfaces, with vegetative cover dominated by:

- Robust brown (including *Ecklonia* sp.) and foliose brown algae;
- *Amphibolis antarctica* seagrass;
- *Thalassodendron pachyrhizum* seagrass; and
- A combination of algae and seagrass.

Low relief reef

Low relief reef (rising <1 m from surrounding seabed) exhibiting generally horizontal surfaces and dominated by the following vegetative cover:

- *Amphibolis* spp. seagrasses;
- Foliose algae and *Thalassodendron pachyrhizum* seagrass; and
- Low relief reef exhibiting a mix of algae and seagrass cover.

Seagrass

As well as the *Amphibolis* spp. and *Thalassodendron pachyrhizum* seagrasses associated with the reef habitats, seagrasses were also recorded in sandy substrates as follows:

- *Amphibolis* spp. forming relatively dense coverage ($\leq 50\%$) within sand areas in approximately 9-12 m water depth;
- *Posidonia australis* growing in small, isolated patches within sheltered inshore sand areas;
- *Halophila* sp. and *Heterozostera tasmanica* growing in small, isolated patches within sheltered inshore sand areas; and
- *Heterozostera tasmanica* growing in relatively small patches within sheltered inshore areas (Drummonds Cove).

Fauna (non NES)

Both the bottlenose and common dolphin are often seen in the waters of the region. Mothers and calves have also been observed close to shore (100-200 m) along the open coast, including at the Oakajee port development site.

Three (WA listed) conservation significant species have been previously recorded at Oakajee. These species are the Carpet Python (*Morelia imbricata*), Woma (*Aspidites ramsayi*) and Australian Bustard (*Ardeotis australis*).

3.3 (h) Current state of the environment in the area

The Oakajee marine environment is a largely undisturbed location, which has not been significantly influenced by human development or disturbance. However it is likely that the area has had minor and indirect impact from professional Rock Lobster fishing in the area.

The Oakajee River is a potential, but infrequent source of anthropogenic nutrients and contaminants associated with agricultural drainage during high rainfall and river flow. The Oakajee River has a small catchment (<10km²) and rarely flows (approximately once every 10 years).

3.3 (i) Other important or unique values of the environment

There are no other important or unique values known on site.

3.3 (j) Tenure of the action area (eg freehold, leasehold)

The project works are located within Reserve 25300 vested in the Geraldton Port Authority.

3.3 (k) Existing land/marine uses of area

The project area is within an active fishery area for Western Rock Lobster extending hundreds of kilometres along the Western Australian coast. Little professional fishing for other species is carried out in the nearshore waters at Oakajee (Tingay and Associates, 1997).

The beach area is difficult to access; however, the area is utilised by the community for recreational pursuits; including fishing, camping and windsurfing. More popular areas exist to the north (Coronation Beach) and south (Buller River) which will be unaffected by the proposal. The proponent has also developed a Recreation and Fishing Access Management Plan to appropriately manage human uses during the construction and operational phases of the project.

3.3 (l) Any proposed land/marine uses of area

The land is proposed for development of the Oakajee deepwater port.

4 Measures to avoid or reduce impacts

The proponent has developed an extensive set of management plans and mitigation programs to manage potential impacts on the environment. The risk assessment and identification of mitigation measures involved the following (full details are contained in the relevant EMPs):

Identification of key activities that may interact with the project environment

The key project activities of the proposal were identified. The events that may cause impacts to the environment were determined, and their associated potential impacts listed.

The risk of the impacts occurring was analysed by determining the consequence severity of the impacts and the likelihood of consequences being realised.

Implementing controls to reduce risk and severity of impacts

To prevent or minimise the impacts, controls are placed on the impacts in this order of hierarchy of control principles:

- *Elimination* of the activity;
- *Substitution* with a lower risk activity or product;
- *Engineering* solutions to reduce the impact of the event;
- Implementation of *administrative* procedures to control the activity; and
- *Clean up* or remediation measures to mitigate impacts after an event.

Monitoring the effectiveness of controls

Performance indicators were selected that provide indications of the effectiveness of the management strategies. These indicators have been translated to performance targets.

Environmental Management Plans for the Project

The following tables provide an overview of the potential impacts and the relevant EMP where the management measures for these impacts are contained. All EMPs will be reviewed and the final version approved by the WA EPA and DSEWPC (if required) prior to any relevant works commencing.

The mitigation measures and EMPs have been developed with the assistance and in consultation with recognised experts, including: Curtin University (Rob McCaughley); and marine mammal specialists Curt Jenner and Chris Burton.

Potential impact to marine flora

Phase/Activity	Potential Impact	Impact Pathway	Relevant Environmental Management Plan*
Construction			
Dredging	Indirect impact to BPPH	Sediment Plume – reduction in the amount of light reaching BPPH	DBCLRMP
Dredging	Direct impact to BPPH	Sediment Plume – smothering of BPPH by sediment as it settles out of the water column	DBCLRMP
Dredging	Direct impact to BPPH	Dredge Footprint – destruction of BPPH by the dredge outside the proposed area	DBCLRMP
Breakwater Construction	Indirect impact to BPPH	Sediment Plume from fine particulate material on construction material and disturbance of marine sediments - Reduction in the amount of light reaching	DBCLRMP

Phase/Activity	Potential Impact	Impact Pathway	Relevant Environmental Management Plan*
		BPPH	
Breakwater Construction	Direct impact to BPPH	Sediment Plume – Smothering of BPPH by sediment as it settles out of the water column	DBCLRMP
Breakwater Construction	Direct impact to BPPH	Breakwater Footprint - Destruction of BPPH by breakwater construction outside the proposed area	DBCLRMP
Land Reclamation	Indirect impact to BPPH	Sediment Plume from the discharge of return water from land reclamation containing fine particulate material- Reduction in the amount of light reaching BPPH	DBCLRMP
Land Reclamation	Direct impact to BPPH	Sediment Plume – Smothering of BPPH by sediment as it settles out from return-water discharge	DBCLRMP
Land Reclamation	Direct impact to BPPH	Land Reclamation Footprint – Destruction of BPPH by land reclamation footprint outside the proposed area	DBCLRMP

*MFFMP: Marine Flora and Fauna Management Plan. DBCLRMP: Dredging, Breakwater Construction and Land Reclamation Management Plan. BWMP: Beach Wrack Management Plan. UNMP: Underwater Noise Management Plan.

Potential impacts to Marine Fauna

Phase/Activity	Impact Pathway	Potential Impact	Relevant Environmental Management Plan*
Construction			
Dredging	Vessel Strikes	Injury or death caused by collision with vessel or damage from propellers	MFFMP
Dredging	Underwater noise	Injury to marine fauna caused by noise from the dredge cutter head and/or pumps. Injury to marine fauna may include Temporary Threshold Shift (TTS) or Permanent Threshold Shift (PTS) to the auditory systems of marine fauna	UNMP
Dredging	Introduced Marine Organisms	Introduction of Introduced Marine Pests (IMP) from the dredge. Potential impacts may include loss of biodiversity and loss of ecosystem function	IMPMP
Breakwater Construction	Vessel Strikes (Barges and construction material transport vessels)	Injury or death caused by collision with vessel or damage from propellers	MFFMP
Breakwater Construction	Underwater Noise (end tipping of core material)	Injury to marine fauna caused by noise from tipping rocks into the sea. Injury to marine fauna may include TTS to the auditory systems of marine fauna	UNMP
Breakwater Construction	Introduced Marine Organisms	Introduction of Introduced Marine Pests (IMP) from construction barges and/or construction material transport vessels. Potential impacts may include loss of biodiversity and loss of ecosystem function.	IMPMP

Phase/Activity	Impact Pathway	Potential Impact	Relevant Environmental Management Plan*
Operation			
Vessels entering port	Vessel Strikes	Injury or death caused by collision with vessel or damage from propellers	MFFMP
Vessels at mooring sites	Vessel Strikes	Injury or death caused by collision with vessel or damage from propellers	MFFMP
Beach-cast Wrack	Indirect impact to the food chain from altered nutrient flows	Nutrients - Disruption of the long-shore distribution of beach-cast wrack and the associated pool of regenerated nutrients.	BWMP
Vessels entering port	Introduced Marine Organisms	Introduction of Marine Pests (IMP) from import/export vessels. Potential impacts may include loss of biodiversity and loss of ecosystem function	IMPMP

*MFFMP: Marine Flora and Fauna Management Plan. DBCLRMP: Dredging, Breakwater Construction and Land Reclamation Management Plan. BWMP: Beach Wrack Management Plan. UNMP: Underwater Noise Management Plan.

Protecting Matters of NES

To ensure that matters of national environmental significance are protected, management strategies have been developed to avoid and mitigate any adverse impacts at Oakajee. As described in Section 3.1 (d) the key matters of NES that may be impacted by the Port development are primarily marine mammals, particularly Humpback whales.

Underwater Noise

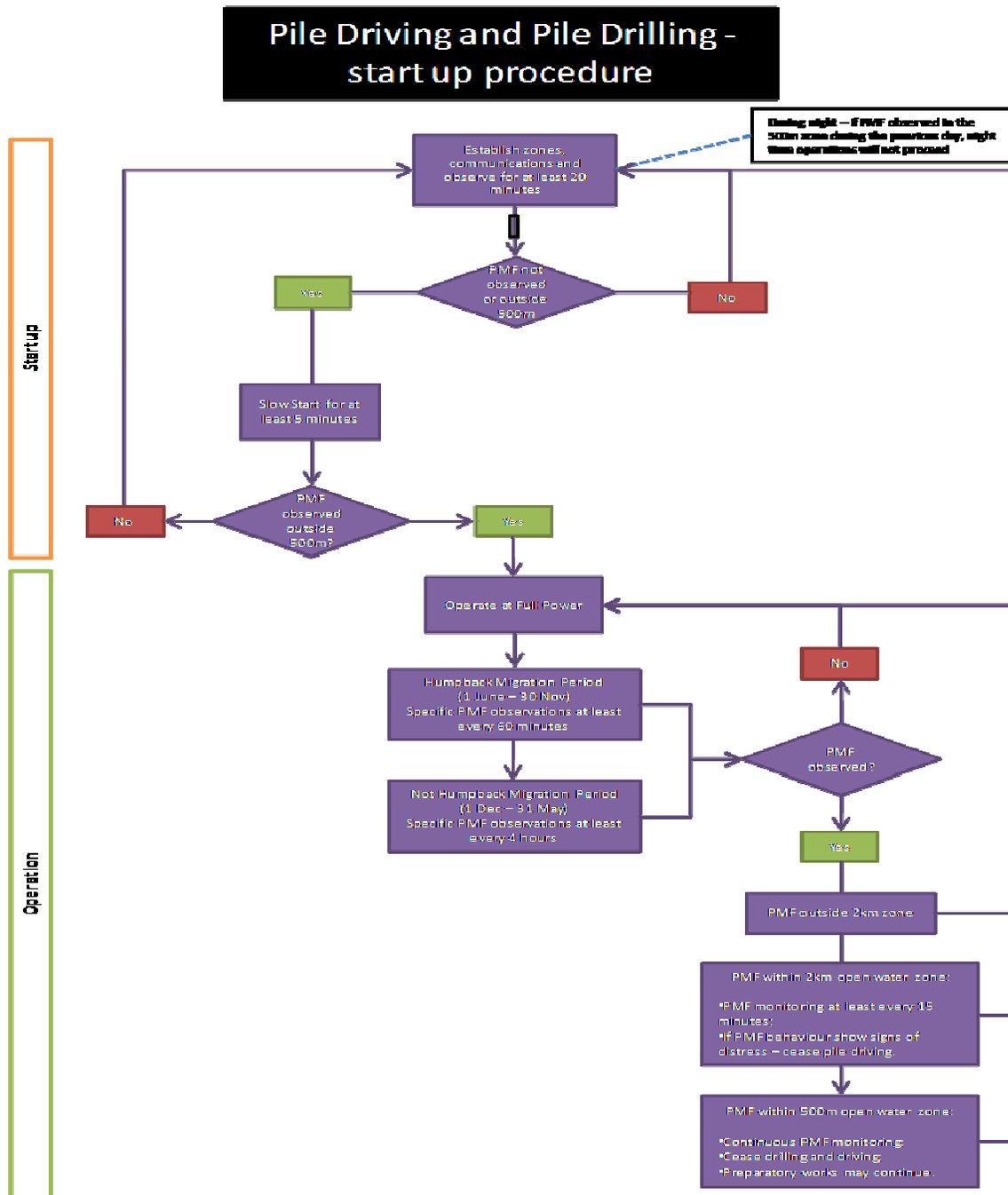
Advice from *EPBC Policy Statement 2.1* indicates that the best method to protect marine fauna from underwater noise is through the establishment of exclusion zones around noise generating activity, from within which specific management measures can be instigated. To determine how construction noise is likely to propagate at Oakajee, underwater noise modelling was conducted (McCauley *et al.* 2010). The noise modelling was based on pile driving which will be the loudest activity during construction (i.e. no blasting will be undertaken at Oakajee).

An Underwater Noise Management Plan (UNMP, **Attachment 6**) has been developed to reduce the risk of acoustic injury to marine mammals. In the UNMP exclusion zones have been developed on an understanding of noise level impacts on marine fauna and the underwater noise propagation model output (McCauley *et al.* 2010).

The UNMP contains a series of control measures to address the potential impacts related to underwater noise and its effects on protected marine fauna that could arise during the construction of the Port Marine infrastructure. The Control measures for underwater noise are detailed in Section 6 of the UNMP and include:

- Marine mammal management zones will be established in all open water seaward directions from the noise sources.
- Monitoring for the presence and behaviour of marine mammals within 2 km of the pile driving activity. Cease pile driving activities if marine mammals show signs of distress. Note that the 2km zone will only extend to the north and northwest (311-360°) because the breakwater and land attenuates sound in all other directions.
- Pile driving work will be temporarily suspended in the presence of marine mammals which enter within 500 m of the pile driving activity.

- Monitoring of management zones and slow start options will be employed (e.g. “Fairy taps”) during pile driving to avoid impacts on protected marine fauna (PMF), as outlined in the diagram below.



- Trained observers will be qualified marine fauna observers or construction staff that have been trained by a qualified marine fauna observer. Marine observers will be provided with appropriate reference materials, visual aids, tools and reporting material.
- At night additional measures apply for construction activities that are expected to cause elevated acoustic disturbance. If PMF are observed in the shut down zone in the previous day, night time works will not proceed.
- If Australian sea lions are observed during construction and appear affected by construction activities, the regional DEC office will be notified and options to minimise impacts will be identified.
- Monitoring of underwater noise levels to confirm that the model results used for the risk assessment are accurate (ie model verification). To be conducted during the initial pile driving phase (within the first week of pile driving).
- Fortnightly aerial surveys of marine fauna during the migratory period (June to November) during the construction phase.

Dredging

In addition to underwater noise, minor impacts to marine mammals may also arise during the dredging operations for the Port. Dredging causes sediment to be suspended in the water column which adds to the natural turbidity which, in the absence of management controls, could possibly cause environmental impact via the following pathways:

- Reduced light penetration to the photosynthetic algae and seagrasses;
- Inhibit filter feeding animals and larval recruitment of benthic biota;
- Cause mechanical damage to fauna;
- Deplete oxygen; and/or,
- Cause nutrient enrichment.

While significant impacts from dredging on matters of NES are not expected, a Dredging, Breakwater Construction and Land Reclamation Management Plan (DBCLRMP, **Attachment 9**) has been developed that details the management strategies to be implemented to ensure dredging, breakwater construction and land reclamation works and any associated adverse impacts on benthic primary producers and water quality are managed in an appropriate manner during the construction of the Oakajee Port Development.

Vessel Strike

The Marine Flora and Fauna Management Plan (MFFMP, **Attachment 7**) contains measures to protect marine mammals from the risk of vessel strike. The following table outlines the measures to be employed during both construction and operation of the Port.

Marine Fauna Strikes	
Activity	Construction and operation
Environmental Value(s)	Marine fauna abundance
Potential Environmental Impact(s)	Vessel strike
Impact Pathway	Harm to marine fauna
Triggers/EQC	<p>Speed limits on all commissioned vessels - 12 knots or less in shipping channels during peak whale season (June-November). Note: Speed limit of 12 knots to be enforced unless for safety or emergency reasons, a higher speed is required, e.g. in cases of storms, winds, large swells or risk of collision.</p> <p>During normal port operations the shipping channel will constitute a confined waterway. As such, and in accordance with the <i>Australian National Guidelines for Whale and Dolphin Watching 2005-2006</i> it may not be possible for vessels to maintain approach distances or the appropriate number of boats within the caution zone. In these instances all necessary caution to avoid marine mammals will be employed.</p>
Monitoring Programme Summary	
Frequency	<ul style="list-style-type: none"> A five minute observation, by a suitable trained crew member, of the exclusion zone every 30 mins during dredging, barge rock dumping and any other construction vessel operations during the humpback whale migration season (June-November). Permanent speed restrictions enforced.
Location	<ul style="list-style-type: none"> An elevated vantage point on vessels to provide a view beyond the 300 m caution zone. Vessel speed restrictions will be enforced within the shipping channel.
Method	<ul style="list-style-type: none"> Observation of the 300 m caution zone. Use of distance measuring binoculars and the naked eye.
Construction Management Strategies Summary	
	<ul style="list-style-type: none"> Marine fauna observation inductions for vessel operators and crew. 300 m caution zone <ul style="list-style-type: none"> Vessel may only progress at no wake speed (unless where safety measures/requirements do not permit). A maximum of two vessels (excluding any required guidance vessels) is permitted within the caution zone. No entry to the zone if animals are stranded, entangled or distressed. 100 m no approach zone <ul style="list-style-type: none"> No entry into the 100 m zone. No waiting in front of direction of travel (of the animal). No approach from the rear (or the animal). Maintain speed limit < 12 knots in shipping channel. (Note: Speed limit of 12 knots unless for safety or emergency reasons, a higher speed is required, e.g. in cases of storms, winds, large swells or risk of collision)

5 Conclusion on the likelihood of significant impacts

5.1 Do you THINK your proposed action is a controlled action?

X	No, complete section 5.2
	Yes, complete section 5.3

5.2 Proposed action IS NOT a controlled action.

DSD / OPR do not consider that the project is likely to be a “controlled action” for the following reasons:

Marine

- No items relevant to Sections 12, 15A, 15B, 15C, 16, 17B, 21, 22A, 26, 27A, 27B, 27C and 28 of Part 3 of the EPBC Act will be impacted by the development.
- No significant impact on items referred to in Section 18, 18A (listed threatened species and communities), 20 and 20A (listed migratory species) of the EPBC Act are proposed (refer to Sections 3.1(d), 3.1(e), **Attachment 5**).
- Any potential impact will be managed via an Underwater Noise Management Plan (**Attachment 6**). A draft has been attached to this referral for DSEWPC review, the document will be finalised on receipt of comments from DSEWPC and final data available through the monitoring programme (discussed below).
- No blasting activities are required for the port development.
- An exclusion zone will be established to ensure that any threatened or migratory species are not impacted by marine noise during pile driving.
- Previous large scale works in the region, particularly the Geraldton Port upgrade and dredging projects, have had no apparent impact on threatened or migratory species.
- A strong monitoring program is continuing to be undertaken, which includes more than a two years of marine mammal observation data, clearly showing the major species and their preferred migratory routes. The program has provided robust data with which to evaluate the potential impacts during the course of construction. The data will also provide reference information to determine any change in the species composition and migratory pathways of marine mammals after the port has been constructed. The monitoring program was designed in consultation with marine mammal specialists Curt Jenner and Chris Burton. The results have also been peer reviewed and endorsed by these specialists.

Terrestrial

While Carnaby’s Black Cockatoo may utilise the Banksia and Eucalypt woodland in the vicinity for feeding if it were to frequent the area, the loss of <1 ha (0.77 ha) of the supplementary feeding habitat is not expected to significantly affect the species because:

- the species is not thought to be a common visitor the area and the habitat represents close to its northern known historical range;
- the species is not known to breed in the area (Barrett et al 2003), based on breeding distribution and lack of trees of suitable age and diameter, and the closest recording of a breeding population near Oakajee was at Howatharra (10 km away) in 1983;
- the impacted vegetation within the Project area is isolated and of low quality due to weeds and grazing; and
- An impact to less than 1 ha of secondary foraging habitat is not considered to be significant in a regional context.

6 Environmental history of the responsible party

	Yes	No
<p>6.1 Does the party taking the action have a satisfactory record of responsible environmental management?</p> <p>OPR has been appointed by the Government of Western Australia as the preferred developer of the Oakajee Deepwater Port.</p> <p>OPR is a joint venture between Mitsubishi Development Pty Ltd and Murchison Metals Ltd.</p> <p>Mitsubishi Development Pty Ltd is a subsidiary of Mitsubishi Corporation, Japan's largest general trading company. Mitsubishi Corporation handles a diverse range of products and services through its international business operations, managing environmental impacts and performance through an ISO 14001 compliant Environmental Management System. Mitsubishi strives to preserve and improve the global environment and pursue sustainable development through all aspects of their business activities.</p> <p>Murchison Metals Ltd and Mitsubishi Development Pty Ltd each have a 50% share in Crossland Resources which is the owner of the Jack Hills iron ore project located in the mid-west region of Western Australia. The Jack Hills mining, transport and port operations are managed via a range of Environmental Improvement Plans and Environmental Management Plans. All Crosslands staff and contractors are required to attend a comprehensive environmental induction to ensure adverse impacts to the environment are avoided.</p>	X	
<p>6.2 Has the party taking the action ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?</p> <p>If yes, provide details</p>		X
<p>6.3 If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?</p> <p>See below:</p>	X	

OPR ENVIRONMENTAL POLICY

Oakajee Port and Rail Pty Ltd (OPR) is creating a world class iron ore exporting logistics chain which will include a port, land-based iron-ore materials handling and storage infrastructure and a rail network.

OPR is committed to excellence in environmental management, including ensuring compliance with applicable environmental legislation and “beyond compliance” through continuous improvement measures in key areas. The foundation principles of OPR’s environmental policy are:

1. Compliance with all applicable environmental legislative requirements, statutory and contractual obligations related to environmental management
2. Implementation of an Environmental Management System (EMS) consistent with the principles of AS/NZS ISO 14001 which identifies impacts and risks, establishes responsibilities, objectives, targets and mechanisms for reviewing and continuously improving environmental performance
3. Providing sufficient and suitable resources to implement and maintain the EMS
4. Using appropriate planning, design, technology and training to avoid, minimise, reduce, rectify or offset significant environmental impacts
5. Taking all practicable measures to prevent pollution and environmental harm
6. Seek to maximise efficiencies in the use of raw materials, energy and water, minimise the generation of wastes, and ensure that all materials are appropriately managed throughout the product lifecycle that OPR has stewardship of
7. Encourage suppliers, agents and contractors to support the attainment of OPRs environmental goals
8. Communicate openly with the community, government and industry on environmental issues and respect the views of others
9. Conduct regular monitoring to ensure environmental management activities are achieving objectives and targets
10. Seek continual improvement in OPR’s environmental performance through active identification of and response to environmental issues

All OPR employees and other persons working for or on behalf of OPR must commit to and work in accordance with this Environmental Policy and associated EMS and its procedures.

6.4	Has the person proposing to take the action previously referred an action under the EPBC Act?	X
	2010/5500 Oakajee Rail Development, submitted 19 May 2010	

7 Information sources and attachments

7.1 References

- Anderson (1982), *Studies of dugongs at Shark Bay, Western Australia*. Australian Wildlife Research 9:69-84.
- Alan Tingay & WEC 1997, *Oakajee Deepwater Port Public Environmental Review*, Prepared for Minister for Resources Development by Alan Tingay & Associates and Welker Environmental Consultancy, Report no. 96/93, Perth, Western Australia, May 1997.
- Bannister, J.L. (2001). *Status of southern right whales (Eubalaena australis) off southern Australia*. Journal of Cetacean Research and Management (Special Issue 2). Page(s) 103-110.
- DEH 2006, *EPBC Act Policy Statement 1.1 Significant Impact Guidelines - Matters of National Environmental Significance*, Prepared by Department of Environment & Heritage, Canberra, ACT, May 2006.
- DEWHA 2008, *EPBC Act Policy Statement 2.1 - Interaction between offshore seismic exploration and whales*, Prepared by Department of the Environment, Water Heritage and the Arts, September 2008.
- Ecologia Environment. 2009. *Oakajee Port and Industrial Estate Terrestrial Fauna Assessment*. Unpublished report for Oakajee Port and Rail.
- Ecologia 2010, *Oakajee Terrestrial Port Development: Terrestrial Vertebrate Fauna Assessment*, Prepared for Oakajee Port and Rail, January 2010.
- EPA 2009, *Environmental Assessment Guidelines No 3 - Protection of Benthic Primary Producer Habitats in Western Australia's Marine Environment*, Prepared by Environmental Protection Authority, Perth, Western Australia, December 2009.
- GPA, 2004, *Final Report: Geraldton Port Enhancement Project, Sea Dumping/Cetacean Disturbance Permit No, E202-0027*.
- Hodgson et al. (2007), *Is attempting to change marine mammal behaviour a generic solution to the bycatch problem? A dugong case study*. Animal Conservation 10 (2):263-273.
- Jenner, K. C. S., Jenner, M. N. M. & McCabe, K. A. 2001, 'Geographical and temporal movements of humpback whales in Western Australian waters', APPEA Journal.
- Johnstone, R.E., Johnstone, C. and Kirkby, T. 2007. *Assessment of significant habitat for Carnaby's Cockatoo Calyptorhynchus latirostris in the Eneabba region*. Unpublished Report for Iluka Resources.
- LeProvost, I., Collins, P., Mulligan, M. & Hubbert, G. 2003, *Geraldton Port Dredging Project 2002-3: The Issues, the Events and the Final Outcome*. Report
- McCauley, R., Duncan, A., Parsons, M., Salgado Kent, C. 2010. *Underwater sound exposure predictions for pile driving within the proposed Oakajee breakwater and predictions of environmental effects*, Draft report prepared for Oceanica Consulting Pty Ltd
- Oceanica 2007, *Oakajee Port Marine and Coastal Baseline Studies Scope of Works*, Prepared for Murchison Metals Limited by Oceanica Consulting Pty Ltd, Report no. 503/1, Perth, Western Australia, September 2007.
- Oceanica 2010, *Marine Mammals Baseline Survey Report by Oceanica Consulting Pty Ltd*, Report no. 503/01-2, Perth, Western Australia, September 2007.
- Oceanica 2010a *Oakajee Port and Rail Marine and Coastal Baseline Studies - Habitat Monitoring Report 2010*, Prepared for Oakajee Port and Rail by Oceanica Consulting Pty Ltd, Report no. 503_004/2, Perth, Western Australia, August 2010.
- Oceanica (2009) *Benthic Habitat Monitoring Report*
- Oceanica 2010b, *Oakajee Port - Marine Mammal Baseline Investigation 2008-2009*, Prepared for Oakajee Port and Rail by Oceanica Consulting Pty Ltd, Report no. 503_010/2, Perth, Western Australia, September 2010.
- Shah, B. 2006. *Conservation of Carnaby's Black-Cockatoo on the Swan Coastal Plain, Western Australia*.

7.2 Reliability and date of information

Information used in the preparation of this referral is based on a number of reports and studies developed to inform both the WA and Commonwealth approval processes. These studies have been undertaken by professional consultants who are expert in their respective fields.

All ecological studies have been undertaken by expert ecologists with practical experience in surveying and monitoring.

7.3 Attachments

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	✓	Attachment 1 - Figures
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	Attachment 1 - Figures
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.3)	✓	Ministerial Statement 469, EPA Bulletin 866
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.4)		
	copies of any flora and fauna investigations and surveys (section 3)	✓	Attachments 4, 5 and 10
	technical reports relevant to the assessment of impacts on protected matters and that support the arguments and conclusions in the referral (section 3 and 4)	✓	Attachments 4-10
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		

8 Contacts, signatures and declarations

Project title:

8.1 Person proposing to take action

Name Gail McGowan
Title A/ Director General
Organisation Department of State Development on behalf of the Minister for State Development, Western Australia

ACN/ABN 90 199 516 864
Postal address Level 6, 1 Adelaide Terrace, East Perth, Western Australia 6004
Telephone +61 (08) 9222 0555
Email Gail.McGowan@dsd.wa.gov.au

Declaration I declare that the information contained in this form is, to my knowledge, true and not misleading. I agree to be nominated as the proponent for this action.

Signature



Date

19/11/10

8.2 Person preparing the referral information (if different from 8.1)

Name Tom Kaveney
Title Manager, Environmental Approvals, Eco Logical Australia
ABN 87096512088
Postal address GPO Box 1558, Canberra ACT 2601
Telephone 02 6103 2313
Email tomk@ecoaus.com.au

Declaration I declare that the information contained in this form is, to my knowledge, true and not misleading.

Signature



Date

22/11/10

ATTACHMENTS

Attachment 1 – Figures

Attachment 2 – State Approval Statement 469 (WA Minister Environment)

Attachment 3 – State Approval Bulletin 866 (EPA Western Australia)

Attachment 4 – Terrestrial Vertebrate Fauna Assessment (Ecologia)

Attachment 5 – Marine Mammals Baseline Investigation (Oceanica)

Attachment 6 – Underwater Noise Management Plan (OPR)

Attachment 7 – Marine Flora and Fauna Management Plan (Oceanica)

Attachment 8 – Protected Matters Search (23 August 2010)

Attachment 9 – Dredging, Breakwater Construction and Land Reclamation Management Plan

Attachment 10 – Carnaby's Black Cockatoo Habitat Assessment, Port Marine: Services Corridor (Ecologia)

Attachment 11 – Introduced Marine Pests Management Plan (OPR)