Title of Proposal - Scarborough Development nearshore component

Section 1 - Summary of your proposed action

Provide a summary of your proposed action, including any consultations undertaken.

1.1 Project Industry Type

Mining

1.2 Provide a detailed description of the proposed action, including all proposed activities.

The Scarborough gas field is located 380 km west-north-west of the Burrup Peninsula in the north-west of Australia. Woodside Energy Ltd (Woodside) will be the development operator, with BHP Billiton Petroleum (North West Shelf) Pty Ltd (BHP) as joint venture participant. The Scarborough gas field development (Scarborough Project) includes drilling of a number of subsea gas wells (which includes wells in the Scarborough, Thebe and Jupiter reservoirs) but may also include additional future tiebacks. Wells will be tied-back to a semi-submersible Floating Production Unit (FPU) moored in approximately 900 m of water, over the Scarborough field. The FPU topsides has processing facilities for gas dehydration and compression to transport the gas through an approximately 430 km trunkline to the Woodside-operated Pluto Liquified Natural Gas (LNG) facility on the Burrup Peninsula. Woodside is proposing the brownfield expansion of Pluto LNG to process third-party gas. Which will require brownfield expansion to process the Scarborough gas.

The Proposal, subject of this referral under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and the WA Environmental Protection Act 1986 (EP Act), is defined as the State waters components of the Scarborough Project. A detailed scope of the Proposal is presented in Section 2 of the Scarborough Project Nearshore Component Supplementary Report. The proposed extent of physical and operational elements are detailed below:

-Trenching, pipelay and backfill activities for the installation of the trunkline including: Dredging of maximum 2,781,700 m3 during the trenching for the trunkline, of which a maximum of 1,612,600 m3 will be in State Waters. The volumes would be confirmed during detailed engineering design.

Installation of the pipe up to Kilometre Point (KP) 0, 1.5m above Highest Astronomical Tide (HAT), the exact location may vary slightly but will remain within the referred proposal development envelope. A 32 inch carbon steel trunkline 32.7 kilometres long installed in a trench around 2–4.3 metres deep and up to 30 m wide. The trench would be backfilled with sand and/or rock material for stabilisation purposes along the trunkline as required.

Concrete blocks backfilled with trenching material may also be required to provide reaction forces. These would be laid within the trench footprint and retained in place to maintain the reaction forces once the pipe is laid. The trench backfilling operations will cover these blocks on completion of the construction works.

-The use of existing spoil grounds within State Waters for disposal of dredged sediments.
Spoil from the trunkline dredging operations will be placed in a combination of the spoil grounds listed below. The final spoil ground locations are subject to further engineering design and consultation with relevant stakeholders.

- Spoil Ground A/B (restricted to backhoe works) and 2B located in State Waters.
- Spoil Ground 5A located in Commonwealth Waters (Provided for information only but not assessed as part of this referral)

-The potential use of an existing borrow ground within State Waters, to obtain sediment for trunkline stabilisation activities.
Sand and Rock materials may be required to assist with trunkline stabilisation. Sand is proposed to be obtained from borrow ground locations located in either State or Commonwealth waters. Rocks would be obtained from domestic or international sources.

-The installation of temporary facilities along the shoreline at the Pluto LNG Facility to facilitate the installation of the trunkline in shallower depth and the connection to the Facility.
A temporary groyne around 100 metres long would be constructed on the shoreline between the pre-excavated trench and the Pluto jetty to allow excavating equipment to access and excavate the rock berm currently covering the trench. A suitable storage location will be required for the excavated rock assuming that this rock will be used to reinstate the shore crossing rock berm following trunkline installation. Piles may also be required to anchor the nearshore pipelay barge. Piles are required due to the proximity to the Pluto trunkline which may prevent the use of anchors for the pipelay activities. It's estimated a total of 8 driven piles may be required. Space would be required at the shore crossing location for temporary offices, cranes and other equipment for the shore pull of the trunkline.

-Wet and/or dry pre-commissioning testing would need to be undertaken prior to trunkline operations.
Wet and/or dry pre-commissioning testing would need to be undertaken prior to trunkline operations. Total discharge volume for a wet pre commissioning would be maximum 225,189 m^3 based on length (434 km) and trunkline internal diameter (32 inch). Bulk discharge of the hydrotesting water is likely to be undertaken in Commonwealth Waters. The nearshore component of the pipeline may be tested separately to provide pipeline stability prior to back fill/rock dumping activities or if a performance test of the nearshore component of the pipeline is required prior to back fill/rock dumping operations.

All activities in Commonwealth Waters will be assessed separately as part of an Offshore Project Proposal (OPP) to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA). This includes the following components of the proposed Scarborough Project:

- drilling of the gas wells and installation of the FPU
- the trunkline section and all related activities within Commonwealth Waters
- the dredging of material from borrow grounds within Commonwealth Waters
- the hydrotesting of the trunkline and release of hydrotest water in Commonwealth Waters.

The use of spoil grounds will be the subject of a separate Sea Dumping Permit application to

the Department of Environment and Energy (DoEE).

1.3 What is the extent and location of your proposed action? Use the polygon tool on the map below to mark the location of your proposed action.

Area	Point	Latitude	Longitude
Development envelope	1	-20.605003251682	116.75696954567
Development envelope	2	-20.593375947351	116.74454127874
Development envelope	3	-20.562764219841	116.75238963187
Development envelope	4	-20.528468217468	116.75958566338
Development envelope	5	-20.48926981033	116.76547022041
Development envelope	6	-20.434130601014	116.76220178109
Development envelope	7	-20.413906066293	116.7589264686
Development envelope	8	-20.353216370006	116.68568887718
Development envelope	9	-20.342793327753	116.69942178734
Development envelope	10	-20.402875688579	116.77331857354
Development envelope	11	-20.482528789225	116.78050773189
Development envelope	12	-20.53520713866	116.77200709906
Development envelope	13	-20.598267331578	116.7582741889
Development envelope	14	-20.604392619407	116.76023798499
Development envelope	15	-20.606841410313	116.7582741889
Development envelope	16	-20.604392619407	116.7563103509
Development envelope	17	-20.604392619407	116.7563103509
Development envelope	18	-20.605003251682	116.75696954567

1.5 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for off-shore actions, shortest distance to mainland).

The proposal is located within the Pilbara region in State Waters and in the Port of Dampier limits managed by Pilbara Ports Authority. The shore crossing site is located adjacent to the Pluto LNG facility in an industrial zone. The facility is located eight kilometres to the north east of Dampier Port and 15 kilometres north west of Karratha, the closest residential townships.

1.6 What is the size of the proposed action area development footprint (or work area) including disturbance footprint and avoidance footprint (if relevant)?

Trunkline development (approx. 30 m by 33 km corridor) and Spoil ground/borrow grounds (Approx. 17 square kilometres)

1.7 Is the proposed action a street address or lot?

Lot

1.7.2 Describe the lot number and title. Seabed within State Waters and within Port of Dampier limits

1.8 Primary Jurisdiction.

Western Australia

1.9 Has the person proposing to take the action received any Australian Government grant funding to undertake this project?

No

1.10 Is the proposed action subject to local government planning approval?

No

1.11 Provide an estimated start and estimated end date for the proposed action.

Start date 03/2021

End date 07/2055

1.12 Provide details of the context, planning framework and State and/or Local government requirements.

The proposal is being referred to the EPA in accordance with Part IV (Section 38) of the EP Act. The EP Act is WA's primary environmental legislation. The Act sets out to prevent, control, and abate pollution and environmental harm, for the conservation, preservation, protection, enhancement, and management of the environment. The EPA has statutory obligations under the EP Act to conduct EIAs, initiate measures to protect the environment from environmental harm and pollution and to provide advice to the WA Minister for Environment on environmental matters.

Based on the outcomes of environmental investigations, Woodside does not consider that the elements of the proposal that have been assessed, involve an action that is likely to have a significant impact upon matters of national environmental significance (MNES) or other protected matters. Therefore, the proposal is not expected to require assessment under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). However, this referral to the Commonwealth Department of the Environment and Energy (DoEE) has been undertaken concurrently with the EPA referral to confirm our assessment.

1.13 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders.

Stakeholder Approach

Woodside's objective is to build long-term and meaningful relationships with our host communities. Woodside has been part of the Australian community for over 60 years and has been operating on the Burrup Peninsula for more than 30 years.

Woodside has well established relationships with the Pilbara and surrounding communities, regularly engaging with stakeholders through various forums on a broad range of issues, including potential environmental and social impacts associated with our operations. Key to understanding local issues are mechanisms such as the standing Karratha Community Liaison Group and Heritage Liaison Group, which meet quarterly. Woodside also has an established office in Karratha and presence in Roebourne which provides an avenue for locals to talk to any issues via one-on-one engagement.

Woodside will maintain a program of stakeholder engagement to:

- Ensure all relevant stakeholders are identified and communicated to in a timely and effective manner;

- Provide communications material in response to stakeholder needs; and

- Analyse stakeholder feedback to inform decision-making and planning.

Stakeholder Engagement Plan

Woodside has a Stakeholder Engagement Plan that will continue to be revised as the project is matured to ensure comprehensive engagement with stakeholders.

As operator of the Scarborough Project, Woodside has commenced a phased stakeholder engagement program for this proposal, which will continue throughout the environmental impact assessment process. The program is based on leveraging existing relationships and forging new connections with parties likely to have an interest in the Scarborough Project proposal from the following groups: Traditional Owner groups, Local, State and Commonwealth Government, community, fishing and tourism groups, local businesses and service providers, non-government and environmental non-government organisations and industry.

Preliminary engagement on the Scarborough Project commenced in February 2018. This engagement has broadly informed Woodside's stakeholder planning and execution for the concept definition, front-end engineering and design (FEED) and execute project phases. Specifically, this engagement has informed the frequency and nature of engagement to support key regulatory approvals and our approach to identifying and managing potential impacts.

Woodside's ongoing stakeholder activities will include:

- Independent social impact assessment;

- Social impact management planning;

- Economic impact assessment;

- One-on-one engagement;

- Broad stakeholder forums;

- Targeted correspondence;

- Hard-copy and electronic communication materials; and

- Media and social media.

Stakeholder Identification

Identified stakeholder groups are those that affect and/or could be affected by the proposed Project during all Project phases. Stakeholders have been identified by considering:

- Organisations or individuals with a role in regulatory processes;

- Individuals or groups directly or indirectly affected by the proposed Project either physically, socially and/or commercially;

- Organisations or individuals with an interest in the outcome, progress or activities of the proposed Project.

- The following stakeholder groups have been identified for the Scarborough Project:

- Commonwealth Government / Agencies;

- State Government / Agencies;

- Local Government;

- Business / Industry;

- Indigenous Groups and Traditional Owners;

- Community Groups;

- Marine Users;

- Social Contribution Partners;

- Non-Government Organisations;

- Science / Academia;

- Media and Regulatory Communications;

- Unions.

Feedback and Areas of Stakeholder Interest

The following provides a summary of preliminary consultation completed by Woodside with interested and affected stakeholders.

Preliminary stakeholder consultation has focused on Woodside's Burrup Hub opportunities, including the Scarborough Project, from 14 February 2018 to 12 December 2018. Consultation was completed by email, letter, phone call or meeting.

Consultation completed to date includes the below.

Commonwealth Government

Australian Customs Service – Border Protection Command

National Offshore Petroleum Titles Administrator

Australian Hydrographic Service

Office of Federal Minister for Resources and Northern Australia

Australian Maritime Safety Authority

Office of Shadow Minister for Environment

Department of Industry, Innovation and Science

Office of Shadow Minister for Resources

National Offshore Petroleum Safety and Environmental Management Authority

Senator Pat Dodson

Department of Environment and Energy

Shadow Minister for Environment; Water

Federal Minister for Environment; Member for Durack

State Government

Australian Industry Participation Authority

Member for the Kimberley

Department of Communities, Housing Division Pilbara

Member for the Pilbara

Department of Defence

Office of State Minister for Mines and Petroleum

Department of Education

Office of the Leader of the Opposition, Public Sector Management, State Development, Jobs and Trade and Federal-State Relations

Department of Jobs, Tourism, Science and Innovation

Office of the Minister for Fisheries

Department of Mines, Industry, Regulation and Safety

Office of the Premier & Minister for State Development

Department of Planning, Lands and Heritage

Office of the State Minister for Environment

Department of Primary Industries and Regional Development

Office of the State Minister for Regional Development

Department of Transport

Office of the State Minister for Transport, Planning and Lands

Department of Water and Environmental Regulation

Office of the State Treasurer, Minister for Finance, Energy and Aboriginal Affairs

Environmental Protection Authority

Upper House Member for Mining and Pastoral

Landcorp

Traditional Owner Groups, Local Government, Industry Organisations, Community, Educational Institutions and eNGOs

Australia Maritime and Fisheries Academy

Market Forces

Australian Conservation Foundation

Mawrankarra

Australian Marine Oil Spill Centre Pty Ltd

Murujuga Aboriginal Corporation

Australian Petroleum Production and Exploration Association

Ngarluma Aboriginal Corporation

Broome Chamber of Commerce and Industry

Ngarluma Yindjibarndi Foundation Ltd

Broome Future Alliance

Ngarliyarndu Bindirri Aboriginal Corporation

Broome International Airport

North West Regional TAFE

Broome Visitors Centre

Nyamba Buru Yawuru

Chamber of Minerals and Energy Western Australia

Pearl Producers Association

City of Karratha

Pilbara Development Commission

Conservation Council of WA

Pilbara Port Authority

Dampier Technical Advisory and Consultative Committee (TACC) (includes Pilbara Port Authority, Department of Biodiversity Conservation and Attraction, Department of Transport, Rio Tinto, Department of Environment and Energy, Department of Planning, Lands and Heritage, Department of Primary Industries and Regional Development, Toll, Water Corp, Department of Jobs, Tourism, Science and Innovation, Murujuga Land & Sea Unit)

Friends of Australian Rock Art

Shire of Broome

GreenPeace

Toll

International Fund for Animal Welfare

St Mary’s Senior High School

Karratha and Districts Chamber of Commerce and Industry

Western Australian Marine Science Institution (WAMSI) Dredging Node (includes Australian Institute of Marine Science, Department of Water and Environmental Regulation)

St Luke’s College

Karratha Community Liaison Group (includes Karratha Districts Chamber of Commerce and Industry, Dampier Community Association, Karratha Community Association, City of Karratha, Regional Development Australia, Pilbara Development Commission, Pilbara Ports Authority, Ngarluma Yindjibarndi Foundation Ltd and Yara Pilbara)

Western Australian Country Health Club

Karratha Heritage Group (includes Yindjibarndi Aboriginal Corporation, Yaburara and Coastal Mardudhunera Aboriginal Corporation, Wong-Goo-Tt-Oo, Ngarluma Aboriginal Corporation)

Wilderness Society

Karratha PCYC

Wong-Goo-Tt-Oo

Kimberley Aboriginal Law and Cultural Centre

World Wildlife Fund

Kimberley Aboriginal Medical Services

Yaburara and Coastal Mardudhunera Aboriginal Corporation

Kimberley Ports Authority

Yandina

Kullari Regional Communities Indigenous Corporation

Yindjibarndi Aboriginal Corporation

Kimberley Land Council

1.14 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project.

The proposal is being referred to the EPA in accordance with Part IV (Section 38) of the Environmental Protection Act 1986 (EP Act). The EP Act is WA's primary environmental legislation. The Act sets out to prevent, control, and abate pollution and environmental harm, for the conservation, preservation, protection, enhancement, and management of the environment. The EPA has statutory obligations under the EP Act to conduct EIAs, initiate measures to protect the environment from environmental harm and pollution and to provide advice to the WA Minister for Environment on environmental matters. A preliminary Environmental Impact Assessment (Scarborough Project - Referral Supplementary Report) has been completed to support this referral and referral to the EPA.

The outcomes of this assessment are that the Proposal is not expected to represent a significant environmental risk. The EP Act Principles and relevant EPA guidance have been considered when assessing the potential risks and impacts of the Proposal on the identified Environmental Factors. Potential environmental impacts have been considered in the Proposal design and the pipeline route has been selected to avoid sensitive receptors where possible.

Further studies and management plans have been identified where required to provide additional certainty on the nature and scale of identified impacts and these will be completed prior to the commencement of construction.

Evaluation of impacts against all relevant environmental factors determined that the EPA's objectives were considered to be met. Specifically, for the key environmental factors, the following outcomes were predicted:

Benthic Communities and Habitats – Significant residual impacts are not predicted from the Proposal and therefore the diversity and ecological integrity of BCH will be maintained.

Marine Environmental Quality – Significant residual impacts are not predicted from the Proposal and therefore the environmental value and quality of water, sediment and biota will be maintained.

Marine Fauna – Significant residual impacts are not predicted from the Proposal and therefore the diversity and ecological integrity of Marine Fauna will be maintained.

Social Surroundings – Significant residual impacts are not predicted from the Proposal and therefore no significant impacts to social surroundings are expected.

The assessment of impacts on matters of national environmental significance demonstrates that no significant impacts are expected from the Proposal.

1.15 Is this action part of a staged development (or a component of a larger project)?

Yes

1.15.1 Provide information about the larger action and details of any interdependency between the stages/components and the larger action.

The Scarborough gas field is located 380 km west-northwest of the Burrup Peninsula in the northwest of Australia. Woodside Energy Ltd (Woodside) will be the development operator, with BHP Billiton Petroleum (North West Shelf) Pty Ltd (BHP) as joint venture partner. The Scarborough gas field development (Scarborough Project) includes drilling of a number of subsea gas wells (which includes wells in the Scarborough, Thebe and Jupiter reservoirs) but may also include additional future tie backs. Wells will be tied back to a Floating Production Unit (FPU) moored in approximately 900 m of water, over the Scarborough field. The FPU topsides has processing facilities for gas dehydration and compression to transport the gas through a 434 km trunkline to the Woodside operated Pluto Liquified Natural Gas (LNG) Facility on the Burrup Peninsula, which will require brownfield expansion to process the Scarborough gas. The offshore component will be assessed via an Offshore Project Proposal (OPP) to NOPSEMA and the Pluto expansion to process the gas is considered under a seperate Section 45c application.

1.16 Is the proposed action related to other actions or proposals in the region?

No

Section 2 - Matters of National Environmental Significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest. Consideration of likely impacts should include both direct and indirect impacts.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The following resources can assist you in your assessment of likely impacts:

• Profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;

• Significant Impact Guidelines 1.1 – Matters of National Environmental Significance;

• Significant Impact Guideline 1.2 – Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies.

2.1 Is the proposed action likely to have ANY direct or indirect impact on the values of any World Heritage properties?

No

2.2 Is the proposed action likely to have ANY direct or indirect impact on the values of any National Heritage places?

Yes

2.2.1 Impact table

Place	Impact
Dampier Archipelago (including Burrup Peninsula)	The significance of the potential impacts on the Dampier Archipelago (including Burrup Peninsula) National Heritage Place has been assessed. The proposal would not have any direct impacts to the Dampier Archipelago (including Burrup Peninsula) as it is located at least one kilometre from any construction activities and 1.6 kilometres from the trunkline at its closest location. The listing includes the waters surrounding some of the islands of the Dampier Archipelago. The proposal has the potential to result in the following indirect impacts: -Water quality impacts from dredging

Place	Impact
	potentially resulting in increased turbidity levels and sedimentation. Dredge plume modelling to estimate rates of sedimentation were previously undertaken for the Pluto LNG development which included spoil disposal within the same spoil grounds proposed for the current proposal as well as the installation of a trunkline immediately to the east of the proposed Scarborough trunkline. The Scarborough trunkline is proposing to use a similar methodology to the Pluto trunkline installation. The Pluto trunkline modelling identified that as the dredging activities move along the gas trunkline route deposition is predicted to temporarily increase but remain localised. Furthermore, previous monitoring studies have highlighted the high levels of suspended solids and sedimentation that occur through natural events (for example, swells and storms) and other port operations (such as ship movements) and previous dredge impact modelling studies that examined resuspension by storm events (SKM 2004) concluded that additional TSS and sedimentation that would be contributed by dredged material would be insignificant in relation to the wider resuspension and sedimentation budget of the area. Therefore, any potential impacts on heritage values are highly unlikely and are unlikely to result in the loss, degradation, damage, or notable alteration, modification of any of the heritage values of the Dampier Archipelago (including Burrup Peninsula). -Water quality impacts from accidental oil spill from refuelling operations. The risk is considered highly unlikely but should it occur may result in hydrocarbon reaching the shoreline of the heritage place. In the unlikely event a spill occurs, the small volumes which would be released would limit the overall extent of the area impacted and the limit of exposure to sensitive receptors. This assumes no intervention. Management measures have been proposed to further minimise the scale of any oil spill. -The trunkline would be located on the seabed and no indirect visual impacts would result. The proposed activities have been undertaken in Mermaid Sound in the past and the proposed trunkline is located further away

Place	Impact
	from any shore line compared to the previous trunklines previously installed to the east. The installation of these trunklines did not result in any significant impacts to the Dampier Archipelago (including Burrup Peninsula) heritage place. The proposal is highly unlikely to result in significant impacts to the heritage values of the heritage place considering the distance of the proposal to the heritage place and the likely minor impacts that would result from both planned and unplanned events during construction. Management measures have also been recommended to further minimise the risk of any impacts.

2.2.2 Do you consider this impact to be significant?

No

2.3 Is the proposed action likely to have ANY direct or indirect impact on the ecological character of a Ramsar wetland?

No

2.4 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed species or any threatened ecological community, or their habitat?

Yes

2.4.1 Impact table

Species	Impact
Endangered species Caretta caretta Loggerhead Turtle	The species nests principally from Dirk Hartog Island, along the Gnarloo and Ningaloo Coast to North West Cape and the Muiron Islands. There have been occasional records from Varanus and Rosemary Islands in the Pilbara. However, these are not identified as a nesting Biological Important Area (BIA). Furthermore, considering Rosemary Island is located around 17 kilometres to the west of the Proposal, it is unlikely it would be directly or indirectly impacted. An internesting BIA is, however, present within the waters of the Dampier Archipelago and intersects the development

Species	Impact
	envelope. Potential impacts on turtles may result from the following: (1) Direct impacts from vessel strikes and/or entrainment during dredging. Dredges can be a direct source of turtle mortality where animals become caught in the dredge (entrainment). (2) Elevated underwater noise can affect marine organisms. Physical effects can occur but are only likely at a very short range and at high sound intensities. Physical impacts are unlikely to occur in the majority of large marine species as species will display avoidance behaviour well before they get within the range at which physical effects may occur. Noise sources from the Proposal would only be emitted during construction; from vessel operations including dredging and spoil disposal/rock dumping, piling activities and hydrographic surveys. (3) Marine turtles use light as an orientation cue. Lighting for the Proposal would only be required during construction and be limited to the shore crossing location and construction vessels. The shore crossing location is located within an industrial zone already impacted by lighting impacts. Impacts are likely to be minor. (4) Indirect impact to water quality from dredging operations (increased turbidity and sedimentation of benthic habitats) could reduce foraging resources. However, the plume associated with these combined activities is predicted to remain localised. (5) Indirect impacts to water quality from an oil spill (refuelling accident) resulting in impact to foraging habitat and/or mortality. The risk is considered highly unlikely. This detailed impact assessment is presented in Appendix E of the Scarborough Project Nearshore Component Referral Supplementary Report.
Vulnerable Species Megaptera novaeangliae Humpback Whale	Although the north and south-bound migratory routes for most whales are further offshore than the Dampier Archipelago waters (up to 70 nm from the coast), during the south-bound migration it is likely that most individuals, particularly cow/calf pairs, stay closer to the coast, than the northern migratory path (Double et al., 2010). During the south-bound migration, it is likely some whales may travel through Dampier Archipelago waters, either passing the

Species	Impact
	open outer waters, or travelling into the Mermaid Sound and continuing westwards, likely through the channel bounded by West Lewis Island and Enderby Island to the south and Rosemary Island to the north (with reference to Jenner et al., 2001). The peak of the northward migration in Dampier Archipelago waters is during July, while the southern migration peaks in late August/early September. Potential impacts on Humpback Whales may result from the following: (1) Vessel strikes. The risk of vessel strikes is considered highly unlikely. (2) Generally, elevated underwater noise can affect marine organisms. Physical effects can occur but only likely at a very short range and high sound intensities. Physical impacts are unlikely to occur in the majority of large marine species as species will display avoidance behaviour well before they get within the range at which physical effects may occur. Noise sources from the Proposal would only be emitted during construction; from vessel operations including dredging and spoil disposal/rock dumping, piling activities and hydrographic surveys. (3) Indirect impact to water quality from dredging operations (increased turbidity and sedimentation of benthic habitats) could reduce foraging resources. However, the plume associated with these combined activities is predicted to remain localised. (4) Indirect impacts to water quality from an oil spill (refuelling accident) resulting in impact to foraging habitat and/or mortality. The risk is considered highly unlikely. (5) Anthropogenic activities have the potential to degrade habitat important to the species. An assessment of the Proposal against these threats has been undertaken and based on the conclusions above and the management measures recommended, the Proposal would not interfere with the recovery of the species. This detailed impact assessment is presented in Appendix E of the Scarborough Project Nearshore Component Referral Supplementary Report.
Vulnerable Species -Chelonia mydas Green Turtle -Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth -Eretmochelys	The species nest principally from Dirk Hartog Island, along the Gnarloo and Ningaloo Coast to North West Cape and the Muiron Islands.

Species	Impact
imbricata Hawksbill Turtle -Natator depressus Flatback Turtle	There have been occasional records from Varanus and Rosemary Islands in the Pilbara. However, these are not identified as a nesting Biological Important Area (BIA). Furthermore, considering Rosemary Island is located around 17 kilometres to the west of the Proposal, it is unlikely it would be directly or indirectly impacted. An internesting BIA is, however, present within the waters of the Dampier Archipelago and intersects the development envelope. Potential impacts on turtles may results from the following: (1) Direct impacts from vessel strikes and/or entrainment during dredging. Dredges can be a direct source of turtle mortality where animals become caught in the dredge (entrainment). (2) Elevated underwater noise can affect marine organisms. Physical effects can occur but are only likely at a very short range and at high sound intensities. Physical impacts are unlikely to occur in the majority of large marine species as species will display avoidance behaviour well before they get within the range at which physical effects may occur. Noise sources from the Proposal would only be emitted during construction; from vessel operations including dredging and spoil disposal/rock dumping, piling activities and hydrographic surveys. (3) Marine turtles use light as an orientation cue. Lighting for the Proposal would only be required during construction and be limited to the shore crossing location and construction vessels. The shore crossing location is located within an industrial zone already impacted by lighting impacts. Impacts are likely to be minor. (4) Indirect impact to water quality from dredging operations (increased turbidity and sedimentation of benthic habitats) could reduce foraging resources. However, the plume associated with these combined activities is predicted to remain localised. (5) Indirect impacts to water quality from an oil spill (refuelling accident) resulting in impact to foraging habitat and/or mortality. The risk is considered highly unlikely. This detailed impact assessment is presented in Appendix E of the Scarborough Project Nearshore Component Referral Supplementary Report.

2.4.2 Do you consider this impact to be significant?

No

2.5 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed migratory species, or their habitat?

Yes

2.5.1 Impact table

Species	Impact
Caretta caretta Loggerhead Turtle Chelonia mydas Green Turtle Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth Eretmochelys imbricata Hawksbill Turtle Natator depressus Flatback Turtle	The species nests principally from Dirk Hartog Island, along the Gnarloo and Ningaloo Coast to North West Cape and the Muiron Islands. There have been occasional records from Varanus and Rosemary Islands in the Pilbara. However, these are not identified as a nesting Biological Important Area (BIA). Furthermore, considering Rosemary Island is located around 17 kilometres to the west of the Proposal, it is unlikely it would be directly or indirectly impacted. An internesting BIA is, however, present within the waters of the Dampier Archipelago and intersects the development envelope. Potential impacts on turtles may result from the following: (1) Direct impacts from vessel strikes and/or entrainment during dredging. Dredges can be a direct source of turtle mortality where animals become caught in the dredge (entrainment). (2) Elevated underwater noise can affect marine organisms. Physical effects can occur but are only likely at a very short range and at high sound intensities. Physical impacts are unlikely to occur in the majority of large marine species as species will display avoidance behaviour well before they get within the range at which physical effects may occur. Noise sources from the Proposal would only be emitted during construction; from vessel operations including dredging and spoil disposal/rock dumping, piling activities and hydrographic surveys. (3) Marine turtles use light as an orientation cue. Lighting for the Proposal would only be required during construction and be limited to the shore crossing location and construction vessels. The

Species	Impact
	shore crossing location is located within an industrial zone already impacted by lighting impacts. Impacts are likely to be minor. (4) Indirect impact to water quality from dredging operations (increased turbidity and sedimentation of benthic habitats) could reduce foraging resources. However, the plume associated with these combined activities is predicted to remain localised. (5) Indirect impacts to water quality from an oil spill (refuelling accident) resulting in impact to foraging habitat and/or mortality. The risk is considered highly unlikely. This detailed impact assessment is presented in Appendix E of the Scarborough Project Nearshore Component Referral Supplementary Report.
Sousa chinensis Indo-Pacific Humpback Dolphin Tursiops aduncus Spotted Bottlenose Dolphin	Potential impacts on Dolphins may result from the following: (1) Vessel strikes. The risk of vessel strikes is considered highly unlikely. (2) Generally, elevated underwater noise can affect marine organisms. Physical effects can occur but only likely at a very short range and high sound intensities. Physical impacts are unlikely to occur in the majority of large marine species as species will display avoidance behaviour well before they get within the range at which physical effects may occur. Noise sources from the Proposal would only be emitted during construction; from vessel operations including dredging and spoil disposal/rock dumping, piling activities and hydrographic surveys using multibeam echo sounders. (3) Indirect impact to water quality from dredging operations (increased turbidity and sedimentation of benthic habitats) could reduce foraging resources. However, the plume associated with these combined activities is predicted to remain localised. (4) Indirect impacts to water quality from an oil spill (refuelling accident) resulting in impact to foraging habitat and/or mortality. The risk is considered highly unlikely. This detailed impact assessment is presented in Appendix E of the Scarborough Project Nearshore Component Referral Supplementary Report.
Megaptera novaeangliae Humpback Whale	Although the north and south-bound migratory routes for most whales are further offshore than the Dampier Archipelago waters (up to 70 nm from the coast), during the south-bound

Species	Impact
	migration it is likely that most individuals, particularly cow/calf pairs, stay closer to the coast, than the northern migratory path (Double et al., 2010). During the south-bound migration, it is likely some whales may travel through Dampier Archipelago waters, either passing the open outer waters, or travelling into the Mermaid Sound and continuing westwards, likely through the channel bounded by West Lewis Island and Enderby Island to the south and Rosemary Island to the north (with reference to Jenner et al., 2001). The peak of the northward migration in Dampier Archipelago waters is during July, while the southern migration peaks in late August/early September. Potential impacts on Humpback Whales may result from the following: (1) Vessel strikes. The risk of vessel strikes is considered highly unlikely. (2) Generally, elevated underwater noise can affect marine organisms. Physical effects can occur but only likely at a very short range and high sound intensities. Physical impacts are unlikely to occur in the majority of large marine species as species will display avoidance behaviour well before they get within the range at which physical effects may occur. Noise sources from the Proposal would only be emitted during construction; from vessel operations including dredging and spoil disposal/rock dumping, piling activities and hydrographic surveys using multibeam echo sounders. (3) Indirect impact to water quality from dredging operations (increased turbidity and sedimentation of benthic habitats) could reduce foraging resources. However, the plume associated with these combined activities is predicted to remain localised. (4) Indirect impacts to water quality from an oil spill (refuelling accident) resulting in impact to foraging habitat and/or mortality. The risk is considered highly unlikely. (5) Anthropogenic activities have the potential to degrade habitat important to the species. An assessment of the Proposal against these threats has been undertaken and based on the conclusions above and the management measures recommended, the Proposal would not interfere with the recovery of the species..

Species	Impact
	This detailed impact assessment is presented in Appendix E of the Scarborough Project Nearshore Component Referral Supplementary Report.
Dugong Dugon Dugong	The Dugong is primarily herbivorous and forages on seagrass. Seagrasses in the Dampier Archipelago are generally sparse, occurring in low abundance on shallow sandy sediments in sheltered areas such as flats and larger bays (CALM 2005; Jones 2004). The most significant areas of seagrass in the Dampier Archipelago are found between Keast and Legendre Islands to the north of the Burrup Peninsula, and between West Intercourse Island and Cape Preston. Minor seagrass meadows are also found within macroalgal meadows in shallow sand areas such as West Conzinc Island (URS 2000) and Withnell Bay (Bertolino 2006). Potential impacts on Dugongs may result from the following: (1) Vessel strikes. The risk of vessel strikes is considered highly unlikely. (2) Generally, elevated underwater noise can affect marine organisms. Physical effects can occur but only likely at a very short range and high sound intensities. Physical impacts are unlikely to occur in the majority of large marine species as species will display avoidance behaviour well before they get within the range at which physical effects may occur. Noise sources from the Proposal would only be emitted during construction; from vessel operations including dredging and spoil disposal/rock dumping, piling activities and hydrographic surveys. (3) Indirect impact to water quality from dredging operations (increased turbidity and sedimentation of benthic habitats) could reduce foraging resources. However, the plume associated with these combined activities is predicted to remain localised. (4) Indirect impacts to water quality from an oil spill (refuelling accident) resulting in impact to foraging habitat and/or mortality. The risk is considered highly unlikely. This detailed impact assessment is presented in Appendix E of of the Scarborough Project Nearshore Component Referral Supplementary Report.

2.5.2 Do you consider this impact to be significant?

No

2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?

Yes

2.6.1 Is the proposed action likely to have ANY direct or indirect impact on the Commonwealth marine environment?

Yes

2.6.2 Describe the nature and extent of the likely impact on the whole of the environment.

The Proposal involves the installation of a trunkline on the seabed of Mermaid Sound adjacent to an existing trunkline up to the State Waters boundary. While the trunkline will be in place for an extended period (approximately 25 years or more), it will be buried and/or adequately protected and is unlikely to substantially impact the overrall marine environment.

Construction activities would result in temporary impacts, the majority resulting from dredging operations that will be required to bury the trunkline. This is likely to result in water quality impacts including temporary increases in turbidity levels and sedimentation which may indirectly impact benthic communities and habitats and associated marine flora and fauna. Previous monitoring undertaken for similar dredging activities (i.e. the adjacent Pluto trunkline) have shown that impacts to the most sensitive receptors (i.e. corals) were minor.

Additional potential impacts may result from the light emissions during construction, construction noise and vessel presence. These impacts will be managed through the recommended management measures including the requirement to prepare management plans (e.g. dredge and spoil disposal management plan).

A seperate assessment is currently being prepared for the section of trunkline and other components of the Scarborough Project located in Commonwealth Waters which will be submitted to NOPSEMA.

2.6.3 Do you consider this impact to be significant?

No

2.7 Is the proposed action to be taken on or near Commonwealth land?

No

2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?

No

2.9 Is the proposed action likely to have ANY direct or indirect impact on a water resource related to coal/gas/mining?

No

2.10 Is the proposed action a nuclear action?

No

2.11 Is the proposed action to be taken by the Commonwealth agency?

No

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage Place Overseas?

No

2.13 Is the proposed action likely to have ANY direct or indirect impact on any part of the environment in the Commonwealth marine area?

Yes

2.13.1 Describe the nature and extent of the likely impact on the whole of the environment.

The Proposal involves the installation of a trunkline on the seabed of Mermaid Sound adjacent to an existing trunkline up to the State Waters boundary. While the trunkline will be in place for an extended period (approximately 25 years or more), it will be buried and/or adequately protected and is unlikely to substantially impact the overrall marine environment.

Construction activities would result in temporary impacts, the majority resulting from dredging operations that will be required to bury the trunkline. This is likely to result in water quality impacts including temporary increases in turbidity levels and sedimentation which may indirectly impact benthic communities and habitats and associated marine flora and fauna. Previous monitoring undertaken for similar dredging activities (i.e. the adjacent Pluto trunkline) have shown that impacts to the most sensitive receptors (i.e. corals) were minor.

Additional potential impacts may result from the light emissions during construction, construction noise and vessel presence. These impacts will be managed through the recommended management measures including the requirement to prepare management plans (e.g. dredge and spoil disposal management plan).

A seperate assessment is currently being prepared for the section of trunkline and other components of the Scarborough Project located in Commonwealth Waters which will be submitted to NOPSEMA.

2.13.2 Do you consider this impact to be significant?

No

Section 3 - Description of the project area

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed in Section 2).

3.1 Describe the flora and fauna relevant to the project area.

The proposal is located within the Dampier Archipelago and traverses Mermaid Sound. The following provides a description of the marine environment and the flora and fauna communities present. Further details are provided in Chapter 4 of the Scarborough Project Nearshore Component Referral Supplementary Report.

Marine benthic habitats and communities

Soft sediments and sandy beaches

Soft sediment composed of sand and silt is the dominant subtidal habitat within Mermaid Sound (Bancroft and Sheridan, 2000). While the sand habitat may overlay reef platforms or contain patches of another habitat. In the Dampier Archipelago, sand habitats are typically bare though may contain seasonal vegetation or permanent patches of seagrass, macroalgae and invertebrate infauna. The silty subtidal habitats of the Dampier Archipelago are in more sheltered areas, such as embayments, and are usually unvegetated. These habitats typically support a rich variety of infauna species such as polychaete worms, molluscs and crustaceans. The intertidal mudflats of the inner Archipelago occur predominantly on the eastern side of the Burrup Peninsula and support significant arid-zone mangrove communities, foraging shorebirds and wading birds and can also host bacteria important to carbon cycling (Heyward et al., 2000).

Rocky shores

Rocky shores are the dominant shoreline habitat associated within the Dampier region (Semeniuk et al., 1982). Wells and Walker (2003) described the fauna of the littoral zone as sparse, comprised predominately of littorinid snails and grapsid crabs while the intertidal zones are dominated by a diverse range of species including sponges, oysters, limpets, chitons, crabs, and barnacles. The biota becomes increasingly diverse in the lower intertidal, with a variety of sessile and motile invertebrates and benthic algae. Corals reach into the lowest portions of the intertidal zone (Jackson et al., 2006).

Reefs

Reef habitat is considered as anywhere that hard bottom exists in the subtidal environment. Hard bottom substrates have the potential to support a variety of communities and may have a foundation of biota, such as biogenic reefs composed of skeletal remains of hard corals (i.e. coral reefs). The coral communities of the Dampier Archipelago have been described below. These communities are mostly present as individual colonies that settle and grow on existing hard substrate (Jones, 2004; WorleyParsons, 2009; MScience, 2014), predominantly located

close to shore to a depth of 10 m lower low water (MScience, 2014).

Reef habitat also supports macroalgal and mixed biota communities within the Dampier Archipelago, the majority of which occur in the lower intertidal areas of the Archipelago. Algal habitats have been previously determined to be essentially all hard substrates within the photic zone (MScience, 2014). As a result, large macroalgal reef habitats occur in the southwest region of the inner harbour around West Intercourse Island. Furthermore, there are a number of shallow reef flats on the western and eastern margins of Mermaid Sound that may support seasonal macroalgal assemblages (MScience, 2014).

Marine invertebrates

Nearshore areas of the Dampier Archipelago support an abundant and diverse group of tropical invertebrate species due to the wide variety of suitable habitats. Over 2226 species of marine invertebrates have been recorded in the Archipelago, including 1227 molluscs, 438 crustaceans, 275 sponges and 286 echinoderms (CALM, 2005).

Filter feeder communities

The Pilbara region has a very high diversity of marine sponges (Fromont et al., 2016), within the Dampier Archipelago 275 sponge species have been recorded. About 20% of these species are presently known to be limited to Western Australia and are likely to be endemic (Fromont, 2003). While extensive surveys of the Western Australian coastline are limited, there is data to suggest that some sponge species have limited distributions and Fromont (2003) suggests that the high level of endemism may be the result of a short larval phase and limited dispersal.

Surveys conducted by Fromont (2004) found that the highest diversity of sponges in the Dampier Archipelago occurred in sponge communities that were either low relief or pavement habitats often with a sediment layer with strong tidal currents. High diversity sponge communities have been observed at the eastern end of Flying Foam Passage, at the western end of Mermaid Strait and between Enderby and West Lewis Islands (Fromont, 2004; Jones, 2004). Generally, the high habitat complexity of the Dampier Archipelago corresponds with high sponge species richness, contributing to the high biodiversity value of the nearshore environment of the Pilbara region (Fromont, 2016).

Epifauna and Infauna

Given the dominance of soft sand and silt habitat within the inner Dampier Archipelago (Bancroft and Sheridan, 2000), sedimentary infauna associated with soft unconsolidated sediments is likely to be widespread and well represented. In the context of the contiguous extent of habitats across the region, it is considered of relatively low environmental sensitivity.

Coral

Coral communities of the Dampier Archipelago predominantly occur as narrow linear features fringing the shorelines of islands and the Burrup Peninsula typically between 2 m and 10 m mean lower low water (Blakeway and Radford, 2005; Jones, 2004). The fringing reefs are not true coral reefs in that they establish and grow on existing hard substratum (Jones, 2004; WorleyParsons, 2009).

Both zooxanthellate and azooxanthellate corals are found throughout the Dampier Archipelago, including a total of 229 species from 57 hermatypic coral genera (Woodside, 2006; Griffith, 2004), representing a large proportion of the 318 hermatypic species from 70 genera known to occur in Western Australia (URS, 2004). Distribution of coral communities shows a strong gradient in which nearshore or inner harbour reefs are dominated by sediment tolerant species that shift to wave tolerant clear water species further offshore in the outer port harbour (Wilson, 1994).

It is widely recognised that coral communities provide high ecological value to the marine environment. As such coral communities within the Dampier Archipelago have been researched to identify community ecological structure and manage impacts associated with port development and other anthropogenic impacts. Historically taxonomic surveys and ecological research have concentrated on the outer Archipelago (Griffith, 2004), while studies associated with monitoring potential impacts on coral from industrial development and port expansion have focused on nearshore areas (Blakeway & Radford, 2005).

The coral communities along the mainland Burrup Peninsula coast show little evidence of reef development; rather they grow by encrusting solid substrata such as Precambrian rock (URS, 2004; Jones, 2004). Coral reefs have been recorded in the vicinity of King Bay, between Phillip Point and the Dampier Public Wharf; however, water conditions in this area are extremely turbid and the reef is considered to be patchy (Water Corporation, 2000). URS (2003) recorded various species of coral along the western coast of the Burrup Peninsula, with the most dominant genera being Favities, Favia, Platygyra, Goniastrea and Caulastrea, as well as Turbinaria colonies. Other common corals recorded include Porites, Pavona, Acropora, Lobophyllia, Symphyllia, Goniopora, Montipora and Pectinia species (URS, 2003). These communities experience elevated levels of natural turbidity and suspended sediment most of the year and appear to be relatively resilient in terms of the persistent turbidity (Blakeway & Radford, 2005). The Turbinaria and mixed coral assemblages found in this area are considered less sensitive to turbidity and sedimentation compared with the Pavona, Porites and Acropora-dominated assemblages found further offshore (Blakeway & Radford, 2005).

Seagrass

Seagrasses in the Dampier Archipelago are generally sparse, occurring in low abundance on shallow sandy sediments in sheltered areas and interspersed with other BCH (CALM, 2005; Jones, 2004; MScience, 2014). Surveys and studies of the region have identified nine species: Cymodocea angustata, Enhalus acoroides, Halophila decipiens, Halophila minor, Halophila ovalis, Halophila spinulosa, Halodule uninervis, Thalassia hemprichii and Syringodium isoetifolium (McMahon et al., 2017; Woodside, 2006). However, Halophila is the predominant species and is typically restricted to the 6 m (CD) depth contour (MScience, 2014).

Surveys conducted by Bertolino (2006) reported seagrass in Conzinc and Withnell Bays, southern side of East Lewis Island and between the causeways connecting East Intercourse Island and Mistaken/East Mid Intercourse Islands (MScience, 2014). Sparse patches of seagrass have also been recorded throughout Mermaid Strait and in the nearshore environments of the bordering islands (MScience, 2014; Huisman and Borowitzka, 2003; Waycott, 2004).

The most significant areas of seagrass in the Dampier Archipelago are found between Keast

and Legendre Islands to the north of the Burrup Peninsula, and between West Intercourse Island and Cape Preston. Recorded occurrences of Halophila species in the Dampier Archipelago fluctuate depending on a variety of factors such as salinity, success of seed set and colonisation, temperature and grazing by dugongs (Woodside, 2006). Furthermore, this fluctuation may indicate the presence of transitory communities, which are annual meadows that develop from the seed bank, grow flower, set seed and die back each year (McMahon et al., 2017).

Macroalgae

Macroalgal communities of the north west of Western Australia are relatively poorly understood/surveyed in comparison to other regions of Australia (Huisman, 2004; Huisman and Borowitzka, 2003). Macroalgae generally require a hard substrate, sufficient light and water clarity to survive, and so are generally limited to shallow water. Macroalgal assemblages in the Pilbara region display an ephemeral growth pattern and may not be present year?round, despite presence of suitable habitat. Previously, macroalgal habitats were determined to be essentially all hard substrates within the photic zone. As a result, large algal habitats occur around West Intercourse Island and a number of shallow reef flats on the western and eastern margins of Mermaid Sound. In nearshore areas, macroalgae are most commonly found on shallow limestone pavements located on the northern and western portions of West Intercourse, West Lewis and Malus Island. More broadly, large expanses of macroalgae are prevalent along the seaward side of West Intercourse Island, extending south-west along the coast to Cape Preston and beyond.

The most abundant group of algae in the region is brown algae; in particular, species from the genus Sargassum, Dictyopteris and Padina are very common (Woodside, 2006). The most common species of green algae in the Dampier Archipelago include Caulerpa species and calcareous Halimeda species (CALM, 2005; Jones, 2004). A variety of red algae are also found in the Dampier Archipelago including corallines, calcified red algae and algal turf (Jones, 2004).

Mangroves

Mangroves are an important part of the coastal ecosystem, contributing to primary productivity and providing habitat for fauna species including fish, sea snakes, turtles and birds (Wells et al., 2003). The significance of tropical arid zone mangroves along the Pilbara coastline is recognised and specific guidance documentation has been established by the EPA (2001) for the protection of these communities, habitats and dependant habitats from development pressures.

Six species of mangrove occur in the Dampier region: Avicennia marina, Aegialitis annulata, Aegiceras corniculatum, Bruguiera exaristata, Ceriops tagal, and Rhizophora stylosa. Most mangrove communities contain a number of species, and a variety of structures of zonation persist, dependent on the underlying sediment type, tidal height, and wave and current action (Semeniuk et al., 1987). Avicennia marina is the most abundant species, existing in some monospecific stands that range from forests down to stunted shrubs. Regionally significant areas of mangroves that occur in the Dampier Archipelago include communities at West Intercourse Island, Enderby Island Complex and Searipple Passage/Conzinc Bay (EPA, 2001).

The nearest mangrove community to the Proposal is a stand of Avicennia and Rhizophera

located at the north east pocket of the sandy beach at No Name Bay. This stand has been studied as part of a long term Chemical and Ecological Monitoring Program of Mermaid Sound (ChEMMS) program initiated by Woodside in 1985. The most recent survey undertaken by Advisian (2017) recorded very little, to no decline in the health of this stand over time, indicating very little impact to this mangrove community from existing industrial activities. The next closest, and considerably larger, mangrove community exists at King Bay. The mangrove community at King Bay was the subject of studies by the WA Department of Conservation and Environment in the early 1980s when the main Burrup access road was constructed through its upper reaches (Semeniuk et al., 1982). A comparison of aerial photography from 1957 and 2001 shows the distribution of individuals and species within the Hamersley Lease has changed little over the intervening 44 years (MScience, 2004).

Microphytobenthos and algal mats

Subtidal sandy seabed areas that support benthic algae or microphytobenthos (MPB) are recognised as a major contributor to overall benthic primary productivity of ecosystems as well as providing habitat for short range endemic fauna (Murrell et al., 2009). With the dominance of subtidal sandy habitat and the relatively shallow bathymetry of Mermaid Sound, it is likely that MPB occurs throughout the area, although its abundance and distribution has not been previously described. In Mermaid Sound the more environmentally significant MPB habitat is likely to occur in shallower areas, where more light is available on the seabed. Regular fluctuations in biomass indicate that MPB respond rapidly to environmental variation. Monitoring in Port Phillip Bay, for example, has shown that MPB biomass is highly dynamic and capable of rapid recovery in shallow waters (Beardall et al., 1997; AME, 2006).

In the Dampier region, many areas of the otherwise bare zone contain intertidal blue-green algal mats (Wells and Walker, 2003). These have been studied by Paling (1986) and Paling and McComb (1994). The distribution of algal mats is controlled by tidal height, tidal current, sediment influx and sediment drainage (Wells and Walker, 2003). The algal mat is a cohesive fabric consisting of cyanophyte filaments, stabilising the substrate to resist erosion. The mats are rich in organic matter, storing carbon, nitrogen and phosphorous. The nutrients from the algal mats provide a significant source of nutrient input to mangrove communities in the region (Paling and McComb, 1994).

Marine Fauna

The Dampier Archipelago is an important area for protected species listed under the EPBC Act and/or the WA Wildlife Conservation Act. Protected species that may occur within the vicinity of the development envelope have been identified through the following searches:

-EPBC Act Protected Matters Search Tool for the development envelope (with a 10 km buffer)

-Western Australian Department of Biodiversity, Conservation and Attractions NatureMap tool for the development envelope (with a 20 km buffer) within State waters

The searches identified protected species of bird, mammal, fish and reptiles that may be present within the vicinity of the proposal; and these are summarised in the following sections.

Seabirds and migratory shorebirds

A large number of seabird and shorebird species (or species habitat) may occur within the vicinity of the proposal; this includes species classified as threatened and migratory under the EPBC Act or specially protected under the WA Wildlife Conservation Act. The majority of species identified are also migratory, and as such their presence would only be expected during part of the year. The Wedge-tailed shearwater, Roseate tern and Australian fairy tern have been identified as having ecologically significant interactions within the area.

Marine Mammals

Cetaceans (whales and dolphins) and dugongs may occur within the vicinity of the Proposal; including species classified as threatened and migratory under the EPBC Act or specially protected under the WA Wildlife Conservation Act.

Cetaceans within the region include those that are predominantly found in shallow coastal waters (e.g. Indo-Pacific humpback dolphin). Furthermore, the North-west Marine Region is thought to be an important migratory pathway between feeding grounds in the Southern Ocean and breeding grounds in tropical waters for several cetacean species (DEWHA, 2012b).

The following summary focuses on the subset of species that have been identified as having ecologically significant interactions (e.g. migration BIA) in the area or that are considered ‘iconic’ (e.g. dolphins and dugongs):

Dugong

Dugongs (Dugong dugon) are associated with tropical and sub-tropical coastal waters, and in particular shallow, protected waters such as sheltered bays, mangrove channels and in the lee of large inshore islands (UNEP 2002). Dugongs are herbivores that feed on seagrass. The dugong’s reproductive cycle is sensitive to food availability; with breeding delayed if sufficient food is not available (UNEP 2002).

The distribution of dugong in the Pilbara region is widespread, including Barrow Island and the Montebello Islands, the Dampier Archipelago and the mainland coastal waters. They have been recorded near various islands including Rosemary Island, East Lewis Island, West Lewis Island, Keast Island, Legendre Island and Little Rocky Island (CALM 2005; URS 2000). Dugongs have also been sighted in shallow, sheltered bays of the Burrup Peninsula and mainland such as Regnard Bay and Nickol Bay (CALM 2005).

Humpback whale

Humpback whales are listed as vulnerable and migratory under the EPBC Act, and specially protected under the WA Wildlife Conservation Act. The Western Australian population of humpback whales is genetically distinct from the eastern Australian population.

Breeding and calving grounds occur between Broome and the northern end of Camden Sound, with breeding typically occurring between August and September (DEWHA, 2012b). Feeding occurs primarily during summer in Antarctic waters, with krill forming the major part of the diet (DEWHA, 2012b). A BIA for migration has been identified on the inner shelf, including within the vicinity of the proposed trunkline. Although the north and south-bound migratory routes for most whales are further offshore than the Dampier Archipelago waters (up to 70 nm from the coast),

during the south-bound migration it is likely that most individuals, particularly cow/calf pairs, stay closer to the coast, than the northern migratory path (Double et al., 2010). During the south-bound migration, it is likely some whales may travel through Dampier Archipelago waters, either passing the open outer waters, or travelling into Mermaid Sound and continuing westwards, likely through the channel bounded by West Lewis Island and Enderby Island to the south and Rosemary Island to the north (with reference to Jenner et al., 2001). The peak of the northward migration in Dampier Archipelago waters is during July, while the southern migration peaks in late August/early September.

Indo-Pacific humpback dolphin

In Australia, humpback dolphins are thought to be widely distributed along the northern Australian coastline from approximately the Queensland–New South Wales border to western Shark Bay, Western Australia (Parra & Cagnazzi 2016). While coastal waters are arguably the primary habitat of Australian humpback dolphins, most survey work has been conducted close to the coast; thus, the extent to which humpback dolphins use offshore waters is not yet fully understood. No studies on habitat use have been conducted in Western Australia. Preliminary surveys and ongoing studies in a few locations indicate that Australian humpback dolphins appear to utilise a wide range of near-shore habitats. For example, around the North West Cape, dolphins have been sighted in clear waters over Ningaloo Reef, and in turbid waters in Exmouth Gulf and in depths ranging from 1 to 40 m deep (T. Hunt, personal communication, 19 February 2015, cited in Parra & Cagnazzi 2016).

Bottlenose dolphin

Bottlenose dolphins are distributed continuously around the Australian mainland. Indian Ocean Bottlenose Dolphins have been confirmed to occur in estuarine and coastal waters of eastern, western and northern Australia (Hale et al. 2000; Möller & Beheregaray 2001; Ross & Cockcroft 1990). In Australia, the Indian Ocean Bottlenose Dolphin is restricted to inshore areas such as bays and estuaries, nearshore waters, open coast environments, and shallow offshore waters including coastal areas around oceanic islands (Hale et al. 2000; Kogi et al. 2004; Möller & Beheregaray 2001; Wang et al. 1999).

Fish

There are more than 650 species of fish that occur within the waters of the Dampier Archipelago; this includes species classified as threatened and migratory under the EPBC Act.

The following summary focuses on the subset of species that may be considered ‘iconic’ (e.g. sawfishes, sharks and rays):

Sawfishes

Sawfishes generally inhabit inshore coastal, estuarine and riverine environments. Important areas for sawfishes adjacent to the North-west Marine Region include the Pilbara coast, King Sound, and lower reaches of the Fitzroy, May and Robinson rivers for the dwarf sawfish; and Cape Keraudren for the green sawfish (DEWHA, 2012d).

Grey Nurse SharkThe Grey Nurse Shark (west coast population) has a broad inshore

distribution, primarily in sub-tropical to cool temperate waters (Last & Stevens 1994). The population of Grey Nurse Shark (west coast population) is predominantly found in the south-west coastal waters of Western Australia (Environment Australia 2002a) and has been recorded as far north as the North West Shelf (Stevens 1999; Pogonoski et al. 2002). Grey Nurse Sharks are often observed hovering motionless just above the seabed, in or near deep sandy-bottomed gutters or rocky caves, and in the vicinity of inshore rocky reefs and islands (Pollard et al. 1996). It is therefore unlikely to be present near the development envelope but may occur around the Dampier Archipelago islands.Great white shark

In Australia, Great White Sharks have been recorded from central Queensland around the south coast to north-west Western Australia, but may occur further north on both coasts (Bonfil et al. 2005; Bruce et al. 2006; Last & Stevens 2009; Paterson 1990). It has been sighted in all coastal areas except in the Northern Territory. Within Australian waters, the majority of recorded great white shark movements occur between the coast and the 100 metre depth contour. Great White Sharks can be found from close inshore around rocky reefs, surf beaches and shallow coastal bays to outer continental shelf and slope areas (Pogonoski et al. 2002 in DEWHA 2009). Great White Sharks are often found in regions with high prey density, such as pinniped colonies (DEWHA 2009). White sharks were identified as potentially occurring within the development envelope but given the migratory nature of the species, its low abundance, broad distribution in temperate waters across southern Australia and absence of preferred prey (pinnipeds), white sharks are unlikely to occur in large numbers.

Manta Rays

The reef manta ray is commonly sighted inshore, but also found around offshore coral reefs, rocky reefs and seamounts (Marshall et al., 2009). In contrast to the giant manta ray, long-term sighting records of the reef manta ray at established aggregation sites suggest this species is more resident in tropical waters and may exhibit smaller home ranges, philopatric movement patterns and shorter seasonal migrations (Deakos et al., 2011; Marshall et al., 2009).

The Giant Manta Ray is broadly distributed in tropical waters of Australia. The species primarily inhabits nearshore environments along productive coastlines with regular upwelling, but they appear to be seasonal visitors to coastal or offshore sites including offshore island groups, offshore pinnacles and seamounts (Marshall et al., 2011).

Marine Reptiles

Seasnakes and turtle species may occur within the vicinity of the proposal; this includes species classified as threatened and migratory under the EPBC Act.

The following summary focuses on the subset of species that have been identified as having ecologically significant interactions (e.g. foraging, nesting, internesting BIAs) in the area:

Loggerhead turtle

Loggerhead turtles are listed as endangered and migratory under the EPBC Act, and the western breeding stock is the larger of the two stocks in Australia. Loggerhead turtles occur throughout the North-west Marine Region and forage across a wide range of habitats including rocky and coral reefs, seagrass pastures and estuaries (DEWHA, 2012e). In the North-west

Marine Region, loggerhead turtles breed principally from Dirk Hartog Island in the south, along the Gnaraloo and Ningaloo coast to North West Cape and the Muiron Islands region in the north; with occasional records from Varanus and Rosemary islands and Ashmore Reef. BIAs have been identified for loggerhead turtles intersecting the development envelope.

Green turtle

Green turtles are listed as vulnerable and migratory under the EPBC Act, and are the most common marine turtle breeding in the North-west Marine Region (DEWHA, 2012e). Three distinct breeding stocks of green turtles occur in the region: the North West Shelf stock, the Scott Reef stock and the Ashmore stock. Principal near-coastal rookeries include the Lacepede Islands, some islands of the Dampier Archipelago, Barrow Island, the Montebello Islands, and North West Cape and the Muiron Islands (DEWHA, 2012e). The nesting period for the North West Shelf stock is expected to begin in November, peak in January-February, and end in April (DEWHA, 2012e). Green turtles forage for seagrass and algae in estuarine, rocky and coral reef and seagrass habitats. BIAs for the green turtles have been identified intersecting the development envelope.

Leatherback turtle

Leatherback turtles are listed as endangered and migratory under the EPBC Act, and have the broadest distribution worldwide but are uncommon within their Australian range (DEWHA, 2012e). Leatherback turtles are rarely recorded breeding within Australia, however are known to regularly forage within continental shelf waters. The leatherback turtle is an oceanic, pelagic species that feeds primarily on jellyfish, sea squirts and other soft-bodied invertebrates (DEWHA, 2012e). They do not have BIAs intersecting the development envelope.

Hawksbill turtle

Hawksbill turtles are listed as vulnerable and migratory under the EPBC Act, and are generally associated with rocky and coral reef habitats, foraging on algae, sponges and soft coral (DEWHA, 2012e). There is a single breeding stock in the region: the Western Australian stock, which is centred on the Dampier Archipelago. The most significant breeding areas include Rosemary Island in the Dampier Archipelago, Varanus Island in the Lowendal group, and some islands in the Montebello group (DEWHA, 2012e). Hawksbill turtles nest in the region all year round with a peak between October and January. BIAs for the hawksbill turtles have been identified intersecting the development envelope.

Flatback turtle

Flatback turtles are listed as vulnerable and migratory under the EPBC Act, and are endemic to the northern Australia / southern New Guinea continental shelf. There are two breeding stocks within the North-west Marine Region, one of which (the North West Shelf stock) has significant rookeries on Thevenard Island, Barrow Island, the Montebello Islands, Varanus Island, the Lowendal Islands, islands of the Dampier Archipelago, and coastal areas around Port Hedland or along the Kimberly coast where suitable beaches occur (DEWHA, 2012e). Nesting begins in late November–December, peaks in January, and finishes by February–March. Flatback turtles differ from other marine turtles in that they do not have a pelagic phase to their lifecycle; instead, hatchlings grow to maturity in shallow coastal waters thought to be close to their natal

beaches. BIAs for the flatback turtles have been identified intersecting the development envelope.

Planktonic communities

In the North West Marine Bioregion, productivity is typically greater during the wet season when the weakening of surface currents allows for increased upwelling (DEWHA, 2008a; Brewer et al., 2007). Areas of enhanced production are also observed at the interface between stable waters warmed by solar heating and unstable waters mixed by tidal turbulence, which is more prevalent in nearshore environment where depths are greater than 40 m (Heyward et. al. 2000). Productivity is greater in shallow nearshore environments within State waters than in the offshore waters. During the warmer months, extensive blooms of Trichodesmium occur on a regional scale, including within the Dampier Archipelago. It's role in the trophic system and the nutrient cycle is not well understood though it may contribute significantly to the nitrogen budget. There have been no known deleterious water quality impacts caused by toxic algal blooms in the region (Heyward et. al. 2000).

A study by Jones (2001) determined that a total of 22 zooplankton species and 45 other planktonic taxa, including, crustaceans, molluscs, polychaete worms, arrow worms, sea squirts and coelenterates have been introduced into Dampier Archipelago via vessel ballast water.

3.2 Describe the hydrology relevant to the project area (including water flows).

Not applicable.

3.3 Describe the soil and vegetation characteristics relevant to the project area.

Marine Vegetation is described in Section 3.1.

Marine Sediment characteristics are described in Section 4.3 of the Scarborough Project Nearshore Component Referral Supplementary Report and are summarised below.

Grain size

Seabed sediment grain size in the Dampier Archipelago region is highly variable, due to the presence of strong tidal currents, periodic cyclones, protected embayments and sediment-producing organisms such as coral reefs (Talbot et al. 1985). Analysis of particle size distribution sediment survey for the Pluto dredging footprint in January 2006, found sediments adjacent to Holden Point to be predominately sand (particle size of 0.06–2.0 mm). Further offshore, within the navigation channel the sediments were comprised of sand (particle size of 0.06–2.0 mm); silt (0.002–0.06 mm) and clay (?0.002 mm) (Woodside, 2006). Similarly, the majority of sites sampled by Jacobs (2015), within Mermaid Sound were dominated by silt and clay.

Contaminants

Past studies have rarely found contaminants in sediments of the Dampier Archipelago. This is

considered attributable to the lack of riverine inputs and controls on discharges associated with low levels of industrial development (MScience, 2004). Historically, sediments in Mermaid Sound have been considered to be generally clean (in that they were below screening levels of National Ocean Disposal Guidelines for Dredged Material (NODGM), with Tributyltin (TBT) the only contaminant of concern (Woodside, 2006; DEC, 2006). TBT, which has been used as an anti-foulant on ships, is a compound acutely toxic to many species of marine animals as it inhibits growth. It leaches from treated surfaces, such as ship hulls, and is further introduced to the marine environment through paint flaking (Laughlin et al., 1986). TBT thus accumulates in sediments in areas of heavy shipping such as harbours and wharves. The elevated concentrations found in previous sampling programmes have been in the upper sediment layer in areas used by the shipping industry (IRCE, 2003a; 2003b).

In January 2006, an extensive sediment survey of Mermaid Sound covering the proposed Pluto LNG Facility channel and gas trunkline route screened the upper 1 m of seabed for TBT. Overall the 95% Upper Confidence Limit of TBT for all areas was below screening level as stipulated by the then guideline at the time (NODGM), and the sediments were therefore considered acceptable for ocean disposal. Of the 98 sites screened only two sites, located in the vicinity of existing shipping channels, contained TBT above detection levels (20 ?g Sn/kg and 3.85 ?g Sn/kg (normalised to 1% Total Organic Carbon). Both samples were taken from the upper 50 cm of seabed, with the lower 50 cm of the same sites containing no detectable TBT, indicating TBT contamination was confined to the upper layer of seabed. The sample containing 20 ?g Sn/kg was one of three taken at the same location as part of a triplicate series for analysis of inter-sample variation. The other two samples in this triplicate series contained no detectable levels of TBT. This is not unusual given paint flakes from ships can cause highly localised elevated levels of TBT in sediments (Woodside, 2006).

It is expected that the complete prohibition on the presence of TBT paints on ships since 2008 will have resulted in a continuing reduction of TBT levels in sediments in the Dampier Archipelago. A study conducted by Jacobs (2015), where sediment samples were taken at 200 m and 500 m distances from existing developments/infrastructure within Mermaid Sound (including shipping channels and spoil grounds) found that, when normalised to 1% total organic carbon (TOC), levels of TBT were below the screening level of current guidelines, National Assessment Guidelines for Dredging (NAGD).

In the first quarter of 2006, a further 35 sediment samples were collected at 15 borehole locations from the lower seabed (that is, below 1 m) during a geotechnical survey undertaken by Woodside in Mermaid Sound. Sporadic traces of petroleum based hydrocarbons were found, with no detectable levels of any polyaromatic hydrocarbons listed by the current guidelines at the time (NODGM). The sediments were also tested for metals, with levels of arsenic, chromium, nickel and silver found slightly above screening level in a few individual samples (Woodside, 2006).

More recent studies undertaken throughout the Archipelago, within Port limits have indicated that surficial sediments (upper 1 m of sediment) were still considered generally clean. The only analytes to exceed NAGD screening levels were arsenic and nickel and only at a small subset of sampling locations (Advisian, 2017; Jacobs, 2015; GHD, 2016). These elevated levels were considered attributable to the natural geology of the region, which is in line findings of studies conducted in 2006 (DEC, 2006; Woodside, 2006). The GHD study also determined that locations with the smallest particle grain size had higher adsorption potential and generally had

higher concentrations of metals, metalloids and total organic carbon (GHD, 2016). The analysis for the intermediate suite of parameters of sediments at the three sites sampled by Jacobs (2015) recorded no detectable concentrations of hydrocarbons, phenols/phenolics or chlorobenzenes. Similarly, there were no detectable concentrations of pesticides, PCBs, herbicides or cyanides recorded as part of the analysis for the detailed suite of parameters.

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

The Dampier Archipelago consists of 42 islands covering approximately 400 kilometres. It contains a wide diversity of habitats including coral reefs, mangroves, inter-tidal sands and mudflats, inter-tidal reef platforms, beaches, rocky shores, seagrasses and macro algae. Conservation significant species also occur in the waters surrounding the islands including but not limited to dugongs, dolphins, whales and marine turtles. Twenty five of the islands are protected as a Nature Reserve (Dampier Archipelago Nature Reserve).

The Dampier Archipelago including the Burrup Peninsula is known as Murujuga (meaning hipbone sticking out) by traditional owners. It is rich in Aboriginal heritage sites of considerable cultural and archaeological significance including quarries, middens, fish traps, rock shelters, artefact scatters, grinding patches, stone arrangements and petroglyphs. Dating back more than 15,000 years, these sites demonstrate the world’s oldest living continual culture. Their significance was recognised with the Dampier Archipelago and parts of the Burrup Peninsula being placed on the National Heritage List in 2007 and the creation of the Murujuga National Park in 2013

3.5 Describe the status of native vegetation relevant to the project area.

Marine Vegetation is described in Section 3.1.

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

The proposed trunkline will be located in water depths ranging from 0 m to approximately 34 m, running though Mermaid Sound parallell to the existing Pluto trunkline.

3.7 Describe the current condition of the environment relevant to the project area.

As per the Environmental Quality Management Framework (EQMF) set out by the DoE (2006), the majority of Mermaid Sound is afforded a high to maximum Level of Ecological Protection due to its largely pristine condition. Areas where infrastructure and industrial activity are common, such as Karratha Gas Plant nearshore infrastructure and dredge spoil disposal grounds, have been allocated a moderate Level of Ecological Protection as they are distrubed environments and areas around saltworks and sewage wastewater discharges have been allocated a low to moderate Level of Ecological Protection since they are more highly distrubed.

3.8 Describe any Commonwealth Heritage Places or other places recognised as having heritage values relevant to the project area.

There is no heritage listed sites within or in proximity to the development envelope except the Dampier Archipelago (including Burrup Peninsula), classified as an indigenous class feature on the National Heritage List. See section 3.9 for a description of Aboriginal heritage.

3.9 Describe any Indigenous heritage values relevant to the project area.

Aboriginal Heritage

The Dampier Archipelago (including Burrup Peninsula) is an indigenous class feature on the National Heritage List. Aboriginal people have a strong on-going association with the North-west Marine Region. The saltwater peoples of the north-west continue to rely on coastal and marine environments and resources for their cultural identity, health and wellbeing, as well as their domestic and commercial economies (DEWHA, 2008a).

The Western Pilbara region and associated islands contain a prolific and diverse range of Aboriginal heritage sites and objects. Aboriginal heritage sites types represented include petroglyph (rock art) sites, ethnographic sites, standing stones, shell middens, artefact scatters, quarries and grinding patches. It has been estimated that the Dampier Archipelago may contain around 1 million rock art images known as petroglyphs (Woodside, 2006), at a density of between 17 and 76 heritage sites per square kilometre (National Trust, 2006). State records and Woodside's own surveys during the operation of the Pluto LNG Project have identified a range of Aboriginal heritage site types, inside and adjacent the Pluto LNG Project facilities, including adjacent to the shore crossing location. The shore crossing site for the Scarborough trunkline has been disturbed by the trenching for the Pluto trunkline and the construction of the Pluto jetty and is unlikely to contain heritage sites. A thorough audit of Aboriginal heritage sites within Woodside Pluto LNG Project confirmed the presence of Aboriginal heritage sites preserved in situ within lease areas. Woodside maintains a database of Aboriginal heritage sites and restricts access to identified features within the operating site. Quarterly heritage update meetings are held with traditional owners to discuss Woodside activities and ongoing heritage management requirements. Annual Aboriginal heritage sites audits are conducted with traditional owners and a qualified archaeologist, to inspect, monitor and report on the conditions of the sites within Woodside leases boundaries. These sites are managed through existing cultural heritage management plans implemented at the Pluto LNG facility (Woodside 2012).

A Native Title (WC 1996/089 by the Yaburara and Mardudhunera people) partially extends into waters through which the trunkline would traverse near the State Waters boundary.

3.10 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area.

Seabed is within Pilbara Port Authority limits (Port of Dampier).

The shore crossing site is located adjacent to the Pluto LNG facility on land zoned as 'Strategic Industry' (City of Karratha Town Planning Scheme No.8).

3.11 Describe any existing or any proposed uses relevant to the project area.

Land use

The proposal is located within the Pilbara region in the Port of Dampier limits managed by Pilbara Ports Authority (PPA) and within the City of Karratha council limits. Dampier Port is a major industrial port in the northwest of Western Australia. It is one of the world's largest bulk export ports by tonnage and services including; petrochemical, salt, iron ore and natural gas export industries.

The onshore crossing site is located adjacent to the Pluto LNG facility in an industrial zone. The shoreline crossing and the state waters component of the pipeline are within the Dampier Port Boundary. The closest residential township is Karratha which lies 15 km to the South East of the shoreline crossing. Surrounding land uses include:

- The North West Shelf project – one of the world's largest LNG producers supplying oil and gas to the Western Australian and international markets from offshore gas and condensate fields located 135 km north-west of Karratha in the Carnarvon Basin.

- Pluto LNG project – a major LNG gas project with onshore gas processing facilities that process gas from the Pluto and Xena gas fields located 190 km north-west of Karratha in the Carnarvon Basin.

- Rio Tinto Iron Ore operations – a major iron ore producer that exports iron ore from inland mines from their export facilities at Parker Point and East Intercourse Island.

- Rio Tinto Dampier Salt operations – world's largest exporter of salt.

- Yara Pilbara Fertilisers operations – one of the world's largest ammonia producers.

Shipping

The region supports significant commercial shipping activity, mostly associated with the mining and oil and gas industries. Major shipping routes in the area are associated with vessels entering the ports of Dampier and Barrow Island. The relevant port authority for Dampier Port is the PPA.

Tourism

Charter fishing, diving, snorkelling, whale watching, marine turtle and dolphin watching and cruising are the main commercial tourism activities in and adjacent to the North-west Marine Region. With the exception of offshore charter fishing, most marine tourism activities occur in State Waters, including in the Dampier Archipelago (DEWHA, 2008a).

Recreational fishing tends to be concentrated in State Waters adjacent to population centres, with highest records typically recorded in areas such as Point Samson, Coral Bay and Carnarvon (DEWHA, 2008a). The Dampier Archipelago is also a popular recreational fishing area.

Fisheries

A number of Commonwealth and State fisheries are located within and in proximity of the development envelope, these are listed below.

Commonwealth Managed Fisheries

- Southern Bluefin Tuna Fishery

- Western Skipjack Fishery

- Western Tuna and Billfish Fishery

State Managed Fisheries

- Pilbara Demersal Scalefish Fishery (fish trawl, trap and line)

- West Coast Deep Sea Crustacean Managed Fishery

- Specimen Shell Managed Fishery

- Onslow Prawn Managed Fishery

- Nickol Bay Managed Prawn Fishery

- Pearl Oyster Managed Fishery

- Marine Aquarium Managed Fishery

- West Australian Abalone Fishery

- Mackerel Managed Fishery

- South West Coast Salmon Managed Fishery

Section 4 - Measures to avoid or reduce impacts

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

4.1 Describe the measures you will undertake to avoid or reduce impact from your proposed action.

The mitigation measures reccomended for MNES are presented below for key receptors in the vicinity of the proposal. Additional measures are also detailed in Chapter 4 of Scarborough Project Nearshore Component Referral Supplementary Report.

Marine Fauna

Marine fauna will be considered in the Dredging and Spoil Disposal Management Plan (DSDMP) to avoid and minimise impacts. As a minimum the plan will include the following mitigation measures:

- Requirement for inductions for onsite personnel which will highlight the MNES potentially occurring within the waters of the Dampier Archipelago and the need to avoid impacts.

- Measures to avoid direct vessel strikes with marine fauna. Support vessels will operate in accordance with EPBC Regulations 2000 – Part 8 Division 8.1.

- Noise management procedures to avoid permanent threshold shift (PTS) and temporary threshold shift (TTS) in marine fauna and minimise behavioural responses, particularly during any pile driving activities will be developed. The procedure must determine the area (radius) around which piling activities and other noise generating activities would have a potential PTS/TTS and include a soft start approach to enable any fauna to move away.

- Measures to avoid and/or minimise direct and indirect impacts on turtles (e.g. vessel strikes, entrainment, lighting).

- Measures to avoid the introduction of invasive marine species (IMS) including:

  * Implementation of Woodside’s IMS Management Plan (including risk based assessment and implementation of management options as required by the plan) to reduce the risk of introducing IMS to Australian waters. This may include inspections prior to entry into Australian waters and the use of antifouling coating.

  * All vessels will be required to meet both Commonwealth and State ballast water and

biofouling legislation and guidelines including the Ballast Water Management Requirements and the National Biofouling Management Guidance for the Petroleum Production and Exploration Industry.

- Sightings and locations of marine fauna must be recorded in the vessel's daily log book.

- Any incidents relating to marine fauna injury/mortality must be documented and reported to relevant regulators.

Aboriginal Heritage – Dampier Archipelago (including Burrup Peninsula)

Heritage sites, including the Dampier Archipelago (including Burrup Peninsula), will be identified in a Cultural Heritage Management Plan (CHMP) and construction personnel will be informed during onsite inductions of the sites and their heritage values and requirement to avoid impacts.

4.2 For matters protected by the EPBC Act that may be affected by the proposed action, describe the proposed environmental outcomes to be achieved.

The environmental outcomes proposed for the MNES relevant to the proposal are as follows:

- To protect benthic communities and habitats so that biological diversity and ecological integrity are maintained

- To maintain the quality of water, sediment and biota so that environmental values are protected

- To protect marine fauna so that biological diversity and ecological integrity are maintained

- To protect social surroundings, including heritage values, from significant harm

Section 5 – Conclusion on the likelihood of significant impacts

A checkbox tick identifies each of the matters of National Environmental Significance you identified in section 2 of this application as likely to be a significant impact.

Review the matters you have identified below. If a matter ticked below has been incorrectly identified you will need to return to Section 2 to edit.

5.1.1 World Heritage Properties

No

5.1.2 National Heritage Places

No

5.1.3 Wetlands of International Importance (declared Ramsar Wetlands)

No

5.1.4 Listed threatened species or any threatened ecological community

No

5.1.5 Listed migratory species

No

5.1.6 Commonwealth marine environment

No

5.1.7 Protection of the environment from actions involving Commonwealth land

No

5.1.8 Great Barrier Reef Marine Park

No

5.1.9 A water resource, in relation to coal/gas/mining

No

5.1.10 Protection of the environment from nuclear actions

No

5.1.11 Protection of the environment from Commonwealth actions

No

5.1.12 Commonwealth Heritage places overseas

No

5.2 If no significant matters are identified, provide the key reasons why you think the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act and therefore not a controlled action.

Significant work has been completed by Woodside to understand the environmental context of the proposal. This includes an assessment of the predicted and actual impacts from the previous Pluto trunkline trenching program, which is similiar in nature to the referred activity. This detailed understanding of existing environmental conditions and predicted impacts means that potential environmental impacts associated with the proposed development are well understood. In determining whether a potential impact on a MNES is significant, the impact has to have a ‘real chance or possibility’ of occurring.

The management measures that would be implemented and that are detailed Section 4.1 of this referral would ensure any potential impacts are avoided and/or minimise potential impacts.

Section 6 – Environmental record of the person proposing to take the action

Provide details of any proceedings under Commonwealth, State or Territory law against the person proposing to take the action that pertain to the protection of the environment or the conservation and sustainable use of natural resources.

6.1 Does the person taking the action have a satisfactory record of responsible environmental management? Please explain in further detail.

Woodside believes excellence in environmental performance is essential to our business success worldwide and is compatible with balancing the economic, social and environmental needs of sustainable development. Woodside's commitment to responsible environmental management was recognised by the Australian Petroleum Production and Exploration Association (APPEA) as the recipient of the Environment Excellence Award in 2009, 2012, 2015, 2016 and 2017. Woodside was recognised in 2009 for appraisal activities at Scott Reef, including environmental research undertaken at Scott Reef in association with the Maxima 3D Marine seismic survey and the Gigas 2D Pilot OBC Marine seismic Survey. This recognised Woodside's approach and understanding of undertaking activities in a highly sensitive environmental setting. The 2012 and 2017 APPEA Environment Award recognised Woodside's partnerships with Australian Instutue of Marine Science (AIMS) and the Western Australian Museum (WAM). These long-term partnerships have improved scientists', industry and the broader community's understandings of biodiversity and ecological function in WA's tropical marine communities.

6.2 Provide details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against either (a) the person proposing to take the action or, (b) if a permit has been applied for in relation to the action – the person making the application.

Not applicable

6.3 If it is a corporation undertaking the action will the action be taken in accordance with the corporation's environmental policy and framework?

Yes

6.3.1 If the person taking the action is a corporation, please provide details of the corporation's environmental policy and planning framework.

Woodside recognises that our ability to understand the environment in which we operate and minimise our environmental footprint is central to our license to operate. Our systematic approach to environmental management is underpinned by the Woodside Management

System, which includes our Health, Safety, Environment and Quality Policy.

This management system framework is aligned to the ISO14001 international environmental management standard and aims to ensure that a consistent approach to environmental management is applied across our business.

6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

Yes

6.4.1 EPBC Act No and/or Name of Proposal.

2013/7079 Browse FLNG Development

2012/6618 Outer Canning Exploration Drilling Program

2012/6493 Rosebud 3D Marine Seismic Survey

2011/5959 Tridacna 3D Ocean Bottom Cable Marine Seismic Survey

2008/4111 Browse Upstream Development

2007/3839 Gigas 2D Pilot Ocean Bottom Cable Marine Seismic Survey

2006/2945 Maxima 3D Marine Seismic Survey

2000/11 Echo Yodel

2000/89 Searipple

2001/257 Enfield

2004/1805 Angel

2005/2110 Vincent

2006/2968 Pluto

2011/5980 Greater Western Flank

Section 7 – Information sources

You are required to provide the references used in preparing the referral including the reliability of the source.

7.1 List references used in preparing the referral (please provide the reference source reliability and any uncertainties of source).

Reference Source	Reliability	Uncertainties
Refer to Chapter 7 of the Scarborough Project Nearshore Component Referral Supplementary Report used in the preparation of the environmental impact assessment.	This submission was prepared using information sourced from an extensive selection of background studies, scientific papers, text books, government websites and published and unpublished technical reports. All information used has undergone at least technical review or scientific review, with many being published in peer reviewed journals. The referral contains the most current information available that is of a high quality.	Any uncertainties in data will be addressed in additional studies (e.g. plume modelling, noise modelling) that will be used to inform management measures.

Section 8 – Proposed alternatives

You are required to complete this section if you have any feasible alternatives to taking the proposed action (including not taking the action) that were considered but not proposed.

8.0 Provide a description of the feasible alternative?

The Scarborough field was discovered in 1979 with the drilling of the Scarborough-1 well. The field was previously held by ExxonMobil (50%) and BHP (50%). Woodside now holds a 75% share along with BHP who retained 25%. Since discovery various development options have been considered.

The previous operator evaluated two concept themes, a tieback to a shore-based LNG site and Floating LNG (FLNG). Given high costs for developing a greenfield LNG site and the limited commercial solutions for expanding existing LNG facilities at the time, the previous operator selected FLNG as the preferred development concept. The FLNG concept included proprietary technologies of the previous operator. Woodside's view of the concept was that it would take several years to fully mature the technology prior to being ready for deployment.

Woodside has further considered development options and undertaken a comparative assessment (including a 'no development' option) to identify the benefits, risks and impacts of each. A summary of the evaluation outcome is presented in (Table 2?1).

Woodside's Assessment of Alternative Concepts for the Scarborough Project is presented below.

1. Semisubmersible to Pluto LNG - Semisubmersible platform with trunkline to Pluto LNG. Includes infield processing and compression at ready for start-up (RFSU).

Preferred approach - Pre-investment made during construction of Pluto LNG (including the trunkline corridor, tanks and jetty infrastructure) for future expansion, and existing primary environmental approvals for a second LNG train, has provided cost benefits and reduced risk.

Processing Scarborough gas through Pluto LNG will maximise use of existing infrastructure, extend the life of the facility and supply domestic and export markets from mid 2020s for decades.

Lower environmental impact as area has previously been developed and no additional onshore clearing or significant dredging required.

2. Subsea Tieback to Shore - Various subsea focussed development options with initial free flow and later installation of floating or subsea compression facilities.

There is negligible difference in environmental impacts/risks between this option and the preferred option (ie both have an infrastructure footprint and both require an export pipeline from the field site to the onshore location).

Weakness in the concept are complexity in delivering design rate, technology development risk and complex liquids management in the Scarborough trunkline.

3. Subsea Tieback via Pluto upstream - Subsea development tieback to existing offshore Pluto Platform.

Carries similar weaknesses to the above subsea tieback to Shore option, and presents higher technical risks and value impacts associated with the offshore brownfield integration (i.e. integration of new platform with existing riser platform, complex liquids management in the Scarborough trunkline, shutdown implications during offshore installation and integration).

4. FLNG - Concept as proposed by previous operator, includes immature proprietary gas processing, storage and cryogenic offloading technology.

Higher technical risk including unproven technology in Scarborough conditions. Higher cost, longer schedule and risks to predictable delivery.

Does not support use of existing onshore LNG infrastructure.

5. No Development

Titleholder is required to undertake certain petroleum exploration and production related activities towards commercialising the Scarborough resources.

Concept 1 is Woodside's (as operator) preferred development option, where Scarborough gas would be processed through a brownfield expansion of Pluto LNG, where additional LNG processing capacity and domestic gas infrastructure will be installed. The composition of Scarborough gas is well suited to Pluto LNG facilities, which is designed for lean gas and nitrogen removal.

Design/Activity Alternatives

As part of Woodside's (as operator) preferred concept, namely a brownfield expansion of the existing Woodside-operated Pluto LNG Facility to process Scarborough resources, Woodside is considering and assessing a range of options for facilities, activities, installation and construction methods as listed below:

- Mooring of construction vessels

- Manning of FPU

- Drilling fluids

- Piling techniques

- Compression facilities

- Trunkline route

- Pre-lay survey vessel/technique

- Trunkline construction technique

- Pre-lay seabed preparation and Post-lay stabilisation/protection

- The process for considering options for each of these will include evaluation against set criteria, including environment and safety and be documented in the key decision logs (KDL) where appropriate.

8.1 Select the relevant alternatives related to your proposed action.

- Timeframes
- Activities

8.2 Provide an estimated start and estimated end date for the proposed alternative action.

Start 03/2021

End 03/2048

8.9 Describe any public consultation that has been, is being or will be undertaken (including with Indigenous stakeholders).

Stakeholder Approach

Woodside's objective is to build long-term and meaningful relationships with our host communities. Woodside has been part of the Australian community for over 60 years and has been operating on the Burrup Peninsula for more than 30 years.

Woodside has well established relationships with the Pilbara and surrounding communities, regularly engaging with stakeholders through various forums on a broad range of issues, including potential environmental and social impacts associated with our operations. Key to understanding local issues are mechanisms such as the standing Karratha Community Liaison Group and Heritage Liaison Group, which meet quarterly. Woodside also has an established office in Karratha and presence in Roebourne which provides an avenue for locals to talk to any issues via one-on-one engagement.

Woodside will maintain a program of stakeholder engagement to:

- Ensure all relevant stakeholders are identified and communicated to in a timely and effective manner;

- Provide communications material in response to stakeholder needs; and

- Analyse stakeholder feedback to inform decision-making and planning.

Stakeholder Engagement Plan

Woodside has a Stakeholder Engagement Plan that will continue to be revised as the project is matured to ensure comprehensive engagement with stakeholders.

As operator of the Scarborough Project, Woodside has commenced a phased stakeholder engagement program for this proposal, which will continue throughout the environmental impact assessment process. The program is based on leveraging existing relationships and forging new connections with parties likely to have an interest in the Scarborough Project proposal from the following groups: Traditional Owner groups, Local, State and Commonwealth Government, community, fishing and tourism groups, local businesses and service providers, non-government and environmental non-government organisations and industry.

Preliminary engagement on the Scarborough Project commenced in February 2018. This engagement has broadly informed Woodside's stakeholder planning and execution for the concept definition, front-end engineering and design (FEED) and execute project phases. Specifically, this engagement has informed the frequency and nature of engagement to support key regulatory approvals and our approach to identifying and managing potential impacts.

Woodside's ongoing stakeholder activities will include:

- Independent social impact assessment;

- Social impact management planning;

- Economic impact assessment;

- One-on-one engagement;

- Broad stakeholder forums;

- Targeted correspondence;

- Hard-copy and electronic communication materials; and

- Media and social media.

Stakeholder Identification

Identified stakeholder groups are those that affect and/or could be affected by the proposed Project during all Project phases. Stakeholders have been identified by considering:

- Organisations or individuals with a role in regulatory processes;

- Individuals or groups directly or indirectly affected by the proposed Project either physically, socially and/or commercially;

- Organisations or individuals with an interest in the outcome, progress or activities of the proposed Project.

- The following stakeholder groups have been identified for the Scarborough Project:

- Commonwealth Government / Agencies;

- State Government / Agencies;

- Local Government;

- Business / Industry;

- Indigenous Groups and Traditional Owners;

- Community Groups;

- Marine Users;

- Social Contribution Partners;

- Non-Government Organisations;

- Science / Academia;

- Media and Regulatory Communications;

- Unions.

Feedback and Areas of Stakeholder Interest

The following provides a summary of preliminary consultation completed by Woodside with interested and affected stakeholders.

Preliminary stakeholder consultation has focused on Woodside's Burrup Hub opportunities, including the Scarborough Project, from 14 February 2018 to 12 December 2018. Consultation was completed by email, letter, phone call or meeting.

Consultation completed to date includes the below.

Commonwealth Government

Australian Customs Service – Border Protection Command

National Offshore Petroleum Titles Administrator

Australian Hydrographic Service

Office of Federal Minister for Resources and Northern Australia

Australian Maritime Safety Authority

Office of Shadow Minister for Environment

Department of Industry, Innovation and Science

Office of Shadow Minister for Resources

National Offshore Petroleum Safety and Environmental Management Authority

Senator Pat Dodson

Department of Environment and Energy

Shadow Minister for Environment; Water

Federal Minister for Environment; Member for Durack

State Government

Australian Industry Participation Authority

Member for the Kimberley

Department of Communities, Housing Division Pilbara

Member for the Pilbara

Department of Defence

Office of State Minister for Mines and Petroleum

Department of Education

Office of the Leader of the Opposition, Public Sector Management, State Development, Jobs and Trade and Federal-State Relations

Department of Jobs, Tourism, Science and Innovation

Office of the Minister for Fisheries

Department of Mines, Industry, Regulation and Safety

Office of the Premier & Minister for State Development

Department of Planning, Lands and Heritage

Office of the State Minister for Environment

Department of Primary Industries and Regional Development

Office of the State Minister for Regional Development

Department of Transport

Office of the State Minister for Transport, Planning and Lands

Department of Water and Environmental Regulation

Office of the State Treasurer, Minister for Finance, Energy and Aboriginal Affairs

Environmental Protection Authority

Upper House Member for Mining and Pastoral

Landcorp

Traditional Owner Groups, Local Government, Industry Organisations, Community, Educational Institutions and eNGOs

Australia Maritime and Fisheries Academy

Market Forces

Australian Conservation Foundation

Mawrankarra

Australian Marine Oil Spill Centre Pty Ltd

Murujuga Aboriginal Corporation

Australian Petroleum Production and Exploration Association

Ngarluma Aboriginal Corporation

Broome Chamber of Commerce and Industry

Ngarluma Yindjibarndi Foundation Ltd

Broome Future Alliance

Ngarliyarndu Bindirri Aboriginal Corporation

Broome International Airport

North West Regional TAFE

Broome Visitors Centre

Nyamba Buru Yawuru

Chamber of Minerals and Energy Western Australia

Pearl Producers Association

City of Karratha

Pilbara Development Commission

Conservation Council of WA

Pilbara Port Authority

Dampier Technical Advisory and Consultative Committee (TACC) (includes Pilbara Port Authority, Department of Biodiversity Conservation and Attraction, Department of Transport, Rio Tinto, Department of Environment and Energy, Department of Planning, Lands and Heritage, Department of Primary Industries and Regional Development, Toll, Water Corp, Department of Jobs, Tourism, Science and Innovation, Murujuga Land & Sea Unit)

Friends of Australian Rock Art

Shire of Broome

GreenPeace

Toll

International Fund for Animal Welfare

St Mary’s Senior High School

Karratha and Districts Chamber of Commerce and Industry

Western Australian Marine Science Institution (WAMSI) Dredging Node (includes Australian Institute of Marine Science, Department of Water and Environmental Regulation)

St Luke’s College

Karratha Community Liaison Group (includes Karratha Districts Chamber of Commerce and Industry, Dampier Community Association, Karratha Community Association, City of Karratha, Regional Development Australia, Pilbara Development Commission, Pilbara Ports Authority, Ngarluma Yindjibarndi Foundation Ltd and Yara Pilbara)

Western Australian Country Health Club

Karratha Heritage Group (includes Yindjibarndi Aboriginal Corporation, Yaburara and Coastal

Mardudhunera Aboriginal Corporation, Wong-Goo-Tt-Oo, Ngarluma Aboriginal Corporation)

Wilderness Society

Karratha PCYC

Wong-Goo-Tt-Oo

Kimberley Aboriginal Law and Cultural Centre

World Wildlife Fund

Kimberley Aboriginal Medical Services

Yaburara and Coastal Mardudhunera Aboriginal Corporation

Kimberley Ports Authority

Yandina

Kullari Regional Communities Indigenous Corporation

Yindjibarndi Aboriginal Corporation

Kimberley Land Council

Yiraman Project

8.10 Describe any environmental impact assessments that have been, is being or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project for the alternative.

Not applicable

8.12 Nominate any matters of National Environmental Significance that are likely to be impacted by this alternative proposal by ticking the relevant checkboxes.

8.13 Describe any impacts on the flora and fauna relevant to the alternative proposal.

Not applicable

8.26 What are the proposed measures for any alternative action to avoid or reduce impact?

Not applicable

8.27 Do you have another alternative?

No

Section 9 – Contacts, signatures and declarations

Where applicable, you must provide the contact details of each of the following entities: Person Proposing the Action; Proposed Designated Proponent and; Person Preparing the Referral. You will also be required to provide signed declarations from each of the identified entities.

9.0 Is the person proposing to take the action an Organisation or an Individual?

Organisation

9.2 Organisation

9.2.1 Job Title

SVP Scarborough

9.2.2 First Name

Daniel

9.2.3 Last Name

Kalms

9.2.4 E-mail

feedback@woodside.com.au

9.2.5 Postal Address

11 Mount Street
Perth WA 6000
Australia

9.2.6 ABN/ACN

ABN

63005482986 - WOODSIDE ENERGY LTD.

9.2.7 Organisation Telephone

1800 442 977

9.2.8 Organisation E-mail

feedback@woodside.com.au

9.2.9 I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:

Not applicable

Small Business Declaration

I have read the Department of the Environment and Energy's guidance in the online form concerning the definition of a small a business entity and confirm that I qualify for a small business exemption.

Signature:..... Date: .....

9.2.9.2 I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations

No

9.2.9.3 Under sub regulation 5.21A(5), you must include information about the applicant (if not you) the grounds on which the waiver is sought and the reasons why it should be made

Person proposing the action - Declaration

I, DAVID SMART KELLY, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.

Signature:..... Date: 12/12/18.

I, DAVID SMART KELLY, the person proposing the action, consent to the designation of WOODSIDE ENERGY LTD as the proponent of the purposes of the action describe in this EPBC Act Referral.

Signature:..... Date: 12/12/18.....

9.3 Is the Proposed Designated Proponent an Organisation or Individual?

Organisation

9.5 Organisation

9.5.1 Job Title

Senior Vice President Scarborough

9.5.2 First Name

Daniel

9.5.3 Last Name

Kalms

9.5.4 E-mail

feedback@woodside.com.au

9.5.5 Postal Address

11 Mount Street
Perth WA 6000
Australia

9.5.6 ABN/ACN

ABN

63005482986 - WOODSIDE ENERGY LTD.

9.5.7 Organisation Telephone

1800 442 977

9.5.8 Organisation E-mail

feedback@woodside.com.au

Proposed designated proponent - Declaration

I, DANIEL STUART KALMS, the proposed designated proponent, consent to the designation of myself as the proponent for the purposes of the action described in this EPBC Act Referral.

Signature: ..... Date: 12/12/18.

9.6 Is the Referring Party an Organisation or Individual?

Individual

9.7 Individual

9.7.1 Job Title

Environment Advisor

9.7.2 First Name

Tegan

9.7.3 Last Name

Box

9.7.4 E-mail

feedback@woodside.com.au

Referring Party - Declaration

I, TEGAN BOX, I declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence.

Signature: ..... Date: 12/12/18

Appendix A - Attachments

The following attachments have been supplied with this EPBC Act Referral:

1. Development_Envelop_and_Indicative_Footprint_RevH.jpg
2. Development_Envelop_and_Indicative_Footprint_Shorecrossing_RevE.jpg
3. DoEEApplication GIS.zip
4. Health, Safety, Environment and Quality Policy.pdf
5. Marine_Benthic_Habitat_RevF.jpg
6. Woodside Scarborough Project- Referral Supplementary Report - PART A.pdf
7. Woodside Scarborough Project- Referral Supplementary Report - PART B.pdf