Scarborough Trunkline Operations (State waters) Environment Plan Summary

February 2025

Revision 1

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1. INTRODUCTION

1.1 Overview

Woodside Energy Ltd, on behalf of the Scarborough Joint Venture (JV), is nominated operator under the Petroleum (Submerged Lands) (Environment) Regulations 2012 (referred to as the Environment Regulations), as administered by the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) for pipeline licence TPL/26 (trunkline) from the Mean Low Water Mark (MLWM) at KP 0.04 to the Coastal Waters boundary (3NM; ~ KP 32.04). The scope of this Environment Plan (EP) is limited to the following activities:

- Trunkline Commissioning and Start-up.
- Routine operations of the trunkline.
- Routine inspection, monitoring, maintenance and repair (IMMR) activities of the trunkline.
- Non-routine and unplanned activities and incidents associated with the above.
- Activities of vessels within the Operational Area.

These activities will hereafter be referred to as the Petroleum Activities Program (PAP) and form the scope of the EP. A summary of the activities is provided in **Section 2**. The onshore section of the trunkline running from the MLWM up to the beach valve and further to the onshore pig launcher/receiver (both within the Pluto Gas Plant), there are several onshore approvals that apply. One of these is the Scarborough Project Nearshore Component Ministerial Statement 1172, published 11 August 2021 which approves a Development Envelope and indicative footprint for the shore crossing site (Figure 1-1). The key environmental regulatory instruments onshore at the Pluto Gas Plant are the Pluto Prescribed Premise Licence issued under Part V of the Environmental Protection Act 1986 (L8752/2013/2 – last amended June 2024) and the Ministerial Statement 757.

Other regulatory instruments which apply to onshore operation / activities associated with the Scarborough Trunkline include:

- Ministerial Statements 1208 published 15 August 2023 and 850 published 19 January 2011;
- EPBC Act Referral (2006/2968) Conditions of Approval, initial approval 12 October 2007 and Consolidated Approval Conditions published 15 June 2015;
- Dangerous Goods Licence (DGS021370) – to be amended for inclusion of Scarborough

Safety Case: X0005AF0035 – amended to include Scarborough Figure 1-1 shows the extent of the most relevant environment approvals for onshore operations of the Scarborough Trunkline. The Safety Case and Dangerous Goods Licence are taken to come into effect from the Mean Low Water Mark (where this Environment Plan PAP ends), as can be seen in Figure 2-2 of the Safety Case, which depicts the extent of the Major Hazard Facility boundary.

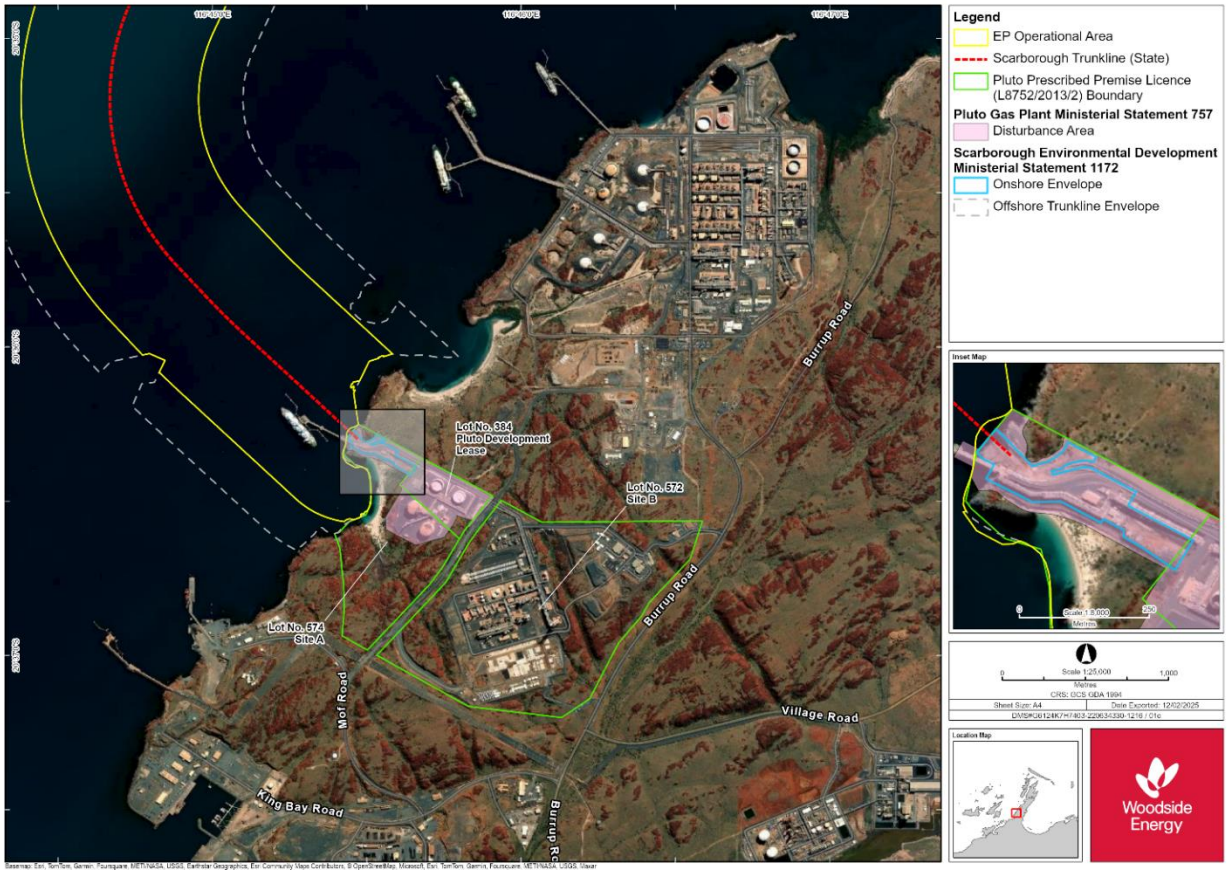

Figure 1-1: Location of relevant licences for the Trunkline

NB: The discrepancy that can be seen between the EP Operational Area boundary and the Pluto approvals boundaries (Ministerial Statement 757 and Prescribed Premises L8752/2013/2) is due to the change over time in the Low Water Mark portion of the cadastral boundary, as defined on Lot 574 Deposited Plan 28209.

1.2 Contact details

Woodside Energy Limited

11 Mount Street

Perth, Western Australia

T: 08 9348 4000

ACN: 63 005 482 986

Andrew Winter

Corporate Affairs Advisor

11 Mount Street

Perth,

Western Australia

T: 08 9348 4000

feedback@woodside.com.au

2. DESCRIPTION OF THE ACTIVITY

2.1 Location and Operational Area

The Petroleum Activities Program includes operation of the 36-inch Scarborough trunkline in State waters in Western Australia. The full trunkline is approximately 430 km in length and will transport dry gas from a floating production unit, located in Commonwealth waters close to the Scarborough Field, to the onshore Pluto LNG Facility on the Burrup Peninsula, Western Australia. The Operational Area for the EP is restricted to the State Waters component of the Scarborough trunkline which will extend from the Mean Low Water Mark (MLWM) at KP 0.04 to the Coastal Waters boundary (3NM; ~ KP 32.04) (**Table 2-2**). It also includes an area of 500 m either side of the trunkline, with the spatial boundaries illustrated in **Figure 2-1.**

Vessel-related activities within the Operational Area will comply with the EP (refer to **Table 2-2** for vessels involved with the Petroleum Activities Program). Vessels supporting the Petroleum Activities Program when outside the Operational Area must adhere to applicable maritime regulations and Port of Dampier requirements.

Activities that extend beyond the Coastal Waters boundary, into Commonwealth Waters will be executed under a different Environment Plan, to be accepted by National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).

2.2 Timing

The trunkline operates 24 hours per day, 365 days per year. Supporting operations, such as inspections and maintenance activities, take place intermittently as required. The earliest commencement date for activities relating to the Petroleum Activities Program is estimated to be the second half (H2) of 2025 **Table 2-1.** The inspection requirements are identified through a risk-based inspection (RBI) assessment which is used to determine the trunkline's maintenance plan and the frequency of the IMMR activities. IMMR activities may also be required to investigate an anomaly, or in response to a suspected third-party event and/or following a cyclone event. As the trunkline's maintenance plans are risk-based, the frequency of activities is likely to change in the life of this EP. For the purposes of the risk assessment, it has been assumed that trunkline operation activities (Table 2-1) could occur at any time throughout the year (all seasons) to provide operational flexibility for schedule changes, as well as vessel availability.

Table 2-1: Timing and Duration of the Petroleum Activities Program

Activity	Earliest start of activity	Estimated duration
Commissioning and Start-up	H2 2025	Initial start-up of the offshore Floating Production Unit, purging nitrogen from the Trunkline and introducing gas may take 2-4 months.
Trunkline operation	H2 2025 - onwards	Ongoing post-commissioning of offshore facility
IMMR Activities	H2 2025 - onwards	Intermittent as required during trunkline operations
Contingent Trunkline Repair and Flood, Clean gauge test	H2 2025 – onwards	Contingent activity not planned to occur

Note: Durations are indicative and subject to change due to vessel availability, weather and unforeseen circumstances.

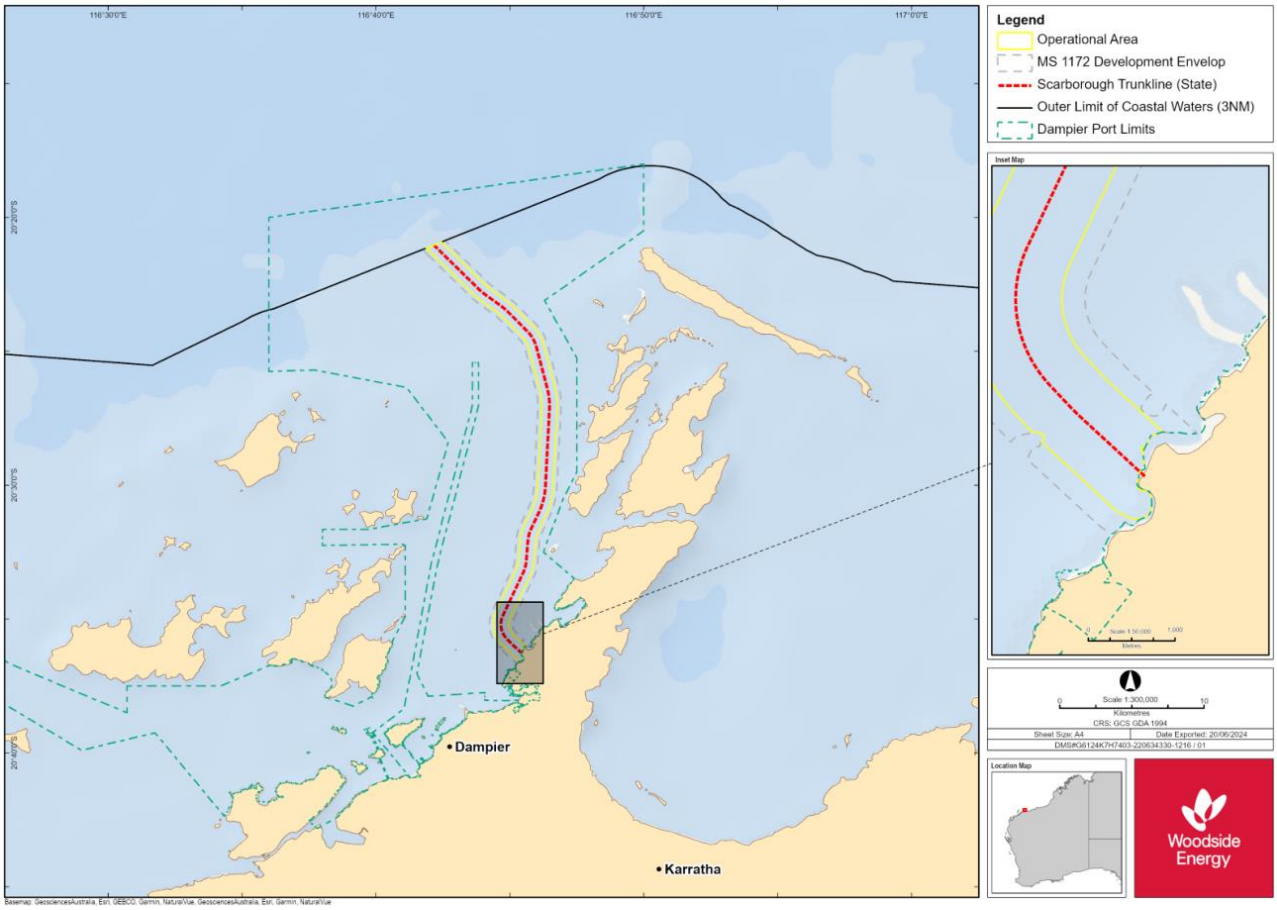

Figure 2-1: Location of the Petroleum Activities Program

2.3 Key activities

An overview of the Petroleum Activities Program is provided in **Table 2-2**.

Table 2-2: Petroleum Activities Program overview

Item	Description
Permit Titles	TPL/26
Location	Dampier Archipelago, between the State Waters boundary (~KP 32.04) and the trunkline shore crossing location (MLWM at ~KP 0.04).
Water depth	Ranges from Mean Low Water Mark (MLWM) at the shore crossing to about 34 m at the State Waters boundary.
Subsea infrastructure	• 36" trunkline.
Vessels	Vessels supporting trunkline operations may include light construction vessels (LCV), inspection, monitoring, maintenance, and repair (IMMR) vessels, survey / inspection vessels, uncrewed surface vessels (USV). Collectively, vessels will be referred to as support vessels throughout the EP.
Key activities	• Trunkline Commissioning and Start-up • Routine operation of the Scarborough trunkline • Inspection, Monitoring, Maintenance and Repair activities along the trunkline within State Waters (3 nm) • Vessel operations to support the Petroleum Activities Program. • Contingent activities and emergency situations

Item	Description
Design Life	25 years

2.3.1 Trunkline Operations

Normal operations involve the delivery of dry gas from the Scarborough FPU in Commonwealth Waters (WA-61-L) to the onshore processing facilities, via the Scarborough Trunkline.

All production operations are controlled and initiated from the FPU and/or Perth Central Control Room's (CCR's) via the offshore facility Process Control System (PCS). Process control of the Trunkline is predominantly through management of production system pressures via both well flow controls and the Trunkline onshore terminal.

2.3.2 Inspection, Maintenance, Monitoring and Repairs Activities

Subsea activities can be broadly categorised into IMMR activities. **Table 2-3** provides a summary of IMMR activities that may be required for the trunkline. Subsea activities are typically undertaken from a support vessel and may use a remotely operated vehicles (ROV) with transponders, autonomous underwater vehicles (AUV), and divers. Inspection and maintenance are undertaken to verify the integrity of the infrastructure and identify vulnerabilities before they present an integrity risk. Maintenance and repair activities are those required on a planned or as-required basis to support the integrity of infrastructure. Any relevant or new information on IMMR activities will be assessed using the EP Management of Change Process (refer to Section 6.1).

Table 2-3: Trunkline IMMR activities

Item	Description

IMMR Activities	• Inspection:
	  ○ General and close visual inspections
	  ○ Cathodic protection
	  ○ Wall thickness surveys
	  ○ Side scan sonar (SSS) or multibeam echo sounder (MBES)
	  ○ Non-destructive testing
	  ○ Operational pigging
	  ○ Post cyclone/post seismic event inspections
	• Monitoring:
	  ○ Process composition testing
	  ○ Corrosion probes
	  ○ Corrosion mitigation checks
	  ○ Metocean and geological seismic monitoring
	  ○ Cathodic protection testing
	• Maintenance
	  ○ Maintenance activities at regular or planned intervals to prevent deterioration or integrity failure of infrastructure (noting, little maintenance typically required for State Waters infrastructure)
	  ○ Deployment of frames/baskets
	• Repair
	  ○ Scour prevention installation
	  ○ Corrosion protection
	  ○ Anode bonding wire installation
	  ○ Trunkline coating repair
	  ○ Backfill remediation

Item	Description
	○ Pipeline repair • Sediment and Trunkline fill relocation • Trunkline repair and Flood, Clean Guage and Test (FCGT)

3. DESCRIPTION OF THE EXISTING ENVIRONMENT

3.1 Overview

The key existing environment characteristics of the activity are described in terms of the Operational Area, and the environment that may be affected (EMBA). The Operational Area encompasses the key existing environment characteristics and receptors that may be affected by planned aspects of the Petroleum Activities Program. The EMBA encompasses all environmental characteristics and receptors with the potential to be impacted by unplanned activities.

For the purposes of this EP, Woodside has identified the environment that may be affected by the petroleum activity by combining the potential spatial extent of surface and in-water (dissolved and entrained) hydrocarbons, from modelling of a worst-case credible spill. The EMBA also includes areas that are predicted to experience shoreline contact with hydrocarbons above threshold concentrations. Woodside recognises that surface hydrocarbons may be present at low concentrations that may be visible but are not expected to cause ecological impacts. An additional socio-cultural EMBA has therefore been defined for surface hydrocarbons, which encompasses the spatial extent within which social-cultural impacts may potentially occur from changes to the visual amenity of the marine environment. Receptors relevant to the socio-cultural EMBA include Commonwealth and State marine protected areas (MPAs), National and Commonwealth Heritage Listed places, areas of tourism and recreation, and commercial and traditional fisheries.

For this EP, the socio-cultural EMBA for surface hydrocarbons encompasses an area fully within the boundaries of the EMBA for ecological impacts (which includes the spatial extent of entrained and dissolved hydrocarbons in addition to the surface slick). The ecological EMBA and socio-cultural EMBA are shown in **Figure 3-1**.

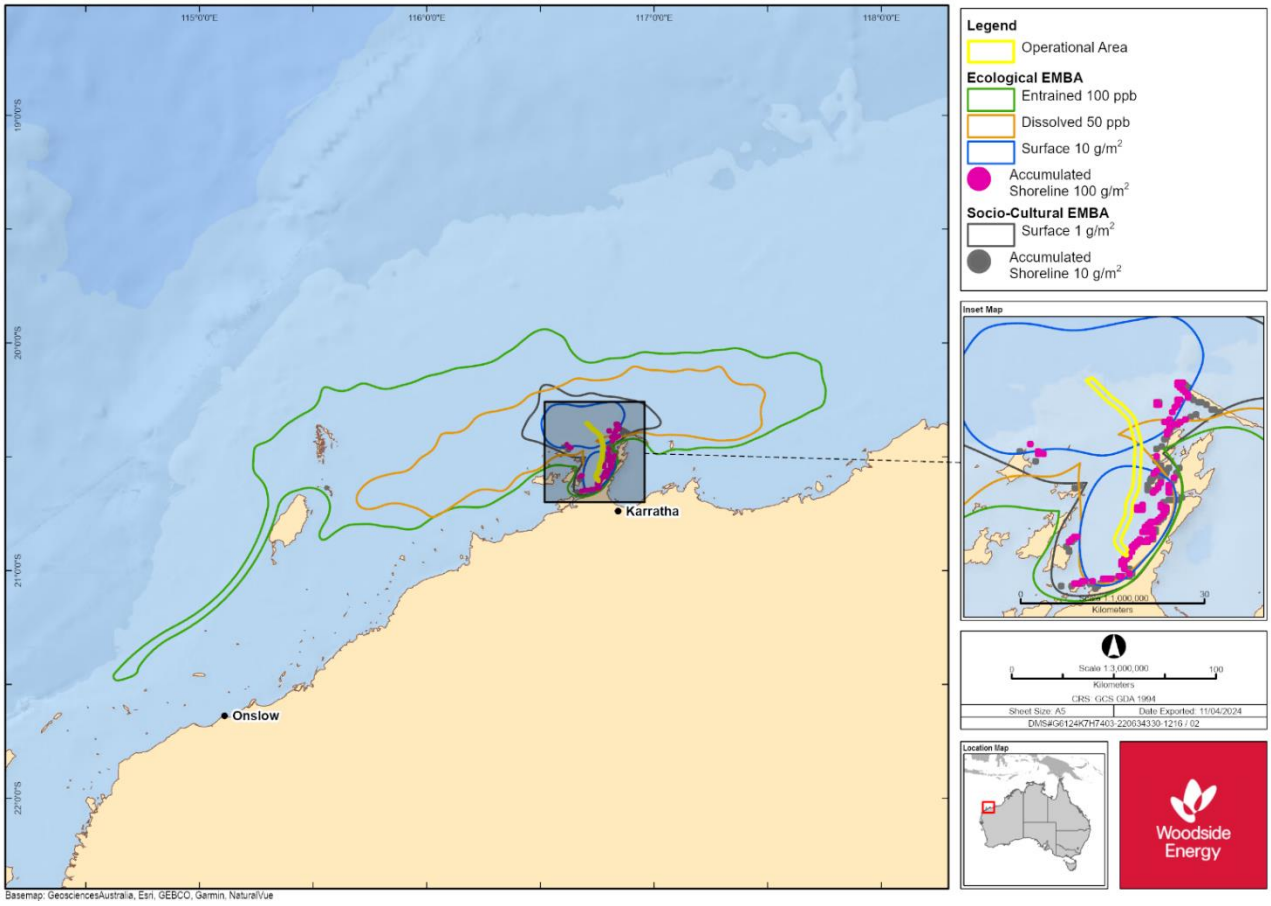

Figure 3-1: Environment that may be affected (EMBA) by the Petroleum Activities Program

3.2 Physical Environment

Table 3-1 provides a summary of the physical environment of the Operational Area and EMBA in the context of the wider North-West Marine Region (NWMR).

Table 3-1: Physical environment receptors and characteristics

Receptor	Description
Climate and meteorology	
Seasonal patterns	The climate within the region is dry tropical, exhibiting a hot summer season from October to April and a milder winter season between May and September (Bureau of Meteorology (BoM), 2019).
Temperature and rainfall	At Karratha aerodrome, maximum temperatures during summer reach an average of 36.2 ºC in March, falling to an average maximum of 26.3 ºC in July (BoM, 2019). Rainfall in the region is typically at its highest during late summer (BoM, 2019). This is often associated with passing tropical lowpressure systems and cyclones (Pearce et al., 2003). Rainfall outside this period is typically low.
Wind	Winds vary seasonally, with a tendency for winds from the south-west quadrant during summer and the south-east quadrant in winter (Pearce et al., 2003). Winds typically weaken and are more variable during the transitional period between the summer and winter regimes (typically April and August).
Tropical cyclones	Tropical cyclone activity can occur between November and April and is most frequent in the area during January to March, with an annual average of about one storm per month. Cyclones are less frequent in the area in the months of November, December and April.
Oceanography	

Receptor	Description
Currents and tides	The large-scale ocean circulation is primarily influenced by the Indonesian Through Flow (ITF) and the Leeuwin Current. Both currents are significant drivers of the region's ecosystems. Currents in the Dampier Archipelago are driven by tides, local winds, large scale ocean circulation, and strongly influenced by the local topography. Flow is complex around the islands. Currents are generally weak in Mermaid Sound and stronger in seaward entrances to the Archipelago and interisland water passages (Pearce et al., 2003).
Waves	Waves are predominantly from a south-west direction, with swell height averaging 1 to 2 m and rising to 3 m during June to August. Waves in the Dampier Archipelago are driven by westerly winds in summer, while the western shores of the Burrup Peninsula and the islands to its north are protected from the persistent winter easterlies (Woodside, 1998). During cyclone season, intense low-pressure systems and extreme winds can generate swells higher than 8 m.
Bathymetry	
Bathymetry	Gently sloping seabed where the 10 m bathymetric contour is generally between 1 and 2 NM offshore. The Operational Area is located on the continental shelf, in depths of 0 m to 40 m at the intersection of the state and Commonwealth waters boundary. The portion of the Operational Area within the Dampier Archipelago has a relatively consistent gradient, with depths less than 15 m. The gradient increases towards the northern end of the Operational Area, sloping north-west to depths of about 40 m.
Other physical attributes	
Air quality	Air quality in nearshore and offshore waters of the Pilbara area is considered high given remote setting. Previous monitoring (e.g., DEP, 2002; CSIRO, 2008) around the Burrup Peninsula suggest that concentrations of measured air quality parameters remain low (ERM, 2012). Air quality on the Burrup Peninsula has been monitored by Woodside from 2008 to 2015 and results concluded that both NO_X and O_3 were below the relevant National Environment Protection Ambient Air Quality standard (Woodside, 2019; NEPC, 2016).
Ambient light	Light in the waters of the Operational Area is expected to be limited to vessels traversing through the area. At the southern end of the Operational Area, anthropogenic light will be increased due to the proximity to industrial activity. Heavy vessel traffic exists within the Port of Dampier area.
Ambient marine noise	Physical (wind and waves), biological (vocalisations of marine species) and anthropogenic (vessels and other industrial activity) processes contribute to ambient marine noise. The Operational Area overlaps with the Port of Dampier and heavy vessel traffic exists within the defined shipping fairways which will contribute to background noise levels.
Marine water quality and characteristics	
Water temperature and salinity	These nearshore waters are semi-enclosed from the offshore waters by the islands of the Archipelago, resulting in warmer temperatures in summer and cooler temperatures in winter, Mean temperature of the nearshore waters of the Dampier Archipelago ranges from 22.5 °C in July/August to 30.4 °C in February (Pearce et al., 2003). Within the Dampier Archipelago salinity is generally vertically stratified, wedging seaward beneath the open waters of the continental shelf. Though typically the nearshore waters are more saline, surface water salinity is diluted during periods of cyclonic activity and heavy rainfall within the Archipelago. Salinity in offshore waters typically remains uniform.
Turbidity and suspended solids	The waters in the inner Archipelago are characterised as having naturally higher levels of turbidity than the clearer offshore environment, related to the continual resuspension of fine sediment material through natural inputs such as winds, tidal currents and wave energy, which is exacerbated in shallow areas where strong tidal flows exist (such as through Flying Foam Passage) or where a high volume of vessel movements occur (such as shipping channel and berthage areas). Periodic events, such as major sediment transport associated with tropical cyclones, may influence turbidity on a regional scale (CSIRO, 2007).
Trace metals and organics	A study measuring trace metals and organics, found water quality in the Dampier Archipelago met the guidelines for a 'very high' level of ecological protection (99% species protection) based on the recommended guidelines and approaches in ANZECC/ARMCANZ (2000) (Wenziker et al., 2006). The study (Wenziker et al., 2006) found no detectable levels of organics in the waters of the Dampier Archipelago.

Receptor	Description
Nutrients	In the Dampier region, intertidal blue-green algal mats have been observed that have the potential to increase nutrient levels in the sediments (Wells and Walker, 2003). The distribution of algal mats is controlled by tidal height, tidal current, sediment influx and sediment drainage (Wells and Walker, 2003). The nutrients from the algal mats provide a significant source of nutrient input to mangrove communities in the region (Paling and McComb, 1994).
Marine sediment quality and characteristics	
Contaminants	Samples were collected from 36 locations along the trunkline route. Total metal concentrations were very low and below the limits of reporting (LOR) for many analytes. Concentrations of organotin compounds were also very low and below the LOR for all locations tested. All results from the Scarborough Project SAP implementation were below the National Assessment Guideline for Dredging (NAGD) screening levels and found the sediments are free from anthropogenic contamination. Regionally, 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 generally clean (in that they were below screening levels of National Ocean Disposal Guidelines for Dredged Material) with tributyltin, which has been used as an anti-foulant on ships, the only contaminant of concern (Woodside, 2006; DEC, 2006) and only found in the upper sediment layer, in areas used by the shipping industry (IRCE, 2003a; 2003b). More recent studies performed throughout the Archipelago, within Port limits, have indicated surficial sediments (upper 1 m of sediment) were still considered generally clean. From recent sampling (Advisian 2019; O2 Marine 2021), no hydrocarbons were detected above the respective screening level (ANZG 2018: total TPH 280 mg/kgb, NAGD 2009: total PAH 10,000 mg/kg). Recent studies (Advisian 2019; Advisian, 2017; Jacobs, 2015; GHD, 2016) found that the only analytes to exceed NAGD screening levels were nickel and arsenic (only in a subset of studies), and only at a small subset of sampling locations. These elevated levels were considered attributable to the natural geology of the region, which accords with the findings of previous studies (DEC, 2006; Woodside, 2006). Stoddart et al. (2019), found that natural concentrations of nickel routinely occur in sediments off the Pilbara coast at levels above the NAGD (low) screening levels. The GHD study also determined 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 good spatial coverage and sampling of recently deposited fine sediments suggests that sediments within the port continue to exhibit low levels of contamination.
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 LNG Foundation project dredging footprint in January 2006, found sediments adjacent to Holden Point to be predominantly sand (particle size of 0.06 to 2.0 mm). Further offshore, within the navigation channel, the sediments were comprised of sand (particle size of 0.06 to 2.0 mm); silt (0.002 to 0.06 mm) and clay (≤ 0.002 mm) (Woodside, 2006). Similarly, most sites sampled by Jacobs (2015) within Mermaid Sound were dominated by silt and clay. Particle size diameter (PSD) data within the trunkline footprint was collected as part of the Scarborough Project SAP Implementation Study. Sand was the dominant fraction of sediments at all sites within the nearshore zone KP0 to KP3.6. Levels of silt varied a little across sites, though generally comprised <30% of sediments and small fractions of clay were at nine of the 19 sites. Very small amounts of gravel were present at most sites. Between KP3.6 and KP4.6 sediments were much coarser, with higher percentages of gravel and sand and less than 21% silt. Between KP11 and KP15, particle sizes were similar to those observed between KP0 to KP3.6, but with a slightly lower proportion of silt (<25%). PSD data was also collected from a geotechnical survey of the trunkline route (Fugro, 2019). Between KP15 and KP21.3, increasing proportions of clay and coarse sand were observed (on average around 7% clay, 23% silts, 70% sand), trending towards higher proportions of larger particle sizes between KP23 and KP38 (on average around 9% clay, 16% silts, 75% sand), and KP38 and KP50 (on average around 3% clay, 10% silts, 87% sand) (Fugro, 2019).

3.3 Biological Environment

Table 3-2 provides a summary of the biological environment of the Operational Area and EMBA.

Table 3-2: Biological environment receptors and characteristics

Receptor	Description
Marine Habitats and Communities	
Critical Habitats or Threatened Ecological Communities	No marine Critical Habitats or TECs as listed under the EPBC Act or *Biodiversity Conservation Act 2016* (WA) are known to occur within the Operational Area or EMBA. The Burrup Peninsula rock pool communities have been identified as a Priority 1 Priority Ecological Community (PEC) for containing calcareous tufa deposits and interesting aquatic snails (DBCA, 2020).
Soft sediments and sandy beaches	Dominant subtidal habitat in Mermaid Sound consists of soft sediment composed of sand and silt. Likely broad areas of low or no benthic communities and habitats. Sedimentary infauna associated with unconsolidated soft sediments likely to be widespread and well represented. Sandy habitat may overlay reef platforms and interspersed with seasonal or permanent areas of seagrass, macroalgae or other invertebrate fauna. Silty subtidal habitats in sheltered areas typically support a rich variety of infauna (e.g., polychaete worms, crustaceans and molluscs). Intertidal mudflats in the EMBA support significant arid-zone mangrove communities and associated avifauna. Subtidal soft-bottom communities are recognised as important to traditional custodians for their support of invertebrate diversity (MAC, 2021).
Rocky shores	Dominant shoreline habitat in the Dampier Archipelago. Intertidal fauna consists of sponges, molluscs, crustaceans etc., becoming increasingly diverse in the lower intertidal and featuring benthic algae and a range of sessile and motile invertebrates. Rocky shores are recognised as important to Traditional Custodians as habitats for intertidal organisms and feeding sites for shorebirds (MAC, 2021).
Reef habitat	Hard bottom subtidal environment, supporting a range of coral, macroalgae and mixed biota communities. Some areas, such as Madeleine Shoals, feature soft corals and gorgonians in shallow areas as well as siltier sediments and sea whips in deeper water depths.
Mixed communities	Soft corals and sponges are assigned to the mixed community classification. The Pilbara region has a very high diversity of marine sponges (Fromont et al., 2016); 275 sponge species have been recorded within the Dampier Archipelago. About 20% of these species are presently known to be limited to WA and are likely to be endemic (Fromont, 2003). Surveys conducted by Fromont (2004) found 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.
Coral	Coral communities occur in narrow linear features, fringing the shorelines of islands and Burrup Peninsula between 2m – 10 m. Coverage ranges from 5.7% to 56.7% throughout Mermaid Sound. Mass coral spawning generally occurs between February to April. Corals are recognised as important to Traditional Custodians for attracting fish and other marine organisms, the potential for symbiotic relationships between fish and corals, and for their aesthetic values (MAC, 2021).
Seagrass	Seagrasses in the Dampier Archipelago, occur in low abundance on shallow sandy sediments in sheltered areas and interspersed with other benthic communities and habitats (BCH) (Department of Conservation and Land Management (CALM), 2005; Jones, 2004; MScience, 2014). The species composition and temporal patterns of abundance and distribution of seagrasses in northwest Australia are highly dynamic and highly variable, often seasonal, dying off over certain periods of the year and subsequently re-establishing (Vanderkliff et al. 2017). Seagrasses are recognised as important to Traditional Custodians as refuges for small marine fauna and foraging habitat for dugongs (MAC, 2021).
Macroalgae and microphytobenthos	Macroalgal assemblages in the Pilbara region display an ephemeral growth pattern and may not be present year-round, despite the presence of hard substrate, sufficient light and water clarity. The most abundant group of algae in the region is brown algae.

Receptor	Description
	In the Dampier region, many areas of the otherwise bare substrate contain intertidal blue-green algal mats (Wells and Walker, 2003). Macroalgal communities are recognised as important to traditional custodians as primary production sites, habitats and food sources (MAC, 2021).
Mangroves	Six species of mangrove occur in the Dampier region, and most communities contain many species, and a variety of structures of zonation persist, dependent on the underlying sediment type, tidal height and wave and current action (Semeniuk & Wurm, 1987). 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 Operational Area occurs in No Name Bay and has been studied as part of the long-term Chemical and Ecological Monitoring Program of Mermaid Sounds. Traditional custodians also report mangrove populations in Flying Foam Passage and the north-east bay of West Lewis Island, which are important for shelter, crab and shellfish resources and possible turtle nurseries (MAC, 2021).
Pelagic and demersal fish communities	Fish fauna in the Pilbara region is considered diverse (Sainsbury et al., 1985) and shows a trend of decreasing species richness as depth increases (Last et al., 2005). Fish species richness has been shown to correlate with habitat complexity, with more complex habitat supporting greater species richness and abundance than bare areas (Gratwicke and Speight, 2005). Species found within the Dampier Archipelago include coral reef fishes and mangrove and silty bottom dwellers. Coastal waters support schools of baitfish, and offshore, pelagic species include marlin, sailfish, sharks and trevally. Fish are reported by traditional custodians as culturally important species in Mermaid Sound and surrounds, with Thalu ceremonies associated with increasing fish stocks. Further fish traps in Conzinc Bay, and others would have/do exist in coastal areas of islands (e.g., Angel and Gidley Islands), as well as harvesting of squid from the ocean around Conzinc Island are also important aspects of the marine environment to traditional custodians (MAC, 2021).
Planktonic communities	In the NWMR, productivity is typically greater during the wet season when the weakening of surface currents allows for increased upwelling (DEWHA, 2008a; Brewer et al., 2007). Productivity is greater in shallow nearshore environments within State waters than in the offshore waters. During the warmer months, algal blooms occur on a regional scale, including within the Dampier Archipelago however its role in the trophic system and the nutrient cycle is not well understood.

3.3.1 Species

A total of 64 EPBC Act listed threatened and/or migratory species considered to be MNES were identified in the Protected Matters Search Tool(PMST) as potentially occurring within the EMBA, of which a subset of 46 species were identified as potentially occurring within the Operational Area (**Figure 3-2**). The full list of species identified from the PMST report is provided in **Appendix A**. Two conservation dependent marine species have also been identified with a potential to occur within the Operational Area and EMBA. Species identified as potentially occurring within the Operational Area and EMBA are summarised in **Table 3-3**.

Table 3-3: Threatened and migratory marine and terrestrial species under the EPBC Act potentially occurring within both the Operational Area and EMBA.

Receptor	Description
Fish, Sharks and Rays	• Seven shark species were identified that may occur within the Operational Area and EMBA, including the whale shark, great white shark, grey nurse shark, oceanic whitetip shark, shortfin mako, longfin mako and scalloped hammerhead. • A whale shark foraging BIA overlaps the EMBA, 23km north of the Operational Area. • Four species of sawfish were identified including the green sawfish, dwarf sawfish, freshwater sawfish and narrow sawfish. • Southern bluefin tuna, reef manta rays and giant manta rays may also be present in the Operational Area and EMBA.

Receptor	Description
Marine reptiles	• Five marine turtle species were identified that may occur including the loggerhead turtle, green turtle, hawksbill turtle, flatback turtle and leatherback turtle. • Nesting and internesting Habitat Critical to the Survival of a Species have been identified as overlapping the Operational Area for green turtles, flatback turtles, and hawksbill turtles. • Dampier Archipelago is a BIA for hawksbill turtle (foraging, nesting and internesting), loggerhead turtle (internesting), green turtle (foraging, nesting and internesting), and flatback turtle (foraging, nesting and internesting). • Nesting periods are November to March for green turtles, October to March for flatback turtles, October to February for hawksbill turtles, and December to January for loggerhead turtles. • Hatching periods are January to May for green turtles, February to March for flatback turtles, all year for hawksbill turtles, with combined peak hatchling emergence period from December to March. • The habitat critical to the survival of a species and the BIAs listed above overlap the majority of the EMBA. Internesting buffers are about 60 km for flatback turtles and 20 km for hawksbill turtles, green turtles, and loggerhead turtles. • Two species of seasnake may also occur in the Operational Area; the short-nosed sea snake and the leaf-scaled seasnake • The short-nosed sea snake is a species endemic to WA and has been recorded from the Exmouth Gulf to the reefs of the Sahul Shelf. • Seasnakes and turtles are reported by traditional custodians as culturally important species, with a turtle songline reaching Withnell Bay from Fortescue (MAC, 2021).
Marine Mammals	• Eleven cetacean species were identified that may occur including the Blue whale, Humpback whale, Bryde's whale, Killer whale, the Australian snubfin dolphin, the Spotted bottlenose dolphin, the Australian humpback dolphin, and the Dugong. These species may transverse the Operational Area at certain times of the year, but the likelihood of their occurrence is low. Other cetacean species are likely to occur at low densities and may traverse through the Operational Area infrequently through the year. • Dugongs may transit within the Operational Area. • A humpback whale migration corridor (north and south) BIA overlaps the Operational Area and the majority of the EMBA; occurrence is expected between May and November. • A pygmy blue whale general distribution BIA overlaps the Operational Area; may occur from April to November. • Whales and dolphins are recognised as important to traditional custodians as totems (MAC, 2021). Humpback whales are recognised as culturally significant to traditional custodians (MAC, 2021).
Seabirds and Shorebirds	• Twenty species of seabird were identified as potentially occurring within the Operational Area and wider EMBA. • Thirteen shorebird species were identified as potentially occurring. • The Dampier Archipelago is a breeding and foraging BIA for a number of seabirds and shorebirds. Eight BIAs overlap the Operational Area for Australian fairy terns (breeding/foraging), roseate terns (breeding/foraging), wedge-tailed shearwaters (breeding/foraging). • Breeding periods occur from August to May (wedge-tailed shearwaters), March to July (roseate tern), June to September (Australian fairy tern) and March to October (Caspian tern.

3.4 Cultural Features and Heritage Values

3.4.1 Native Title

In order to understand cultural features of the environment for First Nations groups, Woodside uses the existing systems, such as native title, to identify First Nations groups that may be consulted. To that end, Woodside identifies native title representative bodies and nominated representative entities, as well as native title claims, determinations and Indigenous Land Use Agreements (ILUAs) which the Operational Area overlaps or is adjacent to. Native title claims, determinations and ILUAs are defined under the *Native Title Act 1993* (Cth). While acknowledging that cultural features and heritage values may exist outside of the native title framework, Woodside considers this to be the broadest extent over which First Nations groups have claimed native title rights and interests.

A summary of native title claims, determinations and ILUAs overlapping or coastally adjacent to the Operational Area is illustrated in **Figure 3-2** and set out in **Table 3-4** Claims and determinations have not been differentiated in this table, as it is acknowledged that either of these may indicate the existence of rights and interests.

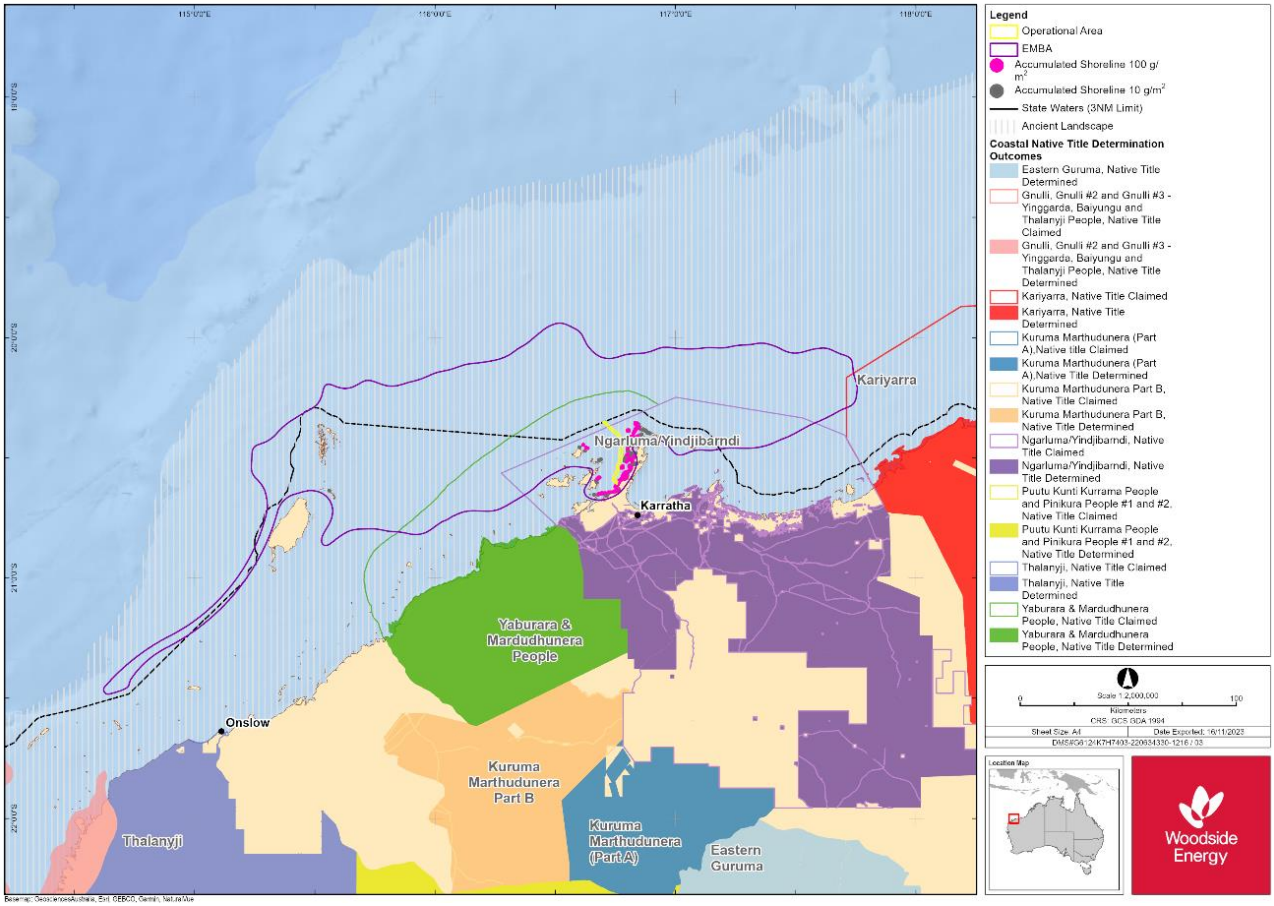

Figure 3-2: Operational Area overlap with native title claims, determinations, ILUAs and the Ancient Landscape.

Table 3-4: Summary of Native Title Claim or Determination and ILUA Operational Area overlap.

Claim/Determination/ILUA/Traditional People Name	Registered Native Title Body Corporate	Overlap with Operational Area	Coastally Adjacent to the Operational Area
Ngarluma/Yindjibarndi People	Ngarluma Aboriginal Corporation (NAC), Yindjibarndi Aboriginal Corporation	Yes	No
Yaburara & Mardudhunera People	Wirrawandi Aboriginal Corporation (WAC)	Yes	No
Kuruma Marthudunera and Yaburara and Coastal Mardudhunera Indigenous Land Use Agreement	WAC, Robe River Kuruma Aboriginal Corporation (RRKAC)	Yes	No
RTIO Ngarluma ILUA (Body Corporate Agreement)	NAC	No	Yes
KM & YM ILUA	WAC, RRKAC	Yes	No
Cape Preston Project Deed (YM Mardie ILUA)	WAC	No	Yes
Anketell Port, Infrastructure Corridor and Industrial Estates Agreement	NAC, Kariyarra Aboriginal Corporation	No	Yes

3.4.2 Marine Parks

Woodside acknowledges that Commonwealth and State Marine Park Management Plans have sought to recognise cultural values of First Nations groups. A summary of Marine Park Management Plan that overlap with the Operational Area and EMBA is provided in **Table 3-5**.

Table 3-5: Summary of Marine Park Management Plan Operational Area and EMBA overlap

	Operational Area Traditional Custodian Group Overlap	EMBA Traditional Custodian Group Overlap
Commonwealth Marine Park Management Plan		
Dampier AMP	No	Yes – NAC, Yindjibarndi Aboriginal Corporation, YMAC
Montebello AMP	No	Yes – YMAC
State Marine Park Management Plan		
Barrow Island MP	No	Yes – however no Traditional Custodian group specified
Montebello Islands MP	No	Yes – however no Traditional Custodian group specified
Montebello Islands Conservation Park	No	Yes – however no Traditional Custodian group specified
Barrow Island Marine Management Area	No	Yes – however no Traditional Custodian group specified
Nature Reserve Management Plan		
Lowendal Islands Nature Reserve	No	Yes – however no management plan identified
Barrow Island Nature Reserve	No	Yes – however no Traditional Custodian group specified
National Park Management Plan		

Murujuga National Park	No	Yes - Murujuga Aboriginal Corporation

3.4.3 Sea Country Values

'Sea Country' can be defined as the area of sea over which a First Nations group has interests, cultural value, connection and use.

Sea country values have been defined using multiple lines of evidence including:

- Desktop assessment of sea country values from publicly available sources (Table 3-6). Also, values identified in the Scarborough Cultural Heritage Management Plan (Cultural features and heritage values identified in other assessments

In addition to publicly available literature, Woodside has reviewed its own publicly available Cultural Heritage Management Plan (CHMP) which was developed in consultation with MAC for the nearshore installation of the export trunkline. The CHMP identifies a list of features which may hold heritage values. Not all features on this list, included in Table 5-7 of the CHMP, exist in the area relevant to the CHMP or in the Operational Area for this EP (Woodside Energy Ltd, 2023).

The features listed in the CHMP include, at the highest level:

A Tangible Heritage
B Ethnographic sites
C Intangible Heritage
D Heritage Landscapes
E Features with National Heritage Values
F Features with Outstanding Universal Values
G Submerged heritage
H Features with values to neighbouring groups

Item H in the CHMP recognises that Traditional Custodians of Country beyond Murujuga may hold values such as those in items A-G. Given the scope of relevant authorities and other relevant interested persons and organisations considered under this EP the distinction between cultural heritage on Murujuga and beyond Murujuga is not considered meaningful. Where features were noted to exist in or near the area relevant to the CHMP, Table 3-7 below considers their relevance to the Operational Area.

- Table 3-7).
- Specific studies including ethnographic surveys and archaeological heritage assessments (See Section 3.4.3.2)
- Consultation with First Nations groups and individuals (See Section 4)

3.4.3.1 Desktop Assessment of Sea Country Values

Table 3-6: Cultural features and heritage values identified in publicly available literature

First Nations Group	Features and Values	Source	Potential for overlap	
			Operational Area	EMBA
Gnulli (Baiyungu, Thalanyji, Yinggarda)	Feature: resources including marine animals. Value: traditional knowledge holds that ancestors live on the land and in the water. Therefore, people have obligations to access and care for these places (e.g., keeping them clean).	Peck on behalf of the Gnulli Native Title Claim Group v State of Western Australia [2019] FCA 2090	Possible (unspecified) Possible (unspecified)	Possible (unspecified) Possible (unspecified)
	Feature: heritage sites in the Ningaloo region include shell middens, artefact scatters, skeletal material/burial sites, camps, meeting places, hunting places and water sources. Feature: resources including gajalbu (emu), bundgurdi (kangaroo), bardurra (bush turkey), majun (marine turtles), turtle eggs, bilygurumarda (osprey), fish, shellfish and plants. Feature: mudflats, mangroves and sand dunes provide a critical breeding ground for marine and terrestrial wildlife. Value: the Ningaloo region contains cultural heritage dating back at least 32,000 years, including ceremonial thalu sites. Value: connection to Country is important to the Traditional owners' spirituality and religion. Value: caring for Country - "The southern coastal reserves along the Ningaloo Coast are jointly managed by Traditional Owners and the Department of Biodiversity, Conservation and Attractions (DBCA). The Joint Management Body ensures that the Traditional Owners have an opportunity to make decisions about environmental management and land use". This document also includes information that is marked that cannot be copied, reproduced or used without consent.	DBCA 2020	No No No No No No	No Possible (turtles, turtle eggs, fish, shellfish) No (other resources) No Possible (unspecified, but likely refers to onshore areas outside the EMBA) Possible (unspecified, but likely due to location of EMBA) No
	Feature: resources including mangrove crabs, gastropods, shellfish, dugong, turtle.	Morse 1993.	Possible	Possible

First Nations Group	Features and Values	Source	Potential for overlap	
			Operational Area	EMBA
Kariyarra	Value: traditional knowledge recalls that a salt water serpent lives in the sea and brings fish to shore	Zaunmayr 2016	Possible (unspecified)	Possible (unspecified)
Ngarda-Ngarli (Mardudhunera, Ngarluma, Wong-Goo-Tt-Oo, Yaburara and/or Yindjibarndi)	Feature: archaeological sites on Murujuga. Feature: ceremonial sites. Feature: dreaming sites.	Department of the Environment and Heritage 2006	No No Possible (unspecified)	Possible Possible (unspecified) Possible (unspecified)
	Value: traditional knowledge recalls that the sea is a source of creation for flying foxes. Value: petroglyphs are understood as permanent signs left by ancestral beings. Value: petroglyphs depict the law. Value: cultural obligations to look after places of special potency. Value: petroglyphs are important in initiation and education.	DEC 2013	Possible (unspecified) No No Possible No	Possible (unspecified) Possible (submerged) Possible (submerged) Possible Possible (submerged)
	Value: the sea is acknowledged a starting point for songlines, including the flying fox songline.	MAC 2023a	Possible (unspecified)	Possible (unspecified)
	Feature: resources including fishes, turtles and dugong. Value: traditional knowledge recalls a sea serpent which travelled from the coast to inland pools.	Water Corporation 2019	Possible (turtles, dugong, fish) Possible (unspecified)	Possible (turtles, dugong, fish) Possible (unspecified)
	Value: traditional knowledge recalls a water serpent from the ocean now lives in an inland pool. He created many sites and punishes law breakers. Value: In a separate account a sea serpent punishing people was driven back to the sea by a freshwater serpent.	Barber and Jackson 2011	Possible (unspecified) Possible (unspecified)	Possible (unspecified) Possible (unspecified)
	Value: traditional knowledge recalls Manggan created the seas.	NAC n.d.	Yes	Yes
	Value: traditional knowledge recalls Pannawonica Hill being carried from the sea near Barrow Island or Murujuga by a spirit bird.	Hook et al 2004.	Possible (unspecified)	Possible
	Value: traditional knowledge recalls Murujuga is where ancestral beings emerged from the sea and brought the Law.	Australian Heritage Council 2012	Possible (unspecified)	Possible (unspecified)

First Nations Group	Features and Values	Source	Potential for overlap	
			Operational Area	EMBA
	Feature: Submerged First Nations archaeological sites in Cape Bruguieres channel.	Benjamin et al 2020	No	Possible
	Feature: Submerged First Nations archaeological sites in Flying Foam Passage.	Benjamin et al 2023	No	No
	Value: traditional knowledge recalls Maarga (creation ancestors) lifted the land and sky out of the ocean.	Milroy and Revell 2013 Japingka Aboriginal Art Gallery 2023.	Possible (unspecified)	Possible (unspecified)
	Feature: submerged waterholes related to the Kangaroo songline. Value; traditional knowledge holds that Songlines continue beyond the current coast and across the submerged landscape.	Kearney et al 2023.	Possible Possible (unspecified)	Possible Possible (unspecified)
	Value: songlines are captured through storytelling, rock art, songs and dance, and in the landmarks themselves. Value: Murujuga is the start of many songlines, including the Seven Sisters.	Bainger 2021	Possible (unspecified) Possible (unspecified)	Possible (unspecified) Possible (unspecified)
	Value: songlines at Murujuga date back to times when the sea-level was lower.	MAC 2023b.	Possible (unspecified)	Possible (unspecified)
	Feature: rock art Feature: sacred sites	Weerianna Street Media Production 2017.	No Possible (unspecified)	Possible (submerged) Possible (unspecified)
	Feature: resources including fish, turtles. Feature: fish traps exist throughout the archipelago. Feature: shell middens exist on coastal margins. Feature: submerged archaeological sites. Value: Law emerged from the sea and travelled inland.	Leach 2020.	Possible (turtles, fish) No No No Possible (unspecified)	Possible (turtles, fish) Possible Possible Possible Possible (unspecified)

First Nations Group	Features and Values	Source	Potential for overlap	
			Operational Area	EMBA
	Feature: resources including mangrove seeds, turtles, turtle eggs) Value: it is recalled that ceremonies were conducted on islands.	Smyth 2007	Possible (turtles) No (other resources) No	Possible (turtles, turtle eggs, mangrove seeds) Possible (unspecified)
	Feature: archaeological sites on Murujuga.	McDonald 2015 McDonald 2023	No	Possible (submerged)
	Feature: archaeological sites on Enderby Island.	McDonald et al 2022a	No	No
	Feature: archaeological sites on Rosemary Island.	McDonald et al 2022b	No	Possible
	Feature: petroglyph and other archaeological sites at Murujuga. Feature: archaeological evidence of the use of resources including fish, turtles, marine mammals, crocodiles, crabs and sea urchins.	Dortch et al 2019	No Possible albeit unlikely (submerged)	Possible (submerged) Possible (submerged, highly unlikely for most evidence of faunal use to survive inundation)
Thalanyji	Feature: resources including fish, shellfish, crabs, crustaceans, sea urchins, turtle, dugong and flora and fauna associated with mangrove communities. Feature: archaeological sites on Barrow Island. Value: connection to Country.	Commonwealth of Australia 2002.	Possible (fish, turtle, dugong, invertebrates) No Possible (unspecified)	Possible (fish, turtle, dugong, invertebrates) No Possible (unspecified)
	Feature: resources include turtles, eggs, fish, shellfish and plants.	DBCA et al. 2002.	Possible (fish, turtle)	Possible (fish, turtle, eggs, shellfish)
	Value: traditional knowledge recalls a water snake is located in inland waters.	Hayes on behalf of the Thalanyji People v State of Western Australia [2008] FCA 1487	No (inland waters)	No (inland waters)

First Nations Group	Features and Values	Source	Potential for overlap	
			Operational Area	EMBA
	Value: connection to Country. Value: transfer of knowledge. Value: access to Country.	DBCA 2022	Possible (unspecified) Possible (unspecified) Possible (unspecified)	Possible (unspecified) Possible (unspecified) Possible (unspecified)
	Value: access to Barrow and possibly Montebello Islands	Hook et al. 2004.	No	Possible
	Feature: artefact scatters are located in coastal sand dunes. Feature: burials are located in coastal sand dunes. Value: traditional knowledge recalls a water snake is located in inland waters.	Hook 2020.	No No No	Possible (Shoreline accumulation areas) Possible (Shoreline accumulation areas) No
	Feature: archaeological sites are located on Barrow Island.	Ditchfield et al. 2018 Paterson 2017	No	No
	Feature: archaeological sites are located at Barrow and Montebello Islands. Feature: archaeological evidence of the use of resources including fish, turtles, marine mammals, crocodiles, crabs and sea urchins.	Dortch et al. 2019.	No No	No Possible (submerged, highly unlikely for most evidence of faunal use to survive inundation)
	Feature: thalu ceremonial sites for the increase of turtle, shark, ray, fish, squid, octopus, hill kangaroo and emu. Feature: ceremonies. Value: connection to Country. Value: transfer of knowledge. Value: access to Country.	DBCA 2022	No No Possible Possible Possible	No (ceremonial use) Possible (submerged thalu sites e.g., petroglyphs) No Possible Possible Possible
Unspecified	Feature: the ocean can include sacred sites and songlines. Value: people have kin relationships to important animals, plants tides and currents.	Smyth 2008	Possible (unspecified) Possible (unspecified)	Possible (unspecified) Possible (unspecified)

First Nations Group	Features and Values	Source	Potential for overlap	
			Operational Area	EMBA
	Feature: archaeological sites in submerged landscapes.	Bradshaw 2021.	No	Possible
	Value: sea country has customary law defining ownership and management rights and responsibilities.	Muller 2008.	Possible (unspecified)	Possible (unspecified)
	Value: knowledge of Sea Country Value: connection to Sea Country Value: care for Sea Country Value: the extent of Sea Country is determined by the travels of dreaming ancestors. This is recorded and conveyed through songlines.	Kearney et al 2023.	Possible (unspecified) Possible (unspecified) Possible (unspecified) Possible (unspecified)	Possible (unspecified) Possible (unspecified) Possible (unspecified) Possible (unspecified)
	Feature; archaeological sites indicate that islands were occupied prior to sea level rise.	DBCA 2020	No	Possible (submerged)
	Value: sea country includes values, places, resources, stories and cultural obligations. Value: activities relating to resources included: • Dugong hunting; • Turtle hunting; • Turtle egg collecting; • Seabird egg collecting; • Spearing fish; • Reef trapping fish; • Herding fish; • Line fishing; • Collecting fish in stone fish traps; • Poisoning fish; • Gathering shellfish and other marine resources.	Smyth 2007	Possible Possible (activities and fauna present)	Possible Possible (activities and fauna present)
	Value: people have kinship relationships with every plant and animal. Value: certain species, including fish and seafood, must not be eaten during initiation rituals due to their sacredness to the creation being Barrimirndi. Breaking this law may lead to cyclones.	Juluwarlu 2004	Likely to occur No	Likely to occur No

First Nations Group	Features and Values	Source	Potential for overlap	
			Operational Area	**EMBA**
	Feature: tangible and intangible heritage. Feature: archaeological evidence of varied occupation and adaptation. Value: a distinct way of life centred around the use of limited water and coastal resources.	Macfarlane and McConnell 2017	Possible (unspecified) No No	Possible (unspecified) Possible (submerged, highly unlikely for most evidence of faunal use to survive inundation) Possible (unspecified)

Cultural features and heritage values identified in other assessments

In addition to publicly available literature, Woodside has reviewed its own publicly available Cultural Heritage Management Plan (CHMP) which was developed in consultation with MAC for the nearshore installation of the export trunkline. The CHMP identifies a list of features which may hold heritage values. Not all features on this list, included in Table 5-7 of the CHMP, exist in the area relevant to the CHMP or in the Operational Area for this EP (Woodside Energy Ltd, 2023).
The features listed in the CHMP include, at the highest level:

A Tangible Heritage
B Ethnographic sites
C Intangible Heritage
D Heritage Landscapes
E Features with National Heritage Values
F Features with Outstanding Universal Values
G Submerged heritage
H Features with values to neighbouring groups

Item H in the CHMP recognises that Traditional Custodians of Country beyond Murujuga may hold values such as those in items A-G. Given the scope of relevant authorities and other relevant interested persons and organisations considered under this EP the distinction between cultural heritage on Murujuga and beyond Murujuga is not considered meaningful. Where features were noted to exist in or near the area relevant to the CHMP, Table 3-7 below considers their relevance to the Operational Area.

Table 3-7: Values identified in the Scarborough Cultural Heritage Management Plan (Woodside 2023b)

Feature		Identification in the CHMP	Relevance to the Operational Area
A.1.a	Petroglyphs	Noted onshore only.	The Operational Area overlaps the Ancient Landscape where these features may exist.
A.1.b	Artefact scatters	Archaeological assessment of the submerged landscape (UWA 2021) assessed the likelihood of impacting potential archaeological Indigenous heritage such as artefact scatters/middens in the nearshore or offshore Development Envelope as low to nil.	The Operational Area overlaps the Ancient Landscape where these features may exist.
A.1.d	Middens		
D.3	Submerged calcarenite ridges	Calcarenite features at the edge of the continental shelf are young enough that they may include artefacts, but these features are covered by modern sediments and marine growth, and the export trunkline will be installed over this. These calcarenite ridges will be crossed by the export trunkline.	Exists within Operational Area
A.1.b.i	Site 19675 (Tool Shed)	Noted onshore only.	Outside of Operational Area
B.1	Features with spiritual values	It was concluded that ethnographic sites with spiritual values exist outside	No ethnographic sites have been identified within the Operational Area.

Feature		Identification in the CHMP	Relevance to the Operational Area
B.2	Features with social/cultural values	of the Development Envelope (Mott 2019, McDonald and Phillips 2021). No impacts from the Project to ethnographic sites were foreseen during these consultations. It was concluded that ethnographic sites which may have social and cultural values exist outside of the Development Envelope (Mott 2019, McDonald and Phillips 2021). No impacts from the Project to ethnographic sites were foreseen during these consultations.	
B.1.a	Songlines	It was concluded that ethnographic sites and features connected to songlines exist outside of the Development Envelope (Mott 2019, McDonald and Phillips 2021). No impacts from the Project to ethnographic sites were identified during these surveys. Woodside notes that trunklines and other infrastructure including shipping channels already exist in close proximity to the export trunkline route, and if there were to be any impacts to surviving songlines these would be significantly more likely to be described as qualitative (i.e. "weaken" a songline) rather than binary or absolute (i.e. destroy a songline).	Areas identified in the CHMP with connection to songlines or stories were limited to onshore locations and islands not included within the Operational Area.
C.1.b	Stories		
B.2.a	Places for which access must be preserved	Noted onshore only.	Limitation of access is a relevant consideration within the Operational Area.
C.1	Living culture	The continuous living culture of Murujuga is a component of the Outstanding Universal Values proposed as a justification for World Heritage Listing.	Ongoing access, connection to Country and transfer of knowledge are relevant considerations for the Operational Area.
C.1.a	Customs	Consultation with MAC has identified concerns about the movement of rocks to and from Country as requiring consultation with representatives of other areas.	Outside of Operational Area.
C.2.a	Animals of medicinal/food/economic value	Miscellaneous values as identified in MAC 2021.	The relevant values of MAC 2021 are considered in Table 5-1
C.2.c	Plants		
C.2.c.i-vi	Plants (misc values)		
D.1	Conservation zones	Noted onshore only.	Outside of Operational Area.
D.4	Submerged hills	Archaeological assessment of the submerged landscape (UWA 2021) identified submerged hills which may have archaeological or other heritage values.	Do not exist within Operational Area.

Feature		Identification in the CHMP	Relevance to the Operational Area
D.5.a	Rivers	Archaeological assessment of the submerged landscape (UWA 2021) identified a submerged river which may have archaeological or other heritage values but confirmed that the export trunkline does not cross this feature. Review of SSS data (Nutley 2022b) concluded that "In the middle shelf and outer shelf there were no indicators of former riverbeds, creek lines or lakes with which [any archaeological] feature may be associated."	The Operational Area overlaps the Ancient Landscape where these features may exist.

3.4.3.2 Studies of Cultural Features and Heritage Values

Woodside understands that communal cultural connection may exist between Traditional Custodians and land and waters. It is understood from the onshore archaeological record that First Nations people have occupied the Australian continent for at least 65,000 years (Clarkson et al 2017) and in many places maintain a strong continuing connection that is said to extend back in First Nations cosmology to the beginning of time.

It is understood that the sea level has risen significantly during the 65,000 years of First Nations occupation, and areas that were once inhabited are now submerged on the continental shelf (Veth et al 2019; UWA 2021). Woodside also understands that, at its lowest level during First Nations occupation, sea level was between 125 m (O'Leary et al 2020, Veth et al 2019, Williams et al 2018) and 130 m below current levels (Benjamin et al 2020, Benjamin et al 2023, UWA 2021). Archaeological material preserved on the Ancient Landscape has the potential to provide further information about the earliest periods of human occupation (Veth et al 2019; UWA 2021).

Recent archaeological discoveries demonstrate that the now submerged landscape was occupied and inhabited and can retain archaeological material from this time (Benjamin et al, 2020; Benjamin et al 2023; see Ward et al 2022 for an opposing view).

In recognition of this, Woodside considers the Ancient Landscape between the mainland and the Ancient Coastline KEF as an area where potential First Nations archaeological material may exist on the seabed, as this covers the full extent of this possible First Nations occupation. The Operational Area intersects part of the Ancient Landscape within State Waters.

Further major First Nations archaeological studies relating to the Operations area and EMBA include:

- A UWA Indigenous underwater cultural heritage (UCH) assessment along the Scarborough trunkline route developed a predictive model for the potential for UCH to be located within the submerged landscapes along the Scarborough trunkline route (UWA, 2021). It concluded that the Scarborough trunkline development will have "nil or very low impact" on archaeological heritage values within the inner shelf (including the Dampier Archipelago).
- Integrated Heritage Services was engaged by Woodside to conduct an Indigenous heritage desktop investigation and initial ethnographic consultations with Traditional Custodian representatives, for the offshore and landfall component of the Project (Mott, 2019). After the finalisation of Mott (2019), the conclusions of Veth et al (2019) were tested through direct inspection with DHSC divers which led to the discovery of two locations with Indigenous underwater cultural heritage (Benjamin et al., 2020) in Flying Foam Passage and Cape Bruigeres in State waters. This demonstrated the potential for UCH to exist on the NW Shelf and highlighted the need to assess the potential impacts of offshore developments on submerged heritage landscapes (UWA, 2021).

- MAC was consulted during the development of the Scarborough Project (Nearshore Component) Dredging and Spoil Disposal Management Plan (DSDMP) which included Commonwealth activities associated with Scarborough Project construction activity for full activity context. As a part of the DSDMP consultation, MAC advised that DHSC had identified two areas considered "culturally prospective":

  > *The first is the Madeline [sic] Shoals, which… is formed of the same igneous geology as the other areas of the archipelago where sub-tidal archaeological sites have been found. The second area is a 3 km wide relict submerged paleo beach barrier system that extends across the northern entrance to Mermaid Sound, over which the trunk line route passes. This is an area of hard grounds… with high potential to contain Aboriginal lithic materials cemented within the deposits*.

- MAC requested that calcarenite ridges on the inner shelf be directly inspected where the trunkline entered State waters. Direct inspection in these areas was completed by ROV with the participation of a qualified marine archaeologist and representative of MAC (Nutley 2023a). No instances of potential cultural heritage material were detected during these inspections (Nutley 2023a).

Ethnographic heritage assessment surveys and studies relating to the Operational Area and EMBA include:

- A 2019 survey was undertaken due to the potential planned impact of offshore, nearshore and onshore activities associated with the Scarborough Project within the cultural jurisdiction of Ngarda Ngarli people, traditional custodians of Murujuga. The survey was conducted with members of all five Traditional Custodian groups of Murujuga (Mardudhunera, Ngarluma, Wong-Goo-Tt-Oo, Yaburara and Yindjibarndi) invited through Prescribed Bodies Corporate for Ngarda Ngarli people (including NAC and WAC) and MAC, who met on country with heritage consultants.
- The aim of this aspect of the work was "to undertake an initial ethnographic site visit to consult with traditional owners to discuss the current research undertaken by others on submerged landscapes generally, and to seek specific feedback on the nature of the export trunkline pipeline plans including the pipe landfall area, adjacent to a significant Aboriginal heritage site" (Mott 2019). Participants were provided with a map of the Scarborough development (Figure 4 12) and asked to identify any values in the surrounding landscape.
- No cultural features or heritage values were identified in the Operational Area or EMBA through this survey (Mott 2019).
- A 2020 survey (McDonald and Phillips 2021) was undertaken due to the potential planned impact of offshore, nearshore and onshore activities associated with the Scarborough Project within the cultural jurisdiction of Ngarda Ngarli people, traditional custodians of Murujuga. Some ethnographic values identified included:
  - stories related to Eaglehawk Island and several sites in Withnell Bay
  - The remainder were exclusively onshore.
- McDonald and Phillips (2021) identified their work as Phase I of a planned two-phase survey. Phase I describes and assesses the cultural, spiritual, aesthetic and social values held by Traditional Custodians for the Scarborough Development Project area (including the State Waters trunkline) and surrounding land and seascape. Phase II is envisioned to incorporate consultation with senior Traditional Custodians from surrounding communities. Phase II is to be led by MAC. Woodside has offered support to MAC to facilitate the conduct of this survey, however to date MAC have not progressed the survey.
- Beyond MAC, no Indigenous group has articulated cultural jurisdiction over any area of waters subject to impacts from planned activities. BTAC has stated that their Sea Country extends "out

to the vast islands off the coast of the Pilbara, including the Monte Bello Islands, Barrow Island, and the Mackerel Islands." These locations are outside the Operational Area and EMBA.

Intangible Cultural Values

Intangible cultural heritage has been identified through consultation with First Nations people as culturally important. Cultural knowledge, as expressed through songlines, dreaming, dance and other cultural practices, can be associated with tangible objects and physical sites that are culturally important to First Nations people (Ardler 2021; Bursill et al. 2007). Intangible cultural heritage can also be embodied in the practices, representations, expressions, knowledge, uses and skills associated with physical sites (UNESCO 2003). As a result, physical features may have intangible dimensions (ICOMOS 2013).

Marine ecosystems and species

First Nations people have raised through consultation that they have a general interest in environmental management and ecosystem health (i.e., natural environment interest), where a group/individual was seeking further information about potential impacts and risks from the Petroleum Activities Program on marine species and benthic communities in the Operational Area and EMBA. This includes marine mammals, marine reptiles, fish, seabirds, plankton, benthic and shoreline habitats and marine parks, which are described in context of their distribution and populations in **Section 3.2** and **3.3**.

First Nations Archaeological Heritage Assessment

A search of the Department of Planning, Lands and Heritage (DPLH) Aboriginal Heritage Inquiry System (AHIS) was undertaken for the Operational Area and EMBA. The search results showed 14 Registered Aboriginal Sites and eight Lodged Aboriginal sites in the Operational Area. 1, 311 Registered Aboriginal Sites and 763 Lodged Aboriginal sites were identified in the EMBA. Given that the shore crossing is located within the Woodside Pluto LNG Facility in a pre-disturbed industrial zone that was fully surveyed in 2006 and considered in Mott (2019), sites of significance are not expected to occur within intertidal areas at the shore crossing the boundaries of the onshore Operational Area.

The registered sites within the EMBA included middens, burial, ceremonial, artefacts, rock shelters, mythological, meeting places, grinding areas, engraving sites and man-made structures. The exact location, access and traditional practices for a number of these sites are not disclosed and, if required such as in a major hydrocarbon release, would involve prioritising further consultation with key contacts within DPLH and local Indigenous communities.

3.4.3.3 Consultation Feedback to Inform Existing Environment

A summary of the topics/interests and values raised by First Nations groups through consultations on this Petroleum Activities Program, or raised in context of general Scarborough Project activities or other activities are provided in Table 3-8.

Table 3-8: Summary of Feedback received via consultation to inform Existing Environment Description

First Nation Group/ Individuals	Consultation context	Description of Value/Interest	Potential for overlap	
			Operational Area	***EMBA***
Kariyarra Aboriginal Corporation (KAC)	Consultation in the course of preparing Scarborough Operations (Commonwealth) EP	Value: Turtles Validity of management controls over periods time	Possible	Possible
		Value: Access to Sea Country (1) Accessing Sea Country for fishing, trapping, crabbing catching turtle, hunting dugong, using stingray barbs for spears and collecting shellfish. (2) Visiting offshore islands at low tide	Possible (access to sea country) No (access to offshore islands)	Possible (access to sea country) Possible (access to offshore islands)
		Value: Marine species resources Resource species of cultural interest to Kariyarra people include marine mammals, fish, molluscs including bivalves, gastropods and cephalopods.	Possible	Possible
		Value: The existence of intangible cultural heritage including the Yinta (associated with Sea Country). From Kariyarra Native Title documents it is clear that Yinta are significant cultural/spiritual sites, often a pool or water source but possibly a hill or other feature. These are, at least generally, associated with creation beings and are a core part of cultural rights to land in determining who can use or speak for an area.	Possible	Possible
		Interest: Coastal Landforms (Cultural interest)	Unlikely (Operational Area does not interact with KAC Coastline)	Unlikely (EMBA does not interact with KAC Coastline)
		Interest: Coastal Native Vegetation (Cultural interest)	Unlikely (Operational Area does not interact with KAC Coastline)	Unlikely (EMBA does not interact with KAC Coastline)
		Feature: Cultural interest in cultural heritage sites associated with the coast and the ocean.	Possible (ocean related only)	Possible (both)
		Value: Traditional fishing and gathering rights in the ocean	Possible	Possible

First Nation Group/ Individuals	Consultation context	Description of Value/Interest	Potential for overlap	
			Operational Area	***EMBA***
		Value: Cultural interest in intangible cultural heritage associated with the coast and the ocean. (1) Presence of mythic snakes	Possible (unspecified)	Possible (unspecified)
		Value: Intergenerational Knowledge	Possible (unspecified)	Possible (unspecified)
		Value: Cultural obligations to care for Country, including Sea Country. Value: Secret Habitat Totems associated with Sea Country	Possible (unspecified)	Possible (unspecified)
		Interest: Assertion of sea rights in native title claim area Interpreted as general connection to country, assertion of rights to access country and cultural obligation to care for environmental values of sea country (1) Having duties to look after and protect all KACs sea country.	No	Yes
	Raised in consultation for another EP	Value: Whales (Connection to Songlines) Impacts to whale migration	Possible (unspecified)	Possible (unspecified)
		Value: Sea Turtle (Nesting)	Possible	No
		Value: Food Resources	Possible (unspecified)	Possible (unspecified)
Murujuga Aboriginal Corporation representing Ngarda-Ngarli people (Mardudhunera, Ngarluma, Wong-Goo-Tt-Oo, Yaburara and Yindjibarndi)	Raised in context of Nearshore Scarborough Project activities (MAC 2021 as cited in Woodside 2023)	Value: Mermaid Sound ecosystem health	Yes	Possible
		Feature: Whale Value: A whale thalu is an increase at a totemic site that brings whales into beach Value: Whales and other species of totemic importance need to be protected, including their populations, biodiversity, and migration patterns Value: Whales are culturally important species that migrate through Mermaid Sound. Humpback whales in particular.	Possible (whales) Possible (thalu; unspecified) Possible (unspecified; other species)	Possible (whales) Possible (thalu; unspecified) Possible (unspecified; other species)
		Feature: Dolphins Value: There are cultural ceremonies associated with communicating with dolphins	Possible (dolphins) Possible (unspecified)	Possible (dolphins) Possible (unspecified)
		Feature: Dugongs Value: Are a food source associated with seagrasses near Gidley Island	Possible (dugongs) No (based on defined location)	Possible (dugongs) Possible (based on defined location)

First Nation Group/ Individuals	Consultation context	Description of Value/Interest	Potential for overlap	
			Operational Area	***EMBA***
		Feature: Fish Value: There are thalu ceremonies associated with increasing fish stocks	Possible (fish) Possible (unspecified)	Possible (fish) Possible (unspecified)
		Feature: Sea snakes Specifically mentioned as culturally important species	Possible (sea snakes)	Possible (sea snakes)
		Feature: Flatback, green, hawksbill, loggerhead and leatherback turtles Turtles are culturally important species that moves through Mermaid Sound. Turtles are most often seen in shallower areas and where there are seagrasses Most beaches are nesting sites for turtles, including those on Gidley and Legendre Islands Value: The songline associated with the turtle comes from Fortescue to Withnell Bay. This song is sung by four or five tribes for day and night without consuming food or water	Possible (turtles) Possible (based on defined location) No (beaches; based on defined location) Unlikely (songline geographically restricted nearshore)	Possible (turtles) Possible Possible (beaches; based on defined location) Possible (songline)
		Feature: Coral Fish are attracted to areas with coral Concerned about coral bleaching because corals are important. Beautiful colours. They also attract a lot of other things Fish carry coral spawn like bees pollinate flowers. If fish were looked after, the corals would get brighter and brighter (by transmitting nutrients and performing other ecosystem services, fish can be symbiotic with corals) Spawning events should be avoided (associated with full moon). Locations identified during consultation include Withnell Bay; Conzinc Bay; south west of Legendre Island	Possible (fish) Possible (Coral)	Possible (fish) Possible (Coral)
		Feature: Seagrass Seagrasses provide protection for animals. Locations identified during consultation include Conzinc Island; between Angel and Gidley Island.	Possible	Possible (Accumulated hydrocarbons above threshold concentrations (≥100 g/m²) with a low probability: Gidley Island) Possible (based on defined location)

First Nation Group/ Individuals	Consultation context	Description of Value/Interest	Potential for overlap	
			Operational Area	***EMBA***
		Value: Mangroves would have provided shelter, crabbing, digging for shellfish, could be turtle nurseries Locations identified during consultation include Conzinc Bay north end; Flying Foam Passage; Searipple Passage; north-east bay of West Lewis Island	No	Possible Possible (based on defined location)
		Interest: Macroalgal communities, which are important primary production sites, habitats, and food sources (not explicitly identified by elders) Interest: *Subtidal soft-botto*m communities, which support invertebrate diversity (not explicitly identified by elders) Interest: Intertidal sand and mudflat communities, which are important primary production sites, support invertebrate diversity and provide food for shorebirds (not explicitly identified by elders) Interest: Rocky shores, which are habitats for intertidal organisms and provide food for shorebirds (not explicitly identified by elders)	No Possible No No	Possible Possible Possible Possible
		Feature: Fish traps There are known fish traps in Conzinc Bay, and others would have or do exist in coastal areas of islands, such as Angel and Gidley Islands. People still use the Conzinc Bay fish traps regularly for catching mangrove jack, trevally and other fish. Value: Squidding (harvesting of squid from the ocean) around Conzinc Island	No No No	Possible (submerged) Possible (broader EMBA, Accumulated hydrocarbons above threshold concentrations (≥100 g/m²) with a low probability: Gidley Island) Possible Conzinc Bay (based on defined location) Possible Conzinc Bay (based on defined location)
	Consultation in the course of preparing this EP	Interest: Submerged Heritage Interest: The impact on Jinna (Songlines) due to the lack of broader-scale bathymetric information for the submerged landscape	Possible (unspecified)	Possible (unspecified)
Ngarluma Aboriginal Corporation (NAC)	Consultation in the course of preparing this EP	No values raised	-	-

First Nation Group/ Individuals	Consultation context	Description of Value/Interest	Potential for overlap	
			Operational Area	***EMBA***
Ngarluma Yindjibarndi Foundation Ltd (NYFL)	Consultation in the course of preparing this EP	No values raised	-	-
Wirrawandi Aboriginal Corporation (WAC)	Consultation in the course of preparing this EP	No values raised	-	-
Murujuga Aboriginal Corporation representing Ngarda-Ngarli people (Mardudhunera, Ngarluma, Wong-Goo-Tt-Oo, Yaburara and Yindjibarndi)	Raised in context of Nearshore Scarborough Project activities (MAC 2021 as cited in Woodside 2023)	Value: Mermaid Sound ecosystem health	Yes	Possible
		Interest: Plankton - unspecified	Possible	Possible
		Interest: Seagrass - unspecified	Possible	Possible
		Interest: Where saltwater and freshwater meet	No	Possible
Save Our Songlines, [name redacted] and [name redacted]	Raised in context of general Scarborough Project activities	Feature: Songlines, dreaming and energy lines (unspecified)	Possible (unspecified)	Possible (unspecified)
		Feature: Whales – including migratory patterns	Possible	Possible
		Interest: Turtles – including migration patterns	Possible	Possible
		Interest: Dugongs - unspecified	Possible	Possible
	Raised in Concise Statement and Affidavit in context of Scarborough seismic activities	Value: Caring for Country [name redacted] asserts [name redacted] and [name redacted] are holders of women's lore with cultural obligations to protect, preserve and promote the environment, animals and plants threatened by the Activity (specific to Seismic) [name redacted] asserts the spiritual health and wellbeing of Murujuga and all the plants and animals present on Murujuga and connected to the songlines in and around Murujuga	Possible (unspecified)	Possible (unspecified)

First Nation Group/ Individuals	Consultation context	Description of Value/Interest	Potential for overlap	
			Operational Area	***EMBA***
		Feature: Whales [name redacted] asserts the following values: “Whales carry important songlines, the whale Dreaming, and connection between land and sea” "As the biggest animal on earth, the whale has the greatest heart connection to songlines, people and animals and carries the songlines around the ocean, connecting places." “Whale Dreaming story has a strong connection to the heart centre in each person, this story helps people to open up and to realise, understand and raise awareness of the environment and everything humans are connected to.” "In their own families, female whales have a caretaker or midwife role, and those who are connected to the Whale Dreaming and carry the women's lore also have obligations as caretakers of the earth." "The women's lore that [name redacted] and [name redacted] carry is the songline of the whale, which is important for sustaining the creation of all animals and humans." "[name redacted] and [name redacted] connect to the whales like this through their songlines, they sing to the whales, the whales feel that song and the connection through their hearts, regardless of the distance." "the whales tell [name redacted] and [name redacted] a story, and [name redacted] and [name redacted] are the people who feel and who are connected to that story. [name redacted] and [name redacted] have that feeling of connection inside them all the time, they live and breathe it, they are in and everything about it." "Because each animal uses songlines for migration, breeding and feeding, the disruption or distortion to the songlines causes the animals to become disoriented, confused or lost.”	Possible (whales) Possible (songlines, unspecified)	Possible (whales) Possible (songlines, unspecified)

First Nation Group/ Individuals	Consultation context	Description of Value/Interest	Potential for overlap	
			Operational Area	***EMBA***
		Interest: Whales Interest: Pygmy Blue whales “Potential impacts on marine species and natural environment, relevant to the natural environment, relevant to the Applicant's interests, including but not limited to ii. behavioural changes (leaving or avoiding the area where the Activity occurs) to turtles, pelagic fish (such as tuna and billfish), sharks, pygmy blue whales iii. whales' sonar communications systems, particularly between mothers and calves, from sound and vibrations emitted by the Activity v. potential impacts on water quality and consequent potential impacts on marine fauna such as whales, dugongs, sharks, rays, and seabirds from the risk of unplanned chemical discharges (non-hydrocarbon); and vi. vehicle collision and/or entanglement with marine fauna"	Possible (whales)	Possible (whales)

First Nation Group/ Individuals	Consultation context	Description of Value/Interest	Potential for overlap	
			Operational Area	***EMBA***
		Interest: Turtles "Other animals, such as turtles, dolphins, dugongs, and krill follow the whale's songlines, because they're all connected together - the whale creates a path for the other animals like 'grading a road'." “Potential impacts on marine species and natural environment, relevant to the natural environment, relevant to the Applicant's interests, including but not limited to: ii. behavioural changes (leaving or avoiding the area where the Activity occurs) to turtles, pelagic fish (such as tuna and billfish), sharks, pygmy blue whales v. potential impacts on water quality and consequent potential impacts on marine fauna such as whales, dugongs, sharks, rays, and seabirds from the risk of unplanned chemical discharges (non-hydrocarbon); and vi. vehicle collision and/or entanglement with marine fauna"	Possible (turtles)	Possible (turtles)
		Interest: Dugongs “Potential impacts on marine species and natural environment, relevant to the natural environment, relevant to the Applicant's interests, including but not limited to: v. potential impacts on water quality and consequent potential impacts on marine fauna such as whales, dugongs, sharks, rays, and seabirds from the risk of unplanned chemical discharges (non-hydrocarbon)”	Possible (dugong)	Possible (dugong)

First Nation Group/ Individuals	Consultation context	Description of Value/Interest	Potential for overlap	
			Operational Area	***EMBA***
		Interest: Pelagic fish "Potential impacts on marine species and natural environment, relevant to the natural environment, relevant to the Applicant's interests, including but not limited to: ii. behavioural changes (leaving or avoiding the area where the Activity occurs) to turtles, pelagic fish (such as tuna and billfish), sharks, pygmy blue whales"	Possible (fish)	Possible (fish)
		Interest: Sharks "Potential impacts on marine species and natural environment, relevant to the natural environment, relevant to the Applicant's interests, including but not limited to: ii. behavioural changes (leaving or avoiding the area where the Activity occurs) to turtles, pelagic fish (such as tuna and billfish), sharks, pygmy blue whales v. potential impacts on water quality and consequent potential impacts on marine fauna such as whales, dugongs, sharks, rays, and seabirds from the risk of unplanned chemical discharges (non-hydrocarbon)"	Possible (sharks)	Possible (sharks)
		Interest: Plankton "Potential impacts on marine species and natural environment, relevant to the natural environment, relevant to the Applicant's interests, including but not limited to: i. chronic mortality to some marine organisms, including zooplankton	Possible	Possible

First Nation Group/ Individuals	Consultation context	Description of Value/Interest	Potential for overlap	
			Operational Area	***EMBA***
		Interest: Water quality "Potential impacts on marine species and natural environment, relevant to the natural environment, relevant to the Applicant's interests, including but not limited to: iv. potential operational discharges associated with the presence of ships in the area, including potential impacts to water quality v. potential impacts on water quality and consequent potential impacts on marine fauna such as whales, dugongs, sharks, rays, and seabirds from the risk of unplanned chemical discharges (non-hydrocarbon)	Yes	Yes
		Interest: Seabirds "Potential impacts on marine species and natural environment, relevant to the natural environment, relevant to the Applicant's interests, including but not limited to: v. potential impacts on water quality and consequent potential impacts on marine fauna such as whales, dugongs, sharks, rays, and seabirds from the risk of unplanned chemical discharges (non-hydrocarbon)	Possible	Possible
		Interest: Where saltwater and freshwater meet "The places where the saltwater from the sea and the freshwater from the land connect are where the biggest energy lines[1] are, and that connection is a core of creation relevant to a Dreaming story."	No	Possible
		Value: Bungarra, Eagle, Kangaroo Identified totemic species	No	No

1 Although [name redacted], [name redacted] and Save our Songlines referred to and described Energy Lines, these are understood to be the same as songlines and this document therefore refers to songlines

First Nation Group/ Individuals	Consultation context	Description of Value/Interest	Potential for overlap	
			Operational Area	***EMBA***
		Interest: Murujuga "When [name redacted] and [name redacted] and their people stand on Country they are connected to their songlines through the rocks. As holders of women's lore, [name redacted] and [name redacted] put healing energy into the rocks and use that to heal the songlines." "[name redacted] and [name redacted] connect to their bloodline, old people and songlines through Country, including the rocks at Murujuga, which are encrypted with ancient stories that keep connection to the bloodline and songlines alive and well."	No	Possible
	Consultation in the course of preparing this EP and raised in Concise Statement and Affidavit[3] in context of Scarborough seismic activities	Value: Rock Art "Rocks at Murujuga symbolise stories, the totems (the depicted artwork) - whether representing plants or animals - and tell a story of their history, and how long they've been there." Threat posed to Murujuga rock art due to acid gas emission from Woodside's LNG processing operations on the Burrup and climate change.	No	Possible (Presence of Rock Art)
Wirrawandi Aboriginal Corporation representing Ngarda-Ngarli (Mardudhunera and Yaburara)	Raised in context of general Scarborough Project activities	Interest: Whales - query with regard to whale migration and timing of Project activities; impact of noise on whale communication	Possible	Possible
		Interest: Turtles - query with regard to turtle monitoring programs	Possible	Possible
		Interest: Underwater heritage – query with regard to where sites have been recently found	Possible	Possible
	Raised in context of decommissioning activities	Value: Rock Art – query whether air emissions from activities impacts rock art and controls to minimise potential impacts	No (no credible impact pathway from air emissions to possible submerged rock art within the Operational Area)	No (no credible impact pathway from air emissions to possible submerged rock art within the EMBA)

First Nation Group/ Individuals	Consultation context	Description of Value/Interest	Potential for overlap	
			Operational Area	***EMBA***
Yamatji Marlpa Aboriginal Corporation (YMAC)	Consultation in the course of preparing this EP	No values raised	-	-
Yindjibarndi Aboriginal Corporation (YAC)	Consultation in the course of preparing this EP	No values raised	-	-
BTAC representing some of the Gnulli native title claimants (Baiyungu and Thalanyji people)	Raised in context of general Scarborough Project activities	Value: Cultural obligation to care for the environmental values of sea country Sea country extends "*out to the vast islands off the coast of the Pilbara, including the Monte Bello Islands, Barrow Island, and the Mackerel Islands*"	Possible (unspecified) No	Possible (unspecified) Possible (unspecified)
Nganhurra Thanardi Garrbu Aboriginal Corporation representing Baiyungu and Thalanyji people	Raised in context of general Scarborough Project activities	Interest: Whales - query regarding noise impacts, monitoring and operational responses to whale sightings	Possible (whales)	Possible (whales)
	Raised in context of decommissioning activities	Interest: Whale sharks – query regarding activity timing	Possible (whale sharks)	Possible (whale sharks)
		Interest: Marine parks – query regarding risks from activity in relation to decommissioning	No	Possible
Robe River Kuruma Aboriginal Corporation (RRKAC)	Raised in context of general Scarborough Project activities	Feature: Submerged heritage	Possible	Possible
Malgana Aboriginal Corporation	Raised in context of general Scarborough Project activities	Interest: Shark Bay environment is unique and has the largest living organism in the world	No	No
		Feature: Stromatolites Interest: Shark Bay contains stromatolites and microbial mats which are amongst the oldest living in the world.	No (based on defined location)	No (based on defined location)
		Interest: Seagrass For Shark Bay Malgana Aboriginal Corporation stated that they had observed a nearly 25% loss of seagrass from a hypersaline discharge into the bay	No (based on defined location)	No (based on defined location)

First Nation Group/ Individuals	Consultation context	Description of Value/Interest	Potential for overlap	
			Operational Area	***EMBA***
Yinggarda Aboriginal Corporation representing Yinggarda People.	Raised in context of Scarborough Project activities.	Interest: Whales – query with regard to potential impacts to whale migration patterns and impacts from vessel collision	Possible	Possible
		Value: Shark Bay Mullet – important resource	No	No
		Interest: Dugong – raised in context of Shark Bay	No (geographically limited)	No (geographically limited)
		Interest: Seagrass being food source for Dugong	Possible (seagrass)	Possible (seagrass)

3.4.4 Maritime Cultural Heritage Sites

A search of the Australian National Shipwreck Database (DAWE, 2021c), which records all known Maritime Cultural Heritage (shipwrecks, aircraft, relics and other underwater cultural heritage) in Australian waters, indicated that there are no Underwater Cultural Heritage sites within the Operational Area (see **Section 3.4.3** for submerged indigenous heritage sites). Four underwater heritage sites were identified within 50 km of the Operational Area.

3.4.5 World, National and Commonwealth Heritage Listed Places

One World, National or Commonwealth heritage listed place within the Operational Area is the Dampier Archipelago (including Burrup Peninsula), classified as an Indigenous class feature on the National Heritage. The Murujuga Cultural Landscape, which has no boundary yet defined but also relates to the Indigenous heritage values of Murujuga, was included on Australia's World Heritage Tentative List in 2020. One World, National or Commonwealth heritage listed place occurs within the EMBA, the Barrow Island and Montebello-Barrow Islands Marine Conservation Reserves.

3.4.6 State Heritage Listed Places/Items

The Dampier Archipelago (including Burrup Peninsula) is also listed as a heritage place on the City of Karratha Municipal Inventory. The next closest place is Sam's Island seven kilometres to the south-west of the shore crossing site.

3.5 Socio-Economic Environment

3.5.1 Fisheries – Commercial

A number of Commonwealth and State fisheries designated management areas overlap the Operational Area, however only the following WA State fisheries have the potential to interact with the Operational Area

- Western Australian Mackerel Managed Fishery (near surface trolling, jig)
- Pilbara Crab Managed Fishery (trap)
- Nickol Bay Prawn Managed Fishery (trawl)
- Marine Aquarium Fish Managed Fishery (dive based)
- Specimen Shell Managed Fishery (hand collected)
- Pilbara Line Managed Fishery (lines).

3.5.2 Fisheries – Traditional

The Indigenous communities who are traditionally from the Burrup Peninsula are understood to have strong connections and uses for the sea, which includes the coastal areas adjacent to the Operational Area.

The Indigenous community continue to use the marine environment for a diverse range of traditional fishing methods, including hunting (dugongs, turtles, egg collecting (turtles, seabirds), capturing fish (spearing, reef trapping, herding, line fishing, collecting in stone fish traps, poisoning), and gathering shellfish and other marine sources.

3.5.3 Tourism and Recreational Fishing

Recreational fishing is expected to occur throughout the Operational Area and EMBA. The Dampier Archipelago and Montebello Islands are particularly popular for marine nature-based tourist

activities. Tourism in the region typically peaks in winter when significant numbers of metropolitan and interstate tourists travel through the area and visit the Pilbara. Licenced fishing tours in the region are also a popular tourist attraction.

3.5.4 Industrial Development and Shipping

The Operational Area is located within the Pilbara region, with the state waters component in the Port of Dampier limits, managed by the Pilbara Port Authority (PPA). Dampier Port is a major industrial port in the northwest of Western Australia. The coastal waters of the region support significant commercial shipping activity, mostly associated with mining and oil and gas.

The Operational Area abuts the Burrup Peninsula, which is an area of established oil and gas operations including the Karratha Gas Plant (operated by Woodside), King Bay Supply Base and Dampier Port. Subsea infrastructure in the area includes the Pluto and NWS trunklines.

3.5.5 Defence

There are designated defence practice areas in the offshore marine waters off Ningaloo and North West Cape, beyond the Operational Area. A Royal Australian Air Force base at Learmonth, on North West Cape, is about 330 km from the Operational Area.

3.5.6 Oil and Gas

There are a number of petroleum titles held by various title holders within the EMBA. The pipeline route crosses the Woodside channel which contains pipelines associated with existing oil and gas infrastructure. Subsea infrastructure in the area includes oil and gas trunklines including Woodside's Pluto and NWS (1TL and 2TL) trunklines. The onshore Karratha Gas Plant and Pluto LNG are located adjacent to the shore crossing site. The trunkline follows the route of the existing Pluto trunkline, with a separation distance of approximately 80 m.

3.6 Values and Sensitivities

The environment of the NWMR contains high value or sensitive environmental assets (such as habitat and species) including offshore waters and coastal waters and habitats.

Many sensitive receptor locations are protected as part of Commonwealth and State managed areas and have been allocated conservation objectives (International Union for Conservation of Nature (IUCN) Protected Area Category) based on the Australian IUCN reserve management principles in Schedule 8 of the EPBC Regulations 2000. **Table 3-9** summarises the established and proposed Marine Protected Areas (MPAs) and other sensitive areas overlapping the EMBA.

Table 3-9: Summary of established and proposed protected places and other sensitive areas overlapping the EMBA (within 100 km of the Operational Area).

	Distance from Operational Area to protected place or sensitive area (km)	IUCN category* or relevant park zone overlapping the Operational Area and/or EMBA
Australian Marine Parks (AMPs)		
NWMR		
Dampier AMP	36	Multiple Use Zone (IUCN VI)
	27	National Park Zone (IUCN II)
	13	Habitat Protection Zone (IUCN IV)
Montebello AMP	73	Multiple Use Zone (IUCN VI)
State Marine Parks and Nature Reserves		
Fish Habitat Protection Areas		
None overlapping the Operational Area or EMBA	N/A	N/A
National Parks		
Murujuga National Park	2	II
Nature Reserves		
Dolphin Island	7	Ia
Eaglehawk and Delambre Islands	30	Ia
5(1)(h) reserves		
West Lewis Island	8	II
East Lewis Island	6	II
Pt Malus Island	8	II
Rosemary Island	18	V
Cultural heritage areas		
National Heritage Places		
Dampier Archipelago (including Burrup Peninsula)	0	N/A

**Conservation objectives for IUCN categories include:*
Ia: Strict Nature Reserve
Ib: Wilderness Area
II: national Park
III: Natural Monument or Feature
IV: Habitat/Species Management Area
V: Protected Landscape
VI: Protected area with sustainable use of natural resources – allow human use but prohibits large scale development.

4. CONSULTATION

Woodside consults relevant authorities and other relevant interested persons and organisations in the course of developing an EP in accordance with regulation 17(1)(b) of the Petroleum (Submerged Lands) (Environment) Regulations 2012 (WA) (the Environment Regulations).

The consultation process is designed to provide information to enable relevant authorities, other relevant interested persons and organisations to provide feedback for Woodside to consider in developing its EP and to help build ongoing positive relationships. Woodside assesses feedback received during consultation to assist Woodside to identify appropriate measures in response to the feedback so that the activity may be carried out in a manner in which the environmental impacts and risks of the activity will be reduced to as low as reasonably practicable (ALARP) and will be of an acceptable level.

The purpose of consultation is to enable Woodside to better understand how others, with an objective stake in the environment where it proposes to undertake the activity, perceive the potential environmental impacts and risks, and to provide those persons and organisations with an opportunity to provide feedback. This process provides the opportunity to acquire information that may improve the overall environmental outcome or refine or change the control measures Woodside proposes to address those risks and impacts. This information also provides a basis for DEMIRS' considerations of the control measures, if any, that Woodside proposes to take or has taken to lessen or avoid the effect of its proposed activity on the environment. This is the intended outcome of consultation.

Woodside notes that consultation is voluntary for relevant authorities and other relevant interested persons and organisations, and does not carry with it any obligation for Woodside to seek or to reach agreement with the person or organisation being consulted. Woodside understands that, in community consultation, there may be persons within a group who did not participate for various reasons and the absence of their participation does not invalidate the process, especially when reasonable efforts were made to consult with them.

4.1 Identification of Relevant Authorities and Other Relevant Interested Persons and Organisations for Consultation

In developing its methodology to identify relevant persons to consult with on its proposed petroleum activity, Woodside assesses relevance based on overlap with the planned activities of the PAP. (see **Section 2**). In this instance, the risk of an unplanned hydrocarbon release associated with the activity and the potential impact that it may have on the environment was considered in consultation. Woodside defines the broadest extent of the unplanned activities as the environment that may be affected (EMBA). The EMBA for this PAP is used to inform consultation with government departments or agencies based on their potential involvement in a spill / incident response or with a regulatory or decision-making role in response planning.

Woodside's methodology for identifying relevant authorities and other relevant interested persons and organisations considers the following, but is not limited to:

- The defined responsibilities of the departments and agencies to which the activities in the Operational Area to be carried out under the EP may be relevant.
- The defined responsibilities of the departments and agencies and other users with regulatory or decision-making roles in response for unplanned events.
- Relevance based on overlap with its planned activities within the Operational Area.

A list of relevant authorities and other relevant interested persons and organisations, together with persons Woodside chose to contact (**see Section 4.3**), is provided in **Table 4-1.**

4.2 Assessment of Additional Persons

The methodology also allows for additional persons and organisations to be identified during the course of developing the EP. Additional persons are persons and organisations identified following Woodside's initial assessment and consultation.

4.3 Persons or Organisations Woodside chooses to Contact

In addition to consultation undertaken with relevant persons in accordance with Regulation 17(1)(b), Woodside may also, at its discretion, choose to seek feedback, advice or provide information to authorities, persons or organisations it has assessed as not being a relevant authority or other relevant interested person or organisation.

4.4 Ongoing Consultation

As per Woodside's ongoing consultation approach, feedback and comments received continue to be assessed and responded to, as appropriate, through the life of an EP, including during EP assessment and throughout the duration of the approved EP, in accordance with the intended outcome of consultation (as set out above).

4.5 Consultation for this EP

- Woodside advertised consultation for this EP in national, state and local newspapers, and ran a social media campaign.
- A Consultation Information Sheet was provided to persons and organisations being consulted which included details such as an activity overview, maps, a summary of key risks and/or impacts and management measures. The Consultation Information Sheet has been available on Woodside's website since the commencement of the consultation period on 20 March 2024.
- Where appropriate, Woodside conducted phone calls, meetings and community information sessions with persons and organisations being consulted and sent targeted follow-up emails.
- Woodside considered relevant responses of persons and organisations being consulted.
- Woodside hosted community liaison group information sessions, including the Karratha Community Liaison Group quarterly meeting and the Woodside Heritage quarterly meeting.

Table 4-1 Relevant Authorities and Other Relevant Interested Persons or Organisations, and Persons Woodside Chose to Contact for the Proposed Activity

Authority, Person or Organisation	Summary of responsibilities
Commonwealth and WA State Government Departments or Agencies – Marine	
Australian Border Force (ABF)	Responsible for coordinating maritime security
Australian Communications and Media Authority (ACMA)	Regulator for communications and media
Australian Fisheries Management Authority (AFMA)	Responsible for managing Commonwealth fisheries
Australian Hydrographic Office (AHO)	Responsible for maritime safety and Notices to Mariners
Australian Maritime Safety Authority (AMSA) – Marine Safety	Statutory agency for vessel safety and navigation
Australian Maritime Safety Authority (AMSA) – Marine Pollution	Legislated responsibility for oil pollution response in Commonwealth waters. Consulted on the basis of unplanned events.
Department of Agriculture, Fisheries and Forestry (DAFF) – Fisheries	Responsible for implementing Commonwealth policies and programs to support agriculture, fishery, food and forestry industries
Department of Primary Industries and Regional Development (DPIRD)	Responsible for managing State fisheries
Department of Transport (DoT)	Legislated responsibility for oil pollution response in State waters. Consulted on the basis of planned activities and unplanned events.
Pilbara Ports Authority	Responsible for the operation of the Port of Dampier. Consulted on the basis of planned activities and unplanned events.
Commonwealth and WA State Government Departments or Agencies – Environment	
Department of Agriculture, Fisheries and Forestry (DAFF) – Biosecurity (marine pests, vessels, aircraft and personnel)	DAFF administers, implements and enforces the Biosecurity Act 2015. The Department requests to be consulted where an activity has the potential to transfer marine pests.

Authority, Person or Organisation	Summary of responsibilities
	DAFF also has inspection and reporting requirements to ensure that all conveyances (vessels, installations and aircraft) arriving in Australian territory comply with international health regulations and that biosecurity risk is managed. The Department requests to be consulted where an activity involves the movement of aircraft or vessels between Australia and offshore petroleum activities either inside or outside Australian territory.
Department of Climate Change, Energy, the Environment and Water (DCCEEW)	Responsible for implementing Commonwealth policies and programs to support climate change, sustainable energy use, water resources, the environment and our heritage. Administers the *Underwater Cultural Heritage Act 2018 in collaboration with the States, Northern Territory and Norfolk Island,* which is responsible for the protection of shipwrecks, sunken aircraft and other types of underwater heritage and their associated artefacts in Commonwealth waters.
Director of National Parks (DNP)	Responsible for the management of Commonwealth parks and conservation zones. Whilst no field activities are planned that would trigger DNP's responsibilities, Woodside has chosen to provide information on arrangements for unplanned events, such as an oil spill, which have potential to impact the values within a Commonwealth marine park.
Department of Biodiversity, Conservation and Attractions (DBCA)	Responsible for managing WA's parks, forests and reserves to achieve wildlife conservation and provide sustainable recreation and tourism opportunities.
Commonwealth and State Government Departments or Agencies – Industry	
Department of Industry, Science and Resources (DISR)	Department of relevant Commonwealth Minister
Department of Mines, Energy, Industry Regulation and Safety (DEMIRS)	Department of relevant State Minister
Commonwealth Commercial fisheries and representative bodies	
Southern Bluefin Tuna Fishery	Commonwealth commercial fishery
Western Skipjack Fishery	Commonwealth commercial fishery
Western Tuna and Billfish Fishery	Commonwealth commercial fishery
Commonwealth Fisheries Association (CFA)	Represents the interests of commercial fishers with licences in Commonwealth waters

Authority, Person or Organisation	Summary of responsibilities
Australian Southern Bluefin Tuna Industry Association (ASBTIA)	Represents the interests of the Southern Bluefin Tuna Fishery and Western Skipjack Fishery
Tuna Australia	Represents the interests of the Western Tuna and Billfish Fishery
Pearl Producers Association	Peak representative organisation of The Australian South Sea Pearling Industry, with members in Western Australia and the Northern Territory
State Commercial fisheries and representative bodies	
Marine Aquarium Managed Fishery	State commercial fishery
Mackerel Managed Fishery (Area 2)	State commercial fishery
Pilbara Crab Managed Fishery	State commercial fishery
Specimen Shell Managed Fishery	State commercial fishery
Onslow Prawn Managed Fishery	State commercial fishery
Western Australian Sea Cucumber Fishery	State commercial fishery
Nickol Bay Prawn Managed Fishery	State commercial fishery
Pilbara Fish Trawl (Interim) Fishery	State commercial fishery
Pilbara Trap Managed Fishery	State commercial fishery
Pilbara Line Fishery (Condition)	State commercial fishery
Western Australian Fishing Industry Council (WAFIC)	Represents the interests of commercial fishers with licences in State waters.

Authority, Person or Organisation	Summary of responsibilities
Recreational marine users and representative bodies	
Pilbara/Kimberley Recreational Marine Users	Pilbara/Kimberley-based dive, tourism and charter operators
Recfishwest	Represents the interests of recreational fishers in WA
Marine Tourism WA	Represents the interests of marine tourism in WA
WA Game Fishing Association	Represents the interests of game fishers in WA
Peak Industry Representative bodies	
Australian Energy Producers (AEP)	Represents the interests of oil and gas explorers and producers in Australia
Traditional Custodians and nominated representative corporations	
Murujuga Aboriginal Corporation (MAC)	Representative Aboriginal Corporation.
Yindjibarndi Aboriginal Corporation RNTBC	Representative Aboriginal Corporation
Ngarluma Aboriginal Corporation RNTBC (NAC)	Representative Aboriginal Corporation
Wirrawandi Aboriginal Corporation (WAC)	Representative Aboriginal Corporation
Robe River Kuruma Aboriginal Corporation (RRKAC)	Representative Aboriginal Corporation
Nganhurra Thanardi Garrbu Aboriginal Corporation (NTGAC)	Representative Aboriginal Corporation
Buurabalayji Thalanyji Aboriginal Corporation (BTAC)	Representative Aboriginal Corporation

Authority, Person or Organisation	Summary of responsibilities
Yinggarda Aboriginal Corporation (YAC)	Representative Aboriginal Corporation
Malgana Aboriginal Corporation	Representative Aboriginal Corporation
Kariyarra Aboriginal Corporation	Representative Aboriginal Corporation
Native Title Representative Bodies	
Yamatji Marlpa Aboriginal Corporation (YMAC)	Native Title Representative Body
Self-identified First Nations Groups	
Ngarluma Yindjibarndi Foundation Ltd (NYFL)	Representative Aboriginal Corporation
Local government and community representative groups or organisations	
City of Karratha	Local government governed by the Local Government Act 1995 representing the suburbs and localities of Baynton, Baynton West, Bulgarra, Cossack, Dampier, Gap Ridge, Karratha, Karratha Industrial Estate, Jingarri, Madigan, Millars Well, Nickol, Pegs Creek, Point Samson, Roebourne, Whim Creek and Wickham.
Karratha Community Liaison Group	The Karratha CLG is the recognised community group that represents the interests of a range of local government, industry and community organisations in relation to oil and gas matters in the Pilbara region.
Karratha and Districts Chamber of Commerce and Industry	Independent not-for-profit organisation responsible for promoting the interests of its members in the business community in the town of Karratha and surrounding areas.
Other non-government groups or organisations	
Australian Conservation Foundation (ACF)	Non-government organisation
Australian Marine Conservation Society (AMCS)	Non-government organisation

Conservation Council of Western Australia (CCWA)	Non-government organisation
Greenpeace Australia Pacific (GAP)	Non-government organisation
350 Australia (350A)	Non-government organisation
Australasian Centre for Corporate Responsibility (ACCR)	Non-government organisation
Doctors for the Environment Australia (DEA)	Non-government organisation
Extinction Rebellion WA (XRWA)	Non-government organisation
Friends of Australian Rock Art. Inc (FARA) and [name redacted]	Non-government organisation
International Fund for Animal Welfare (IFAW)	Non-government organisation
Lock The Gate Alliance (LTGA)	Non-government organisation
Market Forces	Non-government organisation
Say No to Scarborough Gas (SNTSG)	Non-government organisation
Sea Shepherd Australia (SSA)	Non-government organisation
The Wilderness Society (TWS)	Non-government organisation
World Wildlife Fund (WWF) Australia	Non-government organisation
Research institutes and local conservation groups or organisations	

University of Western Australia (UWA)	Research institute
Western Australian Marine Science Institution (WAMSI)	Research institute
Commonwealth Scientific and Industrial Research Organisation (CSIRO)	Research institute
Australian Institute of Marine Science (AIMS)	Research institute
Edith Cowan University (ECU)	Research institute
Curtin University (Curtin)	Research institute
Murdoch University	Research institute
Other	
Save Our Songlines (SOS)	Representatives of Non-Government Organisation Save Our Songlines

5. ENVIRONMENTAL IMPACT AND RISK ASSESSMENT SUMMARY

Woodside undertook an environmental risk and impact assessment to understand the potential environmental impacts associated with the Petroleum Activities Program, and used Woodside standards and methods so that they are reduced to As Low As Reasonably Practicable (ALARP) and will be of an acceptable level. Control measures described below will be implemented so that risks and impacts are reduced to ALARP and an acceptable level.

Table 5-1 summarises the environmental impact assessment and relevant control measures for risks deemed credible to the Petroleum Activities Program.

Cumulative Impacts

Woodside has assessed the cumulative impacts of the Petroleum Activities Program in relation to other relevant petroleum activities which could realistically result in overlapping temporal and spatial extents. It is noted that other petroleum activities overlapping the Operational Area are operated by Woodside or Woodside Joint Ventures (Pluto Trunkline) and will be managed under a SIMOPS plan.

Due to the Operational Area occurring wholly inside the Pilbara Ports Authority (PPA) Port of Dampier, cumulative impact potential is managed through adherence to the Port of Dampier Handbook. The addition of one or two vessels carrying out activities as per the PAP is unlikely to contribute significantly to cumulative impacts such as noise and light due to the temporary, transient and short-term nature of potential IMMR activities.

Table 5-1: Environmental impact analysis summary of activities.

Aspect	Source of Environmental Risk	Key Potential Environmental Impact	Summary of Control Measures
Planned Activities in State Waters (Routine and Non-routine)			
Physical Presence – Disturbance to Marine Users	• Presence of subsea infrastructure • Movement and physical presence of support vessels.	Displacement of third-party vessels by the establishment of temporary exclusion zones; navigational hazard.	• Vessels complying with Marine Orders for safe vessel operations: o Marine Order 21 (Safety of navigation and emergency procedures) o Marine Order 27 (Safety of navigation and radio equipment) o Marine Order 30 (Prevention of Collisions). • Designation of applicable temporary exclusion zones around relevant vessels, where applicable, which are communicated to marine users. • Compliance with relevant requirement in the Port of Dampier Handbook. • Activity notifications to relevant parties (where vessels will be in Operational Area > 3 weeks). • Implement a risk management approach in determining inspection, monitoring and maintenance requirements that are undertaken to identify potential risk areas or anomalies which may require remediation.
Physical Presence: Disturbance to Seabed	• Presence of subsea infrastructure modifying marine habitat • Subsea operations and IMMR activities resulting in seabed disturbance	Minor seabed disturbance resulting from IMMR activities, including (but not limited to): • Localised sediment suspension • Localised modification of benthic habitat • Deployment of frames/baskets and transponders to the seabed • Use of Dynamic Positioning (DP)	• No planned anchoring within the Operational Area unless emergency or contingent scenario • Supplementary impact assessment undertaken for all IMMR activities within 500 m of identified sensitive benthic habitat, so that there is no physical disturbance to known nearshore coral sites that overlap with the Operational Area and Development Envelope. • No seabed disturbance outside the Operational Area • Implement an Unexpected Finds Procedure in the event of discovery of what appears to be Underwater Cultural Heritage.

Aspect	Source of Environmental Risk	Key Potential Environmental Impact	Summary of Control Measures
			• Implement a risk management approach in determining inspection, monitoring and maintenance requirements that are undertaken to identify potential risk areas or anomalies which may require remediation.

Routine Acoustic Emissions: Generation of Noise during Routine Operations and IMMR activities	• Trunkline operation acoustics
	• Vessel operations (e.g. DP)
	• Subsea IMMR activities
	  ○ Geophysical sources (MBES, SSS)
	  ○ Positioning equipment (transponders)
		Direct physical effects on hearing and other organs of marine fauna (temporary or permanent); masking or interfering with other biologically important sounds such as vocal communication, echolocation, and signals and sounds made by predator or prey; causing disturbance leading to behavioural changes or displacement from BIAs.	• Compliance with EPBC Regulations 2000 Part 8.1: Interacting with cetaceans (vessels)
			• Speed limits and approach limits in place for whales (as per Ministerial Condition under EPBC Referral 2018/8362)
			• Vessels will not travel greater than 6 knots within 250 m of a whale shark and not allow the vessel to approach closer than 30 m of a whale shark.

Routine and Non-routine Discharges: Discharges of Chemicals During Subsea Activities	• Discharge of chemicals during subsea IMMR activities	Localised reduction in water and sediment quality; sub lethal effects to marine organisms.	• Woodside's Chemical Selection and Assessment Environment Guideline will be applied which ensures that suitable chemicals are selected to reduce the environmental impacts. Including below requirements that chemicals will be selected preferentially to:
			  ○ not be carcinogenic, reproductive toxicants, mutagens or endocrine disruptors;
			  ○ not contain BTEXN chemicals (except as trace/contaminants);
			  ○ Have bioaccumulation data and be products with a HQ of Gold (OCNS Group E);
			  ○ Readily biodegrade (>60% in 28d).
			• Implement a risk management approach in determining IMMR activities to be undertaken and identify potential risk areas or anomalies which may require remediation.

Aspect	Source of Environmental Risk	Key Potential Environmental Impact	Summary of Control Measures
Routine and Non-Routine Discharges: Discharges from Vessels	• Routine and non-routine discharge to the marine environment of: ○ Greywater ○ Deck drainage and bilge water ○ Cooling water and brine	Temporary and highly localised changes to marine water quality.	• Vessels comply with relevant Marine Orders including: ○ Marine Order 95 – pollution prevention – garbage (as appropriate to vessel class) ○ Marine Order 96 – pollution prevention – sewerage (as appropriate to vessel class) ○ Marine Order 91 – oil (ass appropriate to vessel class) • Compliance with relevant vessel discharge requirements in the Port of Dampier Handbook
Routine and Non-Routine Atmospheric and GHG Emissions: Fuel Combustion	• Fuel use/Internal combustion engines and incinerators on vessels	Decline in local air quality, including odour and aesthetic value; association with global concentrations of GHG emissions.	• Vessel compliance with Marine Order 97 (Marine Pollution Prevention – Air Pollution) • National Greenhouse and Energy Reporting Scheme (NGERS) reporting and National Pollutant Inventory (NPI) reporting • Compliance with relevant vessel discharge requirements in the Port of Dampier Handbook
Routine Vessel Light Emissions	• Light emissions from support vessels	Increased light emissions at night can affect fauna behaviour and orientation. Artificial lighting has the potential to create a constant level of light at night that can behaviourally affect marine fauna by overriding natural levels and cycles. For species such as marine turtles and birds the artificial light may override natural cues, leading to disorientation.	• Implementation of a Seabird Management Plan • Best practice lighting design as described in the National Light Pollution Guidelines for Wildlife
Unplanned Events in State Waters (Accidents/Incidents)			
Unplanned Hydrocarbon Release: Hydrocarbon Release Cause by Marine Vessel Collision/Grounding	• Loss of hydrocarbons to marine environment due to vessel collision or grounding	Potential significant impacts to intertidal and subtidal marine environment such as physical impacts (adverse health impacts, mortality) to marine fauna and avifauna; oiling of breeding and nesting BIAs affecting wider population viability; impacts and long-term recovery of marine primary producers; localised changes to community structure of shoreline habitats; changes to marine water quality.	• Vessel compliance with relevant Marine Orders including: ○ Marine Order 21 – safety and emergency arrangements ○ Marine order 27 – safety of navigation and radio equipment ○ Marine Order 30 – prevention of collisions

Aspect	Source of Environmental Risk	Key Potential Environmental Impact	Summary of Control Measures
			• Development, testing, and implementation of the OSCP • Notification to relevant authorities prior to activity ((where vessels will be in Operational Area > 3 weeks) • Designation of temporary exclusion zones • Develop SIMOPS plan if more than one Woodside contracted vessel is operating at any time • Apply Woodside Marine Offshore Vessel Assurance Procedure for emergency preparedness • Spill response kits positioned in high risk areas
Unplanned Hydrocarbon Release: Trunkline Loss of Containment (Dry Gas)	• Loss of hydrocarbons (dry gas) to marine environment from loss of trunkline containment as a result of external or internal damage/failure.	Minor, localised change in water and air quality.	• Maintenance of Trunkline integrity to avoid significant loss of containment • Maintenance of Safety Instrumented System to detect and respond to conditions and/or responses that put equipment in safe condition • Maintain availability of external and internal communication systems to facilitate response to accidents and emergencies. • Maintenance of environmental incident response equipment • Compliance with DEMIRS Work Health and Safety (Petroleum and Geothermal Energy Operations) Regulations 2022: Accepted Safety Case for the Trunkline • Implementation of management systems to maintain operational procedures and emergency response
Unplanned Discharges: Unplanned release of chemicals and hydrocarbons from vessel activities during storage and use	• Accidental discharge to the ocean of other hydrocarbons/chemicals from project vessel deck activities and equipment (e.g. ROV), including subsea spills	Localised decreased water quality; physical impacts to marine fauna; temporary changes in behaviour.	• Vessel compliance with relevant Marine Orders including: • Marine Order 91 – marine pollution prevention - oil • Chemicals will be stored safely to prevent the release to the marine environment.

Aspect	Source of Environmental Risk	Key Potential Environmental Impact	Summary of Control Measures
			• Woodside's Chemical Selection and Assessment Environment Guideline will be applied which ensures that suitable chemicals are selected to reduce the environmental impacts. Including below requirements that chemicals will be selected preferentially to: o not be carcinogenic, reproductive toxicants, mutagens or endocrine disruptors; o not contain BTEXN chemicals (except as trace/contaminants); o Have bioaccumulation data and be products with a HQ of Gold (OCNS Group E); o Readily biodegrade (>60% in 28d). • Spill response kits onboard vessels
Unplanned Discharges: Loss of Hazardous and Non-hazardous Solid Wastes	• Accidental loss of solid non hazardous or hazardous wastes to the marine environment	Localised contamination of the marine environment including changes to marine water quality; physical impacts to marine fauna; temporary changes in behaviour.	• Vessel compliance with relevant Marine Orders including: o Marine Order 95 – marine pollution prevention – garbage (as appropriate to vessel class) o Marine Order 94 – packaged harmful substances (as appropriate to vessel class) • Implementation of waste management procedures • Recovery of dropped objects where safe and practicable to do so
Physical Presence – Unplanned Seabed Disturbance	• Dropped objects • Activities outside designated project footprint as a result of operator error, adverse weather conditions or sea states • Vessel grounding resulting in seabed disturbance	Localised physical impacts to benthic communities; changes to water and sediment quality; changes to visual amenity of impacted area.	• Vessels equipped with depth sounder • Implementation of work procedures for lifts, bulk transfers and cargo loading. • No seabed disturbance outside the Operational Area • Recovery of dropped objects where safe and practicable to do so

Aspect	Source of Environmental Risk	Key Potential Environmental Impact	Summary of Control Measures
Physical Presence: Interaction with Marine Fauna	• Accidental collision between vessels and protected marine fauna	Physical injury or mortality, or changes in behaviour of marine fauna.	• Compliance with EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with cetaceans • Speed limits and approach limits in place for whales (as per Ministerial Condition under EPBC Referral 2018/8362) • Vessels will not travel greater than six knots within 250 m of a whale shark and not allow the vessel to approach closer than 30 m of a whale shark.
Physical Presence: Introduction of Invasive Marine Species (IMS)	• Introduction and establishment of IMS to the Operational Area through support vessel biofouling and ballast water exchange.	Potential introduction and establishment of invasive marine species resulting in alteration of the localised environment	• Compliance with Australian Ballast Water Management Requirements. • Internationally sourced vessels to manage biosecurity risk associated with biofouling as specified in the Australian Biofouling Management Requirements • Implementation of Woodside's Invasive Marine Species risk assessment process which identifies potential risks and additional controls to minimise the likelihood of introducing IMS.
Non-routine Discharges: Contingent Trunkline Dewatering (FCGT)	• Non-routine discharge to the marine environment from contingent dewatering	Toxicological effects from discharged chemicals, ranging from the inhibition of key biological processes (e.g., reproduction) to mortality; highly localised change in water quality.	• Woodside's Chemical Selection and Assessment Environment Guideline will be applied which ensures that suitable chemicals are selected to reduce the environmental impacts. Including below requirements that chemicals will be selected preferentially to: o not be carcinogenic, reproductive toxicants, mutagens or endocrine disruptors; o not contain BTEXN chemicals (except as trace/contaminants); o Have bioaccumulation data and be products with a HQ of Gold (OCNS Group E); o Readily biodegrade (>60% in 28d). • All chemicals used to treat water will be Hazard Quotient Colour Band 'Gold' (or OCNS Grouping E) with no substitution or product warnings

Aspect	Source of Environmental Risk	Key Potential Environmental Impact	Summary of Control Measures
			• Water treatment chemicals (if those selected vary to those assessed in the EP) will meet stipulated health criteria including not being carcinogenic, reproductive toxicants, mutagenic or endocrine disrupting. • Development and implementation of pipeline contingency dewatering procedures. • Notifications sent to PPA Harbour Master and PPA Environment Department, when required.
Cultural Features and Heritage Values Assessment	As described in the above sources of environmental risk.	As described above.	• Apply a 'living heritage' management approach. • Consideration of cultural values / new information through the life of the EP – Woodsides Management of Change and Management of Knowledge processes. • Inductions to relevant marine crew, prior to the individual commencing the activity. • New information from further archaeological or ethnographic studies relevant to MAC will be forwarded to MAC for their consideration. • Activities under the Petroleum Activities Program will be carried out in accordance with any protection declarations relevant to the Operational Area, under Sections 9,10,12 of the ATSIHP Act • Implement an Unexpected Finds Procedure in the event of discovery of what appears to be Underwater Cultural Heritage. • Speed limits and approach limits in place for whales (as per Ministerial Condition under EPBC Referral 2018/8362) • Implementation of the Scarborough Cultural Heritage Management Plan

6. IMPLEMENTATION STRATEGY

6.1 Systems, Practice and Procedures

Operational activities are planned and carried out in accordance with relevant legislation and standards, management measures (i.e., controls) identified in the EP and internal environment standards and procedures (**Section 5**).

Woodside Management System

The Woodside Management System (WMS) provides a structured framework of documentation to set common expectations governing how all employees and contractors at Woodside will work. Many of the standards presented in the EP are drawn from the WMS documentation, which comprises the following four elements:

- **Our Values and Policies**: Set the enterprise-wide direction for Woodside by governing our behaviours, actions, and business decisions and ensuring we meet our legal and other external obligations.
- **Expectations**: Set essential activities or deliverables required to achieve the objectives of the Key Business Activities and provide the basis for developing processes and procedures.
- **Processes and Procedures**: Processes identify the set of interrelated or interacting activities that transforms inputs into outputs, to systematically achieve a purpose or specific objective. Procedures specify what steps, by whom, and when required to carry out an activity or a process.
- **Guidelines**: Provide recommended practice and advice on how to perform the steps defined in Procedures, together with supporting information and associated tools. Guidelines provide advice on how activities or tasks may be performed, information that may be taken into consideration, or, how to use tools and systems.

Management of Change

Woodside's Change Management Procedure describes Woodside's requirements for change management at Woodside owned or controlled operations. Changes relevant to the EP will be managed in accordance with the Change Management Procedure and the Environment Regulations specifically Regulation 7 (2), 18 and 20.

In the event of a change to Woodside's nominated liaison person, or a change to the contact details for the titleholder or the nominated liaison person, Woodside will notify DEMIRS of the change in writing as soon as practicable.

6.2 Roles and Responsibilities

Key roles and responsibilities for Woodside and Contractor personnel in implementing, managing and reviewing the EP are described in **Table 6-1**.

Table 6-1: Roles and Responsibilities

Title (role)	Environmental Responsibilities
Office-based personnel	
Asset Manager	• Accountable for ensuring all necessary regulatory approvals are in place to operate approves (decides on) the content to be contained in the EP • Accountable for managing the asset throughout its operations in accordance with legislative/regulatory requirements (including this EP). • Responsible for continuous improvement of operations of the facility, including environmental performance • Decides on technical decisions where required based on assessed current level of risk • Accountable for incident notification, reporting and investigation in line with regulatory requirements, and EP requirements

Title (role)	Environmental Responsibilities
Subsea and Pipeline (IMMR) Activity Manager (or delegate/s)	• Monitor and manage the activity so it is undertaken as per the relevant standards and commitments in this EP. • Notify the Woodside Environment Adviser of scope changes in a timely manner. • Liaise with regulatory authorities as required. • Review this EP as necessary and manage change requests. • Ensure all relevant operations and vessel crew members complete an HSE induction. • Verify that contractors meet environmental related contractual obligations. • Confirm environmental incident reporting meets regulatory requirements (as outlined in this EP) and Woodside's Health, Safety and Environment Reporting and Investigation Procedure. • Monitor and close out corrective actions identified during environmental monitoring or audits
Woodside Environmental Adviser	• Verify relevant Environmental Approvals for the activities exist prior to commencing activity. • Track compliance with performance objectives and performance standards as per the requirements of this EP. • Prepare environmental component of relevant Induction Package. • Assist with the review, investigation and reporting of environmental incidents. • Ensure environmental monitoring and inspections/audits are undertaken as per the requirements of this EP. • Liaise with relevant regulatory authorities as required. • Assist in preparation of external regulatory reports required, in line with environmental approval requirements and Woodside incident reporting procedures. • Monitor and close out corrective actions (Campaign Action Register (CAR)) identified during environmental monitoring or audits. • Provide advice to relevant Woodside personnel and contractors to assist them to understand their environment responsibilities. • Liaise with contractors to ensure communication and understanding of environment requirements as outlined in this EP and in line with Woodside's values and management systems.
Woodside Corporate Affairs Adviser	• Prepare and implement the Stakeholder Consultation Plan for the Petroleum Activities Program. • Report on stakeholder consultation. • Ongoing stakeholder liaison as required.
Woodside Marine Assurance Superintendent	• Conducts relevant audit and inspection to confirm vessels comply with relevant Marine Orders and Woodside Marine Charters Instructions requirements to meet safety, navigation and emergency response requirements.
Woodside Corporate Incident Management Team Incident Commander (CIMT IC)	On receiving notification of an incident, the Woodside CIMT IC shall: • establish and take control of the CIMT and establish an appropriate command structure for the incident assess situation, identify risks and actions to minimise the risk • communicate impact, risk and progress to the Crisis Management Team and stakeholders • develop the incident action plan (IAP) including setting objectives for action • approve, implement and manage the IAP • communicate within and beyond the incident management structure • manage and review safety of responders • address the broader public safety considerations • conclude and review activities.

Title (role)	Environmental Responsibilities
Vessel-based personnel	
Vessel Master	• Ensure the vessel management system and procedures are implemented. • Ensure personnel commencing work on the vessel receive an induction that meets the relevant requirements specified in this EP. • Ensure personnel are competent to undertake the work they have been assigned. • Verify SOPEP drills are conducted as per the vessel's schedule. • Ensure the vessel Emergency Response Team (ERT) has been given sufficient training to implement the SOPEP. • Ensure environmental incidents or breaches of relevant performance objectives or performance standards detailed in this EP, are reported immediately to the Woodside Site Representative. • Ensure corrective actions for incidents or breaches are developed, communicated to the Woodside Site Representative, and tracked to close out in a timely manner. Close out of actions is communicated to the Woodside Site Representative.
Logistics Coordinators	• Ensure waste is managed on the relevant vessels and sent to shore as per the relevant Waste Management Plan.
Offshore Campaigns Woodside Site Representative	• Ensure relevant management measures in this EP are implemented on the vessels • Ensure vessel induction attendance is recorded. • Ensure periodic environmental inspections are completed • Ensure environmental incidents or breaches of EPOs, EPSs or MCs are reported in accordance with Woodside and regulatory requirements

6.3 Decommissioning

Decommissioning is a planned activity for the offshore oil and gas industry. Current best practice is for decommissioning to include:

- Preliminary design for decommissioning during the early development phase of projects (i.e Basis of Design (BOD) or Front End Engineering Design (FEED)), before environment approvals are in place
- Maintaining and removing property, equipment and infrastructure, such as a facility or a pipeline, and plugging wells associated with a petroleum activity
- Assessing and finalising decommissioning options and opportunities during the operational life of the facility leading up to cessation of production
- Full decommissioning and removal of all infrastructure, however exceptions to this may be considered on a case by case basis by the Minister and subject to further environment approvals
- Increasing the level of information about decommissioning in future revisions/plans as life of the asset progresses
- Selecting, developing and planning the selected decommissioning option
- Executing decommissioning plans; and
- Restoring the marine environment.

This assists with compliance with s104(2) of the Petroleum (Submerged Lands) Act 1982 and is consistent with guideline for Decommissioning of petroleum and geothermal energy property, equipment and infrastructure in Western Australian onshore areas and State coastal waters (DEMIRS 2023). The Guideline states that closure planning should start in the project feasibility stage (before project approvals) and continue through exploration, construction and operations".

6.3.1 Decommissioning in Operations

Asset specific decommissioning plans are generally developed prior to cessation of production. Planning includes redundant infrastructure as well as structures coming to the end of production and the identification of decommissioning critical systems to enable removal. Appropriate maintenance plans are developed and implemented to ensure decommissioning critical systems meet the requirements to facilitate removal.

6.3.2 Decommissioning Planning

Preliminary decommissioning planning generally commences in the early project phases (BOD and FEED) with plans being re-assessed and finalised during execution, prior to Cessation of Production (CoP) (**Figure 6-1**). The timeframe selected for decommissioning planning depends on the complexity of the infrastructure requiring decommissioning.

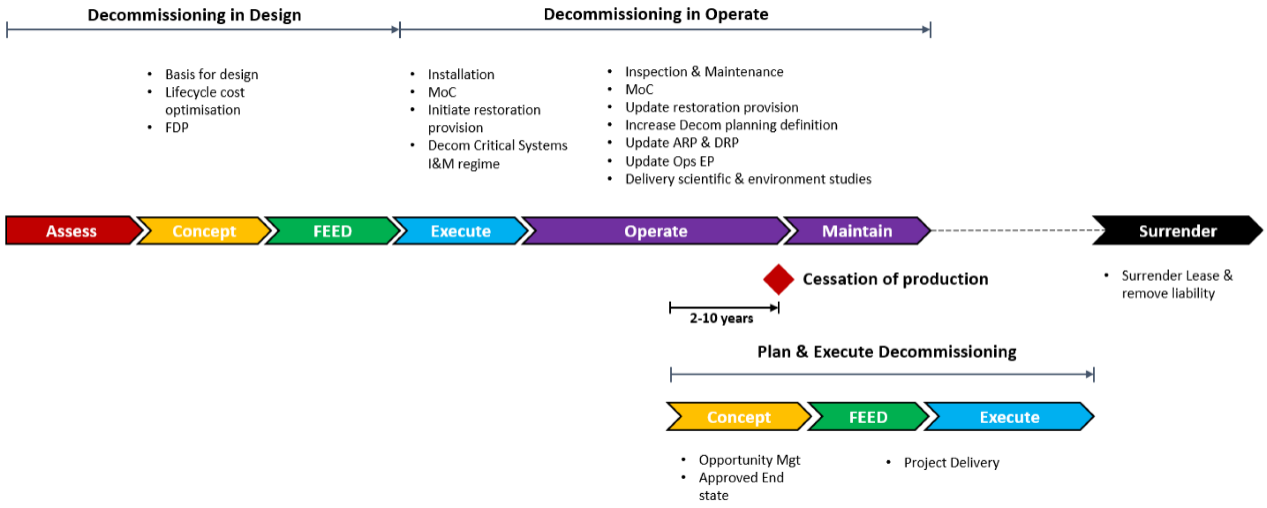

Figure 6-1: Woodside's process for decommissioning planning

6.4 Training and Competency

As part of its contracting process Woodside undertakes assessments of a proposed Contractor's environmental management system to determine the level of compliance with the standard AS/NZS ISO 14001. This assessment is undertaken for the Petroleum Activities Program as part of the pre-mobilisation process. The assessment determines whether there is a clearly defined organisational structure that clearly defines the roles and responsibilities for key positions. The assessment also assesses whether there is an up-to-date training matrix that defines corporate and site/activity-specific environmental training and competency requirements.

As a minimum, the below training is required:

- environmental awareness training during inductions is required for all personnel, detailing awareness and compliance with the Contractor's environmental policy and environmental management system
- Marine Fauna Observation Training must be completed prior to commencing work by vessel crew performing observations relevant to cetacean mitigation/adaptive management measures in this EP. For trained crew who have not conducted MFO training for greater than 12 months, refresher training is required prior to undertaking the role.

Inductions are provided to all relevant personnel (e.g. Contractors and Company representatives) before mobilising to or on arrival at the activity location. The induction covers the HSE requirements and environmental information specific to the activity location. Attendance records are maintained.

6.5 Monitoring and Management of Compliance

Monitoring is conducted during an activity to monitor compliance against the environmental performance objectives, environmental performance standards and measurement criteria which are developed based on the impacts, risks and associated controls described above. These are reviewed throughout the life of the EP to identify opportunities for improvement.

Any non-conformances with the environmental performance objectives and environmental performance standards in the EP are classified as environmental incidents. These are reported and managed in accordance with Woodside's Health, Safety and Environment Event Reporting and Investigation Procedure and the EP.

All emissions and discharges to the environment from vessels will be monitored to assess the environmental performance, as required in the EP.

Throughout this activity, Woodside will continuously identify new source-based risks and impacts through Monitoring and Auditing systems and tools.

6.5.1.1 Management of Cultural Heritage

In accordance with Condition 7.2 of Ministerial Statement No. 1172, the Scarborough Project will implement a Cultural Heritage Management Plan (CHMP) which will align with Woodside's Cultural Heritage Management Procedure and supplements the Pluto LNG Cultural Heritage Management Plan - Commissioning and Operations Phase and the Pluto Expansion Cultural Heritage Management Plan. The CHMP has been developed in consultation with MAC. The CHMP is published on Woodside's website at Scarborough Cultural Heritage Management Plan (woodside.com).

6.6 Reporting

To meet the environmental performance objectives and standards outlined in the EP, Woodside reports at a number of levels. Internal reporting includes:

- Daily progress reports and meetings

- Regular HSE meetings
- Performance reporting

External routine reporting also occurs, which includes documenting:

- Environmental performance review and reporting
- Incident reporting
- Quarterly emissions and discharges reporting (including greenhouse gas emissions)
- National Pollutant Inventory (NPI) reporting
- National Greenhouse and Energy Reporting (NGERS).

6.7 Emergency Preparedness and Response

Woodside has detailed Oil Pollution Emergency Arrangements and Hydrocarbon Spill Preparedness and Response Procedures. These are supported by various plans that detail the actions and resources available in the event of various emergency scenarios.

Vessels are required to have a Ship Oil Pollution Emergency Plan (SOPEP) in accordance with the requirements of the Australian Marine Orders. These plans outline responsibilities, specify procedures and identify resources available in a hydrocarbon or chemical spill from vessel activities.

The Scarborough Trunkline Operations (State Waters) First Strike Plan provides immediate actions required to commence a response if hydrocarbons are released to the marine environment and would be implemented in conjunction with the SOPEP and the Tactical Response Plans that have been developed for priority protection areas.

In the event of a major spill, the Department of Transport (DoT) as the administrator of the State Hazard Plan Maritime Environmental Emergencies provides support to Woodside through advice and access to equipment, people and liaison. The interface and responsibilities are described in the Oil Pollution Emergency Arrangements and the Scarborough Trunkline Operations (State Waters) Hydrocarbon Spill First Strike Plan.

In the event of a Level 2/3 spill, the role of Controlling Agency may be appointed to either DoT or the Pilbara Ports Authority (PPA) and will be determined by the Jurisdictional Authority (DoT) in consultation with the PPA. The Controlling Agency will be the agency deemed most capable of performing the role of Controlling Agency. The Controlling Agency will appoint an Incident Controller and form a separate Incident Management Team.

6.7.1 Emergency and Spill Response Drills and Exercises

Woodside's capability to respond to incidents will be tested periodically, in accordance with the Emergency and Crisis Management Procedure.

The overall objective of exercises is to test procedures, skills and the teamwork of the Emergency Response and Command Teams in their ability to respond to major accident / major environment events. After each exercise, the team holds a debriefing session, during which the exercise is reviewed. Lessons learned or areas for improvement are identified and incorporated into revised procedures, where appropriate.

6.7.2 Hydrocarbon Spill Testing of Arrangements

Woodside's arrangements for spill response are common across its Australian operating assets and activities so that the controls are consistent. The overall objective of testing these arrangements is to ensure that Woodside maintains an ability to respond to a hydrocarbon spill, specifically to:

- Relevant responders, contractors and key personnel understand and practise their assigned roles and responsibilities in hydrocarbon spill response.
- Test response arrangements and actions to validate response plans.
- Lessons learned are incorporated into Woodside's processes and procedures and improvements are made where required.

The hydrocarbon spill arrangements are tested against Woodside's regulatory commitments. Each arrangement has a support agency/company and an area to be tested (e.g. capability, equipment and personnel). Testing methods may include audits, drills, field exercises, functional workshops, assurance reporting, assurance monitoring and review of key external dependencies. Hydrocarbon spill arrangements will be tested over a 5-year rolling schedule.

6.7.3 Cyclone and Dangerous Weather Preparation

Tropical cyclones and other severe weather events are a potential risk to the safety and health of personnel and can potentially cause spills of hazardous materials into the environment from infrastructure and/or damaged vessels. If conducting activities in cyclone season, the vessel contractors must have a Cyclone Contingency Plan (CCP) in place outlining the processes and procedures that would be implemented during a cyclone event, which will be reviewed and accepted by Woodside.

The vessels will receive daily forecasts from the Bureau of Meteorology. If a cyclone (or severe weather event) is forecast, the path and its development will be plotted and monitored using the BoM data. If there is the potential for the cyclone (severe weather event) to affect the Petroleum Activities Program, the CCP will be actioned. If required, vessels can transit from the proposed track of the cyclone (severe weather event). Due to the nearshore location of the trunkline and flexible nature of IMMR activities, vessel deployments will take into consideration risk of cyclones.

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Appendix A

Threatened and migratory marine and terrestrial species identified by the EPBC Act Protected Matters Search Tool as potentially occurring within the Operational Area or EMBA

Species name	Common name	Threatened status under the Biodiversity Conservation Act	Threatened status under the EPBC Act	Migratory status	Potential for interaction	
					Operational Area	*EMBA*
Marine mammals						
Balaenoptera musculus	Blue whale	Endangered	Endangered	Migratory	✓	✓
Megaptera novaeangliae	Humpback whale	Conservation Dependent	N/A	Migratory	✓	✓
Balaenoptera edeni	Bryde's whale	Not listed	N/A	Migratory	✓	✓
Orcinus orca	Killer whale	Not listed	N/A	Migratory	✓	✓
Sousa sahulensis as *Sousa chinensis*	Australian humpback dolphin	Rare, Near threatened, and other species in need of monitoring	N/A	Migratory	✓	✓
Tursiops aduncus	Spotted bottlenose dolphin (Arafua/Timor sea populations)	Not listed	N/A	Migratory	✓	✓
Dugong dugon	Dugong	Other specially protected fauna	N/A	Migratory	✓	✓
Balaenoptera borealis	Sei whale	Endangered	Vulnerable	Migratory	N/A	✓
Balaenoptera physalus	Fin whale	Endangered	Vulnerable	Migratory	N/A	✓
Eubalaena australis	Southern right whale	Vulnerable	Endangered	Migratory	N/A	✓
Physeter macrocephalus	Sperm whale	Vulnerable	N/A	Migratory	N/A	✓
Orcaella heinsohni	Australian snubfin dolphin	Priority	N/A	Migratory	✓	✓
Fish						
Rhincodon typus	Whale shark	Other specially protected fauna	Vulnerable	Migratory	✓	✓
Carcharodon carcharias	White shark	Vulnerable	Vulnerable	Migratory	✓	✓
Pristis clavata	Dwarf sawfish	Vulnerable	Vulnerable	Migratory	✓	✓
Pristis zijsron	Green sawfish	Vulnerable	Vulnerable	Migratory	✓	✓

Species name	Common name	Threatened status under the Biodiversity Conservation Act	Threatened status under the EPBC Act	Migratory status	Potential for interaction	
					Operational Area	*EMBA*
Pristis pristis	Freshwater sawfish	Vulnerable	Vulnerable	Migratory	✓	✓
Carcharias taurus	Grey nurse shark	Vulnerable	Vulnerable	N/A	✓	✓
Carcharhinus longimanus	Oceanic whitetip shark	Not listed	N/A	Migratory	✓	✓
Anoxypristis cuspidata	Narrow sawfish	Not listed	N/A	Migratory	✓	✓
Manta alfredi	Reef manta ray	Not listed	N/A	Migratory	✓	✓
Manta birostris	Giant manta ray	Not listed	N/A	Migratory	✓	✓
Sphyrna lewini	Scalloped hammerhead	Not listed	Conservation Dependent	N/A	✓	✓
Thunnus maccoyii	Southern bluefin tuna	Not listed	Conservation Dependent	N/A	✓	✓
Isurus oxyrinchus	Shortfin mako	Not listed	N/A	Migratory	N/A	✓
Isurus paucus	Longfin mako	Not listed	N/A	Migratory	N/A	✓
Seabirds						
Macronectes giganteus	Southern Giant Petrel	Endangered	Endangered	Migratory	✓	✓
Anous stolidus	Common noddy	N/A	N/A	Migratory	✓	✓
Ardenna pacifica	Wedge-tailed shearwater	N/A	N/A	Migratory	✓	✓
Calonectris leucomelas	Streaked shearwater	N/A	N/A	Migratory	✓	✓
Fregata ariel	Lesser frigatebird	N/A	N/A	Migratory	✓	✓
Pandion haliaetus	Osprey	N/A	N/A	Migratory	N/A	✓
Onychoprion anaethetus	Bridled tern	N/A	N/A	Migratory	N/A	✓
Fregata minor	Great frigatebird	N/A	N/A	Migratory	N/A	✓
Sternula albifrons	Little tern	Not listed	N/A	Migratory	✓	✓
Sternula nereis	Australian fairy tern	Vulnerable	Vulnerable	N/A	✓	✓
Hydroprogne caspia	Caspian tern	N/A	N/A	Migratory	N/A	✓
Sterna dougallii	Roseate tern	N/A	N/A	Migratory	✓	✓
Phaethon lepturus	White-tailed tropicbird	N/A	N/A	Migratory	✓	✓
Phaethon rubricauda	Red-tailed tropic bird	N/A	Endangered	Migratory	N/A	✓

Species name	Common name	Threatened status under the Biodiversity Conservation Act	Threatened status under the EPBC Act	Migratory status	Potential for interaction	
					Operational Area	*EMBA*
Phaethon lepturus fulvus	Christmas Island White-tailed Tropicbird, Golden Bosunbird	N/A	Endangered	N/A	N/A	✓
Thalasseus bergii	Greater Crested Tern	N/A	N/A	Migratory	N/A	✓
Thalassarche carteri	Indian Yellow-nosed Albatross	N/A	Vulnerable	Migratory	N/A	✓
Apus pacificus	Fork-tailed Swift	N/A	N/A	Migratory	N/A	✓
Limosa lapponica menzbieri	Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit	N/A	Endangered	N/A	N/A	✓
Erythrotriorchis radiatus	Red Goshawk	N/A	Endangered	N/A	N/A	✓
Shorebirds						
Calidris ferruginea	Curlew sandpiper	Critically Endangered	Critically Endangered	Migratory	✓	✓
Numenius madagascariensis	Eastern curlew	Critically Endangered	Critically Endangered	Migratory	✓	✓
Calidris canutus	Red knot	Endangered	Vulnerable	Migratory	✓	✓
Actitis hypoleucos	Common sandpiper	N/A	N/A	Migratory	✓	✓
Calidris acuminata	Sharp-tailed sandpiper	N/A	Vulnerable	Migratory	✓	✓
Calidris melanotos	Pectoral sandpiper	N/A	N/A	Migratory	✓	✓
Charadrius veredus	Oriental plover	N/A	N/A	Migratory	✓	✓
Glareola maldivarum	Oriental pratincole	N/A	N/A	Migratory	✓	✓
Tringa nebularia	Common greenshank	Endangered	N/A	Migratory	✓	✓
Charadrius leschenaultii	Greater sand plover	Vulnerable	Vulnerable	Migratory	✓	✓
Limnodromus semipalmatus	Asian dowitcher	N/A	N/A	Migratory	N/A	✓
Limosa lapponica	Bar-tailed godwit	N/A	N/A	Migratory	✓	✓
Rostratula australis	Australian painted snipe	Endangered	Endangered	N/A	✓	✓
Marine Reptiles						
Caretta caretta	Loggerhead turtle	Endangered	Endangered	Migratory	✓	✓
Chelonia mydas	Green turtle	Vulnerable	Vulnerable	Migratory	✓	✓
Eretmochelys imbricata	Hawksbill turtle	Vulnerable	Vulnerable	Migratory	✓	✓

Species name	Common name	Threatened status under the Biodiversity Conservation Act	Threatened status under the EPBC Act	Migratory status	Potential for interaction	
					Operational Area	***EMBA***
Natator depressus	Flatback turtle	Vulnerable	Vulnerable	Migratory	✓	✓
Dermochelys coriacea	Leatherback turtle	Vulnerable	Endangered	Migratory	✓	✓
Aipysurus apraefrontalis	Short-nosed sea snake	Critically endangered	Critically endangered	N/A	✓	✓
Aipysurus foliosquama	Leaf-scaled sea snake	Critically endangered	Critically endangered	N/A	✓	✓