



# Environmental Protection Authority

EPA Referral Form

## Form for the referral of a proposal to the Environmental Protection Authority under Section 38 of the *Environmental Protection Act 1986*

Referrer information				
Who is referring this proposal?		<input checked="" type="checkbox"/> Proponent <input type="checkbox"/> Decision-making authority <input type="checkbox"/> Community member/third party		
Name (print) <u>TOM RADIC</u>		Signature <u>[Signature]</u>		
Position	Project Manager	Organisation	Subsea 7 Australia Contracting PTY LTD	
Email	Tom.Radic@subsea7.com			
Address	15-17	William Street		
	Perth	WA	6000	
Date	<u>15 MAY 2019</u>			
Does the referrer request that the EPA treat any part of the proposal information in the referral as confidential? <i>Provide confidential information in a separate attachment.</i>		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
<b>Referral declaration for organisations, proponents and decision-making authorities:</b>  I, <u>TOM RADIC</u> , (full name) declare that I am authorised to refer this proposal on behalf of <u>SUBSEA 7</u> and further declare that the information contained in this form is true and not misleading.				
Part A: Proponent and proposal description				
Proponent information				
Name of the proponent/s (including Trading Name if relevant)		Subsea 7 Australia Contracting Pty Ltd (Subsea 7)		
Australian Company Number(s) <input type="checkbox"/> <b>OR</b> Australian Business Number(s) <input checked="" type="checkbox"/>		005 288 406		
Contact for the proposal (if different from the referrer)  <i>Please include: name, physical address, phone, and email.</i>		<input type="checkbox"/> Yes <input type="checkbox"/> No		
Does the proponent have the legal access required for the implementation of all aspects of the proposal?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		

<p><i>If yes, provide details of legal access authorisations / agreements / tenure.</i></p> <p><i>If no, what authorisations / agreements / tenure is required and from whom?</i></p>	<p>The Site is subject to the 'Exmouth Gulf' Pastoral Lease, which has a term of 39 years, 3 months, 1 day, as of 1 July 2015. An agreement with the Pastoral Lease holder has been signed.</p> <p>Under the Local Planning Scheme (LPS) 4, the Proposal area is zoned as 'Rural'. Subsea 7 has submitted a Scheme Amendment Request to rezone the Proposal area from 'Rural' to 'Special Use' under LPS 4.</p> <p>Engagement with the Gnulli people, who hold a Native Title claim over an area that includes the Proposal Development Envelope, will be maintained. An Indigenous Land Use Agreement (ILUA) process is underway.</p>
<p><b>Proposal type</b></p>	
<p><b>What type of proposal is being referred?</b></p> <p>For a change to an approved proposal please state the Ministerial Statement number/s (MS No./s) of the approved proposal</p> <p>For a derived proposal please state the Ministerial Statement number (MS No.) of the associated strategic proposal</p>	<p><input checked="" type="checkbox"/> significant – new proposal</p> <p><input type="checkbox"/> significant – change to approved proposal (MS No./s: _____)</p> <p><input type="checkbox"/> proposal under an assessed planning scheme</p> <p><input type="checkbox"/> strategic</p> <p><input type="checkbox"/> derived (Strategic MS No.: _____)</p>
<p>For a significant proposal:</p> <ul style="list-style-type: none"> <li>Why do you consider the proposal may have a significant effect on the environment and warrant referral to the EPA?</li> </ul>	<p>The Proposal has the potential, if not managed correctly, to impact one of more of the preliminary key environmental factors:</p> <ul style="list-style-type: none"> <li>Benthic Communities and Habitats</li> <li>Coastal Processes</li> <li>Marine Environmental Quality</li> <li>Marine Fauna</li> <li>Flora and Vegetation</li> <li>Subterranean Fauna</li> <li>Terrestrial Fauna</li> <li>Inland Waters</li> <li>Social Surrounds</li> </ul> <p>Or Other Factors or Matters:</p> <ul style="list-style-type: none"> <li>Terrestrial Environmental Quality</li> </ul>
<p>For a proposal under an assessed planning scheme, provide the following details:</p> <ul style="list-style-type: none"> <li>Scheme name and number</li> </ul> <p>For the Responsible Authority:</p> <ul style="list-style-type: none"> <li>What new environmental issues are raised by the proposal that were not assessed during the assessment of the planning scheme?</li> <li>How does the proposal not comply with the assessed scheme and/or the environmental conditions in the assessed planning scheme?</li> </ul>	<p>NA</p>
<p><b>Proposal description</b></p>	
<p>Title of the proposal</p>	<p>Learmonth Pipeline Fabrication Facility</p>

Name of the Local Government Authority in which the proposal is located.	Shire of Exmouth
Location: a) street address, lot number, suburb, and nearest road intersection; or b) if remote the nearest town and distance and direction from that town to the proposal site.	Lot 233 and Lot 1586, to the east of the Minilya-Exmouth Road, approximately 35 km south of Exmouth townsite.
Proposal description – including the key characteristics of the proposal <i>Provide as an attachment to the form</i>	Refer Attachment A. Refer Figure 1 for Proposal Development Envelope. Refer Figure 2 for Proposal Offshore Operations Area.
Have you provided electronic spatial data, maps and figure in the appropriate format? <i>Refer to instructions at the front of the form</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
What is the current land use on the property, and the extent (area in hectares) of the property?	Pastoral  Development Envelope 452 ha.
Have you had pre-referral discussions with the EPA at DWER Services? If so, quote the reference number and/or the DWER contact.	Leanne Thompson
<b>Part B: Environmental impacts</b>	
<b>Environmental factors</b>	
What are the likely significant environmental factors for this proposal?	<input checked="" type="checkbox"/> Benthic Communities and Habitat <input checked="" type="checkbox"/> Coastal Processes <input checked="" type="checkbox"/> Marine Environmental Quality <input checked="" type="checkbox"/> Marine Fauna <input checked="" type="checkbox"/> Flora and Vegetation <input type="checkbox"/> Landforms <input checked="" type="checkbox"/> Subterranean Fauna <input checked="" type="checkbox"/> Terrestrial Environmental Quality <input checked="" type="checkbox"/> Terrestrial Fauna <input checked="" type="checkbox"/> Inland Waters <input type="checkbox"/> Air Quality <input checked="" type="checkbox"/> Social Surroundings <input type="checkbox"/> Human Health
<i>For <b>each</b> of the environmental factors identified above, complete the following table, or provide the information in a supplementary report</i>	

Potential environmental impacts		
1	<b>EPA Factor</b>	Benthic Communities and Habitat
2	<b>EPA policy and guidance</b> - What have you considered and how have you applied them in relation to this factor?	<ul style="list-style-type: none"> <li>Environmental Factor Guideline – Benthic Communities and Habitats (EPA 2016a). This guidance was consulted in the consideration of potential direct and indirect impacts to Benthic Communities and Habitat (BCH) as a result of the Proposal, and in the development of options to avoid or mitigate impacts.</li> <li>Technical Guidance – Protection of Benthic Communities and Habitats (EPA 2016b). This guidance was consulted in the development of local assessment units (LAUs) for the assessment of potential impacts to BCH, the characterisation of the BCH present within the LAUs, and in the assessment of impacts.</li> <li>Technical Guidance Environmental Impact Assessment of Marine Dredging (EPA 2016c). This guidance was referenced in the consideration of potential indirect impacts associated with Bundle launch and tow.</li> </ul>
3	<b>Consultation</b> – Outline the outcomes of consultation in relation to the potential environmental impacts	Refer to Attachment B.
4	<b>Receiving environment</b> – Describe the current condition of the receiving environment in relation to this factor.	<p>Surveys at and adjacent to Heron Point identified four intertidal BCH types (360 Environmental 2017):</p> <ul style="list-style-type: none"> <li>Soft Sediment (Fine sand within upper littoral zone).</li> <li>Pavement reef (Unvegetated pavement reef within the upper littoral zone).</li> <li>Reef with macroalgae.</li> <li>Mangroves.</li> </ul> <p>Surveys offshore of Heron Point identified six subtidal BCH types (360 Environmental 2017):</p> <ul style="list-style-type: none"> <li>Soft sediment (Mud and sand dominated habitats with sparse turf algae).</li> <li>Soft sediment with turf algae (Mud and sand dominated habitats with turf algae/ microphytobenthos (MPB)).</li> <li>Seagrass (Mud and sand dominated habitats with sparse <i>H. uninervis</i> and <i>H. ovalis</i>).</li> <li>Soft sediment with filter feeders (Soft sediment veneer overlying low relief reef. Sparse cover of filter feeders (sponges and soft corals)).</li> <li>Reef with macroalgae (Low relief reef with macroalgae (brown)).</li> <li>Reef with macroalgae and filter feeders (Low relief reef with macroalgae (brown) and filter feeders (sponges, soft corals, hard corals)).</li> </ul> <p>Surveys along the Offshore Operations Area identified (MBS Environmental 2018a):</p> <ul style="list-style-type: none"> <li>Soft sediment.</li> </ul>

Potential environmental impacts		
		<ul style="list-style-type: none"> <li>• Pavement reef with filter feeders.</li> <li>• Pavement reef with macroalgae and filter feeders.</li> </ul> <p>These BCH types are mapped in Figure 3.</p>
5	<b>Proposal activities</b> – Describe the proposal activities that have the potential to impact the environment	<ul style="list-style-type: none"> <li>• Construction of coastal infrastructure.</li> <li>• Operation of the Proposal including Bundle launch, towing and laydown.</li> <li>• Closure and rehabilitation.</li> </ul>
6	<b>Mitigation</b> – Describe the measures proposed to manage and mitigate the potential environmental impacts.	<p>Measures to avoid:</p> <ul style="list-style-type: none"> <li>• None.</li> </ul> <p>Measures to minimise:</p> <ul style="list-style-type: none"> <li>• Launchway design to minimise footprint.</li> <li>• Silt curtains to manage turbidity.</li> <li>• Bundle tow activities within Exmouth Gulf Prawn Fishery area.</li> </ul>
7	<b>Impacts</b> – Assess the impacts of the proposal and review the residual impacts against the EPA objective.	<ul style="list-style-type: none"> <li>• Small-scale local direct and indirect impacts to nearshore BCH as a result of launchway construction.</li> <li>• Small-scale local direct impacts to nearshore BCH as a result of Bundle launch.</li> <li>• Direct impacts to offshore soft sediment habitat (within Exmouth Gulf Prawn Fishery area) as a result of Bundle tow and parking.</li> <li>• The biological diversity and ecological integrity of BCH will be maintained and the EPA objective will be met.</li> </ul>
8	<b>Assumptions</b> - Describe any assumptions critical to your assessment e.g. particular mitigation measures or regulatory conditions.	NA

Potential environmental impacts		
1	<b>EPA Factor</b>	Coastal Processes
2	<b>EPA policy and guidance</b> - What have you considered and how have you applied them in relation to this factor?	Environmental Factor Guideline – Coastal Processes (EPA 2016d). This guidance was consulted in the consideration of potential impacts to geophysical processes and how these may impact natural coastal dynamics causing an impact to coastal ecosystems and associated values such as landforms, recreation and tourism.
3	<b>Consultation</b> – Outline the outcomes of consultation in relation to the potential environmental impacts	Refer to Attachment B.
4	<b>Receiving environment</b> – Describe the current condition of the receiving environment in relation to this factor.	<p>The Exmouth Gulf region's susceptibility to change and landform instability is low. This was concluded from the following regional attributes including (Eliot et al. 2012):</p> <ul style="list-style-type: none"> <li>• Partial sheltering from swell.</li> <li>• Presence of subtidal terraces and rocky features.</li> <li>• Sheltered beach faces.</li> <li>• Perching of beaches on inshore rock and moderately stable foredunes.</li> </ul> <p>A shoreline movement assessment for the Learmonth Jetty site undertaken by MP Rogers (2017) showed a degree of change in the adjacent shoreline between 1949 and 2013 with a net accretion over the assessment time period.</p>
5	<b>Proposal activities</b> – Describe the proposal activities that have the potential to impact the environment	<ul style="list-style-type: none"> <li>• Construction of coastal infrastructure.</li> <li>• Closure and decommissioning.</li> </ul>
6	<b>Mitigation</b> – Describe the measures proposed to manage and mitigate the potential environmental impacts.	<p>Measures to avoid:</p> <ul style="list-style-type: none"> <li>• None.</li> </ul> <p>Measures to minimise:</p> <ul style="list-style-type: none"> <li>• Design of launchway to minimise height of structure above surrounding beach/seabed.</li> <li>• Periodic bypassing of sand during launchway maintenance to limit sand accumulation to the north of the launchway and associated sand depletion to the south of the launchway.</li> </ul>
7	<b>Impacts</b> – Assess the impacts of the proposal and review the residual impacts against the EPA objective.	<ul style="list-style-type: none"> <li>• Potential sediment accretion to the north of the launchway and potential minor erosion of perched beaches to the south.</li> <li>• Given the relatively slow rates of sediment transport and the proposed implementation of sand bypassing in the event that minor changes to the shoreline are recorded, the geophysical processes that shape coastal morphology will be maintained so that the environmental values of the coast are protected.</li> <li>• The EPA objective will be met.</li> </ul>
8	<b>Assumptions</b> - Describe any assumptions critical to your assessment e.g. particular mitigation measures or regulatory conditions.	NA

Potential environmental impacts		
1	<b>EPA Factor</b>	Marine Environmental Quality
2	<b>EPA policy and guidance</b> - What have you considered and how have you applied them in relation to this factor?	<ul style="list-style-type: none"> <li>• Environmental Factor Guideline – Marine Environmental Quality (EPA 2016e). Referred to in the assessment of potential impacts to marine water quality as a result of the Proposal.</li> <li>• Technical Guidance – Protecting the quality of Western Australia’s marine environment (EPA 2016f). Referred to in the identification of the relevant environmental values and environmental quality objectives for the waters of Exmouth Gulf and in the assessment of potential impacts to marine environmental quality.</li> <li>• Pilbara Coastal Water Quality Consultation Outcomes: Environmental Values and Environmental Quality Objectives (DoE 2006). Referred to in the identification of the relevant environmental values and environmental quality objectives for the waters of Exmouth Gulf.</li> </ul>
3	<b>Consultation</b> – Outline the outcomes of consultation in relation to the potential environmental impacts	Refer to Attachment B.
4	<b>Receiving environment</b> – Describe the current condition of the receiving environment in relation to this factor.	<p>Previous regional studies have characterised Exmouth Gulf as having a naturally turbid state due to wind, waves and tidal currents creating resuspension of the fine sediments found throughout the gulf. Primary productivity within the region from phytoplankton biomass is relatively low and is limited by the availability of nitrogen within the system (Oceanica 2006). Water temperatures range from 18° to 30°C depending on season, with salinity ranges similar to oceanic measurements (34 to 36 PSU). A sediment quality survey found the sediments from five sites within Exmouth Gulf to exhibit relatively low levels of contaminants (DEC 2006).</p> <p>The average turbidity recorded at the launchway location was 4.3 NTU. The average turbidity recorded in the vicinity of the Bundle Parking area was 3.6 NTU. Numerous short term turbidity peaks were recorded at up to approximately 30 NTU (GHD 2018a).</p>
5	<b>Proposal activities</b> – Describe the proposal activities that have the potential to impact the environment	<ul style="list-style-type: none"> <li>• Construction of the coastal infrastructure and operations of the Proposal, including Bundle launch, tow and laydown.</li> <li>• Closure and decommissioning of coastal infrastructure.</li> </ul>

Potential environmental impacts		
6	<b>Mitigation</b> – Describe the measures proposed to manage and mitigate the potential environmental impacts.	<p>Measures to avoid:</p> <ul style="list-style-type: none"> <li>• Bundle fully pressure tested and leak tested prior to launch.</li> <li>• Ongoing monitoring of Bundle pressures prior to and during launch.</li> <li>• Weather forecast/seasonal data reviewed to inform launch schedule.</li> <li>• Weather forecast monitored ahead of launch operations and launch window defined.</li> <li>• High specification tow vessels for launch operations.</li> <li>• Lead tow vessels to be equipped with ‘Dynamic Positioning’ (DP) systems, with a suitable level of system redundancy.</li> <li>• Notice to mariners supporting information issued prior to tow to inform local vessels of operations.</li> <li>• Guard vessel to monitor/enforce exclusion zones.</li> <li>• Community engagement and announcements locally.</li> <li>• Timing of Surface tow through Ningaloo Marine Park chosen to coincide with benign sea, tidal and weather conditions.</li> </ul> <p>Measures to minimise:</p> <ul style="list-style-type: none"> <li>• Launchway designed to minimise footprint (including extent of rock fill) thus reducing seabed disturbance and duration of construction.</li> <li>• Use of pre-cast concrete panels to reduce seabed disturbance and duration of construction.</li> <li>• Construction methods to minimise the disturbance of sediments.</li> <li>• Silt curtains deployed to ensure environmental objectives are achieved.</li> </ul>
7	<b>Impacts</b> – Assess the impacts of the proposal and review the residual impacts against the EPA objective.	<ul style="list-style-type: none"> <li>• Minor short-term local increases in water column turbidity adjacent to the launchway during construction.</li> <li>• Short-term local increases in water column turbidity adjacent to the Bundle tow route during a Bundle launch.</li> <li>• Given the inherent strength of the carrier pipe (the outside casing of the Bundle), the lack of liquid chemicals within the annulus and the control measures to be implemented to prevent a loss of control of the Bundle or support vessel, the risk of a chemical leak or spill is considered negligible.</li> <li>• Negligible risk of unplanned releases of chemicals or hydrocarbons associated with launch and tow activities, accidental collisions or ship grounds.</li> <li>• The quality of water, sediment and biota will be maintained so that environmental values are protected and the EPA objective will be met.</li> </ul>
8	<b>Assumptions</b> - Describe any assumptions critical to your assessment e.g. particular mitigation measures or regulatory conditions.	NA



Potential environmental impacts		
1	<b>EPA Factor</b>	Marine Fauna
2	<b>EPA policy and guidance</b> - What have you considered and how have you applied them in relation to this factor?	<ul style="list-style-type: none"> <li>• Environmental Factor Guideline – Marine Fauna (EPA 2016g). This guidance was consulted in the consideration of potential direct and indirect impacts on marine fauna as a result of the Proposal, and in the consideration of critical habitats and ecological windows.</li> <li>• Environmental Assessment Guideline (No. 5) for Protecting Marine Turtles from Light Impacts (EPA 2010). General guidance on light design (wavelength, height, direction, shielding) referred to in the lighting design for the Proposal to minimise impacts to marine fauna (noting that turtle nesting does not occur within Exmouth Gulf).</li> <li>• Management Plan for the Ningaloo Marine Park and Muiron Islands Marine Management Area 2005 – 2015 (MPRA and CALM 2005). This management plan was reviewed during the assessment of potential impacts on marine fauna within the Ningaloo Marine Park and Muiron Islands Marine Management Area, and in the development of management measures.</li> </ul>
3	<b>Consultation</b> – Outline the outcomes of consultation in relation to the potential environmental impacts	Refer to Attachment B.
4	<b>Receiving environment</b> – Describe the current condition of the receiving environment in relation to this factor.	<p><u>Humpback Whale</u></p> <p>Exmouth Gulf has been identified as a biologically important area in recognition of its value as a resting area for migrating Humpback whales, with very high densities of nursing cows with calves during the southern migration (DSEWPAC 2012).</p> <p>At the estimated average annual rate of increase, the number of cow/calf pairs potentially using Exmouth Gulf (1,000 to 1,500 cow/calf pairs in 2005) may have almost doubled by 2010 to nearly 3,000 cow/calf pairs (CWR 2005), with the number of cow/calf pairs in 2018 potentially exceeding 6,000.</p> <p>Aerial surveys undertaken in 2018 indicated that Humpback whale numbers were relatively low (approximately 100) during the first half of August, before increasing to a maximum of approximately 800 by mid-September. From this peak, numbers rapidly declined to approximately 50 by early November (Irvine, In prep).</p> <p><u>Dolphins</u></p> <p>Both the Australian Humpback Dolphin (<i>Sousa sahalensis</i>) (previously named the Indo Pacific humpback dolphin (<i>Sousa chinensis</i>) and the Indo pacific Bottlenose Dolphin (<i>Tursiops aduncus</i>) are likely to occur in the region. During aerial surveys undertaken in 2004/2005, dolphins pods were widely distributed in the Gulf and were found in average depths of approximately 10m (Centre for Whale Research 2005). Aerial surveys undertaken in 2018, between early August and early November (Irvine, In prep) recorded a total of 556 dolphins within Exmouth Gulf, widely distributed across the whole area.</p>

Potential environmental impacts		
		<p><u>Dugong</u></p> <p>Exmouth Gulf and Ningaloo Reef have been identified as biologically important areas, year round, for Dugong foraging and nursing (DSEWPAC 2012).</p> <p>Quantitative surveys of Exmouth Gulf resulted in population estimates of 1,062 in 1989 (Grech and Marsh 1994), 1,006 in 1994 (Preen et al. 1997) and 174 in 1999 (Gales et al. 2004). Quantitative aerial surveys in 2004 indicated a minimum Dugong population estimate of approximately 1,000 individuals in Exmouth Gulf during winter (Oceanwise 2005). An additional survey in 2007 estimated numbers in excess of the 1989 and 1994 estimates (Hodgson et al. 2007).</p> <p>Dugong activity is thought to be focused on the east coast of the Gulf associated with the shallow seagrass habitat in this area (Oceanwise 2005).</p> <p>Aerial surveys undertaken in 2018, between early August and early November (Irvine, In prep) recorded 605 Dugong within Exmouth Gulf, predominantly adjacent to the eastern and southern shorelines.</p> <p><u>Marine Turtles</u></p> <p>Aerial surveys undertaken in 2018, between early August and early November (Irvine, In prep) recorded 1,472 marine turtles within Exmouth Gulf, predominantly adjacent to the eastern and southern shorelines.</p> <p>The Western Australian population of Green turtles numbers in the tens of thousands, with the principal rookeries being the Lacepede Islands, some islands in the Dampier Archipelago, Barrow Island, Montebello Islands, and at North West Cape (DEC 2009). It was estimated that approximately 7,000 to 9,000 live around the North West Cape (Preen et al. 1997). At South Muiron Island, over the period 1991 to 1998, 961 Green turtles were tagged while visiting the island to nest (Prince 1999).</p> <p>Hawksbill turtles also nest around the western side of the North West Cape (Prince 1999) and Muiron islands. Over the period 1991 to 1998, 10 Hawksbill turtles were tagged while visiting South Muiron Island to nest (Prince 1999).</p> <p>A significant Loggerhead turtle rookery is present on South Muiron Island with an annual nesting population of 150 to 350 females (Baldwin et al. 2003).</p> <p><u>Whale shark</u></p> <p>Whale sharks have been recorded along the continental shelf of the central west coast of Australia, with the aggregations within Ningaloo Marine Park being one of the largest seasonal aggregations in the world. Whale sharks travel to Ningaloo Marine Park between March and July every year, with individuals sometimes remaining until early August (DPaW 2013, DoF 2011). Whale sharks exhibit high individual fidelity to the Ningaloo Reef area during the autumn/winter, with individuals often re-sighted in the area over consecutive years (Reynolds et al. 2017). Whale shark abundance at Ningaloo Reef has been modelled by two studies. Meekan et al. (2006) estimated the total population size</p>

Potential environmental impacts		
		<p>to be 319 to 436 (between the years 1992 and 2004), and Holmberg et al. (2009) estimated the annual abundance to vary between 86 and 143 sharks (between the years 2004 and 2007).</p> <p><u>Grey nurse shark</u></p> <p>The Grey nurse shark (<i>Carcharias taurus</i>) (west coast population) is predominantly found in the south west coastal waters of Western Australia but has been recorded as far north as the North West Shelf (DoEE 2017). There have been occasional sightings of this species near Exmouth and the Muiron Islands (DoEE 2017). A study of footage from a camera deployed at the Point Murat Navy Pier in Exmouth, 8 km west of the Bundle tow route, recorded the occurrence of a total of 16 individuals. Individuals displayed strong philopatry, with ten individuals returning to the site over multiple years (Hoschke and Whisson 2016).</p> <p><u>Migratory birds</u></p> <p>The migratory shorebirds that visit Australia are from the East Asian–Australasian (EAA) flyway. The EEA Flyway, which stretches from Siberia and Alaska to Australia and New Zealand, is a geographic region supporting populations of migratory waders during annual migrations. It is one of eight major flyways recognised around the world and is used by about 8 million waders of 54 different species (Bamford et al. 2008).</p> <p>The Shorebird 2020 survey area known as ‘Bay of Rest North’ includes Heron Point and the Development Envelope. Shorebird 2020 data from the period February 2008 to February 2018 indicates that during the non breeding season, numbers of Bar tailed Godwit, Grey tailed Tattler and Sanderling within the Bay of Rest North survey area have exceeded 0.1% of the EAA Flyway population. All major roosts were located well to the south of the proposed launchway location (Western Wildlife 2019).</p>
5	<b>Proposal activities</b> – Describe the proposal activities that have the potential to impact the environment	<ul style="list-style-type: none"> <li>• Construction and physical presence of coastal infrastructure.</li> <li>• Operational activities including vessel movements, Bundle launch, towing and laydown.</li> <li>• Closure and decommissioning of coastal infrastructure.</li> </ul>

Potential environmental impacts		
6	<b>Mitigation</b> – Describe the measures proposed to manage and mitigate the potential environmental impacts.	<p>Measures to avoid:</p> <ul style="list-style-type: none"> <li>No launches during period of peak usage of Exmouth Gulf by Humpback whales (August to October).</li> </ul> <p>Measures to minimise:</p> <ul style="list-style-type: none"> <li>Launchway designed to minimise footprint thus reducing seabed disturbance and duration of construction.</li> <li>Shrouded or directional lighting as well as motion sensor or timed lighting will be used and placed such that the majority of light is focused on the working areas and not out to sea.</li> <li>A maximum of three Bundle launches per year.</li> <li>Adoption of the Department of Agriculture and Water Resources (DAWR) 'Quick Domestic Ballast Water (DBW) Risk Assessment Tool (DAWR 2018).</li> <li>Adoption of the DPIRD on line 'Vessel Check' decision support tool and the adoption of appropriate biofouling management requirements.</li> <li>Bundle carrier pipe does not contain any hydrocarbons.</li> <li>Each vessel equipped with a vessel specific Shipboard Oil Pollution Emergency Plan (SOPEP) or equivalent, and will follow response actions to incidental pollution in accordance with the vessel's emergency plan.</li> </ul>
7	<b>Impacts</b> – Assess the impacts of the proposal and review the residual impacts against the EPA objective.	<ul style="list-style-type: none"> <li>Small-scale local direct and indirect impacts to nearshore BCH (representing potential marine fauna habitat) as a result of launchway construction and Bundle launch.</li> <li>Low risk of a significant impact (i.e. direct physical interaction) with marine fauna.</li> <li>Low risk of the introduction of a non-indigenous marine pest.</li> <li>Given the inherent strength of the carrier pipe (the outside casing of the Bundle), the lack of liquid chemicals within the annulus and the control measures to be implemented to prevent a loss of control of the Bundle or support vessel (refer Marine Emergency Response Plan (Attachment 3)), the risk of a chemical leak or spill leading to an impact on marine fauna health is considered negligible.</li> <li>Biological diversity and ecological integrity of marine fauna will be maintained and the EPA objective will be met.</li> </ul>
8	<b>Assumptions</b> - Describe any assumptions critical to your assessment e.g. particular mitigation measures or regulatory conditions.	NA

Potential environmental impacts		
1	<b>EPA Factor</b>	Flora and vegetation
2	<b>EPA policy and guidance</b> - What have you considered and how have you applied them in relation to this factor?	<ul style="list-style-type: none"> <li>Environmental Factor Guideline – Flora and Vegetation (EPA 2016h). Referred to in the assessment of potential impacts as a result of the Proposal.</li> <li>Technical Guidance – Flora and vegetation surveys for environmental impact assessment (EPA 2016i). Referred to in the survey design</li> </ul>
3	<b>Consultation</b> – Outline the outcomes of consultation in relation to the potential environmental impacts	Refer to Attachment B.
4	<b>Receiving environment</b> – Describe the current condition of the receiving environment in relation to this factor.	<p>Mapping of Pre-European vegetation within Western Australia was completed on a broad scale (1:1,000,000) by Beard (1975) and later re-assessed by Shepherd et al. (2001) with some larger vegetation units divided into smaller units. Two broad vegetation types were identified and mapped over the Proposal area:</p> <ul style="list-style-type: none"> <li>Cape Range 117: Grass steppe – Hummock grassland <i>Triodia</i> spp. (87.8% of Pre-European extent in Cape Range subregion remaining).</li> <li>Coastal Dunes 662 – Hummock grassland; shrub steppe; mixed <i>Acacia</i> scrub and dwarf scrub with soft spinifex and <i>Triodia basedowii</i> (99.6% of Pre-European extent in Cape Range subregion remaining).</li> </ul> <p>Project specific surveys identified 126 flora species, representative of 87 genera and 32 families within the survey area. The majority of the taxa that were recorded within the survey area included:</p> <ul style="list-style-type: none"> <li>Fabaceae (24 taxa).</li> <li>Chenopodiaceae (10 taxa).</li> <li>Poaceae (10 taxa).</li> </ul> <p>Ten vegetation communities were defined and mapped within and adjacent to the Development Envelope (360 Environmental 2018a, Figure 4), as follows.</p> <ul style="list-style-type: none"> <li>AgTe: <i>Acacia gregorii</i> low open shrubland over <i>Triodia epactia</i> closed grassland.</li> <li>AsTe: <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> shrubland over <i>Triodia epactia</i> hummock grassland.</li> <li>McTe: <i>Melaleuca cardiophylla</i> low shrubland over <i>Triodia epactia</i> hummock grassland.</li> <li>AbTe: <i>Acacia bivenosa</i> open shrubland over <i>Triodia epactia</i> hummock grassland.</li> <li>SoTe: <i>Stemodia</i> sp. Onslow low open shrubland over <i>Triodia epactia</i> hummock grassland.</li> <li>AbAc: <i>Acacia bivenosa</i> and <i>Acacia coriacea</i> open shrubland over <i>Spinifex longifolius</i> and <i>Triodia epactia</i> open grassland.</li> <li>AcAt: <i>Acacia coriacea</i> and <i>Acacia tetragonophylla</i> open shrubland over <i>Triodia epactia</i> hummock grassland.</li> <li>AsSs: <i>Acacia stellaticeps</i> and <i>Scaevola sericophylla</i> open</li> </ul>

Potential environmental impacts		
		<p>shrubland over <i>Triodia epactia</i> hummock grassland.</p> <ul style="list-style-type: none"> <li>• AcCl: <i>Acacia coriaecia</i> and <i>Cullen</i> sp. shrubland over <i>Sida rohlenae</i> subsp. <i>rohlenae</i> low shrubland over <i>Triodia epactia</i>.</li> <li>• TiFp: <i>Tecticornia</i> spp. and <i>Frankenia pauciflora</i> low shrubland on saline flat.</li> <li>• CD: Completely Degraded/Track.</li> </ul> <p>Three <i>Acacia</i> shrubland vegetation communities (AbTe, AgTe, and AsSs) accounted for approximately 77% of the survey area and 75% of the Development Envelope.</p> <p>One Priority species was recorded in the survey area, <i>Corchorus congener</i> (P3). <i>C. congener</i> is a spreading shrub endemic to the Cape Range peninsula, with a preferred habitat of red sand or sandy loam with limestone on sand dunes and plains (WAH 2018). <i>C. congener</i> was found to be locally common both within and outside the survey area, occurring readily along tracks and road sides. Regional locations were also surveyed outside of the Development Envelope during a targeted survey to gather population details in a regional context (360 Environmental 2018a).</p>
5	<b>Proposal activities</b> – Describe the proposal activities that have the potential to impact the environment	<ul style="list-style-type: none"> <li>• Clearing of vegetation.</li> <li>• Groundwater abstraction.</li> <li>• Potential alteration of surface water flows due to presence of infrastructure.</li> <li>• Construction and operational activities.</li> <li>• Closure and decommissioning.</li> </ul>
6	<b>Mitigation</b> – Describe the measures proposed to manage and mitigate the potential environmental impacts.	<p>Measures to avoid:</p> <ul style="list-style-type: none"> <li>• None.</li> </ul> <p>Measures to minimise:</p> <ul style="list-style-type: none"> <li>• Project design has considered use of existing disturbed areas and these will be used wherever possible to minimise total ground disturbance.</li> <li>• Land disturbance will be kept to the minimum necessary for development of the project.</li> <li>• Water cart used during clearing to prevent significant dust emissions.</li> <li>• Earth moving machinery will be cleaned of soil and vegetation prior to entering or leaving the Development Envelope.</li> <li>• No weed affected soil, mulch or fill will be brought into the Development Envelope.</li> <li>• Where necessary, suitable floodways, drains and culverts will be installed to maintain, as much as possible, natural flow patterns.</li> <li>• Project design has considered the local surface water flow paths and location of drainage lines with the aim of minimising changes to natural flows.</li> <li>• Groundwater abstraction will be no more than 12 ML/annum at abstraction rates of up to 0.3 L/s in individual bores.</li> </ul>

Potential environmental impacts		
7	<b>Impacts</b> – Assess the impacts of the proposal and review the residual impacts against the EPA objective.	<ul style="list-style-type: none"> <li>• The proposed clearing is of communities that are common and widespread, with all 10 vegetation communities directly impacted by the Proposal being well represented outside of the Development Envelope.</li> <li>• Limited removal of individuals of Priority species <i>Corchorus congener</i> (P3) will occur as a result of implementation of the Proposal. <i>C. congener</i> is known to occur widely in the Development Envelope and more broadly across the Learmonth area.</li> <li>• Indirect impacts from dust, weeds, fragmentation or changes to surface or groundwater flows are expected to be negligible.</li> <li>• The potential impacts to flora and vegetation can be managed such that there are no significant residual impacts to flora and vegetation and the biological diversity and ecological integrity of the present flora and vegetation will be maintained. The EPA objective will be met.</li> </ul>
8	<b>Assumptions</b> - Describe any assumptions critical to your assessment e.g. particular mitigation measures or regulatory conditions.	NA

Potential environmental impacts		
1	<b>EPA Factor</b>	Subterranean Fauna
2	<b>EPA policy and guidance</b> - What have you considered and how have you applied them in relation to this factor?	<ul style="list-style-type: none"> <li>• Environmental Factor Guideline – Subterranean Fauna (EPA 2016j). This guidance was consulted in the consideration of potential impacts on subterranean fauna and the assessment of the significance of the subterranean fauna values within and adjacent to the Development Envelope.</li> <li>• Technical Guidance – Subterranean fauna survey (EPA 2016k). This guidance was consulted to determine the appropriate level of survey.</li> <li>• Technical Guidance – Sampling methods for subterranean fauna (EPA 2016l). This guidance was consulted to determine the appropriate level of survey and the survey design.</li> <li>• A review of subterranean fauna assessment in Western Australia – Discussion paper (EPA 2012). Referred to in the review of subterranean fauna values within and adjacent to the Development Envelope and in the assessment of potential impacts.</li> </ul>
3	<b>Consultation</b> – Outline the outcomes of consultation in relation to the potential environmental impacts	Refer to Attachment B.
4	<b>Receiving environment</b> – Describe the current condition of the receiving environment in relation to this factor.	<p>The Cape Range coastline, and especially the western coastline, is a hotspot and key habitat for subterranean fauna due to the extensive limestone caves and karstic geologies found. A diverse relictual fauna of over 55 species of subterranean fauna have been documented (Humphreys 2000, 2004, 2008).</p> <p>Two desktop reviews were completed to assess the likelihood of subterranean fauna within the Proposal Development Envelope (Invertebrate Solutions 2017, Bennelongia, 2017). The reviews identified that the presence of troglofauna was unlikely due to limited depth to water (1–2 m) near the coast, unsuitable sediment (fine grained units) with pore spaces that are too small to provide appropriate habitat, and no known karstic habitat within the main Development Envelope (Invertebrate Solutions 2017, Bennelongia 2017). Troglofauna habitat may occur in the proposed production bore area but no excavation or significant surface disturbance will occur to threaten any troglofaunal present.</p> <p>Stygofauna sampling across the Development Envelope collected 11 species of stygofauna. Three of these species, the shrimp <i>Stygiocaris stylifera</i>, the amphipod <i>Nedsia sculptilis</i> (Priority 4) and the copepod <i>Diacyclops</i> 'BCY060', were recorded from the proposed production bores. These three species are known to be widely distributed further north on the Exmouth peninsula. The other eight species, collected in bores approximately 500 m from the shoreline, all have marine affinities, and are unlikely to be impacted by the Proposal (Bennelongia, In prep).</p>



Potential environmental impacts		
+	<b>Proposal activities</b> – Describe the proposal activities that have the potential to impact the environment	<ul style="list-style-type: none"> <li>• Clearing and excavation for the construction of onshore infrastructure.</li> <li>• Physical presence of infrastructure.</li> <li>• Abstraction of groundwater.</li> <li>• Waste generation, storage and disposal of treated wastewater.</li> <li>• Closure and decommissioning.</li> </ul>
6	<b>Mitigation</b> – Describe the measures proposed to manage and mitigate the potential environmental impacts.	<p>Measures to avoid:</p> <ul style="list-style-type: none"> <li>• None.</li> </ul> <p>Measures to minimise:</p> <ul style="list-style-type: none"> <li>• Ground excavation will be kept to a minimum (expected to be limited to cuts through the tops of dunes and minor excavations during the construction).</li> <li>• Groundwater abstraction will be minimised through the storage and re-use of hydrotest water.</li> <li>• Low groundwater abstraction rates will reduce the likelihood and magnitude of groundwater drawdown.</li> <li>• The wastewater treatment plant will be designed and located consistent with regulatory requirements relevant to the protection of water quality.</li> <li>• Treatment of greywater will be provided by an advanced system (such as a Wise Water system) to ensure a high recovery of nutrients.</li> </ul>
7	<b>Impacts</b> – Assess the impacts of the proposal and review the residual impacts against the EPA objective.	<ul style="list-style-type: none"> <li>• Minor, localised, groundwater drawdown is predicted with negligible impacts on stygofauna individuals and habitat.</li> <li>• The thorough treatment of greywater and small disposal volumes are not expected to significantly impact individuals or habitat.</li> <li>• The biological diversity and ecological integrity of subterranean fauna will be maintained and the EPA objective will be met.</li> </ul>
8	<b>Assumptions</b> - Describe any assumptions critical to your assessment e.g. particular mitigation measures or regulatory conditions.	NA

Potential environmental impacts		
1	<b>EPA Factor</b>	Terrestrial Fauna
2	<b>EPA policy and guidance</b> - What have you considered and how have you applied them in relation to this factor?	<ul style="list-style-type: none"> <li>• Environmental Factor Guideline – Terrestrial Fauna (EPA 2016m). Referred to in the assessment of potential impacts as a result of the Proposal.</li> <li>• Technical Guidance – Sampling methods for terrestrial vertebrate fauna (EPA 2016n). Referred to in the survey design which included a desktop study and reconnaissance survey.</li> <li>• Technical Guidance – Terrestrial fauna surveys (EPA 2016o). Referred to in the survey design.</li> <li>• Technical Guidance – Sampling of short range endemic invertebrate fauna (EPA 2016p). Referred to in the assessment of potential impacts as a result of the Proposal.</li> <li>• Other guidance (EPA Position Statement No. 3, Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA 2002), EPA Guidance Statement No. 20, Short Range Endemic Invertebrate Fauna (EPA 2009), EPA Guidance Statement No. 56, Terrestrial Fauna Surveys for Environmental Impact Assessment (EPA 2004; revised 2016), EPA and DEC Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA and DEC 2010; revised 2016), Survey Guidelines for Australia's Threatened Mammals (DSEWPac 2011), Survey Guidelines for Australia's Threatened Reptiles (DSEWPac 2011)) were referred to in the survey design.</li> </ul>
3	<b>Consultation</b> – Outline the outcomes of consultation in relation to the potential environmental impacts	Refer to Attachment B.
4	<b>Receiving environment</b> – Describe the current condition of the receiving environment in relation to this factor.	<p>Four broad fauna habitats (including 'beach' habitat) were identified within the Development Envelope (360 Environmental 2018b) with all considered widespread and common in the Exmouth region.</p> <p>Project specific fauna studies identified 40 species from 29 families, comprising five reptile species, 29 bird species and six mammal species including the European rabbit. Out of the 40 species of fauna recorded, six significant species were recorded in the survey area:</p> <ul style="list-style-type: none"> <li>• Osprey (<i>Pandion cristatus</i>)</li> <li>• Lesser Sand Plover (<i>Charadrius mongolus</i>).</li> <li>• Caspian Tern (<i>Hydroprogne caspia</i>).</li> <li>• Lesser Crested Tern (<i>Thalasseus bengalensis</i>).</li> <li>• Crested Tern (<i>Thalasseus bergii</i>).</li> <li>• Rainbow Bee eater (<i>Merops ornatus</i>).</li> </ul>
5	<b>Proposal activities</b> – Describe the proposal activities that have the potential to impact the environment	<ul style="list-style-type: none"> <li>• Clearing of fauna habitat.</li> <li>• Vehicle movement.</li> <li>• Physical presence of infrastructure.</li> <li>• Closure and decommissioning.</li> </ul>

Potential environmental impacts		
6	<b>Mitigation</b> – Describe the measures proposed to manage and mitigate the potential environmental impacts.	<p>Measures to avoid:</p> <ul style="list-style-type: none"> <li>• None.</li> </ul> <p>Measures to minimise:</p> <ul style="list-style-type: none"> <li>• Speed limits will be enforced and vehicles will adhere to designated onsite roads.</li> <li>• Project design has considered use of existing disturbed areas and these will be used wherever possible to minimise the loss of fauna habitat.</li> <li>• Water cart used as required to prevent significant dust emissions.</li> <li>• Earth moving machinery will be cleaned of soil and vegetation prior to entering or leaving the Development Envelope.</li> <li>• No weed affected soil, mulch or fill will be brought into the Development Envelope.</li> <li>• Project design has considered the local surface water flow paths and location of drainage lines with the aim of minimising changes to natural flows.</li> <li>• Where necessary, suitable floodways, drains and culverts will be installed to maintain, as much as possible, natural flow patterns to minimise impacts to fauna habitat.</li> </ul>
7	<b>Impacts</b> – Assess the impacts of the proposal and review the residual impacts against the EPA objective.	<ul style="list-style-type: none"> <li>• Fauna injury or mortality due to vehicle strikes may occur during construction and operations. Implementation of management measures will reduce the likelihood of vehicle strike.</li> <li>• The fauna habitats identified within the Development Envelope are associated with vegetation communities that are well represented locally and regionally.</li> <li>• Potential short term and local indirect impacts to fauna habitat are considered unlikely to significantly affect habitat condition or result in loss of habitat.</li> <li>• The biological diversity and ecological integrity of terrestrial fauna will be maintained and the EPA objective will be met.</li> </ul>
8	<b>Assumptions</b> - Describe any assumptions critical to your assessment e.g. particular mitigation measures or regulatory conditions.	NA

Potential environmental impacts		
1	<b>EPA Factor</b>	Inland Waters
2	<b>EPA policy and guidance</b> - What have you considered and how have you applied them in relation to this factor?	<ul style="list-style-type: none"> <li>• Environmental Factor Guideline – Hydrological Processes (EPA 2016q). This guidance was consulted in the consideration of the environmental values dependent upon the current surface water and groundwater regimes and the consideration of potential impacts on hydrological processes.</li> <li>• Environmental Factor Guideline – Inland Waters (EPA 2018). Referred to in the determination of data requirements to support the assessment of the Proposal.</li> <li>• Identification and investigation of acid sulphate soils and acidic landscapes (DER 2015). Referred to in the assessment and identification of acid sulfate soils.</li> <li>• Treatment and management of soil and water in acid sulphate soil landscapes (DER 2015). Referred to in the treatment and management of identified acid sulfate soils as well as groundwater.</li> </ul>
3	<b>Consultation</b> – Outline the outcomes of consultation in relation to the potential environmental impacts	Refer to Attachment B.
4	<b>Receiving environment</b> – Describe the current condition of the receiving environment in relation to this factor.	<p>Groundwater within the limestone aquifer is generally found to flow eastwards, from Cape Range (source of groundwater recharge) towards Exmouth Gulf where it discharges (DoW 2011). Within the proposed fabrication shed area, groundwater appears to be flowing in an east south easterly direction, whereas in the area closer to the proposed Bundle launchway, groundwater was flowing in a more easterly direction (GHD 2018b).</p> <p>The greatest depth to groundwater is found in the western bores where groundwater occurs at an approximate elevation of around 1.6 mAHD, equivalent to a depth to groundwater from ground level of 22 to 32 m, depending on location. The shallowest depth to groundwater is found in the low lying bores located closest to the coast where groundwater occurs at a depth of less than 1.5 m below ground level (bgl), equivalent to less than 0.5 mAHD. In the main fabrication area, groundwater is found to occur at a depth of between 12 and 17 mbgl depending on location (GHD 2018b).</p> <p>Groundwater quality at the site is typified by two distinct groundwater signatures:</p> <ul style="list-style-type: none"> <li>• Salt dominant groundwater (hypersaline i.e. higher salinity than sea water) in bores located in the main project footprint.</li> <li>• Fresh to slightly brackish groundwater for those bores sampled in the western area representing the proposed groundwater supply area.</li> </ul> <p>The floodplain has very few defined flow paths based on aerial imagery and topographical data. These ephemeral watercourses are expected to flow only during, and for short period following, significant rainfall events.</p>

Potential environmental impacts		
5	<b>Proposal activities</b> – Describe the proposal activities that have the potential to impact the environment	<ul style="list-style-type: none"> <li>• Physical presence of infrastructure.</li> <li>• Alteration of natural drainage regimes, including from road construction and possible alteration of overwash and drainage pathways.</li> <li>• Groundwater abstraction.</li> <li>• Discharge of stormwater and treated wastewater.</li> <li>• Disturbance or exposure of acid sulphate soils.</li> <li>• Storage and handling of hydrocarbons and other chemicals.</li> <li>• Closure and decommissioning.</li> </ul>
6	<b>Mitigation</b> – Describe the measures proposed to manage and mitigate the potential environmental impacts.	<p>Measures to avoid:</p> <ul style="list-style-type: none"> <li>• No acid sulphate soils recorded.</li> </ul> <p>Measures to minimise:</p> <ul style="list-style-type: none"> <li>• Project design has considered the location of drainage lines with the aim of minimising changes to natural flows. Where necessary, suitable floodways, drains and culverts will be installed to maintain, as much as possible, natural flow patterns.</li> <li>• The wastewater treatment plant will be designed and located consistent with regulatory requirements relevant to the protection of water quality.</li> <li>• Treatment of greywater will be provided by an advanced system (such as a Wise Water system) to ensure a high recovery of nutrients.</li> <li>• Hazardous materials will be stored in accordance with relevant Australian Standards and Dangerous Goods Storage regulations.</li> <li>• Chemical storage and handling procedures to prevent leaks or spills.</li> <li>• Groundwater abstraction will be minimised through the storage and re-use of hydrotest water.</li> <li>• Low groundwater abstraction rates will reduce the likelihood and magnitude of groundwater drawdown.</li> </ul>
7	<b>Impacts</b> – Assess the impacts of the proposal and review the residual impacts against the EPA objective.	<ul style="list-style-type: none"> <li>• After installation of surface water drainage measures, surface water flow patterns are expected to remain similar to baseline flow patterns, and changes to flow velocities are not expected to alter the natural scour characteristics of the catchment.</li> <li>• No significant impact to surface or groundwater quality is expected as a result of the discharge of treated wastewater.</li> <li>• Considering the application of standard industry practices for chemical storage and handling, the risk of contamination of surface and groundwaters is considered low.</li> <li>• Under the most conservative (worst case) scenario, modelling predicts a maximum drawdown in the immediate location of the production bores of 1.15 m after 10 years of continuous abstraction, assuming no recharge occurs (GHD 2018b). Changes to localised groundwater levels are not predicted to adversely impact on beneficial uses.</li> </ul>

Potential environmental impacts		
		<ul style="list-style-type: none"> <li>Local hydrological regimes will be maintained and the EPA objective for Inland Waters will be met.</li> </ul>
8	<b>Assumptions</b> - Describe any assumptions critical to your assessment e.g. particular mitigation measures or regulatory conditions.	NA

Potential environmental impacts		
1	<b>EPA Factor</b>	Social Surrounds
2	<b>EPA policy and guidance</b> - What have you considered and how have you applied them in relation to this factor?	<ul style="list-style-type: none"> <li>Environmental Factor Guideline – Social Surroundings (EPA 2016r). This guidance was consulted in the consideration of potential impacts from the Proposal to the social surroundings.</li> <li>Guidance for the Assessment of Environmental Factors – Assessment of Aboriginal Heritage (EPA 2004). Provides guidance on the process of Environmental impact assessment of Aboriginal Heritage. Referred to in the design of Aboriginal Heritage surveys.</li> </ul>
3	<b>Consultation</b> – Outline the outcomes of consultation in relation to the potential environmental impacts	Refer to Attachment B.
4	<b>Receiving environment</b> – Describe the current condition of the receiving environment in relation to this factor.	<p>In 2016, the Gascoyne population was 9,485, the lowest estimated resident population of all the regions in WA (ABS 2016a, GDC 2017). Of the population, 52.7% were male and 47.3% were female. Aboriginal and/or Torres Strait Islander people made up 13.4% of the population.</p> <p>Most of the working population is employed in accommodation (primarily tourism related), followed by supermarket and grocery stores, local government and hospitals (ABS 2016b). Other employing industries include tourism, fishing, mining, horticulture and pastoralism. Opportunities are being created for fly in-fly out mining jobs from Carnarvon to the West Pilbara as well as indigenous and ecotourism in inland and coastal areas of the Gascoyne (GDC 2019). There is a labour shortage in the majority of the industries in the Gascoyne including seasonal workers for the horticultural, fishing and tourism industries and qualified tradespersons for small businesses (GDC 2019).</p> <p>The Gnulli Native Title Claim stretches from Wooramel River to North West Cape and Exmouth Gulf, and is comprised of three groups – the Ingaarda Teddei, the Baiyungu and the Thalanyji peoples (SJC Consultants 2019). Anthropologists place the Ingaarda Teddei as occupying land south of the Gascoyne River and the Baiyungu and Thalanyji peoples living north of the Gascoyne.</p> <p>A desktop review of the DPLH Aboriginal Heritage Inquiry System (AHIS) identified no Registered Aboriginal sites and 4 lodged Aboriginal Sites partially within or adjacent to the Development Envelope (DAA 2019). During surveys, no archaeological or ethnographical sites, as defined under Section 5(a), (b) or (c) of the <i>Aboriginal Heritage Act 1972</i>, were recorded within the Development Envelope (SJC Consultants 2019).</p>
5	<b>Proposal activities</b> – Describe the proposal activities that have the potential to impact the environment	<ul style="list-style-type: none"> <li>Clearing for onshore infrastructure.</li> <li>Construction and operation of the facility.</li> <li>Bundle launch and tow activities.</li> <li>Closure and decommissioning.</li> </ul>

Potential environmental impacts		
6	<p><b>Mitigation</b> – Describe the measures proposed to manage and mitigate the potential environmental impacts.</p>	<p>Measures to avoid:</p> <ul style="list-style-type: none"> <li>Heritage survey completed to allow any significant heritage sites to be mapped and avoided.</li> </ul> <p>Measures to minimise:</p> <ul style="list-style-type: none"> <li>Land disturbance will be kept to the minimum necessary for development of the Proposal.</li> <li>Access to Heron Point and the Bay of Rest will be maintained.</li> <li>Appropriate management of noise, dust and light emissions.</li> <li>Heritage monitors during clearing and construction activities.</li> <li>Approved Indigenous Land Use Agreement (ILUA) to be obtained and adhered to.</li> <li>Where necessary, suitable floodways, drains and culverts will be installed to maintain, as much as possible, natural flow patterns.</li> <li>Cultural Heritage Management Plan.</li> <li>Limit on the number of Bundle launches (average of two, up to a maximum of three, per year).</li> <li>No launches during period of peak usage of Exmouth Gulf by Humpback whales (August to October).</li> <li>Public notification prior to Bundle tow operations.</li> </ul>
7	<p><b>Impacts</b> – Assess the impacts of the proposal and review the residual impacts against the EPA objective.</p>	<ul style="list-style-type: none"> <li>Given that no sites or cultural places of significance were identified during the heritage surveys, significant impacts to Aboriginal Heritage are not expected.</li> <li>Given the maintenance of access to Heron Point and the Bay of Rest, and the management of potential aesthetic and amenity impacts associated with noise, dust and light, significant impacts to Social Surrounds are not expected.</li> <li>Given the short-term nature of the tow operations through the Ningaloo Marine Park, the Bundle tow operation is not likely to have any significant impacts on the natural beauty and aesthetic importance of the area, or on the important and significant natural habitats. A Bundle tow will traverse Ningaloo Marine Park for a duration of approximately four hours per launch, with no residual effect following this period. A maximum of three Bundles will be launched per year.</li> <li>Commercial fishing operators will have advanced notice of a Bundle launch and will be able to schedule activities to avoid the Bundle tow route (as required).</li> <li>Impacts to social values will not be significant and the EPA Objective for Social Surrounds will be met.</li> </ul>



Potential environmental impacts		
8	<b>Assumptions</b> - Describe any assumptions critical to your assessment e.g. particular mitigation measures or regulatory conditions.	NA

Potential environmental impacts		
1	<b>EPA Factor</b>	Terrestrial Environmental Quality (Other Factors or Matters)
2	<b>EPA policy and guidance</b> - What have you considered and how have you applied them in relation to this factor?	<ul style="list-style-type: none"> <li>• Environmental Factor Guideline – Terrestrial Environmental Quality (EPA 2016s). Referred to in the determination of data requirements to support the assessment of the Proposal.</li> <li>• Identification and Investigation of Acid Sulfate Soils and Acidic Landscapes (DER 2015). Referred to in the assessment and identification of acid sulphate soils.</li> <li>• Treatment and Management of Soil and Water in Acid Sulfate Soil Landscapes (DER 2015). Guides the treatment and management of any identified acid sulphate soils.</li> <li>• Acid sulfate soil risk maps (DWER 2016). Referred to in the selection of sampling locations.</li> </ul>
3	<b>Consultation</b> – Outline the outcomes of consultation in relation to the potential environmental impacts	Refer to Attachment B.
4	<b>Receiving environment</b> – Describe the current condition of the receiving environment in relation to this factor.	<p>The Development Envelope is located on coastal plains within a minor syncline between Cape Range in the west and Rough Range in the south east. Within the main Proposal footprint, east of the Minilya Exmouth Road, the site surface geology is typically residual sand plains forming longitudinal dunes, with intertidal flats (calcareous clay, silt and sand) and supratidal flats (calcareous clay, silt and sand with authigenic gypsum and salt) identified in the far north east of the project area along the coastal fringes (GSWA 1980).</p> <p>Review of DWER acid sulphate soil (ASS) risk maps in relation to the Development Envelope identified:</p> <ul style="list-style-type: none"> <li>• Minor portions of the Development Envelope are mapped as Class 1 ‘High to Moderate’ risk of ASS within 3 m of the natural soil surface.</li> <li>• A minor portion of the Development Envelope along the coast is mapped as Class 2: ‘Moderate to Low’ risk of ASS within 3 m of natural soil surface with ‘High to Moderate’ risk of ASS beyond 3 m (DWER 2016). These areas correspond generally with supratidal mud flats.</li> <li>• The surrounding landscape is mostly mapped as having no risk of ASS, with areas of ‘High to Moderate’ risk and ‘Moderate to Low’ risk mapped along the coast and within discrete, low lying areas (DWER 2016).</li> </ul> <p>Results from analysis of soil samples indicated that none were actual or potential ASS (MBS Environmental 2018b).</p>
5	<b>Proposal activities</b> – Describe the proposal activities that have the potential to impact the environment	<ul style="list-style-type: none"> <li>• Potential impact to soil quality following the exposure or disturbance of acid sulphate soils during construction.</li> <li>• Impacts to soil quality due to chemical leaks or spills during construction or operations.</li> </ul>

Potential environmental impacts		
6	<b>Mitigation</b> – Describe the measures proposed to manage and mitigate the potential environmental impacts.	<p>Measures to avoid:</p> <ul style="list-style-type: none"> <li>• None (no ASS recorded).</li> </ul> <p>Measures to minimise:</p> <ul style="list-style-type: none"> <li>• Minimise the extent and depth of excavations.</li> <li>• Implement appropriate chemical transport, storage and handling procedures.</li> <li>• Chemical and hydrocarbon storage vessels will be bunded.</li> <li>• Staff will be trained in refuelling procedures and the handling and management of chemicals.</li> </ul> <p>Measures to rehabilitate:</p> <ul style="list-style-type: none"> <li>• Oil spill kits and equipment will be available on site.</li> </ul>
7	<b>Impacts</b> – Assess the impacts of the proposal and review the residual impacts against the EPA objective.	<ul style="list-style-type: none"> <li>• Given there are no ASS within the Development Envelope, the Proposal will not cause impacts associated with their disturbance.</li> <li>• No significant impact to terrestrial environmental quality is expected as a result of chemical leaks or spills.</li> <li>• The EPA objective for terrestrial environmental quality will be met.</li> </ul>
8	<b>Assumptions</b> - Describe any assumptions critical to your assessment e.g. particular mitigation measures or regulatory conditions.	NA

Part C: Other approvals and regulation			
State and Local Government approvals			
Is rezoning of any land required before the proposal can be implemented? If yes, please provide details.		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Under the Local Planning Scheme 4 (LPS 4), the Proposal area is zoned as 'Rural'. Subsea 7 has resubmitted a Scheme Amendment Request to rezone the Proposal area from 'Rural' to 'Special Use' under LPS 4.	
If this proposal has been referred by a decision-making authority, what approval(s) are required from you?		NA	
Please identify other approvals required for the proposal:			
Proposal activities e.g. clearing, dewatering, mining, processing, dredging	Land tenure/access e.g. Crown land, Mining lease, specify legislation for access if relevant	Type of approval e.g. Native Vegetation Clearing Permit, licence, mining proposal,	Legislation regulating the activity e.g. EP Act 1986 – Part V, RiWI Act 1914, Mining Act 1979
Water abstraction	Crown Land	5c Licence to take groundwater	RIWI Act 1914
Construction of infrastructure	Crown Land	Development Application	Planning and Development Act 2005
Commonwealth Government approvals			
Does the proposal involve an action that may be or is a controlled action under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act)?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Has the proposed action been referred? If yes, when was it referred and what is the reference number (EPBC No.)?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Note: Original Proposal (Assessment No. 2136) referred. Some changes to the onshore and offshore envelopes and footprints have been made. Date: 18/10/2017 EPBC No.: 2017/8079	
If referred, has a decision been made on whether the proposed action is a controlled action? If 'yes', check the appropriate box and provide the decision in an attachment.		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Decision – controlled action <input type="checkbox"/> Decision – not a controlled action	
If the proposal is determined to be a controlled action, do you request that this proposal be assessed under the bilateral agreement or as an accredited assessment?		<input type="checkbox"/> Yes - Bilateral <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes - Accredited	
Is approval required from other Commonwealth Government/s for any part of the proposal? If yes, describe.		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Approval:	

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