

Site Characteristics and Issues Matrix

Site Name Quondong Point

Terrestrial Biophysical Attributes		Extent and Condition			Level of Confidence	Potential for Significant Risk / Hazard and Impact of Development at this Site
Rainfall: 600mm (Broome)		Extent Extent in the local area and regional context. Coastal area extent may be described as either alongshore and cross-shore length. Non-coastal extent could include; highly restricted to landform or habitat, locally common but regionally restricted, or widespread	Key Coastal and Ecological Processes Key coastal processes are defined by NCCOE (2004) and should be interpreted in the context of coastal landform description. Ecological processes relate to terrestrial ecology	Site Condition / Disturbance Factors Includes factors such as weed cover, apparent erosion (on ground or visible in aerial photography), excessive fire frequency	High: from site visit /survey, good map based knowledge, Medium: inferred from other good information sets, Low: limited information.	
Geological Province	Site Geology, Substrate Characteristics & Diversity	Extent in local area and region	Key Coastal / Ecological Processes	Site Condition / Disturbance Factors		Altered Drainage and Stormwater Management H: Site area or substrate restricts effective on site management of storm water, erosion, potential pollution issues M: Site size and / or substrate allows for some retention of stormwater L: Site size and substrate allows for retention and managed discharge of stormwater.
Canning Basin Sandplains	Broome Sandstone (Exposed/soil covered)	Localised coastal (mostly intertidal and subtidal) exposures at Quondong Point	Provides the structural support for Quondong Point. Provides rock substrate for intertidal benthic communities.		H	L
	Pindan Red Earths Quaternary sands and silt	The dominant substrate across the site and region. Exposed as Pindan Cliffs in places along the coastline of this site, mostly covered by Holocene sand dunes.	Tropical cyclones and storm surge episodic erosion of coastal cliffs. Relatively stable very gently sloping surface, streams are ponded behind coastal dunes forming seasonal wetlands.	Repeated extensive fire, previous pastoral grazing, coastal tourism access road has caused localised erosion, weeds.	H	L-M: Drainage management would need to account for concentrated runoff and potential erosion
Coastal Deposits Canning Basin Sandplains	Holocene coastal beach sand and sand dunes	Intertidal sandy beach and extensive partially vegetated dune systems dominate much of the coast north and south of Quondong Point	Erosion during cyclones and storm surge events. Localised impacts of vehicle access disturbing dune vegetation.	Natural system,	H	M: Coastal dune systems would need to be protected, it provides, essential environmental conditions to sustain soil and soil moisture requirements for Monsoon Vine Thicket vegetation and fauna habitat.
Site Diversity/ Extent	Total: Three Geological surfaces	Low geological diversity. Hub in regionally widespread Pindan surface.				L
Coastal Geomorphology, Geomorphological Processes & Landform Stability		Extent in local area and region	Key Coastal / Ecological Processes	Site Condition / Disturbance Factors	Level of Confidence	Potential for Coastal impacts from altered coastal wave / energy regime, or concentrated stormwater flows H: Low lying topography; Proximity to tidal creeks; Cheniers, narrow barrier dunes & associated extensive wetlands; Extensive mudflats; considerable longshore sand drift regime with significant potential for impact M: Moderately elevated topography (to 10 m); Sandy & silty beaches limited longshore sand movement; Moderate to wide barrier dunes and wetlands; Erodable or eroding cliff. L: Elevated topography (>10m); rocky coast and landward landform with little evidence of recent erosion; low longshore

					sediment drift
Coastal Geomorphology, Geomorphological Processes & Landform Stability	Extent in local area and region The location of interest occupies approximately 7 km of a 78 km reach of shore in which, with some exceptions in the vicinity of tidal inlets, a narrow beach is backed by Pindan Plain soils. The 10 metre depth contour is approximately parallel to the shore and 5 km offshore.	Key Coastal / Ecological Processes This location is exposed to all the key processes identified by NCCOE (2004), including 1. Mean Sea Level changes 2. Ocean Currents 3. Ocean Temperature 4. Wind Climate 5. Wave Climate 6. Rainfall & Runoff	Site Condition / Disturbance Factors Secondary processes are significant at a local scale due to variation in aspect and exposure of the coast around the headland. These processes are potentially disturbance factors and include: 1. Local sea level 2. Local currents 3. Local winds 4. Groundwater 5. Coastal flooding 6. Sediment transport This is an eroding coast and the geological structure of the coast is a critical factor in the changes taking place. Cliffing along the backshore and erosion of the Pindan soils landward of rocky headlands indicates intermittent erosion during major storm events.	Level of Confidence M to H: based on field survey in fine weather and interpretation of aerial photography	Potential for Coastal impacts from altered coastal wave / energy regime, or concentrated stormwater flows H: Geologic structure is critical to site conditions. It obscures the level to which secondary (dynamic) processes operate, such that the appearance of stability may be misleading. As a result, the potential for large impacts arising from development and significant risk to the environment is difficult to ascertain but should not be underestimated.
Inshore features (b) Sandy beaches & mudflats	Sandy beaches extend continuously along the coast from Quondong Point to James Price Point Orientation of the shore is approximately parallel to the 10m depth contour.	Tropical cyclones, storm surge, macro-tidal action. Extreme meteorological events.	The coast is exposed to wind, wave, currents and tidal processes; especially tropical cyclones and high sea level events. Changes to coastal sediment movement regime.		H: High potential for impact arising from introduction of engineered structures
(d) Subtidal rock platforms & pavements	Local feature, with platforms outcropping intermittently and particularly close to rocky headlands	Tropical cyclones, storm surge, macro-tidal action. Extreme meteorological events.	Cross-shore and alongshore sediment transport Coastal erosion during extreme meteorological events including tropical cyclones and extended periods of NW monsoonal activity.		L. Modification would affect inshore ecology
Rocky headlands					
(c) Localised outcrops - platform	Localised outcrops which may extend in patches beneath the Pindan	Tropical cyclones, storm surge, macro-tidal action. Extreme meteorological events.	Tidal erosion, storm surge erosion movement of unconsolidated sediment off-shore		H: It would be essential to complete a geotechnical examination of structures prior to or as part of any further stage of investigation.
Embayments					
Barrier dune ridge & vine thicket					
(a) Mobile dunes	Major coastal landform. Storm washouts and subsequent wind activity formed several patches of active dune	Tropical cyclones. Extreme meteorological events. High sea levels coupled with wave and current activity.	Coastal erosion during extreme meteorological events. Changes to coastal sediment movement regime, exposure		M to H: Sandy coastline potentially impacted by offshore component of development with implications for coastal exposure, coastal processes. Development would require substantial coastal setback
(b) Vegetated dunes	Major feature is a high ridge extending approximately 7 km along the coast and 0.5 metres inland of the shore.	Tropical cyclones, extreme meteorological events. Vehicle access tracks, changes to stormwater ponding. Invasion of weeds	Coastal erosion during extreme meteorological events; fire; vehicle tracking for coastal access		M to H: Vine thicket Threatened Ecological Community (TEC). Development would require substantial setback from coast and avoidance of impacts on coastal dunes, stormwater drainage, and ponding behind dunes.
Site Diversity Five landform types on site	Moderate diversity. Some intertidal types have restricted distribution				L-M

Diversity of Vegetation Communities - on site and regional context	Extent in local area and region	Key Coastal / Ecological Processes	Site Condition / Disturbance Factors	Level of Confidence	Potential for Significant Impacts from Site Clearing H: Conservation Significant communities, high physical / biological diversity, or restricted community/s. M: Moderate physical / biological diversity. L: Low diversity, communities widespread regionally
Coastal Vegetation Communities					
Foredune vegetation	Partially vegetated coastal dunes along entire coast of the Site area.	Dune movement (sand erosion / deposition) and vegetation disturbance during cyclonic winds.	Introduced pasture species <i>Cenchrus ciliaris</i> (Buffel Grass) is invading coastal dune community in this area. Vehicle access has caused areas of localised disturbance.	H	M: Potential for impact of coastal structures on coastal sand movement with implications for dune form and stability. Management of point/s of coastal crossing
Wetland Vegetation Communities					
Wetland vegetation					
(a) Seasonal	Several seasonal wetlands on site and local area, This environment type appears in near coastal environments where coastal dune landforms exist, often in association with Monsoon Vine Thicket vegetation.	Controlled by ponding of minor drainage flow lines behind the coastal dunes.	Vegetation understorey is invaded by pasture grasses, and crossed by Manari Road.	H	H: Wetlands support vegetation associated with dune swale Monsoon Vine Thicket TEC. Local drainage flows to the wetlands. Impact on drainage lines and stormwater drainage discharge/flows to the wetlands and back of the dunes.
Upland Vegetation Communities					
(c) Upland on Pindan surfaces					
Pindan Acacia Shrubland with emergent Eucalypts, to low open Eucalyptus dominated woodland.	Dominant vegetation on the site. Widespread and characteristic vegetation of the region.	Fire frequency and scale.	The area and surrounds has suffered from excessively frequent and large scale fires. History of pastoral grazing and vehicle access has introduced weeds. Local disturbance associated with road access.	H	L: Pindan vegetation is widespread
Vine Thicket/Rainforest TEC in Dune Swale	Contiguous patch of Monsoon Vine Thicket TEC occupies dune swale along the length of the site. Regionally this is one of the largest vine thicket patches on the Dampier Peninsula and one of the largest of the Dune Swale type vine thickets.	The vine thicket vegetation is dependent on reliable soil moisture being available through the dry season from the dunes storing wet season rainfall and impairing drainage flows of the hinterland behind the dunes.	Understorey has been invaded by pasture grasses, and is transgressed by Manari Road.	H	M-H: Risk to vine thicket TEC vegetation. The back of the dunes may be affected by direct clearing, modification to coastal dunes, or impact on drainage lines and stormwater drainage discharge/flows that are impounded by the dunes.
Site Diversity	Low - Moderate Diversity – four vegetation communities on general hub area. Five in the general locality.				M:
Threatened, Priority, Significant Flora (Population) (Species/status)	Extent in local area and region	Key Coastal / Ecological Processes	Site Condition / Disturbance Factors	Level of Confidence	Potential for Significant Impacts from Site Clearing H: Threatened species recorded, High quality/extensive suitable habitat for threatened species, high physical / biological diversity, or restricted community. M: Limited representation of restricted habitat type/s, or habitats suitable for priority/significant species, moderate physical / biological diversity. L: Low habitat diversity, Habitats widespread regionally, limited potential to support threatened/priority or other significant species.
Note: Flora survey still to be undertaken for this location					
DRF (Wildlife Conservation Act) / Endangered (EN)/Vulnerable (VU) EPBC Act Species/Habitat	None known			M	L
Priority flora	Population of <i>Pittosporum moluccanum</i> P4 associated with	Protection of dunes by monitoring dune vegetation required to	Condition of the specific site/s supporting the Priority species is not	M	M:

	the Monsoon Vine Thicket vegetation and white sand, south of James Price Point.	maintain habitat for <i>Pittosporum moluccanum</i> .	known, but has potential to be impacted by disturbance factors affecting the TEC elsewhere.		
Other significant flora. (eg Unnamed species, Range end/outlying populations)	None known			L-M	L
Habitat specialist restricted taxa, restricted habits	Series of plant species confined to vine thicket and wetland habitat types are present on the site			M	M
Threatened, Priority, Significant Fauna Population or Habitat (Species / status) Note: Fauna survey still to be undertaken for this location	Extent in local area and region	Key Coastal / Ecological Processes	Site Condition / Disturbance Factors	Level of Confidence	Potential for Significant Impacts from Site Clearing H: Threatened (Rare) species recorded, High quality/extensive suitable habitat for Threatened species, high physical / biological diversity, or restricted community. M: Limited representation of restricted habitat type/s, or habitats suitable for threatened/priority species, moderate physical / biological diversity. L: Low habitat diversity, Habitats widespread regionally, limited value as habitat for threatened/priority or other significant species.
Threatened (Rare) Wildlife Conservation Act / Endangered (EN), or Vulnerable (VU) EPBC Act Species / Habitat (ie Turtle nesting beach)	Coastal beach and foredune habitat is present, turtle breeding records not known. <i>Macrotis lagotis</i> (Bilby) VU has been recorded for the area - species likely to be widespread in low numbers where suitable habitat. <i>Erythrura gouldiae</i> (Gouldian Finch) EN – declining populations widely distributed in savannah woodlands with suitable habitat Continuing presence of these species on site is not known.			M- Historical records derived from the Museum, it is uncertain as to whether species still extant in area. Fauna surveys are planned to increase knowledge.	M:
Priority listed sp / habitat	Both <i>Lerista separanda</i> (burrowing skink) P2 and <i>Simoselaps minimus</i> (Dampierland Burrowing Snake) P2 - are associated with sandy substrates /leaf litter which is widely distributed on the Dampier Peninsula			M- records derived from the Museum. Fauna surveys are planned to increase knowledge.	M
Ramsar/JAMBA/CAMBA/ROKAMBA Migratory sp / habitat	Seven species of migratory wader have been recorded. This area is unlikely to provide regionally significant habitat.			M- information derived from Museum. Fauna surveys are planned to increase knowledge.	L
Other significant fauna. (eg Unnamed species, Range end/outlying populations, species with declining range)	<i>Falco peregrinus</i> (Pergrine Falcon) Schedule 4, is a wide ranging species			M- information derived from Museum. Fauna surveys are planned to increase knowledge.	L

Potential habitat for Short Range Endemic inc subterranean fauna	Extent in local area and region	Key Coastal / Ecological Processes	Site Condition / Disturbance Factors	Level of Confidence	Potential for Significant Impacts from Site Clearing H: Restricted habitat with high potential for short range endemic species, or restricted community/s or restricted environment with substrate characteristics (high porosity, connectivity and high humidity/moisture) favourable for subterranean fauna M: Moderately restricted habitat with some potential for short range endemic species, or environment with substrate characteristics (high porosity, connectivity and high humidity/moisture) potentially favourable for subterranean fauna. L: Common substrates and communities regionally widespread, without substrate characteristics normally favourable for subterranean fauna
Site environment likely to support restricted habit specialist fauna, SRE fauna Substrate/habitat potential suitability for subterranean fauna, (ie fractured rock, karst environment, springs etc)	Monsoon Vine Thickets are recognised as patchy environments that commonly support Short Range Endemic species. Low potential for subterranean fauna on Pindan substrate.	The environment is significant because it provided moist microhabitats and high vegetation/litter cover habitat for species requiring these conditions for survival. Such environments are isolated and patchy in distribution in the region, isolating populations of habitat specialist species with limited capacity for dispersal.	Significant damage to the vine thicket TEC or the moisture regime supporting the community could pose a threat to SRE species depending on this environment.	L-M	H: Large significant example of Monsoon Vine Thicket with potential to support SRE's
Visual Landscape Significance	Visual Landscape Significance Assessment			Level of Confidence	Potential significance of Landscape impacts from development of the site <i>Suitability Rating and Absorption Capability</i>
Landscape character of hub site and broader context	<p>Landscape Region: The Kimberley</p> <p>Character Type: Dampier Tableland</p> <p>Landscape context: The Quondong Point node is located within a broad-scale landscape with a landform of gently undulating sand plains with closely spaced linear dunes and dramatic coastal features. Vegetation cover is open woodland with pindan thickets and hummock grass understorey common to the Dampier Peninsula. Numerous creeks dissect the peninsula and minor headlands, mangroves, mud-flats, swamps and sandy beaches occur along a relatively uniform coastline. Grazing has occurred on pastoral leases with evident signs of pastoral/residential infrastructure – roads, fences, out-camps and yards. There are small residential communities, localised evidence of mining and exploration and public recreation use in this sub-type.</p> <p>View character of this development node: The landscape is characterised by flat to undulating landform and abrupt coastline with diverse soil colours, beaches, dune ridges, creek mouths and vegetation patterns. Uniformity of low vegetation on the plain would limit even minor screening or buffering of development elements from some viewer positions.</p> <p>Landscape character significance rating: High coastal, moderate inland.</p> <p>Comments: Development in this node would certainly displace or alter some established activities and viewer positions (marine and terrestrial) along the coastal strip. Camping and day use sites are evident along the coastal zone. Views into a hub would be dependent upon redesigned terrestrial access, both road and pedestrian and any marine boating restriction zones. The potential to retain a buffer reserve along the coastal zone within the node is excellent.</p>			H	<p>Suitability rating: Moderate</p> <p>Absorption Capability: Low to Moderate</p> <p>Analysis (+ positive and - negative):</p> <ul style="list-style-type: none"> + built infrastructure evident; some evident changes to landscape character + moderate levels of visual landscape significance + landscape modifications part of public expectation - proximity to marine tour boat routes - proximity to dispersed coastal campsites - established user patterns - low to moderate visual absorption capability - cultural landscape and heritage trail of significance
Degree of evident alteration or change from the 'naturally established' landscape character based on levels of 'naturalness'	<p>Degree of evident change from naturally established character: moderate; roads, tracks, campsites and evidence of human activity are present along the coastal zone, but less evident inland.</p> <p>Naturalness rating: Moderate.</p>			H	
Degree and sensitivity of views and seen areas from travel routes and use areas (duration,	<p>Viewer positions: Marine based visitors on tour/pleasure craft and shore-based fishing boats, pedestrian visitors using coastal campsites, travellers using a network of access roads/tracks including Nanari Road and a coastal 'cultural songline' heritage walking track.</p>			H	

frequency, position in landscape, number of viewers, distance)	<p>Distance zone: Foreground, middle-ground and background. Duration of view: Long duration. Viewer position: Variable depending on position in the landscape, but can be below or level. Sensitivity Level: Level 1 or 2 - High to Moderate, due to numbers of seasonal land-based visitors, standard of access road and number of craft offering views to the land. Implications: Development in this landscape would become visually dominant as viewed from a number of established marine and terrestrial viewpoints and travel routes. Height of coastal dune ridges and some minor variation in vegetation patterns on the terrestrial plain, could help reduce but not eliminate negative visual impacts resulting from development.</p>			
Special features and focal points within view of the hub site	Quondong Point, James Price Point, Flat Rock and Coulomb Point		H	
Remote Area - Quarantine Risks / Hazards from Construction / Operation of development Introducing new species	Site Context	Site Condition and Disturbance Factors	Level of Confidence	Quarantine - Potential Hazard from Introduction of New Species H: Island, or remote mainland area currently largely free of introduced species and distant from most human vectors M: Site has few weeds and limited vehicle access. L: Site some development / existing vehicle access / weeds are common and a stock grazing history
Relative quarantine risk from developing/operating Hub at the location	Existing road access	Site has some development / existing vehicle access / weeds are common and a stock grazing history	H	L
Remote area – potential for future development of Land-based transport or Infrastructure links.			Level of Confidence	Potential for major impacts from off site transport / infrastructure links H: Remote mainland area currently distant from most human vectors M: Mainland area currently not serviced by main road access. L: Island with no potential for off site impacts. or mainland location close to major roads with existing vehicle access.
Degree of impact from potential future land-based transport or infrastructure links	Mainland location close to major roads with existing vehicle access.		H	L:
Existing or proposed conservation reserve (inc marine) or Indigenous Protected Area			Level of Confidence	Conservation Reserve Status H: Existing reserve M: Recommended Reserve L: No reserve proposed
Existing / Proposed Conservation reserve	DPI Waterbank Structure Plan proposal for conservation and indigenous protected area. Plan not endorsed		H	L-M
Existing / Proposed Marine Reserve	None proposed		H	L
Existing / Proposed Indigenous Protected Area	Waterbank Structure Plan Not endorsed.		H	L-M

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