

Referral of proposed action

Proposed action title:

Cleveland Bay Purification Plant Outfall Upgrade

1 Summary of proposed action

1.1 Short description

The proposed action replaces the existing Cleveland Bay Purification Plant outfall pipeline and outfall discharge structure as part of the Cleveland Bay Purification Plant upgrade. The pipeline transfers treated effluent from the Cleveland Bay Purification Plant, 750m out into Cleveland Bay. The replacement will take place within the existing footprint which requires a temporary discharge into Sandfly Creek via an existing discharge point during construction works.

1.2 Latitude and longitude

Latitude and longitude details are used to accurately map the boundary of the proposed action. If these coordinates are inaccurate or insufficient it may delay the processing of your referral.

location point	Latitude			Longitude		
	degrees	minutes	seconds	degrees	minutes	seconds
Outfall	-19 ⁰	17'	23.15"	146 ⁰	51'	24.58"
Outfall	-19 ⁰	17'	22.1"	146 ⁰	51'	24.38"
Outfall	-19 ⁰	17'	16.91"	146 ⁰	51'	51.46"
Outfall	-19 ⁰	17'	17.95"	146 ⁰	51'	51.66"
Discharge Area	-19 ⁰	17'	24.44"	146 ⁰	51'	21.75"
Discharge Area	-19 ⁰	17'	24.32"	146 ⁰	51'	22.4"
Discharge Area	-19 ⁰	17'	25.02"	146 ⁰	51'	22.53"
Discharge Area	-19 ⁰	17'	25.14"	146 ⁰	51'	21.89"

1.3 Locality and property description

The existing Cleveland Bay Purification Plant is located to the east of the main urbanised area of Townsville. The proposed outfall alignment traverses 750 m from the plant into the marine environment, 200 m of which is wholly within the Great Barrier Reef Marine Park. Refer to Appendix 1 - Figure 1 to view a map of the location and existing infrastructure and Appendix 3 for photographs of the immediate area and existing infrastructure.

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

2.68 ha

1.5 Street address of the site

Cleveland Bay Purification Plant, Racecourse Road, Stuart, Townsville, Queensland

1.6 Lot description

Cleveland Bay Purification Plant: Lot 1 RP723944; Lot 1 RP732945
Outfall Pipeline: Lot 4 on USL 51433 and Lot 66 EP1755

1.7 Local Government Area and Council contact (if known)

Townsville City Council, Robert Kent

1.8 Time frame

Construction work on the outfall is planned from April – October 2017.

1.9 Alternatives to proposed action

Were any feasible alternatives to taking the proposed action (including not taking the action) considered which are not proposed?

	No
✓	Yes, please also complete section 2.2

1.10 Alternative time frames, locations or activities

Does the proposed action include alternative time frames, locations or activities?

✓	No
	Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3 and 5 (where relevant).

1.11	Commonwealth, State or Territory assessment Is the action subject to other a Commonwealth, State or Territory environmental impact assessment?	✓	No
			Yes, please also complete section 2.5
1.12	Component of larger action Is the proposed action a component of a larger action?	✓	No
			Yes, please also complete section 2.7
1.13	Related actions/proposals Is the proposed action related to other actions or proposals in the region?		No
		✓	Yes, provide details: Cleveland Bay Purification Works Upgrade
1.14	Australian Government funding Has the person proposing to take the action received any Australian Government grant funding to undertake the proposed action?	✓	No
			Yes, please also complete section 2.8
1.15	Great Barrier Reef Marine Park Is the proposed action inside the Great Barrier Reef Marine Park?		No
		✓	Yes, please also complete section 3.1 (h), 3.2 (e)

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2 Detailed description of proposed action

2.1 Description of proposed action

Townsville City Council (TCC) intends to upgrade the existing treated effluent outfall pipeline at the Cleveland Bay Purification Plant (CBPP). The existing outfall of 900mm diameter concrete sections was constructed in the late 1950's and is currently in very poor condition with a recent history of failure. In order to meet higher standards of environmental discharge requirements, the CBPP is being upgraded to increase the hydraulic capacity of the plant from 1.58 Average Dry Weather Flow (ADWF) to 3 times ADWF for 30 days sustained flow.

The proposed action involves the replacement of the outfall pipeline from the CBPP to the existing discharge location in Cleveland Bay. A new outfall pipe will be placed within the same alignment footprint. During construction, the plant's tertiary treated effluent will be diverted to an existing bypass discharge point in the middle estuary of Sandfly Creek (Refer Figure 2, Appendix 1). Upon commissioning of the new outfall alignment, the discharge will be reverted back to the existing location in Cleveland Bay.

Works are expected to take six months and would occur during the dry season. Works will be undertaken using the following construction methodology.

Terrestrial works

- Site establishment; note no site compounds would be required along the pipeline route.
- Clearing of terrestrial vegetation, grubbing and light earthworks along the outfall route to a width of 2 m to the north and in the existing access track plus 1 m to the south.
- Equipment used for the clearing of vegetation is likely to be bulldozers, graders and backhoes, with manual clearing (utilising chainsaws) occurring in areas unstable for large machines and tidal areas. Trees near the site of the work shall only be removed if they are likely to damage or obstruct the work. All vegetation is to be removed from the outfall pipeline route.
- Existing outfall pipeline to be removed and disposed off-site.
- New outfall pipeline to be installed along the same corridor as the existing pipe.
- Trench excavation along the outfall route is required as the replacement pipe (DN1200) is larger than the replaced outfall (DN900). Maximum trench width of 2 m width to accommodate the concrete buoyancy blocks. Generally trench width will be no greater than 1.9 m. Trench excavation depth likely to be less than 2.5 m (the maximum excavation depth will be in the dune area). Trench shields will be required to support the trench (to mitigate collapsing) due to the nature of the material.
- Depending on tide levels, trench will need to be dewatered to enable pipeline installation.
- It is noted that the pipeline will be constructed outside of the wet season to ensure minimal disturbance. Additionally, the construction timing is set due to the intended use of Sandfly Creek as a temporary discharge.
- Placement and compaction of sand fill (150 mm) in the bedding zone.
- Each pipeline length will be installed into the trench and placement on top of the bedding zone.
- Pre-cast concrete buoyancy blocks will be used to weigh down the pipes in order mitigate pipe floating due to high water table.
- Placement and compaction of fill in the side support zone and the overlay zone (150 mm above top of the outfall pipeline where the pipeline is within the dune area).
- Backfilling of the trench with approved material from the excavation immediately follows the placement of the outfall pipeline and fill. The pipe is backfilled over the entire length except for where the pipeline is located above the existing natural surface.
- Disposal of excess spoil offsite.
- Final backfill and clean up.
- Topsoil replacement and final reinstatement (where possible).
- Hydrostatic testing and commissioning of the outfall main.

Marine works

- Delineation of the works area in the marine environment by use of sea buoys.
- Setting anchors in the marine environment and a winch line to a landside anchor to facilitate barge movement.
- Positioning of the construction barge.
- Removal of existing pipeline and outlet structure (to sea bed level).

- Removal of existing headstocks at sea bed level.
- Pile pitching and positioning.
- Use of a crane on the construction barge to drive piles.
- Pile driving and pile drivability analysis (PDA) testing.
- Cut & preparation of piles.
- Installation of headstocks and piles in the marine environment. This is likely to require seabed material to be scraped aside by an excavator and removed to land. In the tidal zone a temporary coffer-dam like structure will be placed around pile clusters to prepare the piles, install the headstocks and complete concrete pours in the nearshore environment.
- A small concrete batching plant and pump will pour concrete from the barge for the piles (note no headstocks would be made on site instead they are to be barged in ready made from the Port of Townsville or the Marine Industry Precinct).
- Installation of pipeline on headstocks (over the marine environment).
- Temporary discharge of the treatment plant outflow into Sandfly Creek for six months until the new outfall comes on line.
- Removal of all controls, markers and material post construction.

Construction discharge

Effluent discharge limits at the proposed Sandfly Creek discharge point will be consistent with the current outfall requirements, as set by the Environmental Authority (EA) (EPPR00927313) as required under the Queensland *Environmental Protection Act 1994*. Compliance limits are outlined in Table 1.

Table 1 Effluent discharge limits of the Cleveland Bay Purification Plant

Parameter	Minimum	LT 50 th %ile	LT 80 th %ile	Maximum
BOD (mg/L)	-	6	10	20
TSS (mg/L)	-	9	14	30
TN (mg/L)	-	5	-	15
NH4 (mg/L)	-	1	-	3
TP (mg/l)	-	1	-	3
pH (units)	6.5	-	-	8.5
DO (mg/L)	2.0	-	-	-
Faecal coliforms (cfu/100mL)	-	1000	-	4000
Mass load TN (kg pa)	-	-	-	52,925
Mass load TP (kg pa)	-	-	-	10,585

2.2 Feasible alternatives to taking the proposed action

TCC have investigated a range of alternative design alignments and construction methodologies for this project in order to find the most appropriate option, balancing environmental outcome with feasible and practical engineering, constructability and cost considerations.

Concept design progressed to consider new outfall pipeline options as follows.

- Relining the existing outfall pipeline with a polyethylene slipline, with the existing supports and piles to be retained and refurbished or replaced.
- Installing a new outfall pipeline in the same alignment, or adjacent to the existing pipeline with new headstocks and piles.
- Installing a new pipeline but retaining the existing supports depending on their condition.
- Directional drilling of a new outfall pipeline.

With respect to Options A and C above, both Options were not considered feasible as a condition assessment of the existing outfall piles and pedestals indicated that the condition was relatively poor and the existing infrastructure did not have the structural capacity to carry the higher loads anticipated. Option D was assessed as being least preferred from an operational (pipeline will be more than 8 m below the surface) and overall cost perspectives.

On this basis, Option B above was chosen as the preferred method.

A multi criteria analysis (MCA) was then undertaken which investigated further sub options for Option B. This included:

- Option 1: Landside 5m offset; ocean-side same alignment as existing footprint
- Option 2: Entire length on existing alignment, temporary discharge into Sandfly Creek

- Option 3: Entire length on 5m offset northern side, and
- Option 4: Entire length on 5m offset southern side (or opposite side of access track).

Options 1, 3 and 4 utilised the existing outfall pipeline to discharge during the construction period.

The MCA considered constructability, environmental risk, relative cost, and operational and maintenance impacts. Each factor was weighted using a pair wise analysis. The main influences on scoring were associated with:

- ease (or difficulty) of construction through wetland areas and around existing infrastructure
- footprint of disturbance area
- cost of a temporary outfall
- risk of potential failure of the existing pipe during construction of a new pipe.

The MCA process identified the need for further environmental assessment through an environmental consequence analysis. This consequence analysis was further developed and presented at a regulator workshop in September 2016 with relevant State government agencies and the Commonwealth Great Barrier Reef Marine Park Authority to discuss the options available, determine the level of environmental assessment required to proceed with any one option and to identify the preferred option from an environmental perspective.

The outcomes from this environmental consequence analysis demonstrated that the key risks of the environmental impacts for the proposed options included the following.

- An increased footprint of construction disturbance due to the removal of marine plants and impact to tidal lands in Cleveland Bay if realignment of the outfall is required.
- The need to extend the exclusion zone of the Queensland Declared Fish Habitat Area (FHA) to accommodate a new outfall alignment.
- Potential temporary impacts through effluent discharge upon the FHA and water quality objectives, if treated effluent discharge to Sandfly Creek occurs.

As a result of the analysis and workshop findings, Option 2 was selected on the basis that disturbance to marine plants, tidal lands, benthic habitat and FHA were reduced compared to other options. Historical trends in water quality and nutrient data from previous CBPP upgrades and discharge events into the Sandfly Creek identified that the temporary discharge is likely to cause only short term impacts on the estuarine environment. The impacts are anticipated to be temporary and reversible with the onset of high environmental flows during the wet season which will act to further flush any build-up of nutrients from the estuarine system.

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

No alternative locations, timeframes or activities form part of the referred action.

2.4 Context, including any relevant planning framework and state/local government requirements

Commonwealth and State government approvals are required for the replacement of the CBPP outfall. As the outfall structure is within the Great Barrier Reef Marine Park, a Marine Park permit for the structure, operation and ongoing maintenance is required under the *Great Barrier Reef Marine Park Act 1975*.

A range of State government approvals are required for the physical construction of the outfall and the temporary discharge into Sandfly Creek. Approvals directly relating to the replacement of the outfall pipe includes the following (regulated under the *Sustainable Planning Act 2009*).

- Marine plant clearance and operational works in a declared fish habitat under the *Fisheries Act 1994*.
- Tidal works and works within a Coastal Management District under the *Coastal Management and Protection Act 1995*.

Approvals directly relating to the temporary construction discharge into Sandfly Creek include amendment to an existing Transitional Environmental Program (TEP) under the *Environmental Protection Act 1994* (Qld).

The CBPP is currently an approved Environmentally Relevant Activity under EA EPPR00927313 (issued by the Department of Environment and Heritage Protection (DEHP)), as a Sewage Treatment Plant (STP) greater than 100,000 Equivalent People (EP). Conditions 2, 3 and 7 of the EA state the only approved release point is through the outfall pipe to Cleveland Bay (RP1) at a rate of up to 1007 litres per second (equivalent maximum of 87ML/day), excluding bypass flows, and bypasses greater than 1007 litres per second must be screened prior to discharge. The current TEP (MAN19600) was issued on 31/5/2016 and is valid until 1/12/2019. This TEP allows discharge at the existing outfall at a modified rate of 463 L per second (equivalent maximum of 40ML/day) to be treated to a tertiary level. Primary screened effluent above this volume can be diluted with tertiary treated effluent. This TEP is intended to be amended to include an additional discharge point being the existing Sandfly Creek outlet for the duration of the outfall construction.

2.5 Environmental impact assessments under Commonwealth, State or Territory legislation

No environmental impact assessment is required under State legislation. However, environmental assessment of the temporary treated effluent discharge point from the CBPP to Sandfly Creek has been undertaken with reporting being finalised for the purpose of seeking an amendment to the Environmental Authority. This can be provided upon completion.

An Ecology Report, which will support State approvals, is provided in Appendix 2.

2.6 Public consultation (including with Indigenous stakeholders)

No public consultation has occurred to date. Consultation with traditional owners is planned for prior to the construction period in 2017.

2.7 A staged development or component of a larger action

This action is not a component part of a larger action.

2.8 Related actions

Related actions are described in subsections below, along with plant history for context. The related infrastructure projects are triggered by differing requirements. Each project can occur independently of each other and have been managed as separate projects by TCC.

CBPP history

The CBPP was initially constructed in the 1988 and operated as an activated sludge treatment plant. A sludge digestion train was added later and commissioned in 1994. The outfall pipeline and outfall structure were both constructed in 1959 originally forming part of the Western Outfall Pressure Main which discharged wastewater to the ocean prior to the construction of the CBPP.

During 2005-2008 the plant was upgraded and converted to a Membrane Bioreactor Plant, in order to limit nutrient loads entering the Bay from the plant. The 2008 upgrade to the plant enabled the plant to treat 1.76 ADWF at design capacity achieving a median total nitrogen (TN) and total phosphorus (TP) of 4 and 0.4 mg/L respectively and a decrease in TN of 73 % and TP of 82%.

At the time of this upgrade a significant effluent reuse scheme was proposed which would also reduce the load of nutrients discharged to Cleveland Bay. The effluent reuse scheme did not go ahead due to viability reasons (lack of funding and insufficient numbers of effluent customers).

The EA was renegotiated with DEHP to address the CBPP's ability to adequately treat flows up to 1,007 L/s and remain within the EA conditions and discharge limits. As part of this negotiated process DEHP required the treatment capacity to be increased to 3 times design ADWF or 1,007 litres per second (87 ML/day) in line with standard practice for waste water treatment in Queensland. This now requires the proposed treatment plant hydraulic capacity upgrade.

Plant upgrade – current related action

The current plant upgrade is designed to increase the hydraulic (peak full treatment flow) capacity of the plant from 1.58 Average Dry Weather Flow (ADWF) to 3 x ADWF for 30 days sustained flow. The upgrade, which will enable the plant to meet environmental discharge requirements is expected to provide a net environmental benefit and cater for 126,000 EP connected load (anticipated 2031 forecasts). The expected improvements in CBPP discharge quality over time are outlined below in Table 2.

Table 2 Improvements in CBPP Discharge quality over time

Parameter	Pre-upgrade 2006 (mg/L)	Post upgrade 2011(mg/L)	Current 2016 (mg/L)	Improvement 2006- 2016 (%)	Improvement 2011- 2016 (%)
Ammonia-N	ND	0.17	0.05	ND	70%
Nitrate NOx	ND	2.6	2.4	ND	5.9%
Total Nitrogen	Est 29.3#	4.9	3.2	89%	85%
Total Phosphorus	Est 8.2#	0.7	0.6	93%	92%
Suspended Solids	11.7	4.0	0.5	96%	66%

*ND indicates no data; #indicates an estimate extrapolated from annual mass loads.

TCC entered a TEP (MAN19600) issued by DEHP on 31 May 2016 to permit bypassing when inflows reach 463L/s (equivalent maximum of 40ML/day) while the CBPP upgrade is performed (valid until 1 December 2019). This TEP requires discharge at the outfall (licenced discharge point RP1) to be treated to a tertiary level up to 463L/s. Primary screened effluent above this volume can be diluted with tertiary treated effluent. An addendum to the TEP is now being sought for the outfall upgrade component to permit a second discharge location at Sandfly Creek for the period of outfall construction. The impacts of this second discharge are addressed in this referral.

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

3.1 (a) World Heritage Properties

Description

Great Barrier Reef World Heritage Area.

Cleveland Bay and the lower reaches of Sandfly Creek are a small part of the extensive high nutrients coastal strip marine bioregion (NA3), which extends either side of Townsville for hundreds of kilometres within the World Heritage Area (GBRMPA, 2009). The Bay is well inshore of the inner mid shelf lagoon and the nearest reef region. In relation to the World Heritage Area, a simplified list of natural heritage attributes that contribute to the Reef's Outstanding Universal Values apply in the NA3 bioregion as follows (Valentine, 1994):

- largest and most complex expanse of living corals.
- unique forms of marine life.
- great diversity of life forms.
- most spectacular scenery on earth.
- exceptional natural beauty.
- major feeding grounds of dugongs and turtles.

Within the Greater Cleveland Bay area these qualities and values have been categorised as follows:

- open expanses of water and seabed with natural marine physical and chemical processes.
- benthic biota, including corals.
- marine vertebrates, such as fish, dugongs, turtles and cetaceans and their marine habitats.
- birds foraging, nesting and/or roosting.
- scenery, natural beauty and aesthetics.

Cleveland Bay supports coral reefs, mangroves, seagrass, non-vegetated shoals and deeper waters in close proximity to each other. Within the area of the outfall works mangroves, small fragments of intertidal seagrass and mudflats are the primary habitat types.

Marine megafauna known to occur in Cleveland Bay include numerous green turtles, occasional flatback and Olive Ridley turtles, Australian snubfin dolphin particularly around the Ross River mouth, inshore bottlenose and Indo-Pacific humpback dolphins and dugongs (GHD, 2012). Aerial surveys for the Townsville Port Expansion Project (for a two year period only) show sightings of turtles to the south of the project area in the regional seagrass beds off-shore from the Alligator and Crocodile Creek outflows, along the Pallarenda beaches to the north of the CBD, southern Magnetic Island as well as open water (Figure 3-8 (GHD, 2012)). Local beaches are thought to support low density nesting by green and flatback turtles (with tracks observed at Pallarenda and the Strand foreshore beaches). The Atlas of Living Australia has two recent records of green turtle near Racecourse Road to the west of the CBPP; however there is no published literature on the use of the beach areas around Sandfly Creek for turtle nesting.

Nature and extent of likely impact

It is not expected that the works would reduce the diversity of plant and animal species beyond modification of a very small localised area containing benthic communities, mangroves and seagrass. There will be a limited amount of soft sediment habitat removed for headstock and pile replacement required to support the outfall pipe. These habitats are considered to be well represented throughout Cleveland Bay and it is expected that benthos will recover after works are completed. Fragmentation or isolation impacts are not expected within the marine environment as the pipeline would not present a barrier to connectivity or fauna movement. Rare, endemic or unique species are not known from this immediate area nor from Cleveland Bay region.

There is a very low likelihood of vessel / machinery strike on turtles should they enter the barge construction area while works are occurring. As works will be undertaken at low tide the likelihood of marine vessel strike on other megafauna is significantly reduced.

Potential impacts to World Heritage Area attributes within the construction area are short term, localised changes which are not expected to impact on the world heritage nomination criteria as outlined in Table 3.

Table 3 Response to impacts on World Heritage Criterion - Attribute Level

World Heritage Criterion	EPBC Act Guidelines for Impacts on Attributes	Response
Criterion vii	Will the proposed action of itself, or in combination with other relevant impacts, result in loss or degradation of areas that are essential for maintaining the beauty of the property?	The project may have very short term (3-6 months) localised changes in turbidity resulting from mangrove clearance and small scale removal of seabed to install headstocks and piles. The timing of the action and proposed mitigation measures are considered to be capable of reducing sediment dispersal resulting from the works and are not expected to result in any detracting of the natural beauty of Cleveland Bay or the Great Barrier Reef.
Criterion viii	Will the proposed action of itself, or in combination with other relevant impacts, impact on the key interrelated and interdependent elements in their natural relationships?	The inner shelf region, within which this project resides, is a medium to high turbidity environment and the associated protected matters are adapted to these conditions. While the project will have very small scale impacts (0.82 ha construction footprint overall in the marine park), it is not expected that these will lead to any significant changes to physical, chemical or biological processes which underpin the values of the World Heritage Area.
Criterion ix	Will the proposed action of itself, or in combination with other relevant impacts, result in the loss of necessary elements that are essential for the long term conservation of the area's ecosystems and biodiversity?	Benthic habitat in the construction footprint does not contain coral nor is likely to contain any endangered or significant inter-tidal habitat, nor is known as a breeding or nesting site or key feeding area for any marine megafauna. It is expected that the benthic habitat will recover, particularly as disturbance will not occur at any depth. The small area of seagrass (40m ²) impacted by works is outside of the regional seagrass beds of Cleveland Bay. Therefore it is not expected that elements essential for the long term conservation of the area's ecosystem or biodiversity will be lost as a result of the works.
Criterion x	Will the proposed action of itself, or in combination with other relevant impacts, result in the loss or degradation of habitats required for maintaining the diverse fauna and flora of the region?	Given that the construction area is small and contains habitat represented extensively elsewhere, it is not expected that the proposed action in itself would result in a loss or degradation of habitat required to maintain diversity if species in a regional context

3.1 (b) National Heritage Places

Description

Great Barrier Reef National Heritage Area

Nature and extent of likely impact

Likely impacts on the natural heritage values of the Great Barrier Reef National Heritage Area are addressed in Section 3.1 (a).

In addition to the above section, the register listing recognises the value and diversity of fish species, molluscs and sponges. Given the scale of the proposed works in the context of the larger area, these values are unlikely to be significantly impacted by the proposed action.

The cultural importance including the many middens and other archaeological sites of Aboriginal and Torres Strait Islander origin including rock paintings and historic shipwrecks and operating lighthouses and ruins is also recognised in the heritage register.

With respect to potential impacts on Aboriginal cultural heritage sites, places and values the alignment of the outfall is considered under the *Aboriginal Cultural Heritage Act 2003* (Qld) Duty of Care Guidelines, to be a Category 4 area that has been previously subject to ground disturbance which may still have residual cultural heritage significance given the presence of foreshore and coastal dunes and natural wetlands.

While a traditional owner walkover and archaeological survey have not yet occurred, Department of Aboriginal and Torres Strait Island Partnership search results for the area indicate that there are no known Aboriginal cultural heritage sites recorded in the vicinity of the project area. Previous cultural surveys for the CBPP upgrades in the past have not located any Aboriginal sites or material on the low-lying mudflats and wetlands subject to tidal inundation where the archaeological potential is assessed as low. Surface surveys on elevated beach ridges and dunes have been constrained by grass and vegetation cover in the past. However the overall cultural heritage potential of this landform has been assessed as moderate to high because of findings in the wider Townsville Region (shell scatters and stone artefacts in beach ridges on the southern side of the Ross River). Consequently impacts on potential heritage features in the sand dunes are possible but uncertain and a field survey would be undertaken with the traditional owners before works could commence.

Furthermore there are no listings under the Queensland Heritage Register or the Australian Heritage Database in relation to non-indigenous heritage sites. The closest shipwrecks to the works area are around Magnetic Island (SS Bee (sunk in 1901), SS City of Adelaide (1916), George Rennie (1902), Moltke (1911) and YSS YP-279 (1943) and would not be affected by the proposed work.

The works will traverse through the previously disturbed dune area and it is possible that cultural heritage items may be found and require recovery, however given the scale of the work area through the dune, it is not considered likely that the temporary disturbance to the dune area would significantly affect the inherent cultural heritage values. A site walkover will be undertaken at an appropriate time prior to construction to ensure that heritage values are suitably protected.

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

Description

The western most extent of Bowling Green Bay Ramsar wetland is approximately 7 km directly east of the outfall pipe in Cleveland Bay, with the Ramsar site extending around Cape Cleveland to Russel Island.

Nature and extent of likely impact

Given the small scale nature of the proposed works and distance to the Ramsar wetland, no direct or indirect impacts are expected.

3.1 (d) Listed threatened species and ecological communities

Description

Threatened Ecological Communities

According to the Protected Matters Search Tool, one Threatened Ecological Community (TEC) may occur within the project area. This TEC is described in Table 4 below.

Table 4 TECs potentially occurring within the project area

TEC	Status	Analogous REs
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	11.2.3, 11.3.11, 11.4.1, 11.5.15, 11.8.3, 11.8.6, 11.8.13, 11.9.4, 11.9.8, 11.11.18

This TEC is listed as 'Endangered' under the EPBC Act. It is not analogous with any of the REs mapped within the project area (refer to Section 3.3e) and Appendix 2 (AECOM, 2016b).

Threatened Species

No conservation significant flora species were recorded within the project area during the field survey.

The literature review indicated that four conservation significant flora species have the potential to occur within the project area. A likelihood assessment (see Table 5) was conducted for these species and all four species were considered unlikely to occur within the project area due to the absence of preferred habitat or the location being situated outside of the species known distributional range.

Table 5 Likelihood of conservation significant flora species potentially occurring within the project area

Species Name	Status ¹ (EPBC Act, NC Act)	Habitat	Likelihood of Occurrence
<i>Croton magneticus</i>	-, V	<i>Croton magneticus</i> is found in Araucarian microphyll or notophyll vineforest, or semi -evergreen vine thickets, on a range of substrates including sandstone, granite and granodiorite. The species is endemic to eastern Queensland. It is distributed mainly between Townsville and Proserpine, but is known to extend inland to Greenvale and Collinsville. Known from eight locations: Magnetic Island, Mt Stuart, Greenvale, Mt Blackjack and adjacent areas, Gloucester Island, Mt Abbot, Leichhardt Range and the Fanning River.	Unlikely No records for this species occur within 10 km of the project area. Suitable habitat for this species was not recorded during the field survey. This species is considered an unlikely occurrence within the project area.
<i>Eucalyptus paedoglauc</i>	V, V	<i>Eucalyptus paedoglauc</i> occurs on ridges or hill slopes on shallow sandy-loam soil. The species occurs only in the Townsville area of north-east Queensland. The extent of occurrence is about 400 km ² . The area of occupancy and total population size are unknown, but there are estimated to be thousands of trees (Department of the Environment & Energy, 2016).	Unlikely Nearest record for this species is approximately 9 km to the west of the project area. Suitable habitat for this species was not recorded during the field survey. This species is considered an unlikely occurrence within the project area.
<i>Marsdenia brevifolia</i>	V, V	<i>Marsdenia brevifolia</i> occurs in north and central Queensland where it is known from localities near Townsville, Springsure and north of Rockhampton. North of Rockhampton, <i>M. brevifolia</i> grows on serpentine rock outcrops or crumbly black soils derived from serpentine in eucalypt woodland, often with Broad-leaved Ironbark (<i>Eucalyptus fibrosa</i>) and <i>Corymbia xanthope</i> . At Hidden Valley near Paluma, plants grow in woodland on granite soils and on Magnetic Island the species occurs in open forest on dark acid agglomerate soils (Department of the Environment & Energy, 2016).	Unlikely No records for this species occur within 10 km of the project area. Suitable habitat for this species was not recorded during the field survey. This species is considered an unlikely occurrence within the project area.
<i>Omphalea celata</i>	V, V	<i>Omphalea celata</i> is known from three sites in central east Queensland. Locations include Hazlewood Gorge, near Eungella; Gloucester Island, near Bowen; and Cooper Creek in the Homevale Station area, north-west of Nebo. At Hazlewood Gorge, <i>Omphalea celata</i> grows in fragmented semi-evergreen vine thicket along a watercourse on weathered metamorphics in a steep-sided gorge at an altitude of 560 m. On Gloucester Island, plants grow in a rocky granitic gully near Araucaria microphyll vineforest. At Cooper Creek, plants grow in the creek bed and adjacent bank (Department of the Environment & Energy, 2016).	Unlikely No records for this species occur within 10 km of the project area. Suitable habitat for this species was not recorded during the field survey. This species is considered an Unlikely occurrence within the project area.

1- CE – Critically Endangered; E – Endangered; V – Vulnerable; NT – Near Threatened

Desk top assessment identified 30 fauna species (excluding migratory) as potentially occurring in the project area, including 18 bird species, 9 mammals, and three reptiles. No essential habitat is mapped in state government databases of any of these species. However several are considered to have a high likelihood of occurrence in the project area, particularly the intertidal mudflats as indicated in Table 6 below.

Table 6 Likelihood of conservation significant fauna species potentially occurring within the project area

Species Name	Status ¹ (EPBC Act, NC Act)	Habitat	Likelihood of Occurrence
Avifauna			
<i>Calidris canutus</i> Red Knot	E, SL	In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. The Red Knot roosts on sandy beaches, spits and islets, and mudflats; also in shallow saline ponds of saltworks.	High Suitable foraging habitat exists within the project area. This species has been recorded on mudflats within 1 km of the project area.
<i>Calidris ferruginea</i> Curlew Sandpiper	CE, SL	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Curlew Sandpipers generally roost on bare dry shingle, shell or sand beaches, sandspits and islets in or around coastal or near-coastal lagoons and other wetlands, occasionally roosting in dunes during very high tides.	High Suitable foraging habitat exists within the project area. This species has been recorded on mudflats within 1 km of the project area.
<i>Calidris tenuirostris</i> Great Knot	CE, SL	In Australasia, the species typically prefers sheltered coastal habitats, with large intertidal mudflats or sandflats. This includes inlets, bays, harbours, estuaries and lagoons. Typically, the Great Knot roosts in large groups in open areas, often at the water's edge or in shallow water close to feeding grounds.	High Suitable foraging habitat exists within the project area. This species has been recorded on mudflats within 1 km of the project area.
<i>Charadrius leschenaultii</i> Greater Sand Plover	V, -	Greater Sand Plovers usually feed from the surface of wet sand or mud on open intertidal flats of sheltered embayments, lagoons or estuaries. They usually roost on sand-spits and banks on beaches or in tidal lagoons, and occasionally on rocky points (Bamford 1988; Ewart 1973; Pegler 1983; Sibson 1948, 1953 in (Department of the Environment & Energy, 2016)), or in adjacent areas of saltmarsh (Gosper & Holmes 2002 in (Department of the Environment & Energy, 2016)) or claypans (Collins et al. 2001 in (Department of the Environment & Energy, 2016)). They tend to roost further up the beach than other waders, sometimes well above high-tide mark.	High Suitable foraging habitat exists within the project area. This species has been recorded on mudflats within 5 km of the project area.
<i>Charadrius mongolus</i> Lesser Sand Plover	E, -	The species feeds mostly on extensive, freshly-exposed areas of intertidal sandflats and mudflats in estuaries or beaches, or in shallow ponds in salt works. They roost near foraging areas, on beaches, banks, spits and banks of sand or shells (McGill & Keast 1945; Pegler 1983), and occasionally on rocky spits, islets or reefs. The lesser sand plover rarely roosts on mangroves (Department of the Environment & Energy, 2016).	High Suitable foraging habitat exists within the project area. This species has been recorded on mudflats within 1 km of the project area.
<i>Cyclopsitta diophthalma macleayana</i> Macleay's fig-parrot	-, V	Recent records of Macleay's fig-parrots are from subtropical rainforest, dry rainforest, littoral and developing littoral rainforest, sub-littoral mixed scrub, riparian corridors in woodland, open woodland and otherwise cleared land, and urbanised and agricultural areas with fig trees. These sightings span a range of	Low Habitat suitable to this species is absent from this project area, thus this species is an unlikely occurrence.

		altitudes from sea level to about 900m above sea level. Areas with a high fig diversity, where fruiting is staggered along moisture and altitudinal gradients, may be favoured (ibid.).	
<i>Erythrotriorchis radiatus</i> Red Goshawk	V, E	Red Goshawk prefers forest and woodland with a mosaic of vegetation types, large prey populations (birds), and permanent water. The vegetation types include eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest, and rainforest margins.	Low Habitat suitable to this species is absent from this project area, thus this species is an unlikely occurrence.
<i>Erythrura gouldiae</i> Gouldian Finch	E, E	The Gouldian Finch inhabits open woodlands that are dominated by Eucalyptus trees and support a ground cover of Sorghum and other grasses. The critical components of suitable core habitat for the Gouldian Finch appear to be the presence of favoured annual and perennial grasses (especially Sorghum), a nearby source of surface water and, in the breeding season, unburnt hollow-bearing Eucalyptus trees (especially <i>E. tintinnans</i> , <i>E. brevifolia</i> and <i>E. leucophloia</i>).	Low Habitat suitable to this species is absent from this project area, thus this species is an unlikely occurrence.
<i>Esacus magnirostris</i> Beach Stone-curlew	-, V	The Beach Stone-curlew is usually found on open, undisturbed beaches, islands, reefs, and estuarine intertidal sand and mudflats, preferring beaches with estuaries or mangroves nearby. However, this species also frequents river mouths, offshore sandbars associated with coral atolls, reefs and rock platforms, and coastal lagoons (Department of Environment and Heritage Protection, 2013).	High Species has been recorded from Ross River sand spit approximately 2 km to the north of the project area.
<i>Fregetta grallaria</i> White-bellied Storm-petrel	V, -	The White-bellied Storm-petrel breeds in Australian territory, on offshore islets and rocks in the Lord Howe Island group. The pelagic distribution of the species is poorly understood however it has been recorded north and east of its breeding islands to the tropics, in the Tasman Sea, Coral Sea, and north of New Zealand (Department of the Environment & Energy, 2016).	Low Habitat suitable to this species is absent from this project area, thus this species is an unlikely occurrence.
<i>Limosa lapponica baueri</i> Bar-tailed Godwit	V, SL	The Bar-tailed Godwit usually forages near the edge of water or in shallow water, mainly in tidal estuaries and harbours. They appear not to forage at high tide and prefer exposed sandy substrates on intertidal flats, banks and beaches. They also prefer soft mud; often with beds of <i>Zostera</i> or other seagrasses. Occasionally they have been known to forage among mangroves, or on coral reefs or rock platforms among rubble, crevices and holes. The Bar-tailed Godwit usually roosts on sandy beaches, sandbars, spits and also in near-coastal saltmarsh.	High Suitable foraging habitat exists within the project area. This species has been recorded on mudflats within 1 km of the project area.
<i>Limosa lapponica menzbieri</i> Northern Siberian bar-tailed Godwit	CE, -	The Bar-tailed Godwit (northern Siberian) usually forages near the edge of water or in shallow water, mainly in tidal estuaries and harbours. They appear not to forage at high tide and prefer exposed sandy substrates on intertidal flats, banks and beaches. They also prefer soft mud; often with beds of <i>Zostera</i> or other seagrasses. Occasionally they have been known to forage among mangroves, or on coral reefs or rock platforms among rubble, crevices and holes. The Bar-tailed Godwit (northern Siberian) usually roosts on sandy beaches, sandbars, spits and also in near-coastal saltmarsh.	Moderate Suitable foraging habitat exists within the project area. This species has been recorded on mudflats within 1 km of the project area. Whilst recorded in Queensland, it is noted that <i>L. l. menzbieri</i> is generally associated with coastlines along in the north and north-west of Western Australia.
<i>Lophochroa leadbeateri</i> Major Mitchell's Cockatoo	-, V	Major Mitchell's Cockatoos live mostly in semi-arid and arid areas, in dry woodlands, particularly Mallee. They are also found in stands of River Red Gum, <i>Eucalyptus camaldulensis</i> , or Black Box, <i>E. largiflorens</i> , and on sand plains and dunes. Sometimes they are found in other	Low Habitat suitable to this species is absent from this project area, thus this species is an unlikely

		areas such as Acacia shrubland with a spinifex (<i>Triodia sp</i>) ground cover, or Banksia heathlands.	occurrence.
<i>Neochmia ruficauda ruficauda</i> Star Finch (eastern)	E, E	The Star Finch (eastern) occurs mainly in grasslands and grassy woodlands that are located close to bodies of fresh water (Garnett 1993; Gould 1865; Holmes 1996 in (Department of the Environment & Energy, 2016). The species also occurs in cleared or suburban areas such as along roadsides and in towns. Studies at nine former sites of the Star Finch (eastern) found that the habitat consisted mainly of woodland. These habitats are dominated by trees that are typically associated with permanent water or areas that are regularly inundated; the most common species are <i>Eucalyptus coolabah</i> , <i>E. tereticornis</i> , <i>E. tessellaris</i> , <i>Melaleuca leucadendra</i> , <i>E. camaldulensis</i> and <i>Casuarina cunninghamii</i> .	Low Habitat suitable to this species is absent from this project area, thus this species is an unlikely occurrence.
<i>Numenius madagascariensis</i> Eastern Curlew	CE, V	The Eastern Curlew mainly forages on soft sheltered intertidal sandflats or mudflats, open and without vegetation or covered with seagrass, often near mangroves, on saltflats and in saltmarsh, rockpools and among rubble on coral reefs, and on ocean beaches near the tideline. The Eastern Curlew roosts on sandy spits and islets, especially on dry beach sand near the high-water mark, and among coastal vegetation including low saltmarsh or mangroves. It occasionally roosts on reef-flats, in the shallow water of lagoons and other near-coastal wetlands.	High Species has been recorded from Ross River sand spit approximately 2 km to the north of the project area.
<i>Poephila cincta cincta</i> Black-throated Finch (southern)	E, E	The Black-throated Finch (southern) occurs mainly in grassy, open woodlands and forests, typically dominated by <i>Eucalyptus</i> , <i>Corymbia</i> and <i>Melaleuca</i> , and occasionally in tussock grasslands or other habitats (for example freshwater wetlands), often along or near watercourses, or in the vicinity of water.	Low Habitat suitable to this species is absent from this project area, thus this species is an unlikely occurrence.
<i>Rostratula australis</i> Australian Painted Snipe	E, V	The Australian Painted Snipe typically inhabits shallow terrestrial freshwater wetlands, dams, temporary or permanent lakes, swamps and claypans. They are also known to inhabit waterlogged grassland or saltmarsh typically with sites with rank emergent tusks of grass, sedges, rushes and sedges. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum <i>Muehlenbeckia</i> or canegrass or sometimes tea-tree (<i>Melaleuca</i>). Nest records are all, or nearly all, from or near small islands in freshwater wetlands (Department of the Environment & Energy, 2016).	Low Habitat suitable to this species is absent from this project area, thus this species is an unlikely occurrence.
<i>Tyto novaehollandiae kimberli</i> Masked Owl (northern)	V, V	In northern Australia, the Masked Owl has been recorded from riparian forest, rainforest, open forest, <i>Melaleuca</i> swamps and the edges of mangroves, as well as along the margins of sugar cane fields.	Low This species is has been recorded from the region and mangrove habitat is present within the project area. The project area is situated on the southern extent of species distribution, and is thus regarded a low likelihood of occurrence.
Mammals			
<i>Dasyurus hallucatus</i> Northern Quoll	E, -	In Queensland, populations of Northern Quolls have persisted in upland rocky areas (Cape Cleveland/Mt Elliott, Mareeba, Crediton, Eungella, Clarke Range) and several coastal sites (Cleveland, Cape Upstart, Cape Gloucester,	Low Habitat suitable to this species is absent from this project area, thus this

		Condor Range) in north and central Queensland (Hill and Ward 2010).	species is an unlikely occurrence.
<i>Hipposideros semoni</i> Semon's leaf-nosed Bat	E, E	This species does not have an obligatory requirement for cave roosts. Daytime roost sites include tree hollows, deserted buildings in rainforest, road culverts and shallow caves amongst granite boulders or in fissures (Churchill 1998, 2009; de Oliveira & Schulz 1997; Hall & Richards 1979; Hall 2002 in (Department of the Environment & Energy, 2016)). They appear to prefer rainforest and are more likely to be tree-dwelling than cave-dwelling.	Low Habitat suitable to this species is absent from this project area, thus this species is an unlikely occurrence.
<i>Macroderma gigas</i> Ghost Bat	V, V	This species is known to occur within a wide range of habitat including rainforest, monsoon and vine scrub in the tropics to open woodlands and arid areas (Churchill, 2008). Roost sites are generally deep natural caves or disused mines with a specific microclimate.	Low Habitat features suitable for this species are absent from the project area.
<i>Petauroides volans</i> Greater Glider	V, -	The greater glider is an arboreal nocturnal marsupial, largely restricted to eucalypt forests and woodlands. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows.	Low Habitat suitable to this species is absent from this project area, thus this species is an unlikely occurrence.
<i>Phascolarctos cinereus</i> Koala (combined populations of QLD, NSW and the ACT)	V, V	Koalas inhabit a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by species from the genus <i>Eucalyptus</i> . The species of eucalypt and the extent of tree cover are the most important habitat characteristics for the koala. Preferences for food species vary locally (Department of the Environment & Energy, 2016) Curtis, 2012).	Low Habitat suitable to this species is absent from this project area, thus this species is an unlikely occurrence.
<i>Pteropus conspicillatus</i> Spectacled flying-fox	V, V	The Spectacled flying-fox is associated mainly with rainforests, with most colonial roosts ('camps') occurring in or near (within 6.5 km) of rainforests (Richards 1990a in (Department of the Environment & Energy, 2016). However, the species forages widely away from such camps across a broad range of vegetation types including mangroves, eucalypt forests, Melaleuca forests, gardens and orchards.	Low – Foraging Records for the species suggest the project area is situated on or outside the southern extent of the known distribution. Mangrove habitat is present within the project area however; suitable roosting habitat is not mapped within the immediate area. The species is thus considered a low likelihood of occurrence, with the species considered to potentially use the site of foraging purposes.
<i>Rhinolophus robertsi</i> Greater large-eared Horseshoe Bat	E, V	The Greater Large-eared Horseshoe Bat is found in lowland rainforest, along gallery forest-lined creeks within open eucalypt forest, Melaleuca forest with rainforest understorey, open savannah woodland and tall riparian woodland of Melaleuca, Forest Red Gum (<i>E. tereticornis</i>) and Moreton Bay Ash (<i>C. tessellaris</i>) (Churchill 2009). Distribution of the species in Queensland occurs from the Iron Range southwards to Townsville and west to the karst regions of Chillagoe and Mitchell-Palmer (Department of the Environment & Energy, 2016).	Low Habitat suitable to this species is absent from this project area, thus this species is an unlikely occurrence.
<i>Saccolaimus saccolaimus nudicluniatus</i> Bare-rumped	CE, E	The Bare-rumped Sheath-tail Bat occurs mostly in lowland areas, typically in a range of woodland, forest and open environments. Confirmed roosting records are from deep tree hollows in the Poplar Gum, Darwin Woollybutt	Low Habitat suitable to this species is absent from this project area, thus this

Sheath-tail Bat		(<i>Eucalyptus miniata</i>) and Darwin Stringybark.	species is an unlikely occurrence.
<i>Xeromys myoides</i> Water Mouse	V, V	In central south Queensland, the water mouse has only been captured in the high inter-tidal zone in tall, closed fringing mangrove forest containing only <i>Ceriops tagal</i> and/or <i>Bruguiera</i> sp (Ball 2004 in DOE, 2016). Although not considered core habitat, the Water Mouse has also been captured in saline grassland adjacent to a closed forest of <i>Ceriops tagal</i> and <i>Bruguiera</i> sp and in closed forest of <i>Avicennia marina</i> . A supralittoral bank is usually absent in this subregion (Ball 2004 in (Department of the Environment & Energy, 2016). Although these observations are relevant to the Cape Palmerston-Cannonvale areas (Ball 2004 in (Department of the Environment & Energy, 2016), habitat used in the central Queensland area may be more diverse and include habitat types similar to what is used in south-east Queensland (Ball pers. comm. cited in QGC 2013 in (Department of the Environment & Energy, 2016).	Low Whilst suitable habitat for the species is present, the project area is situated outside the mapped extent of the species. The nearest record of the water mouse is 250 km south, near Proserpine, Qld.
Reptiles			
<i>Denisonia maculata</i> Ornamental Snake	V, V	Ornamental Snake habitat is likely to be found in Brigalow (<i>Acacia harpophylla</i>), Gidgee (<i>Acacia cambagei</i>), Blackwood (<i>Acacia argyrodendron</i>) or Coolibah (<i>Eucalyptus coolabah</i>)-dominated vegetation communities, or pure grassland associated with gilgai. The ornamental snake shelters in logs and under coarse woody debris and ground litter.	Low Habitat suitable to this species is absent from this project area, thus this species is an unlikely occurrence.
<i>Egernia rugosa</i> Yakka Skink	V, V	The Yakka Skink is known to occur in dry sclerophyll forest, woodland and scrub (Department of the Environment & Energy, 2016). The core habitat of this species is within the mulga lands and southern brigalow belt. Microhabitat preferential to the yakka skink include rocks, logs, root cavities and abandoned animal burrows (Department of the Environment & Energy, 2016).	Low Habitat suitable to this species is absent from this project area, thus this species is an unlikely occurrence.
<i>Lampropholis mirabilis</i> Saxicoline Sunskink	-, NT	The Saxicoline Sunskink is a rock-dwelling species found among granitic rocks at the edges of, or in clearings in, rain and monsoon forest, vine thickets and denser woodland habitat types (Cogger, 2014).	Low Habitat suitable to this species is absent from this project area, thus this species is an unlikely occurrence.

Nature and extent of likely impact

Impacts on threatened plant species are not expected to occur. A targeted ecology survey did not identify threatened plant species within the project footprint, or the general area due to the absence of preferred habitat and distance from species known distribution range.

The potential impacts on conservation significant fauna (including migratory shorebirds) include habitat loss (roosting and foraging), mortality and disturbance from increased marine/terrestrial activity.

Total remnant vegetation requiring removal for the project is 0.41 hectares which includes:

- 0.06 ha of RE 11.1.2b – Least concern
- 0.18 ha of RE 11.1.4b - Least concern
- 0.12 ha of RE 11.1.4c – Least concern
- 0.05 ha of RE 11.2.2 – Of concern.

The project will remove approximately 0.26 ha of mangrove vegetation as a percentage of ground cover (within 0.3 ha of RE 11.1.4b and 11.1.4c) (shorebird roosting habitat) and disturb adjacent mudflats. As such, potential impacts on migratory shorebirds include a reduction in mangrove roosting and mudflat habitat availability within the local area. Given that the extent of impact is small (1.5% of the mangroves along the foreshore between Sandfly and the next northerly creek) and extensive alternative habitat similar to the works area exists within the region, the potential impact associated with habitat loss is considered low. Over time it is likely that terrestrial vegetation re-establishes in the clearance zones.

Clearance of mangrove and mudflat habitat could result in the mortality of migratory shorebird individuals. The potential impact of mortality is considered minimal with birds likely to take flight prior to clearing. Any mortality impacts are likely to be locally concentrated with minimal impact on the broader population. The potential direct mortality impacts are considered low.

3.1 (e) Listed migratory species

Description

Desktop review indicates the presence of a range of migratory fauna species, with 11 identified as having a likelihood of occurrence of moderate or high (see Table 7). Note migratory shorebirds are addressed in Table 8.

Table 7 Likelihood of occurrence for migratory fauna species

Scientific Name	Common Name	Habitat	Likelihood of Occurrence
Migratory marine birds			
<i>Apus pacificus</i>	Fork-tailed Swift	Almost exclusively aerial, however known to occur over most types of habitat, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings.	High Known from the region and adjacent environmental reserve
<i>Sterna albifrons</i>	Little Tern	Sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets, especially those with exposed sandbanks or sand-spits, and also on exposed ocean beaches.	High Known from the region and adjacent environmental reserve.
Migratory marine species			
<i>Crocodylus porosus</i>	Estuarine Crocodile	Estuarine crocodile occurs in tidal rivers, coastal floodplains and channels, billabongs and swamps (Department of the Environment & Energy, 2016).	Moderate Suitable habitat present and historical record exists along Sandfly Creek.
Migratory terrestrial species			
<i>Cuculus optatus</i>	Oriental Cuckoo	The species uses a range of vegetated habitats such as monsoon rainforest, wet sclerophyll forest, paperbark swamps, mangrove, open woodlands and appears quite often along edges of forests, or ecotones between forest types (Morcombe,	Moderate Habitat present within the project area. No records within 5 km, thus a moderate likelihood of occurrence.

		2004; (Department of the Environment & Energy, 2016).	
<i>Hirundapus caudacutus</i>	White-throated Needletail	Almost exclusively aerial, however known to occur over most types of habitat, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings.	High Suitable habitat present within project area and species is known from the immediate area.
<i>Monarcha melanopsis</i>	Black-faced Monarch	The Black-faced Monarch occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, rainforest, mesophyll (broadleaf) thicket/shrubland. The species is lesser known from mangrove.	High Suitable habitat (secondary) present within project area. Records for the species exist adjacent to the Purification Plant.
<i>Symposiarchus trivirgatus</i>	Spectacled Monarch	This species is known to occupy dense vegetation, mainly in rainforest but also in moist or wet sclerophyll forest and occasionally in other densely vegetated habitats such as mangroves, drier forest, woodlands, parks and gardens.	Moderate Suitable habitat (secondary) present within project area. No records within 5 km, thus a moderate likelihood of occurrence.
<i>Motacilla flava</i>	Yellow Wagtail	Habitat requirements typically include open grassy flats near water. Habitats include open areas with low vegetation such as grasslands, airstrips, pastures, sports fields; damp open areas such as muddy or grassy edges of wetlands, rivers, irrigated farmland, dams, waterholes; sewage farms, sometimes utilise tidal mudflats and edges of mangroves.	Moderate Suitable habitat (secondary) present within project area. No records within 5 km, thus a moderate likelihood of occurrence.
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	This species is particularly common in tall wet sclerophyll forest, often in gullies or along water courses. Wintering birds in northern Queensland will use the rainforest - gallery forests interfaces, and birds have been recorded wintering in mangroves and paperbark swamps.	Moderate Suitable habitat (secondary) present within project area. No records within 5 km, thus a moderate likelihood of occurrence.
<i>Rhipidura rufifrons</i>	Rufous Fantail	Rufous Fantail inhabit moist, dense habitats, including mangroves, rainforest, riparian forests and thickets, and wet eucalypt forests.	High Suitable habitat is present within project area. Records for the species exist within similar habitat in the adjacent environmental reserve.
Migratory Wetland Species			
<i>Pandion haliaetus</i>	Osprey	The Osprey is a piscivore (fish eater), foraging over open, clear water. Favoured habitats are coastal areas, especially the mouths of large rivers, lagoons and lakes.	High Suitable habitat is present within project area. Records for the species exist within the immediate vicinity of the project area.

Desktop assessment identified 29 migratory shorebirds potentially present within the project area (AECOM, 2016b). Of these 24 were identified as having potential to occur within the project area given the presence of suitable foraging grounds and records within five km (Table 8).

Table 8 Likelihood of Occurrence for migratory shorebirds

Scientific Name	Common Name	Potential Occurrence
Scolopacidae		
<i>Gallinago hardwickii</i>	Latham's Snipe	Low Habitat present within the project area is considered marginal, with the species preferring freshwater wetlands over marine ecosystems. The species may use the area during migration, considered uncommon.
<i>Gallinago stenura</i>	Pin-tailed Snipe	Low Habitat present within the project area is considered marginal, with the species preferring freshwater wetlands over marine ecosystems.
<i>Gallinago megala</i>	Swinhoe's Snipe	Low Habitat present within the project area is considered marginal, with the species preferring freshwater wetlands over marine ecosystems. The species may use the area during migration, considered uncommon.
<i>Limosa limosa</i>	Black-tailed Godwit	High Known to roost north of the site at the sand spit located at the mouth of the Ross River (NRA Environmental Consultants, 2012).
<i>Limosa lapponica</i>	Bar-tailed Godwit	High Known to roost north of the site at the sand spit located at the mouth of the Ross River (NRA Environmental Consultants, 2012).
<i>Numenius minutus</i>	Little Curlew	High Recorded in the adjacent environmental reserve upon tidal mudflats. Suitable habitat present within project area.
<i>Numenius phaeopus</i>	Whimbrel	High Known to roost north of the site at the sand spit located at the mouth of the Ross River (AECOM, 2012).
<i>Numenius madagascariensis</i>	Eastern Curlew	High Known to roost north of the site at the sand spit located at the mouth of the Ross River (AECOM, 2012).
<i>Tringa stagnatilis</i>	Marsh Sandpiper	High Known to roost north of the site within the Port of Townsville (NRA Environmental Consultants, 2012).
<i>Tringa nebularia</i>	Common Greenshank	High Known to roost north of the site within the Port of Townsville (NRA Environmental Consultants, 2012).
<i>Tringa glareola</i>	Wood Sandpiper	Low Known from the broader region. Suitable habitat considered marginal given the species preference to freshwater systems.
<i>Xenus cinereus</i>	Terek Sandpiper	High Known to roost north of the site at the sand spit located at the mouth of the Ross River (NRA Environmental Consultants, 2012).
<i>Actitis hypoleucos</i>	Common Sandpiper	High Known to roost north of the site within the Port of Townsville (NRA Environmental Consultants, 2012).
<i>Tringa brevipes</i>	Grey-tailed Tattler	High Known to roost north of the site within the Port of Townsville (NRA Environmental Consultants, 2012).
<i>Tringa incanus</i>	Wandering Tattler	Moderate Known from Port of Townsville precinct, however habitat mapped in the project area is considered secondary.
<i>Arenaria interpres</i>	Ruddy Turnstone	High Known record of the species within 1 km of the project area. Suitable habitat is present.
<i>Calidris tenuirostris</i>	Great Knot	High Known to roost north of the site at the sand spit located at the mouth of the Ross River (AECOM, 2012).
<i>Calidris canutus</i>	Red Knot	High Known to roost north of the site at the sand spit located at the mouth of the Ross River (NRA Environmental Consultants, 2012).
<i>Calidris alba</i>	Sanderling	High Recorded in the adjacent environmental reserve. Suitable habitat

		present within project area.
<i>Calidris ruficollis</i>	Red-necked Stint	High Known to roost north of the site at the sand spit located at the mouth of the Ross River (AECOM, 2012).
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	High Known to roost north of the site at the sand spit located at the mouth of the Ross River (AECOM, 2012).
<i>Calidris ferruginea</i>	Curlew Sandpiper	High Recorded in the adjacent environmental reserve and on mudflats within the project area. Suitable habitat present within project area.
<i>Limicola falcinellus</i>	Broad-billed Sandpiper	High Recorded in the adjacent environmental reserve. Suitable habitat present within project area.
<i>Philomachus pugnax</i>	Ruff	High Recorded in the adjacent environmental reserve. Suitable habitat present within project area.
Charadriidae		
<i>Pluvialis fulva</i>	Pacific Golden Plover	High Known to roost north of the site at the sand spit located at the mouth of the Ross River (NRA Environmental Consultants, 2012).
<i>Pluvialis squatarola</i>	Grey Plover	High Known to roost north of the site at the sand spit located at the mouth of the Ross River (NRA Environmental Consultants, 2012).
<i>Charadrius mongolus</i>	Lesser Sand Plover	High Known to roost north of the site at the sand spit located at the mouth of the Ross River (NRA Environmental Consultants, 2012).
<i>Charadrius leschenaultii</i>	Greater Sand Plover	High Known to roost north of the site at the sand spit located at the mouth of the Ross River (AECOM, 2012).
<i>Charadrius veredus</i>	Oriental Plover	Low No records within broader area. Habitat suitable within project area, however marginal.

Nature and extent of likely impact

The high tide roost site on the sand spit at the mouth of the Ross River which is located approximately 2.3 km to the north of the outfall is considered to be one of the top 40 sites for shorebirds along the east coast of Queensland (Driscoll, 2009). The roost is considered of national significance for Eastern Curlew, Sharp-tailed Sandpiper, Great Knot, Red-necked Stints and Greater Sand Plovers, with more than 2,000 shorebirds recorded on the sand spit between 2011 and 2012 as cited in (NRA Environmental Consultants, 2012). As the tide recedes shorebirds move off the sand spit to forage on the adjacent intertidal banks, with the majority of the birds using the intertidal banks to the south east of the river especially the area near Sandfly Creek. Pell and Lawler 1996 presumed that the higher numbers of shorebirds utilising the intertidal area out from the mouth of Sandfly Creek reflected a biomass responses to nutrients from the outfall with Driscoll 2009 noting that this may change with upgrades to the plant (Pell, S. & Lawler, W., 1996). No further shorebird counts have occurred in this area since the plant upgrade that can confirm this possible causal relationship. It is not expected that the proposed works will change the extent of intertidal banks available as foraging habitat in the long term.

3.1 (f) Commonwealth marine area

(If the action is in the Commonwealth marine area, please complete 3.2(c) instead. This section is for actions taken outside the Commonwealth marine area that may have impacts on that area.)

Description

The action does not occur in a Commonwealth Marine area.

Nature and extent of likely impact

Not applicable.

3.1 (g) Commonwealth land

(If the action is on Commonwealth land, please complete 3.2(d) instead. This section is for actions taken outside Commonwealth land that may have impacts on that land).

Description

The action will not affect Commonwealth land.

Nature and extent of likely impact

Not applicable.

3.1 (h) The Great Barrier Reef Marine Park**Description**

The outfall pipe currently traverses 750 m in the marine environment with the last 200 m within the General Use zone of the Great Barrier Reef Marine Park.

Nature and extent of likely impact

Direct impacts in the Great Barrier Reef Marine Park are likely to include:

- Direct disturbance and removal of benthic fauna in the intertidal mudflats to remove and replace headstocks and pile supports for the outfall structure.
- Associated loss of seagrass habitat around headstocks B7 and B8 that sit within and on the edge of a small 40 m² seagrass bed (see Appendix 3).
- Loss of mangroves 0.27 ha (in terms of ground cover) in total of which 0.175 ha is in the Great Barrier Reef Marine Park General Use Zone.
- sediment disturbance and temporary increase in turbidity from construction works.

Direct impacts are expected to be temporary within the intertidal area as works are very localised, planned to occur during the dry season and at low tide for a maximum duration of six months. Benthic communities expected to recover. The seagrass area (40m²) that would be disturbed sits outside the regional seagrass beds which have been mapped and monitored historically and most recently in 2015 (see Figure 2 Appendix 1), and is thought to have formed in the lee of the existing outfall which provides shelter from the trade winds. A small area (0.175 ha) of the larger mangrove community that extends along the coastal and into Sandfly Creek would be removed to allow the construction barge access to the outfall. Given the larger extent of the community in the nearby area, this impact is considered insignificant with respect to the diversity and extent of habitat in Cleveland Bay.

Indirect impacts associated of a temporary discharge into Sandfly Creek rather than the current location in the General Use Zone is expected to be short term and be limited to a temporary elevation of nitrogen and phosphorus within Sandfly Creek. Discharge to Sandfly Creek will not increase existing nutrient loads in the GBRMP area. Increases in ammonia are not expected at levels with would lead to fish kills or eutrophication. Mangrove health has been monitored for 18 months previously in the Sandfly Creek estuary when discharges to the creek have been permitted and when high levels of algal and sludge accumulation occurred amongst the mangrove pneumatophores, with the following findings:

- no physio-chemical impacts were noted from nutrient input
- no visual evidence of stress (flaccid or dead pneumatophores, defoliation)
- no major changes in leaf dieback conditions over the monitoring period, although some dieback was recorded (CitiWater 2007)

Further, monitoring in Sandfly Creek, as is required under the Receiving Environment Monitoring Plan (REMP) as part of TCC's environmental authority since the cessation of flows into the creek in 2008, suggest that the creek has the capacity to rapidly recover from environmental impacts caused by the discharge of effluent at this point. It is likely that the onset of high environmental flows during the wet season would act to flush any build-up of nutrient from the estuarine system when tidal exchange would provide a suitable dilution factor to protect the Cleveland Bay water quality. Marine water quality in the nearshore vicinity of the outfall itself is thought to be heavily influenced by tidal processes.

3.1 (i) A water resource, in relation to coal seam gas development or large coal mining development**Description**

Not applicable.

Nature and extent of likely impact

Not applicable.

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

3.2 (a)	Is the proposed action a nuclear action?	√	No
			Yes (provide details below)
If yes, nature & extent of likely impact on the whole environment			
Not applicable.			

3.2 (b)	Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?	√	No
			Yes (provide details below)
If yes, nature & extent of likely impact on the whole environment			
Not applicable.			

3.2 (c)	Is the proposed action to be taken in a Commonwealth marine area?	√	No
			Yes (provide details below)
If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))			
Not applicable.			

3.2 (d)	Is the proposed action to be taken on Commonwealth land?	√	No
			Yes (provide details below)
If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))			
Not applicable.			

3.2 (e)	Is the proposed action to be taken in the Great Barrier Reef Marine Park?		No
		√	Yes (provide details below)
If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))			
The action is not expected to have an impact on the whole of the Great Barrier Reef Marine Park (refer to Section 3.1 (h)).			

3.3 Description of the project area and affected area for the proposed action

3.3 (a) Flora and fauna

Flora

Field survey findings have recorded sixteen marine plants in the project area which includes seven species of mangroves, four salt herbs, one sand dune grass, seagrass species and some vines on the foredune (AECOM, 2016b).

An area of seagrass is on the lee side of the existing outfall pipe in one area and its growth in this location may reflect that the outfall pipe provides some shelter from the trade winds. The closest mapped seagrass bed from Port of Townsville annual monitoring (Davies, JN & Rasheed, MA, 2016) is a little further to the east as shown in Figure 3.

Fauna

Suitable habitat for fauna was recorded during the field survey including remnant vegetation displaying structural and functionally connectivity with large tracks of land adjacent to the project area. It is anticipated that the area would support both terrestrial and marine birds, including shorebirds which are likely to forage within the intertidal mudflats and roost amongst the mangroves. Migratory shorebirds likely to forage include the Eastern Curlew (Migratory EPBC). Mangrove vegetation on the seaward side may provide roosting habitat for mangrove roosting migratory shorebird species such as Grey-tailed Tattler and Terek Sandpiper. Specialised bird species are expected in the mangroves including Mangrove Honeyeater and Mangrove Gerygone and Mangrove Robin. The broader area to the north of the plant and pipeline is known to support large roosting and nesting sites for ibis and egret.

Mammals potentially present in the area include flying foxes such as little red flying fox and black flying fox which are known to roost in mangrove vegetation and forage on mangrove leaves and have been recorded to the north of the outfall.

Other animals that may use the area include agile wallaby which have been recorded in large numbers in the past to the north (Department of Main Roads, 2009).

Likely reptiles in the area include saltwater crocodile, with a previous record in Sandfly Creek catchment and monitor species such as the rusty monitor, and a variety of snakes and skinks.

3.3 (b) Hydrology, including water flows

The CBPP facility is situated within an extensive coastal plain system extending from the mouth of the Ross River to Cape Cleveland. The coastal plain comprises a series of beach ridge and swale complexes with extensive saltflat mangrove and bare intertidal flat areas. The coastal plain is very low lying, generally flat and punctuated by a number of smaller tidal creek systems. Sandfly Creek is located within Stuart Creek sub-basin which is approximately 104 km² in area and comprised of two main catchments, Sandfly Creek and Stuart and Gordon Creeks.

Cleveland Bay is considered by DEHP as an enclosed coastal / lower estuary receiving environment, that is 'waters occurring at the downstream end of estuaries with a moderate amount of water movement from either freshwater inflow or tidal exchange' (Department of Environment and Heritage Protection, 2013). Sandfly Creek is considered middle estuary, defined as waters extending from the majority of the length of estuaries with a moderate amount of water movement from either freshwater inflow or tidal exchange.

Marine water quality in the nearshore vicinity of the outfall is likely to be heavily influenced by tidal processes with the high tidal range producing high current velocities and associated high bed shear stress which facilitates re-suspension of bed material (AECOM, 2014). In these shallow coastal areas waves generated by the prevailing south east trade winds are greater than the depth of water and maintain elevated levels of suspended sediment.

Sandfly Creek is strongly influenced by tidal processes for most of the year as it is a small catchment with limited freshwater inflow. With a tidal range of 4 m in the area, creek systems such as Sandfly contain moderate levels of tidal energy, resulting in a water column being well mixed for most of their length. Tidal current speeds within the creeks creates strong bed shear stress to keep suspended sediment in the water column most of the time, making these systems more naturally turbid than waters further offshore (AECOM, 2014).

3.3 (c) Soil and Vegetation characteristics

The riparian vegetation within Stuart and Sandfly Creek catchments is largely intact (80% remaining) and in good condition (C&R Consulting, 2007).

Soil types in the area have been mapped by Murtha (1982) as "beach ridges and littoral of the Jalloonda association (Ja; Jalloonda series Uc4-21)". The project area is within the broken line of beach ridges fronting Cleveland Bay mapped in this association. Calcareous (shelly) sands of Toolakea series (Ucl-21) are common on the frontal ridges. Murtha describes the soil profile becomes progressively more marked with increasing age of beach ridge, and showing a gradual change from the light brown sands of Toolakea series through sands with yellow or yellowish brown B horizons and to the older sands on the innermost ridges with reddish brown or red B horizons. Small areas of mangroves and salt pans and areas of dark duplex soils of Coonambelah series occur in the swales (Murtha, 1982).

3.3 (d) Outstanding natural features

There are no further outstanding natural features in the project beyond those already discussed in this referral.

3.3 (e) Remnant native vegetation

The following regional ecosystems have been surveyed as present within the project area.

Table 9 Regional ecosystems identified within the project area

RE	RE Description	VM Act Status	Extent within Project Construction Footprint (ha)
11.1.2b	Samphire forbland on Quaternary estuarine deposits	Least concern	0.06
11.1.4b	<i>Avicennia marina</i> low open shrubland to closed forest on Quaternary estuarine deposits	Least concern	0.18
11.1.4c	<i>Ceriops tagal</i> , +/- <i>Avicennia marina</i> open forest on Quaternary estuarine deposits	Least concern	0.12
11.2.2	Complex of <i>Spinifex sericeus</i> , <i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i> and <i>Casuarina equisetifolia</i> grassland and herbland on fore dunes	Of concern	0.05
Total			0.41

The following REs are mapped by the state government.

Table 10. Regional Ecosystems mapped within the project area by DEHP

RE	RE Description	VM Act Status
11.1.1	<i>Sporobolus virginicus</i> grassland on marine clay plains	Least concern
11.1.2a	Samphire forbland on marine clay plains	Least concern
11.1.4b	<i>Avicennia marina</i> low open shrubland to closed forest on Quaternary estuarine deposits	Least concern
11.1.4c	<i>Ceriops tagal</i> , +/- <i>Avicennia marina</i> open forest on Quaternary estuarine deposits	Least concern
11.2.2	Complex of <i>Spinifex sericeus</i> , <i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i> and <i>Casuarina equisetifolia</i> grassland and herbland on fore dunes	Of concern

3.3 (f) Gradient (or depth range if action is to be taken in a marine area)

Elevation changes over the outfall alignment are from 7 m asl at the plant, dropping to 2m over the salt pans, up to 5 m over the dune system. Works would be on the seabed down to a depth of -1.007 m (refer to Figure 4).

3.3 (g) Current state of the environment

Remnant vegetation within the project area is situated on or adjacent to the outfall alignments proposed and extends into much larger area of remnant vegetation. The surrounding landscape is comprised of extensive mangrove and mudflat communities.

The field survey two declared weed species listed under the Queensland *Biosecurity Act 2014*. These species are *Cryptostegia grandiflora** (rubber vine) and *Ziziphus mauritiana** (chinee apple), both Category 3.

Exotic fauna such as wild dog, pig, hare are known from the nearby area (Townsville City Council, 2016) and yellow crazy ant has been recorded in 2005 at the Port of Townsville.

3.3 (h) Commonwealth Heritage Places or other places recognised as having heritage values

National heritage values of the Great Barrier Reef have been addressed in Section 3.1 (a).

3.3 (i) Indigenous heritage values

The CBPP project area is located on the coastal plains to the south of Ross River and therefore lies within the area of a newly authorised Native Title Claim by the Bindal People. This new claim has recently been filed with the Federal Court, but it is not yet a Registered Native Title Claim. Under the *Aboriginal Cultural Heritage Act 2003* the CBPP site is considered to be a Category 3 and the outfall alignment is Category 4.

Many previous cultural heritage impact assessment studies across the Townsville coastal plains have consistently found that there is a high level of indigenous cultural heritage potential and sensitivity associated with particular landforms, especially

coastal sand dunes, beach ridges and wetlands. These areas tend to contain residual Aboriginal cultural heritage sites, places and values.

Department of Aboriginal and Torres Strait Islander Partnerships (DATSIP) search results (dated 16 May 2016) confirm that no Aboriginal cultural heritage sites have been recorded (to date) within the CBPP project area and near surrounds (that is, within the 1 km buffer area of the CBPP included in the cultural heritage search). A highly significant Aboriginal cultural heritage site has been recorded at Sandfly Creek (south of Ross River and approximately 2 km south of the CBPP). Archaeologists first recorded the Sandfly Creek Aboriginal burial ground in the early 1990's. Hatte (1994) recorded at least ten human burials eroding from secondary sand dunes along an old Holocene (hinterland) shoreline to the south of Ross River. The burials were associated with other cultural material including shell middens, stone artefacts, stone manuports and hearthstone. Following Hatte's preliminary study, Bonhomme and Craib (1995) attempted to determine the full extent of the burial site by using ground-penetrating radar to detect possible sub-surface deposits of bone. The results of this work proved inconclusive.

The Sandfly Creek cultural heritage investigations highlighted that coastal sand dunes and beach ridges in the wider Townsville region have high Aboriginal cultural heritage potential and sensitivity. It is important to note that the discovery of the extensive archaeological deposits was made following extensive clear and grade operations of the beach ridges in preparation for sand mining. Hatte (1994) notes that the main cultural (archaeological) deposit at Sandfly Creek was buried within the beach ridge system and was located some 30cm to 50cm beneath the ground surface.

The beach ridge system containing the burial ground at Sandfly Creek is not dissimilar (from a geomorphological point of view), to the narrow bands of sand dunes / ridges located to the east of the CBPP, and especially along the (existing and proposed) outfall pipeline.

An impact assessment and traditional owner walkover is planned for the works before construction.

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

The Townsville Port Access Road Project offset area occurs to the north of the outfall and plant and is currently held as an environmental reserve under the *Land Act 1994* until such time as it becomes gazetted as national park (including Lot 301 SP223354 and 184 EP1756 on the eastern side of the Port Access Road). A smaller reserve occurs to the south of the plant and covers in part Sandfly Creek including elements of the oxbow (Lot 66 EP1755).

The 21,810 ha Cleveland Bay Declared Fish Habitat Area (Management Level A) covers much of the marine plains and Cleveland Bay with a 5 metre exclusion zone on both sides of the existing outfall (gazettal plan FHA-071) (Department of National Parks, Sport and Racing, 2012). The stated habitat values of the fish habitat area include the "extensive seagrass beds dominated by *Halodule* and *Halophila*; mangrove-lined estuaries, 21 mangrove species dominated by *Rhizophora stylosa*, *Ceriops australis* and *Avicennia marina*; intertidal mud and sand flats; intertidal marshes and saltpan; nursery habitats for highly productive and valuable commercial fisheries. Fisheries values include commercial, recreational and Indigenous fisheries resources; banana and tiger prawns, mud crabs, barramundi, mullet, shark and threadfin salmon" (Department of National Parks, Sport and Racing, 2012).

The Cape Cleveland section of Bowling Green Bay National Park is the closest national park to the proposed action with the closest boundary 7 km to the south.

The outfall is within the special management areas species conservation (Dugong Protection) Cleveland Bay and Bowling Green Bay Dugong Sanctuary.

3.3 (k) Tenure of the action area (e.g. freehold, leasehold)

The outfall pipeline would be placed in an easement on Lot 66 EP1755 (DNRM reserve land held for community or public purposes) and Lot 4 USL51433 (state land). The Sandfly Creek discharge location is located in freehold land (Lot 1 RP732945). The Plant is located on Lot 1 RP732944 (freehold land).

3.3 (l) Existing uses of area of proposed action

Existing uses of the area of the proposed action including the CBPP, the existing outfall and the Great Barrier Marine Park.

Land uses of the outfall pipeline alignment are classified by Queensland Globe (Planning Cadastre) as marsh/wetland.

3.3 (m) Any proposed uses of area of proposed action

No proposed uses are known for the area of the proposed action.

4 Environmental outcomes

The proposed action is unlikely to result in or have any potential significant impact on the EPBC-listed matters of NES. Works are for the purpose of rehabilitating the existing outfall which discharges licenced effluent treated to a tertiary level. Impacts from the proposed action are considered minor, temporary and localised in nature. Therefore there will be no outcomes based conditions required to be addressed as a result of the proposed action.

The temporary impacts of the discharge on Sandfly Creek will be monitored through a modified REMP. Conditions 'Water 16-18 of EA EPPR00927313 stipulates the requirements of CBPP's current REMP EA to monitor potential impacts to the receiving surface water environment resultant of effluent discharge through RP1. TCC are seeking modifications to the TEP and consequently the TEP REMP from DEHP for discharge to Sandfly Creek during the upgrade of the outfall.

5 Measures to avoid or reduce impacts

Table 11 below details the proposed mitigation measures that have been considered in the context of known threatening processes understood for the matters of NES within and near the outfall alignment and discharge during construction. These measures will be incorporated into a Construction Environmental Management Plan for the project.

The primary objective of project mitigation strategy is to:

- avoid impacts to matters of NES protected matters by the chosen alignment and by the timing of the works, and
- Reducing and managing the potential for impacts during construction.

While the mitigation measures detailed in Table 11 below target particular protected matters, it is recognised that many of the measures will realise benefits for surrounding natural values in the area.

Table 11 Key mitigation measures proposed for the Cleveland Bay Outfall Upgrade

Matters of NES ¹	Impacts of Action	Proposed Mitigation Measure	Timeframe
AVOID			
Regional seagrass beds*	<p>No direct impacts anticipated on the current extent of the Cleveland Bay regional seagrass bed.</p> <p>Removal of a minor area of localised seagrass around piles (10 m²)</p> <p>Minor low risk of localised turbidity / sedimentation if not controlled during works period.</p>	<p>Primary mitigation measure will be the timing of the works to coincide with low tides.</p> <p>Coffer dams around piling works in the near shore environment to control sediment dispersion and turbidity caused by wave action.</p> <p>Monitoring of turbidity during works in the marine environment.</p> <p>Effectiveness:</p> <p>Coffer dams are a commonly used mitigation measure in riverine and coastal environments for piling works. In this instance they will be applied near the foreshore to prevent wave action re-suspending sediment for the duration of piling works. In deeper waters, it is not intended to use coffer dams as more sediment is likely to be created by the insertion and removal of sheeting to form the coffer dam walls than the small amount of sea bed which will be excavated to level the bed surface for piling works. In deeper waters coffer dams are considered less advantageous for this project.</p>	For duration of construction of the outfall pipeline
Marine mammals (turtles, dugong, dolphin, shark)	Potential disturbance of feeding / nesting.	<p>A spotter catcher will be on the construction barge during piling works.</p> <p>A stop works procedure will be actioned if any marine mammal is observed in or near the works area to avoid interaction with vessel and disturbance by noise.</p> <p>The barge once in position will not run its engine during works and will remain in place for the construction period, with a smaller barge removing material to port and a transfer vessel picking up crew.</p> <p>No works will occur at night to avoid light spill, construction period will be from 6 am to 6 pm.</p> <p>Construction works planned for April to October including pile driving will occur outside of the main turtle nesting and hatching season (December to March).</p> <p>If nesting of marine turtles observed near works area (thought unlikely) then construction barrier fencing and signage erected to protect site from machinery and or any</p>	For duration of construction of the outfall pipeline

¹ *. Note mangroves, seagrass and benthic habitat, water quality and amenity values (and its component parts) are considered of relevance as a component of the outstanding universal values of the Great Barrier Reef.

		<p>human disturbance (but not so that it would inhibit turtle movement or form a sea barrier).</p> <p>Effectiveness:</p> <p>These measures in combination are expected to be effective in avoiding physical disturbance to marine mammals.</p>	
Wading bird habitat (EPBC listed threatened and migratory species)	Temporary loss of foraging habitat in intertidal area.	Construction works will occur outside the key migratory shorebird season in Australia (with birds resident in Australia generally between September to March) to avoid disturbance to foraging birds.	For duration of construction of the outfall pipeline
Changes in water quality	Bypass flows directly into the Great Barrier Reef	<p>Outfall construction is planned for the dry season on the assumption that there will be no substantial wet weather events and therefore no emergency bypass requirements. Additionally there is a program to divert up to 5ML/day of influent flows to Mount St John STP during outfall construction period to decrease the volume of influent to the CBPP where licence conditions for both plants can be met.</p> <p>Effectiveness:</p> <p>Timing of works is a key consideration in the work schedule and specifically been considered to avoid and manage potential impacts. It is expected to be effective.</p>	For duration of construction of the outfall pipeline
REDUCE			
Mangroves and seagrass in Great Barrier Reef environment*	Loss of marine plants.	<p>While the chosen outfall location option reduces the level of mangrove and seagrass disturbance required, some clearance will be required allow access to the pipeline on both sides by the construction barge.</p> <p>Sea anchors will set and delineate the disturbance footprint on the seaward side for the duration of the works period. No construction activities will occur outside of this marine area.</p> <p>Clearance of mangroves below HAT will only occur in the designated area (refer to Figure 5).</p> <p>Mangroves below HAT will be cleared to bed level only rather than excavated to avoid sedimentation. To do this clearance works will occur on the low tide and material removed to the CBPP for storage before removal to landfill.</p> <p>Above the foreshore – limits to marine plant clearance requirements will be controlled by a clearance set out plan prepared by the Contractor and approved by the Principal before construction works commence.</p> <p>Clearing limits will be marked on site and monitored by setting GPS coordinates.</p>	For duration of construction of the outfall pipeline

		Effectiveness: In combination these measures are expected to be effective and provide an auditable measure to confirm contractor performance.	
Benthic habitat loss*	Temporary loss of marine habitat from construction works. 	There will be a minimised level of activities on the seabed (scraping of seabed material to one side to set the headstock and piles in position. Note it is expected that benthic habitats will recover following disturbance within 12 to 24 months. Effectiveness: Studies for the Port Expansion Project supported by monitoring of channel dredging activities have shown the recovery times for benthic habitat. Given that minimal disturbance is needed, it is expected that this will be effective.	For duration of construction of the outfall pipeline
Amenity values of World Heritage Area*	Disturbance of sand dune along foreshore to excavate old pipe, trench and bury new outfall. Note no major land use change would result from this replacement of an existing pipeline.	Revegetation of disturbed areas of sand dune to prevent sand erosion. Use of geofabric for temporary stabilisation and planting of appropriate dune grasses as appropriate. A revegetation plan will be prepared by a suitably qualified person and approved by TCC before works commence.	During construction and post construction.
Fauna generally	Disturbance of habitat.	An approved spotter catcher / ecologist will be present before and during clearing works commence to identify any animal breeding places and should fauna be caught or hurt during works. Should an animal be found injured a DEHP officer will be contacted and arrangements made for the animal's care by an appropriately trained and qualified wildlife carer. Effectiveness: This measure is expected to be effective, it is a standard measure in most Queensland environmental management plans and can only be undertaken by an approved person under the <i>Nature Conservation Act 1992</i> .	For duration of construction
Vegetation & habitat generally	Disturbance of coastal vegetation and marine plants.	Only the vegetation required to be cleared for the construction of the outfall and access track will be undertaken. Note that there is already an existing access track to support the existing pipeline, and vegetation clearance is only required to ensure there is a sufficient work area, where necessary. Rehabilitation of disturbed areas post construction.	For duration of construction
MANAGE			
Water quality of Great Barrier	Works over marine waters.	Manage spill risk by limiting the amount of diesel fuel	For duration of

Reef*		<p>storage on board vessels/barges. Biodegradable oils will be used for equipment working over water.</p> <p>Reduce the sediment dispersion from the installation of the piles and headstocks by the use of coffer dams around each pile cluster in the near shore environment.</p> <p>All waste materials (as demolished/taken from works area) will be removed to port for further disposal to designated landfill.</p> <p>Effectiveness:</p> <p>These measures in combination are expected to be effective in managing water quality in the works area.</p>	construction of the outfall pipeline
Water quality of Great Barrier Reef*	Sediment runoff and outfall discharge into marine environment.	<p>Sediment control measures on land will be in place for the duration of the construction period. The contractor will prepare an Erosion and Sediment Control Plan for the works.</p> <p>Effectiveness:</p> <p>This is a standard measure for TCC projects and coupled with the works period being outside the wet season will minimise the transport of sediments into nearby waterways and the marine environment.</p> <p>The quality of the discharge in Sandfly Creek will be monitored for the duration of the works under a revised Receiving Environmental Monitoring Plan (REMP) approved by DEHP. Revised monitoring requirements including new sampling locations to determine the dilution and mixing of nutrients, and residence time in the creek/estuary.</p>	For duration of construction of the outfall pipeline
OFFSET			
Marine plants*	Clearing of marine plants (mangroves, salt marsh, and seagrass).	State offsets are likely to be required marine plant clearance as permits are required where more than 25m ² of marine plants are required to be cleared. It is likely that a financial contribution will be made once the requirement for offsetting has been determined under the Qld Environment Offset Act framework.	Determined during state permit assessment period
Vegetation & habitat generally	Post clearing rehabilitation and vegetation management.	<p>Ongoing invasive weed control after works to ensure that revegetation areas are stable. Active control of restricted invasive weeds along access track to CBPP and to foredune. Active control of restricted invasive pest species known to the area (dingo/wild dog, rabbit, feral pigs) in construction area and CBPP site.</p> <p>Effectiveness:</p> <p>Rehabilitation measures such as these manage undesirable ecosystem changes which left unchecked would result in deteriorating habitat conditions.</p>	During construction of the outfall pipeline and for three years post its construction

General environmental management controls for the site as a whole which will inform the Construction Environmental Management Plan (CEMP) for the project will include the following.

- Site inductions for all people working/entering the site.
- Signage/flagging/demarcation is in place to protect habitat areas outside of the construction works area.
- Ensure toolbox talks incorporate the significance of the area including the Great Barrier Reef Marine Park, World Heritage Values, threatened and migratory species and habitat on or adjacent to construction works.
- Ensure availability of information sheets on the values identified above.
- No night time work is permitted.
- No night time lighting is permitted over the construction area as a whole (marine and terrestrial).
- Weed management plan is required for the terrestrial component of the site (wash down area will be required for land based operations).
- Biosecurity controls will be applied to the construction barge, storage of plant at the port and marine vessel operations particularly for yellow crazy ants.
- The contractor will prepare appropriate erosion and sediment control plans relevant to the dune and soil conditions on site as part of the CEMP. The principal will approve these plans before works commence.
- Acid Sulphate soil management if required will be detailed in the CEMP.
- All rubbish (especially food items) will be removed from site regularly.
- Speed limits for marine vessels and land vehicles will be enforced on site during construction to reduce collisions with wildlife / marine mammals.
- All vehicles/vessels/ plant will comply with requirements to avoid elevated noise pollution.
- Ensure vehicles use only approved tracks within the works area.
- No storage of material / plant or equipment will be allowed for outside of designated areas (landside – within the CBPP or on the barge).
- All material removed from the construction site will go to a designated landfill.
- Discharge to Sandfly Creek will only occur during the outfall pipeline demolition, construction and commissioning period.
- A project specific Construction EMP will be prepared and signed off by the Principal (TCC) to manage all risks identified.
- Ensure internal environmental auditing is a component of the Contractor's quality assurance plan, and the Principal's (TCC) environmental audits and inspections will occur regularly (with frequency based on risk).

6 Conclusion on the likelihood of significant impacts

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

<input checked="checked" type="checkbox"/>	No, complete section 6.2
<input type="checkbox"/>	Yes, complete section 6.3

6.2 Proposed action IS NOT a controlled action.

The overall CBPP upgrade project will result in a higher standard of environmental discharge to Cleveland Bay.

The proposed action involves the replacement of the outfall pipeline from the CBPP into Cleveland Bay. A number of options have been considered in consultation with State and Commonwealth departments during engineering design minimise potential environmental impacts.

The option assessment has been supported through desktop review of existing and ecological field surveys have been undertaken to consider the potential impacts on NES.

As a result of the option assessment the new outfall pipe will be placed within the same alignment with the tertiary treated effluent being temporarily diverted to an existing outfall discharge point in Sandfly Creek.

The referral has considered the nature and extent of likely impacts of the action on NES, including impacts on;

- The Great Barrier Reef World Heritage Area
- The Great Barrier Reef National Heritage Area
- Declared Ramsar wetlands
- Threatened Ecological Communities.

This assessment is documented in Section 3 of the referral and illustrates that whilst the action is within the Great Barrier Reef Marine Park / World Heritage Area, impacts are likely to minor, temporary and localised and are not likely to have a significant impact on NES.

Mitigation strategies have been developed to avoid or reduce the potential impacts during construction. While these mitigation measures have been targeted towards particular protected matters in Section 5 of this referral it is recognised that many of the mitigation measures will realise benefits for other natural values in the area.

6.3 Proposed action IS a controlled action

Matters likely to be significantly impacted

<input type="checkbox"/>	World Heritage values (sections 12 and 15A)
<input type="checkbox"/>	National Heritage places (sections 15B and 15C)
<input type="checkbox"/>	Wetlands of international importance (sections 16 and 17B)
<input type="checkbox"/>	Listed threatened species and communities (sections 18 and 18A)
<input type="checkbox"/>	Listed migratory species (sections 20 and 20A)
<input type="checkbox"/>	Protection of the environment from nuclear actions (sections 21 and 22A)
<input type="checkbox"/>	Commonwealth marine environment (sections 23 and 24A)
<input type="checkbox"/>	Great Barrier Reef Marine Park (sections 24B and 24C)
<input type="checkbox"/>	A water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)
<input type="checkbox"/>	Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)
<input type="checkbox"/>	Protection of the environment from Commonwealth actions (section 28)
<input type="checkbox"/>	Commonwealth Heritage places overseas (sections 27B and 27C)

7 Environmental record of the person proposing to take the action

	Yes	No
<p>7.1 Does the party taking the action have a satisfactory record of responsible environmental management?</p> <p>Provide details TCC is the Local Government Authority responsible for Townsville and the surrounding region. Townsville is Australia's largest tropical city and second largest regional city. TCC works in partnership with the State and Federal Governments and organisations to deliver the key intrastate services to Townsville including a National highway network, major rail links, Townsville port access, Cruise ship terminal, permanent defence facilities, interstate air terminal, base load power supply, tertiary education, and major health facilities. TCC major infrastructure projects are implemented in compliance with ISO14001 Environmental Management Systems and a Construction and Maintenance Environmental Management System.</p>	√	
<p>7.2 Provide details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:</p> <p>(a) the person proposing to take the action, or (b) if a permit has been applied for in relation to the action - the person making the application.</p> <p>If yes, provide details</p>		√
<p>7.3 If the person taking the action is a corporation, please provide details of the corporation's environmental policy and planning framework and if and how the framework applies to the action.</p> <p>1. Environmental Policy</p> <p>TCC recognises environmental protection as a guiding principle in its Corporate Plan and is committed to minimising the environmental impacts associated with its operations. TCC will seek opportunities to continually improve on its environmental performance and encourage a culture of environmental sustainability amongst its staff and the community.</p> <p>2. Principles</p> <p>Council is committed to:</p> <ul style="list-style-type: none"> demonstrated environmental leadership and encouraging its staff and the community to adopt more sustainable lifestyles effective management and protection of the natural and built environment through sustainable growth and development; and carrying out its operations in an environmentally sustainable manner and integrating sustainability into all its process and decision making. <p>3. Scope</p> <p>This policy applies to all council staff and all council operations.</p> <p>4. Responsibility</p> <p>The Chief Executive Officers, Directors, Executive Managers and Mangers are responsible for ensuring that this policy is understood and adhered to by all (TCC 2015).</p>	√	
<p>7.4 Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?</p>	√	

Provide name of proposal and EPBC reference number (if known)

- Upgrade of Horseshoe Bay Sewage Treatment Plant (EPBC 2004/1727)
- Water management and use of Blakeys Crossing sediment basins (2005/2027)
- Cleveland Bay Wastewater Treatment Facility and Water Reclamation Facility (EPBC 2006/2882)
- Toonpan Water Treatment Plant (EPBC 2007/3675)
- Northern Water Treatment Plant (EPBC 2007/3668)
- North Shore Boulevard Road and Lionel Turner Drive (EPBC 2009/4758)
- Mt St John Wastewater Upgrade (EPBC 2009/4795)
- Recreational Boating Park (EPBC 2012/6375)
- Haughton Pipeline Duplication (EPBC 2015/7606)

8 Information sources and attachments

(For the information provided above)

8.1 References

- AECOM. (2012). *Light impacts on migratory waders. Townsville Port Expansion EIS*. Unpublished report for Port of Townsville.
- AECOM. (2014). *Cleveland Bay Bypass Events Relative Contributions of Bypass Flow and Catchment Input*. Unpublished report for Townsville City Council.
- AECOM. (2016b). *Cleveland Bay Purification Plant Terrestrial Ecology Assessment*. Townsville: Unpublished report for Townsville City Council.
- C&R Consulting. (2007). *Assessment of Selected Riparian Systems of the Ross and Black River Basins Townsville/Thuringowa Region*. Townsville City Council.
- Cogger, H. G. (2014). *Reptiles and amphibians of Australia (Seventh Edition)*. Collingwood: CSIRO Publishing.
- Davies, JN & Rasheed, MA. (2016). *Port of Townsville Annual Seagrass Monitoring September 2015*. Cairns: James Cook University Publication, Centre for Tropical Water & Aquatic Ecosystem Research (TropWater).
- Department of Environment and Heritage Protection. (2013). *Beach stone-curlew (Esacus magnirostris) species profiled*. Retrieved from http://www.ehp.qld.gov.au/wildlife/animals-az/beach_stonecurlew.html
- Department of Environment and Heritage Protection. (2013). *Ross River Basin Environmental Values and Water Quality Objectives*. Brisbane: State of Queensland.
- Department of Main Roads. (2009). *Biodiversity Management Plan for Environmental Reserve 2009-2014*. Queensland Government.
- Department of National Parks, Sport and Racing. (2012). *Declared Fish Habitat Areas*. Retrieved November 2, 2016, from <http://www.nprsr.qld.gov.au/managing/area-summaries/cleveland.html>
- Department of the Environment & Energy. (2016). *Species Profile and Threats Database*. Canberra: Department of the Environment & Energy.
- Driscoll, P. (2009). *Avifauna Assessment. Report for the Marine Precinct EIS Port of Townsville*. Prepared for GHD Australia.
- GBRMPA. (2009). *The Great Barrier Reef Outlook Report*. Townsville: Commonwealth of Australia.
- GHD. (2012). *Port of Townsville Limited. Report for Port Expansion Project Marine Megafauna. Port Expansion Project EIS*. AECOM BMT WBM.
- Murtha, G. (1982). *Soils and Land Use on the Southern Section of the Townsville Coastal Plains, North Queensland*. CSIRO Aust. Soil & Land Use Serv. No 59, 1-78.
- NRA Environmental Consultants. (2012). *Avifauna Survey for the Townsville Port Expansion Project November 2011 to February 2012*. Townsville: Unpublished report for AECOM on behalf of the Port of Townsville.
- Pell, S. & Lawler, W. (1996). *Queensland Wader Survey: Water Communities along the North-east Queensland Coast (Bowen to Cairns)*. Report prepared on behalf of the Queensland Ornithological Society Inc. For the Queensland Department of Environment and Heritage.
- Townsville City Council. (2016). *Emailed advice from TCC's Wastewater Treatment Plant Operator*.
- Valentine, P. S. (1994). *Heritage values and the Oyster Point proposal (report to DEST)*. Townsville: James Cook University (Department of Tropical Environmental Science and Geography).

8.2 Reliability and date of information

The terrestrial ecological report is based on field survey carried out in July 2016.

Marine megafauna surveys were carried out for the Port Expansion EIS in 2012. These documents can be accessed from the Queensland Coordinator General's web site: <http://statedevelopment.qld.gov.au/assessments-and-approvals/townsville-port-expansion-aeis-documents.html>

Regional seagrass surveys carried out in 2015 by JCU's Tropwater, and can be accessed from the Port of Townsville's website http://www.townsville-port.com.au/_data/assets/pdf_file/0007/7495/20160512-Townsville-Seagrass-Monitoring-Report-2015.pdf

All are considered to be reliable sources of information and assessment of baseline conditions in the area.

8.3 Attachments

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the locality of the proposed action (section 1)	✓	<ul style="list-style-type: none"> Appendix 1 – Project Figures Appendix 3 – Photographs Appendix 4 – GIS files
	GIS file delineating the boundary of the referral area (section 1)		
	figures, maps or aerial photographs showing the location of the proposed action in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	Appendix 1– Project Figures <ul style="list-style-type: none"> Figure 1: Location of the Project Figure 2. Related Projects Figure 3. Matters of National Environmental Significance in the Project Environs Figure 4. Layout Plan of Outfall Pipeline Figure 5. Layout for Construction Barge Activities
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.5)		
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.6)		
	copies of any flora and fauna investigations and surveys (section 3)	✓	Appendix 2. CBPP Terrestrial Ecology Assessment.
	technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral (section 3) conclusions in the referral (section 3 and 4)	✓	As above
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		

9 Contacts, signatures and declarations

NOTE: Providing false or misleading information in response to a requirement under Part 7 of the EPBC Act is an offence punishable on conviction by imprisonment and/or fine (section 489 of the EPBC Act).

Under the EPBC Act a referral can only be made by:

- the person proposing to take the action (which can include a person acting on their behalf); or
- a Commonwealth, state or territory government, or agency that is aware of a proposal by a person to take an action, and that has administrative responsibilities relating to the action.

Proposed action title:

Cleveland Bay Purification Plant Outfall Upgrade

9.1 Person proposing to take action

This is the individual, government agency or company that will be principally responsible for, or who will carry out, the proposed action. It may be a trustee (either being an individual or a body corporate) acting on behalf of the trust for which they have responsibility (but not the trust).

If the proposed action will be taken under a contract or other arrangement, this is:

- the person for whose benefit the action will be taken; or
- the person who procured the contract or other arrangement and who will have principal control and responsibility for the taking of the proposed action.

If the proposed action requires a permit under the GBRMP Act², this is the person requiring the grant of a GBRMP permission.

The Minister may also request relevant additional information from this person.

If further assessment and approval for the action is required, any approval which may be granted will be issued to the person proposing to take the action. This person will be responsible for complying with any conditions attached to the approval.

Name and Title: **Mr Robert Kent**, *Senior Project Manager - Major Projects*

Organisation (if applicable): **Townsville City Council**

Trust deed (if applicable): ☐ attached; OR
☐ **Not applicable**

ACN/ABN (if applicable): **44 741 992 9072**

Postal address: **PO Box 1268 Townsville QLD 4810**

Telephone: **47278978**

Email: **Robert.Kent@townsville.qld.gov.au**

COMPLETE THIS SECTION ONLY IF YOU QUALIFY FOR EXEMPTION FROM THE FEE(S) THAT WOULD OTHERWISE BE PAYABLE

I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am: ☐ an individual; OR
☐ a small business entity (within the meaning given by section 328-110 (other than subsection 328-119(4)) of the *Income Tax Assessment Act 1997*); OR

☐ **Not applicable.**

If you are small business entity you must provide the Date/Income Year **N/A**

² If your referred action, or a component of it, is to be taken in the Great Barrier Reef Marine Park the Minister is required to provide a copy of your referral to the Great Barrier Reef Marine Park Authority (GBRMPA) (see section 73A, EPBC Act). For information about how the GBRMPA may use your information, see http://www.gbrmpa.gov.au/privacy/privacy_notice_for_permits.

that you became a small
business entity:

Note: You must advise the Department within 10 business days if you cease to be a small business entity. Failure to notify the Secretary of this is an offence punishable on conviction by a fine (regulation 5.23B(3) *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth)).

COMPLETE THIS SECTION ONLY IF YOU WOULD LIKE TO APPLY FOR A WAIVER

Note: Applications for a waiver must be supported by information in writing setting out the grounds on which the applicant considers that a waiver should be made and the reasons why it should be made. The Minister may, at his or her discretion, waive all or part of a fee that would otherwise be payable in the following circumstances:

- the action's primary objective is to protect the environment, or protect and conserve heritage, in a way that is consistent with the objects of the EPBC Act;
- it is in the public interest to do so; or
- there are other exceptional circumstances justifying the waiver.

The Minister will consider the application within 20 business days.

I would like to apply for a
waiver of full or partial
fees under regulation
5.21A of the [EPBC
Regulations](#). Under
regulation 5.21A(5), you
must include information
about the applicant (if
not you) the grounds on
which the waiver is
sought and the reasons
why it should be made:

☐ **Not applicable.**

Declaration:

I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct.

I understand that giving false or misleading information is a serious offence.

I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.

Signature:



Date: **18 November
2016**

9.2 Designated proponent

Individual or organisation who is proposed to be designated as the proponent if the Minister decides that the action is a controlled action and further assessment and approval is required. The proponent is responsible for meeting the requirements of the EPBC Act during the assessment process. The proponent may or may not be the person proposing to take the action.

Name of proposed proponent: **Robert Kent, Townsville City Council**

If the name of the proposed proponent is not the same person as named at item 1 of section 9.1 above, please complete all of the below fields in section 9.2.

ACN/ABN (if applicable):

Postal address:

Telephone:


Email:

Declaration by the proposed proponent:

Robert Kent

I, the proposed proponent, consent to the proposed designation of myself as the proponent for the purposes of the action described in this referral.

Signature:



Date: *18 November 2016*

Declaration by the person proposing to take the action:

I, the person proposing to take the action, consent to the proposed designation of as proponent for the purposes of the action described in this referral.

Signature:

Date:

9.3 Person preparing the referral information (if different from section 9.1)

Individual or organisation who has prepared the information contained in this referral form.

Name: **Marjorie Cutting**

Title: **Principal Environmental Planner**

Organisation: **AECOM Australia Pty Ltd**

ACN/ABN (if applicable): **20 093 846 928**

Postal address: **PO Box 5423 Townsville**

Telephone: **(07) 4774 5103**

Email: **Marjorie.Cutting@aecom.com**

Declaration: I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct.
I understand that giving false or misleading information is a serious offence.

Signature:



Date: **18 November 2016**

REFERRAL CHECKLIST

NOTE: This checklist is to help ensure that all the relevant referral information has been provided. It is not a part of the referral form and does not need to be sent to the Department.

HAVE YOU:

- ☐ Completed all required sections of the referral form?
- ☐ Included accurate coordinates (to allow the location of the proposed action to be mapped)?
- ☐ Provided a map showing the location and approximate boundaries of the project area for the proposed action?
- ☐ Provided a map/plan showing the location of the action in relation to any matters of NES?
- ☐ Provided a digital file (preferably ArcGIS shapefile, refer to guidelines at [Attachment A](#)) delineating the boundaries of the referral area?
- ☐ Provided complete contact details and signed the form?
- ☐ Provided copies of any documents referenced in the referral form?
- ☐ Ensured that all attachments are less than three megabytes (3mb)?
- ☐ Sent the referral to the Department (electronic and hard copy preferred)

Geographic Information System (GIS) data supply guidelines

If the area is less than 5 hectares, provide the location as a point layer. If the area greater than 5 hectares, please provide as a polygon layer. If the proposed action is linear (eg. a road or pipeline) please provide a polyline layer.

GIS data needs to be provided to the Department in the following manner:

- Point, Line or Polygon data types: ESRI file geodatabase feature class (preferred) or as an ESRI shapefile (.shp) zipped and attached with appropriate title
- Raster data types: Raw satellite imagery should be supplied in the vendor specific format.
- Projection as GDA94 coordinate system.

Processed products should be provided as follows:

- For data, uncompressed or lossless compressed formats is required - GeoTIFF or Imagine IMG is the first preference, then JPEG2000 lossless and other simple binary+header formats (ERS, ENVI or BIL).
- For natural/false/pseudo colour RGB imagery:
 - If the imagery is already mosaiced and is ready for display then lossy compression is suitable (JPEG2000 lossy/ECW/MrSID). Prefer 10% compression, up to 20% is acceptable.
 - If the imagery requires any sort of processing prior to display (i.e. mosaicing/colour balancing/etc) then an uncompressed or lossless compressed format is required.

Metadata or 'information about data' will be produced for all spatial data and will be compliant with ANZLIC Metadata Profile. (http://www.anzlic.org.au/policies_guidelines#guidelines).

The Department's preferred method is using ANZMet Lite, however the Department's Service Provider may use any compliant system to generate metadata.

Privacy and Confidentiality Notice

The Department is required under section 74(3) of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to publish the information (including personal information of the author and/or third parties) provided in this referral on the internet. The information published may include your personal information.

Information including your personal information included in this referral will be used for the purposes of administering the EPBC Act. The information may be provided to various Commonwealth, State and Territory agencies for the purposes of administering the Act or other Commonwealth, State or Territory legislation. For example, if the proposed action (or a component of it) is to be taken in the GBRMP, the Minister is required to provide a copy of your referral to GBRMPA (see section 73A, EPBC Act). For information about how the GBRMPA may use your information, see http://www.gbrmpa.gov.au/privacy/privacy_notice_for_permits.

The Department will collect, use, store and disclose the personal information contained in this referral in a manner consistent with its obligations under the *Privacy Act 1988* and the Department's privacy policy.

The Department's privacy policy contains details about how respondents may access and make corrections to personal information that the Department holds about the respondent, how respondents may make a complaint about a breach of an Australian Privacy Principle, and how the Department will deal with that complaint.

A copy of the Department's privacy policy is available at: <http://environment.gov.au/privacy-policy>.

The Department is not obliged to publish information that the Minister is satisfied in commercial-in-confidence. If you believe that this referral contains information that is commercial-in-confidence, you must clearly identify such information and the reason for its confidentiality at the time of making the referral. The Minister cannot be satisfied that particular information included in a referral is commercial-in-confidence unless you demonstrate to the Minister (by providing reasons in writing) that:

- release of the information would cause competitive detriment to the person; and
- the information is not in the public domain; and
- the information is not required to be disclosed under another law of the Commonwealth, a State or a Territory; and
- the information is not readily discoverable.

The Department is subject to certain legislative and administrative accountability and transparency requirements of the Australian Government including disclosures to the Parliament and its Committees. While the Department will treat all referral information provided in this referral sensitively, any information contained in or relating to a referral, including information identified by a person as commercial-in-confidence, may be disclosed by the Department:

- to its employees and advisers in order to evaluate or assess a referral;
- to the Parliamentary Secretary;
- within the Department or other agencies where this serves the legitimate interest of the Australian Government;
- in response to a request by a House or Committee of the Parliament of the Commonwealth of Australia;
- where information is authorised or permitted by law to be disclosed; and
- where the information is in the public domain other than by the Department's disclosure of that information.