Port of Gladstone
Gatcombe and Golding Cutting Channel Duplication Project

Environmental Impact Statement

Gladstone Ports Corporation
Growth. Prosperity. Community.

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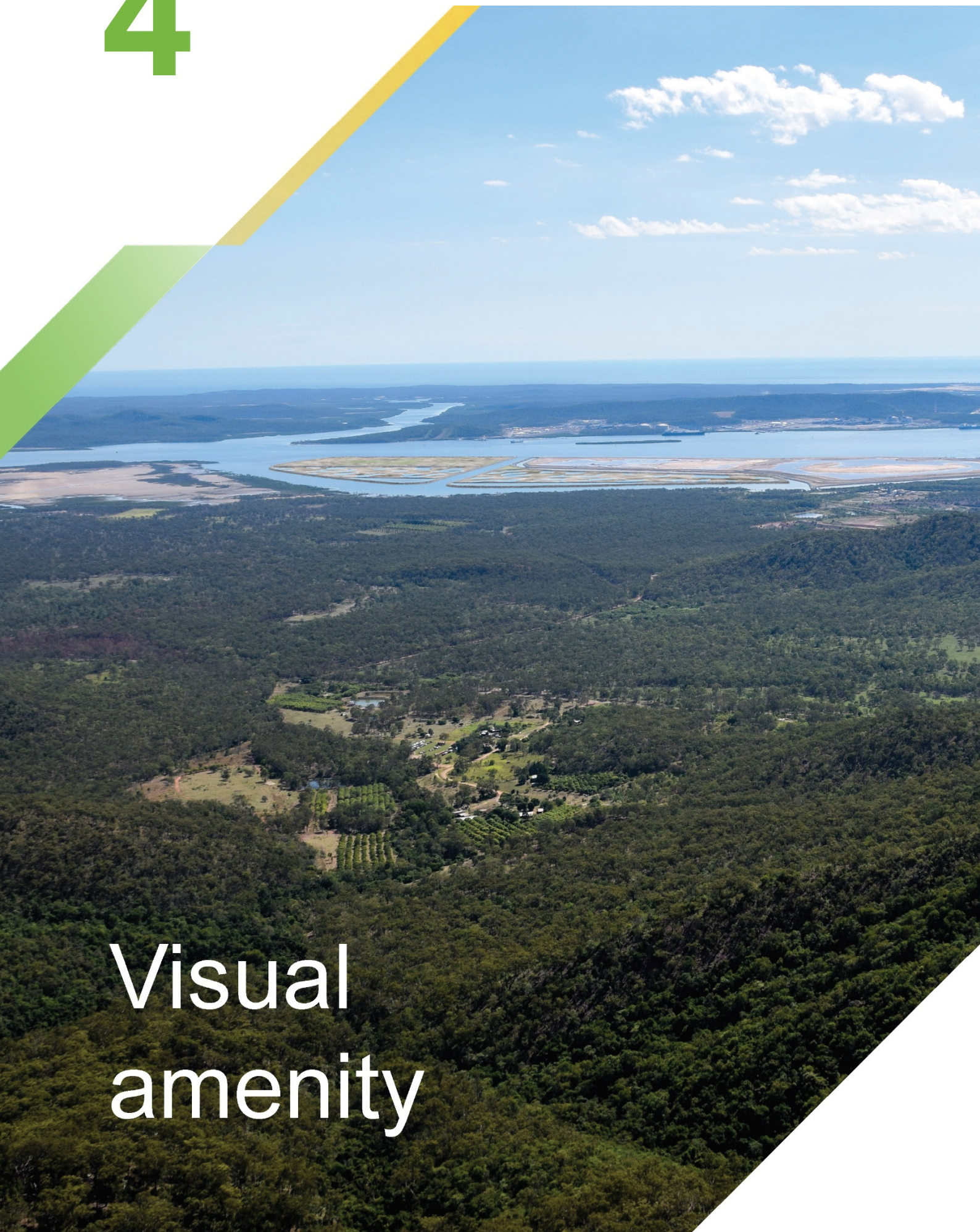

Visual amenity

Contents

4 Visual amenity

4.1 Chapter purpose

The purpose of this chapter is to define the landscape features and visual amenity values within the sensitive receptor viewsheds where the Project activities will occur. This chapter also assesses the potential visual impact of the Project in terms of the GBRWHA values and community viewing amenity including views of the water. The structure and content of this chapter includes:

- Scope and methodology for the visual impact assessment (VIA) (refer Section 4.2)
- Project activities that are relevant to visual/scenic amenity (refer Section 4.3)
- Project activity assumptions (refer Section 4.4)
- The existing visual environment and landscape characteristics of the areas to be impacted by the Project that have, or could be expected to have, value to the community whether of local, regional, State-wide, national or international significance (e.g. values of the GBRWHA) (refer Section 4.5)
- The representative viewpoints, and their typical local landscape character, landform, vegetation, land use and visual context (tables within Section 4.5)
- The visual receptors, and their value relating to scenic amenity and susceptibility and resilience to change (tables within Section 4.5)
- The likely future visual environment from the identified viewpoints (refer Section 4.6)
- An assessment of the significance of the potential visual impacts (refer Section 4.6)
- Mitigation measures to be implemented to minimise visual impacts associated with the Project. (refer Section 4.7)
- An assessment of the potential visual amenity risks to visual amenity values as a result of Project activities (refer Section 4.8)
- A summary of visual amenity impacts (refer Section 4.9).

4.2 Methodology

4.2.1 Objectives and general approach

The broad objectives of this VIA are to:

- Establish the landscape and visual values of the Project impact areas and surrounds
- Establish how these landscape and visual values contribute to the values of the GBRWHA and other community visual amenity values including water views
- Determine the extent to which the Project has the potential to detract from or add to these values
- Identify what measures can be undertaken to avoid or mitigate the identified potential impacts.

A number of specific scope items were identified to achieve the above objectives. Table 4.1 provides an overview of these scope items and their methodology, and a reference to the relevant section of this chapter.

The methodology for this landscape and visual character assessment is generally consistent with the *Guidelines for Landscape and Visual Impact Assessment, Third Edition*, published by the Landscape Institute and Institute of Environmental Management and Assessment (2013).

Table 4.1 Visual impact assessment methodology

VIA scope item	Methodology	Section
Identify the Project activities relevant to existing visual amenity	The Project activities as described in Chapter 2, and their visual characteristics have been defined to establish the context of the visual assessment	4.3
Describe the existing visual environment and landscape characteristics, and establish the extent to which this contributes to the values of the GBRWHA	■ A visual study area was geographically defined, representing the area potentially affected by Project activities. The visual study area was initially defined by desktop review of topographical data and aerial imagery. Field assessment further confirmed the visual study area. ■ The existing landscape characteristics within and adjacent to the Project activities have been described based on a combination of desktop analysis, field assessment and professional judgement. Field assessment involved documenting and analysing the visibility of the Project activities, taking photographs of the views towards the Project activity areas and documenting the landform, land use, vegetation, water and visual context. ■ The existing landscape characteristics within and adjacent to the Project activities which contribute to the values of the GBRWHA have been identified, in respect to the OUV of the GBRWHA as defined in the *Great Barrier Reef Statement of Outstanding Universal Value* (SoOUV) (GBRMPA 2012), *Defining the Aesthetic Values of the Great Barrier Reef* (DoE 2013) and *Priority Port of Gladstone Master Planning – Local Expression of the OUV of the GBRWHA* (Aurecon 2017).	4.5
Define the viewpoints for Project activities	■ Viewpoints have been defined by identifying a range of locations and viewing situations which represent the existing visual values and allow an assessment of the visual influence of the Project activities ■ The likely viewpoints and viewer groups from each of the viewpoints were identified by: – Reviewing existing information relevant to the visual environment, including existing landform, vegetation, water and land use – Undertaking a field assessment which confirmed the locations and land uses within the surrounding environment from which the Project activities will be visible	4.5.4
Describe the future visual environment	Photomontages have been prepared to illustrate the likely appearance of the future landform of the proposed WBE reclamation area as seen from key viewpoints	4.6
Assess the potential visual impacts	■ The likely change to the existing visual environment has been described using the photomontages and applying professional judgement ■ The potential visual impact of the Project activities has been assessed (refer detailed methodology in Section 4.2.2)	4.6
Assess the effectiveness of potential measures to be undertaken to avoid or mitigate the identified impacts	■ Photomontages have been prepared to illustrate the likely change in appearance of the Project activities with mitigation measures incorporated ■ The potential visual impact of the Project activities was reassessed using the photomontages and applying professional judgement (refer detailed methodology in Section 4.2.2)	4.7

A number of specific visual amenity terms are utilised in the VIA and are provided in Table 4.2.

Table 4.2 Visual amenity and impact assessment terms

Term	Definition
Foreground	Is the visual zone within 0 to 1km from the viewpoint where colour contrast and textural detail are most clearly perceived
Middleground	Is the visual zone between 1km to 6km where different elements in the landscape are visually apparent
Background	Is the visual zone between 6km and 16km (and greater) where textures are no longer visible, but mountain and valley forms, skylines, water and ridgelines are important
Backdrop	An element of significance that forms the background, regardless of distance zones

Source: Foreground, middleground and background terms have been adapted from Forest Practice Authority (2006)

4.2.2 Visual significance impact assessment methodology

4.2.2.1 General approach

For assessment of the significance of potential impacts to visual amenity values, both the sensitivity of the receptors and the magnitude of the effects have been considered. The impact assessment process generally follows that recommended in the *Guidelines for Landscape and Visual Impact Assessment* developed by the Landscape Institute and Institute of Environmental Management and Assessment (2013) (LIIEMA), as shown in Figure 4.1.

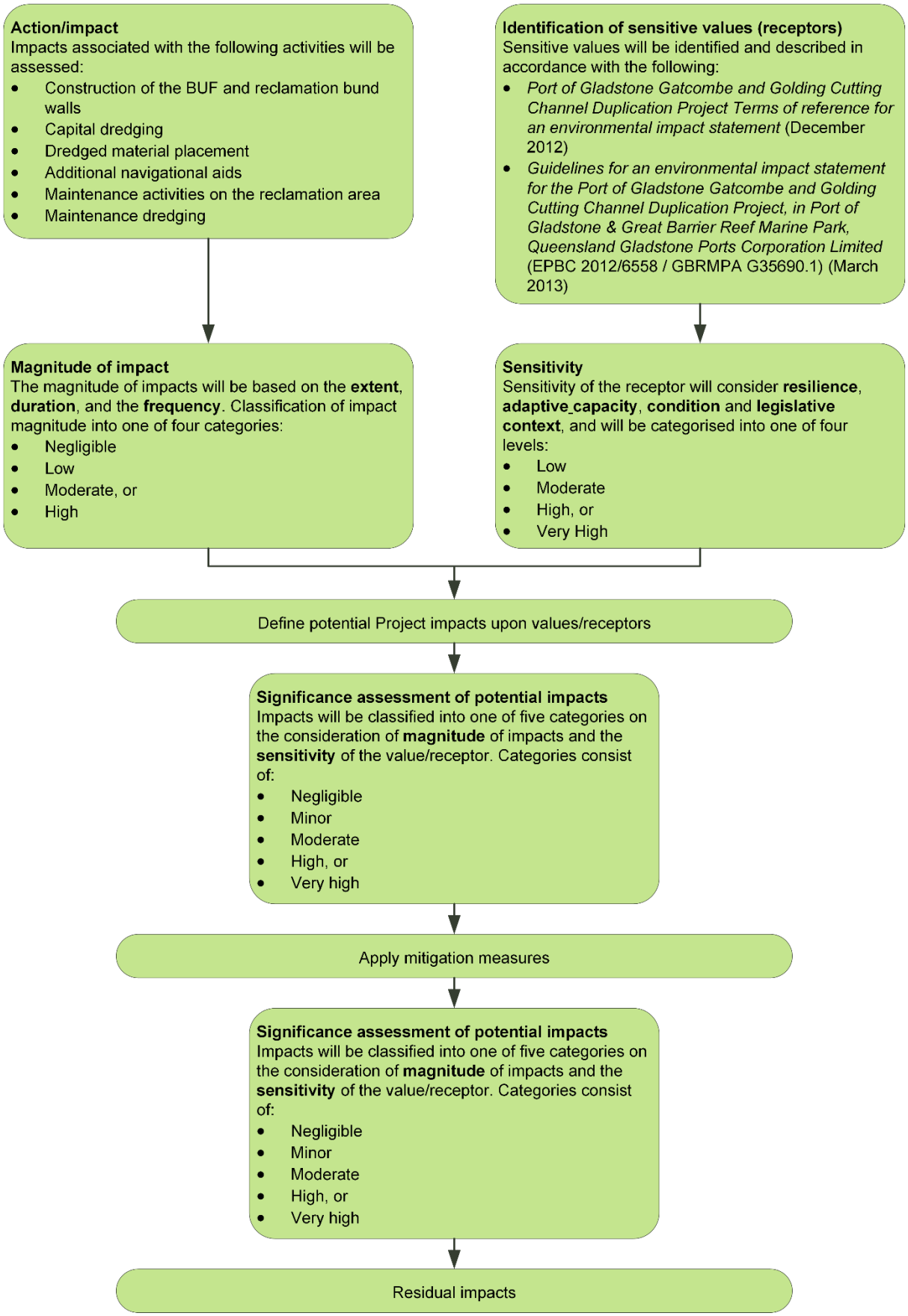

Figure 4.1 **Assessing the significance of visual impacts**

4.2.2.2 Judgement of nature of the visual effects

The nature of the visual effects is essential for the determination of the level of significance of the potential impacts on visual receptors. The nature of visual effects has been determined by considering the **size or scale,** the **geographical extent** of the area influenced, and its **duration** and **reversibility**. The following have been taken into account in determining nature:

- **Size or scale**
  - The scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view occupied by the proposed development
  - The degree of contrast or integration of any new features or changes in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale and mass, line, height, colour and texture
  - The nature of the view of the proposed development, in terms of the relative amount of time over which it will be experienced and whether views will be full, partial or glimpses
- **Geographical extent**
  - The angle of view in relation to the main activity of the receptor
  - The distance of the viewpoint from the proposed development
  - The extent of the area over which the changes would be visible
- **Duration and reversibility**
  - The duration of the effects
  - The prospects and practicality of the effect being reversed (LIIEMA 2013).

The nature of visual effects is divided into four categories (refer Table 4.3).

Timeframes for duration of an impact are discussed in Table 4.4.

Table 4.3 Criteria for magnitude

Magnitude	Description
Negligible	An imperceptible or barely perceptible change to a very small part of the view. Little or no loss or change to the features or characteristics of the landscape. The existing landscape quality is maintained.
Low	Minor loss or alteration to one or more key landscape features or characteristics, or the introduction of features that may be visible but may not be uncharacteristic within the existing landscape.
Moderate	Discernible changes in the landscape due to partial loss of, or change to the features and characteristics of the landscape. The change would be out of scale with the landscape, and at odds with the local pattern and landform, and will leave an adverse impact on a landscape of recognised quality. Changes are likely to impact adversely the integrity/value of the receptor but may be partly mitigated.
High	A major change to the landscape affecting a substantial part of the view due to total loss or change to, features or characteristics of the landscape. A change to *areas of exceptional natural beauty and aesthetic importance* as defined in the Great Barrier Reef SoOUV for the Great Barrier Reef World Heritage Area*. A change would cause a landscape to be permanently changed and its quality diminished. Change is likely to cause a direct adverse permanent or long term impact on the value of the receptor.

Table note:

* OUV for aesthetic importance for the Port of Gladstone have been identified in DoE (2013a) and Aurecon (2017)

Table 4.4 Timeframes for duration terms

Duration term	Timeframe
Temporary	Up to 1 year
Short term	From 1 to 5 years
Medium term	From 5 to 20 years
Long term/long lasting	From 20 to 50 years
Permanent or irreversible	In excess of 50 years

4.2.2.3 Judgement of nature of visual receptors

To assess the significance of potential impacts on visual receptors, sensitivity categories are applied to receptors within the vicinity of selected viewpoints. The sensitivity categories are split into four discrete groups as described in Table 4.5. These groupings are dependent on the receptor type and volume, the receptor's value related to the view, and the receptor's susceptibility to specific change. The susceptibility of different visual receptors to changes in views and visual amenity is mainly a function of:

- The occupation or activity of people experiencing the view at particular locations
- The extent to which their attention or interest may therefore be focused on the views and the visual amenity they experience at particular locations (LIIEMA 2013).

Table 4.5 Sensitivity criteria for visual receptors within the study area

Sensitivity	Description
Negligible	■ Receptors who have a vested interest in the Port (e.g. port workers) ■ Very occasional number of receptors with transient views or one of a sequence of views (e.g. those travelling along minor routes with little viewing opportunity) ■ Receptors from locations where there is screening by vegetation or structures where only occasional views are available and viewing times are short.
Low	■ Receptors whose interest is not specifically focused on the landscape (e.g. people engaged in outdoor sport and recreation which does not involve or depend upon appreciation of views of the landscape) ■ People commuting adjacent to Project activities where there are no stopping points or lookouts thereby having short term viewing opportunity ■ People at their place of work (indoor) whose attention is focused on their work or activity, not on their surroundings and where the setting is not important to the quality of working life.
Moderate	■ Receptors, whether residents or visitors, engaged in outdoor recreation whose interest is in part focused on the landscape and its amenity (e.g. boating, fishing, users of the beach, those travelling along scenic drives, cycling routes or walking trails) ■ Outdoor workers who have a key focus on their work who may also have views of the Project activities ■ Occupiers of residential properties with long viewing periods but predominantly screened from the Project activities.

Sensitivity	Description
High	■ Residents at home with proprietary interest and prolonged uninhibited viewing opportunities including water views ■ Users of valued and/or well used recreational facilities and regionally important locations whose interest is specifically focused on the scenic amenity of the landscape (e.g. users of the beach, nature reserves, lookouts, parks, and water based activities such as boating, swimming and fishing) ■ Communities where views contribute to the landscape setting enjoyed by residents in the area ■ Visitors to heritage assets, or to other attractions, where views of the landscape are an important contributor to the experience ■ Where travel involves recognised scenic routes and therefore where awareness of views is likely to be particularly high.

4.2.3 Judgement of significance of impact

The significance of a potential impact is determined by considering the nature of visual effects expected as a result of the development and the nature of the visual receptor, through the use of a four by four matrix as shown in Table 4.6. Only impacts considered being of high or very high significance are considered as significant for the purposes of this assessment.

Table 4.6 Significance assessment matrix

Magnitude of impact	Sensitivity of visual receptor			
	Negligible	Low	Moderate	High
Negligible	Not significant	Not significant	Not significant	Minor significance
Low	Not significant	Not significant	Minor significance	Moderate significance
Moderate	Not significant	Minor significance	Moderate significance	High significance
High	Minor significance	Moderate significance	High significance	Major significance

Table note:

This table is a guide only. The descriptions of magnitude and sensitivity are illustrative only. Each case is assessed on its own merits using professional judgement and experience, and there is no defined boundary between levels of impacts. A large number of receptors in a category that would otherwise be of low or moderate sensitivity may increase the sensitivity of the receptor.

4.3 Relevance of Project activities to visual amenity

The key Project activities that are relevant to the visual amenity impact assessment are summarised in Table 4.7. Both the construction and maintenance phases of the development have been considered in this assessment. Additional details on the Project are provided in Chapter 2 (Project description).

The primary visual amenity impacts with respect to the magnitude of the impact will occur from the establishment of the WBE reclamation area. The existing WB reclamation area was constructed to a bund wall level of +7m LAT. This level has also been adopted for the WBE reclamation area bund wall. The Project dredged material placement within the WBE reclamation area has been assumed to reach up to a maximum height of +8m LAT within the enclosed bund walls. This will be lower in elevation than the potential final WB reclamation area landform, which has approval for up to +27m LAT. Figure 4.2 illustrates the elevation of the proposed WBE reclamation area in comparison to the current elevation of the WB reclamation area, noting that this reclamation area has approval to allow a mound to be filled to +27m LAT.

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Friend Point

Northern Reclamation Area

Western Basin Expansion Reclamation Area

Existing Western Basin Reclamation Area

Southern Reclamation Area

Curtis Island

Fisherman's Landing

8
5.7
8.9
7.1
9.2
6.5
6.8
7.8
5.8
6.8
4.9
7.7
8
9.5
6.8
9.3
7.2
11.4
15.5
11.9
16.1
6.7
17.3
7
12.9
12.3
16.1
16.1
15.9
16
12.8
12.3
12.7
8.6
9.7
14.6
12.5
12.1

Legend

- Elevation Spot Point (m, LAT)
- Western Basin Expansion reclamation area
- Barge unloading facility

Elevation (m, LAT)

- 2.4 - 3.0
- 3.1 - 4.0
- 4.1 - 5.0
- 5.1 - 6.0
- 6.1 - 7.0
- 7.1 - 8.0
- 8.1 - 9.0
- 9.1 - 10
- 10.1 - 11
- 11.1 - 12
- 12.1 - 13
- 13.1 - 14
- 14.1 - 15
- 15.1 - 16
- 16.1 - 17
- 17.1 - 18.3

Source:
Aerial: GPC Elevation Data (2018) and DigitalGlobe Web Map Service (2013)

P:\GIS\Projects\237374_GPC_Channel_Duplication_EIS\237374_EIS_259.mxd 11/12/2018 14:01

Map by: RB

0 400 800 Metres

Date: 11/12/2018 Version: 2 Job No: 237374

Coordinate system: GDA_1994_MGA_Zone_56

Gatcombe and Golding Cutting Channel Duplication Project

Figure 4.2: Existing Western Basin and Western Basin Expansion Reclamation Areas Elevation

Table 4.7 Summary of Project activities and their associated visual characteristics

Project activity	Activity description	Visual characteristic
Reclamation outer bund wall	Rock material placed on reclamation sites to establish the outer bund walls and BUF. Sheet piling or similar earth retaining structure erected on outer wall of BUF.	The primary visual characteristics of this activity include: ■ The +7m LAT high bund walls and +8m LAT high dredged material placement ■ Construction equipment required, including a number of excavators and/or dozers ■ The BUF constructed adjacent to the existing WB reclamation bund wall using rock material and sheet piling or similar earth retaining structure. BUF to be of the same height as the bund wall with similar visual character when viewed from a distance. ■ A construction compound is likely to be located adjacent to the WBE reclamation area, including a site office and carpark. The workforce during the construction of the reclamation bund walls will be up to 20 people.
	The transport of earth fill and rock material for the construction of the reclamation bund walls and BUF. Approximately 1.12Mm^3 of core and armour material is required to construct the bund walls. The preferred material sourcing location is the Targinnie/Yarwun quarry area, located on Guerassimoff Road. Material is likely to be transported to the WBE reclamation area via the public road network. The haulage route is likely to be Guerassimoff Road, travelling north up Landing Road and then onto the WBE reclamation area. The haulage route is approximately 3.72km in length where using the public road network (5.8km in total).	The primary visual characteristics of this activity include: ■ Truck movements within the WB reclamation area to transport 0.2Mm^3 of dredged material to the BUF from the WB reclamation area ■ Increased traffic along the proposed haul route: – Volumes and truck movements for core and armour material for WBE reclamation area (south): maximum 130 heavy vehicles and 20 light vehicles per day for approximately 18 months Volumes and truck movements for core and armour material for WBE reclamation area (north) and part of the BUF: maximum 198 heavy vehicles and 20 light vehicles per day for a further 18 months
Dredging*	Initial dredging of approximately 0.25Mm^3 of seabed material to establish the barge access channel to allow barges to transport dredged material from the Gatcombe and Golding Cutting shipping channels to the BUF	The primary visual characteristics of this activity include: ■ A TSHD and CSD for 6.5 weeks of dredging to provide a barge access channel and to place the dredged material within the WB reclamation area ■ Lighting associated with night dredging operations ■ Increased turbidity during dredging operations
	Dredging of approximately 12.6Mm^3 of seabed material to deepen the existing Gatcombe and Golding Cutting bypass channels to provide a permanent duplicate channel, approximately 15km long, parallel to the main shipping channel promoting an improved two-way passage	The primary visual characteristics of this activity include: ■ A large sized TSHD dredging the channel for up to 58 weeks (either in 1 or 2 stages) and placing the dredged material in barges ■ A fleet of four barges undertaking 40 trips per week to ship the dredged material to the BUF ■ Increased turbidity during dredging operations ■ Lighting associated with night dredging operations

Project activity	Activity description	Visual characteristic
Unloading dredged material	Barges will arrive at the BUF and be unloaded using excavators into a fleet of trucks to transport the dredged material to the WB and WBE reclamation areas for placement	The primary visual characteristics of this activity include: ■ Four barges arriving, unloading and departing the BUF (40 trips per week for up to 58 weeks, 4 hour unloading cycle) ■ Unloading operations using six excavators ■ Trucks (32) arriving, loading and departing the BUF and transporting dredged material to the WB and WBE reclamation areas ■ Potential plumes and increased turbidity during barge unloading ■ Lighting associated with night unloading and dredged material placement operations
Placement and management of dredged material within the WB and WBE reclamation areas	Placement of the dredged material within the reclamation areas to allow the fine material to settle from the tailwaters	The primary visual characteristics of this activity include: ■ Equipment required to construct the series of decant ponds, including excavators and/or dozers ■ Decant ponds ■ Increased turbidity within the Port in proximity to the licenced discharge points ■ The reclamation area based workforce during dredging, barge unloading, trucking and dredged material placement will consist of up to 196 people. This workforce will utilise the construction compound to be located adjacent to the reclamation area bund wall, including a site office and carpark. ■ Lighting associated with night management operations
Navigational aids	Removal and relocation of existing navigational aids and installing new navigational aids	The primary visual characteristics of this activity include: ■ Floating barge required for the removal, relocation and installation of navigational aids via pile driving ■ Increased turbidity during pile driving ■ Additional navigational aids along the channel ■ Outer bund wall warning lights every 90m to 100m along the outer seaward WBE reclamation area bund walls and the seaward wall and corners of the BUF with navigational lighting at the BUF entrance.

Project activity	Activity description	Visual characteristic
Final landform and maintenance activities on the reclamation area	The creation of reclaimed land above the existing surface level	The primary visual characteristics of the final landform and land uses include: ■ WBE reclamation area filled up to a height of +8m LAT ■ BUF filled up to a height of +7m LAT with outer sheet pile wall removed Following completion of the filling operation within the WB and WBE reclamation areas, GPC will undertake surface stabilisation works for the portion of the reclamation area that has achieved the final surface level. The final land uses for the WB and WBE reclamation areas post Project dredging (Stages 1 and 2) will be stormwater ponds and Port development areas.
Maintenance dredging	Maintenance dredging will be required within the barge access channel and within the duplicated channels following the Project dredging works. It is anticipated that the Port maintenance dredging volume will increase by approximately 7% as a result of the Project. Subject to Commonwealth and State Government environmental approvals the dredged material will be placed offshore within the East Banks DMPA as part of the Port's annual maintenance dredging campaign.	The primary visual characteristics of this activity include: ■ Dredging vessel (likely to be TSHD) ■ Increased turbidity during dredging operations.

Table note:

* The Project dredging methodology adopted for the EIS is based on the nature and volume of the material to be dredged, availability and limitations of dredging equipment, and location of the WB and WBE reclamation areas. However, it is noted that the final dredging methodology will be dependent on the available dredging fleet at the required Project time, the successful tenderer, the market at the time of tendering and any environmental and technical performance requirements specified in the Project approval conditions.

4.4 Project activity assumptions

- During the construction phase of the Project, the only night operations proposed are associated with the 24/7 dredging. No night operations are proposed for the establishment of the BUF and WBE reclamation area.
- It is important to note that while the Project will facilitate an improvement in the existing and future vessel movement efficiency, and a reduction in the likelihood of vessel incident risk, the duplication of the Gatcombe and Golding Cutting Channels will not have any direct influence on increasing vessel movement numbers within the Port.
- The reclamation area bund wall armour and core material is proposed to be sourced from the Targinnie/Yarwun quarry area. The two quarries in this area are existing and therefore the visual impacts of the quarry activities have not been assessed as part of this EIS.

- The Project dredged material volume proposed is 16.05Mm^3, including the material required for the barge access channel, channel duplication dredging, and including an average bulking factor of 1.25. At completion, where the Project dredged material has achieved a final surface level, GPC will undertake surface stabilisation works. However, it is noted that the remaining WB and WBE reclamation areas below the final surface level, will remain available for future Port dredging projects when and if they arise. The final land uses at completion of this Project will include the BUF, stormwater ponds and a Port development area at final surface level. The photomontages reflect this final landform and are the basis of this visual amenity assessment. Future Port development on the reclaimed land would be subject to future approvals and have therefore not be considered as part of this assessment.

4.5 Description of visual values

4.5.1 Section content

This section provides an overview of the landscape character of those areas located in close proximity to the Project activities listed in Section 4.3. For the purposes of this assessment the landscape character has been determined by landform, water, land use and vegetation type. This section also considers those values associated with the GBRWHA. Combined these features and values form the existing visual environment.

4.5.2 Landscape character

4.5.2.1 Landform

The landform of Gladstone city is characterised by the coastal waters, reclaimed land and intertidal areas along the coast, extending to the ridgelines that stretch through the northern suburbs of Gladstone, and into the wider mountain ranges behind. The suburbs of Gladstone are undulating with elevated urban areas including Radar Hill, Round Hill and Auckland Point. The mountainous areas to the back of Gladstone to the south, west and north, including Mount Larcom, form a backdrop to the city.

The Port of Gladstone itself is located within the southern part of the GBRWHA and consists of several reefs and islands. Major reef locations include Oyster Rocks/Gatcombe Heads and Sable Chief Rocks. The Port is defined by the large islands of Curtis Island and Facing Island with numerous smaller islands scattered throughout the Port.

Curtis Island, located to the northeast of Gladstone, has an undulating topography which provides a vegetated backdrop to the visual landscape. Facing Island has a lower profile and spans across most views to the east from Gladstone city. At a distance of 10km away from the mainland, Facing Island often provides a scenic background along the horizon.

4.5.2.2 Land use

Gladstone city is a regional centre which is predominantly recognised as a major port and industrial hub for Queensland. The Port of Gladstone is Queensland's largest multi-commodity port, with RG Tanna Coal Terminal being the world's fourth largest coal export terminal (by throughput) (DTMR 2017). The Port handles over 30 different products. Major cargoes include coal, bauxite, alumina, aluminium, cement and LNG (GPC 2013).

The Project activities are located within the GBRWHA but outside of the GBRMP boundary. Land uses within the Port predominantly include commercial and recreational maritime activities, associated with the current operational shipping channels and surrounding marine water and intertidal areas. The Port is popular with recreational water activities, including swimming, diving, snorkelling, fishing and boating (i.e. canoeing, outrigging, yacht racing and sailing).

Terrestrial land uses surrounding the Port predominantly include Port-related development, and heavy industrial activities, both of which are major features of the visual landscape of Gladstone. Port-related development and industrial activities to the north include the WICT, RG Tanna Coal Terminal, Cement Australia and NRG Gladstone Power Station. Furthermore, the GSDA is an industrial area planned for, and accommodating, large-scale, heavy industry, with precincts approximately 15km northwest of the city. It comprises 27,200ha and accommodates major industries such as the Rio Tinto's alumina refinery within proximity to the WBE reclamation area, Orica chemical manufacturing complex, as well as Transpacific Industries waste management and recycling facility.

South Trees, Boyne Island and Tannum Sands are located to the south of Gladstone city and predominantly comprise industrial land uses, largely associated with the existing QAL operations, port infrastructure, sewage treatment plant and the Boyne Smelter Limited's aluminium smelter. Areas of water, open space and island foreshore are also located in proximity, including a number of parks and reserves for environmental and recreation purposes (including but not limited to Lilley's Beach Camping Area, Wyndham Park, Boyne Island Conservation Park, Bray Park and Boat Ramp, Canoe Point Botanic Reserve and Canoe Point Environmental Park).

Other land uses in the Gladstone region predominantly include rural and agricultural activities. Chapter 3 (land use and tenure) contains further information on land uses within vicinity of Project activities and demonstrates the wide range of Port-related activities which currently influence the character of the areas where Project activities will occur.

4.5.2.3 Vegetation

The WBE reclamation area is situated within the intertidal zone and is defined by exposed mud flats and seagrass, and the adjacent existing WB reclamation area, saltmarsh, mangroves and foreshore vegetation. The seagrass meadow community type within the WB reclamation area is Moderate, including *Halophila ovalis/Zostera muelleri* subsp. *capricorni.* The shoreline directly adjacent to the WBE reclamation area is characterised by remnant mangrove vegetation containing least concern regional ecosystems. *Rhizophora stylosa* (Red mangrove) dominates the mangrove communities on the seaward side at an approximate height of 4m. The mangrove communities on the landward side of the WBE reclamation area are defined by *Ceriops tagal* (Yellow mangrove) in the canopy stratum, with *Avicennia marina* (Grey mangrove) subsp. *australasica* present as an associated species. The ecological community along the landward side of the WBE reclamation area is identified as 'Subtropical and Temperate Coastal Saltmarsh (Vulnerable)', a threatened ecological community in accordance with the EPBC Act.

Areas directly within and adjacent to the WB reclamation area are also identified as Essential Habitat in accordance with the VM Act.

Mangrove regeneration was evident in the communities and the mangroves appeared to be of good health with minimal signs of insect or disease damage notable. A small proportion of *R. stylosa* individuals were displaying black spots, possibly attributable to disease.

Some areas of minor disturbance were noted during the Project EIS field survey and were associated with areas that had been previously cleared. Evidence of fishing and crabbing activities was noted throughout the area.

Areas below the daily high tide level directly adjacent to the WBE reclamation area contain mangrove communities defined by large expanses of exposed mudflats supporting scattered saltmarsh communities.

Due to its offshore location, the areas to be dredged and the proposed location of the navigational aids do not include the direct disturbance of intertidal vegetation communities within or directly adjacent to these areas. (i.e. no intertidal vegetation within 500m of the direct impact areas)

Further information on the vegetation communities within the Project's impact areas can be found in Chapter 9 (nature conservation).

4.5.3 Great Barrier Reef World Heritage Area

4.5.3.1 Background

The Great Barrier Reef was inscribed on the World Heritage List in recognition of its OUV in 1981 for all four of the natural heritage criteria.

The Port of Gladstone is located within the southern part of the GBRWHA. With its numerous reefs and islands, the Port is popular for both recreational and commercial water based activities, including fishing, boating and diving. This section assesses the potential visual impact of the Project on the GBRWHA values.

The identification of GBRWHA values at the Port of Gladstone has been informed by the following key sources:

- Great Barrier Reef SoOUV (GBRMPA 2012)
- United Nations Educational, Scientific and Cultural Organization *Operational Guidelines for the Implementation of the World Heritage Convention* (UNESCO 2015)
- *Matters of National Environmental Significance – Significant impact guidelines 1.1* (DoE 2013b)
- *Defining the Aesthetic Values of the Great Barrier Reef* (DoE 2013a).
- *Independent Review of the Port of Gladstone* (Commonwealth of Australia 2013)
- *Priority Port of Gladstone Master Planning – Local Expression of the OUV of the GBRWHA* (Aurecon 2017).

OUV is the fundamental concept of the World Heritage Convention and underpins the listing of properties on the World Heritage List. In particular, the UNESCO Guidelines define the concept of OUV as *'cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity'* (UNESCO 2015).

For a property to be considered as having OUV, the property must meet one or more of the ten criteria listed in the Guidelines, as well as meet the conditions of integrity and/or authenticity, and have an adequate protection and management system to ensure its safeguarding.

The GBRWHA meets a number of criteria. The key criterion of relevance to this VIA is criterion (vii) relevant to aesthetic values being 'to contain superlative natural phenomena or **areas of exceptional natural beauty and aesthetic importance'**.

The OUV of the GBRWHA is defined in the Great Barrier Reef SoOUV (GBRMPA 2012) and, relevant to criterion (vii), includes:

> *'The GBR is of superlative natural beauty above and below the water, and provides some of the most spectacular scenery on earth. It is one of a few living structures visible from space, appearing as a complex string of reefal structures along Australia's northeast coast. From the air, the vast mosaic patterns of reefs, islands and coral cays produce an unparalleled aerial panorama of seascapes comprising diverse shapes and sizes'.*

The World Heritage values of the Great Barrier Reef include:

- *The vast extent of the reef and island systems which produces an unparalleled aerial vista*
- *Islands ranging from towering forested continental islands complete with freshwater streams, to small coral cays with rainforest and unvegetated sand cays*
- *Coastal and adjacent islands with mangrove systems of exceptional beauty*
- *The rich variety of landscapes and seascapes including rugged mountains with dense and diverse vegetation and adjacent fringing reefs*
- *The abundance and diversity of shape, size and colour of marine fauna and flora in the coral reefs*
- *Spectacular breeding colonies of seabirds and great aggregations of over-wintering butterflies*
- *Migrating whales, dolphins, dugong, whale sharks, sea turtles, seabirds and concentrations of large fish.*

This VIA addresses the potential impacts on the second part of criterion (vii) being impacts on the aesthetic OUV attributes. It is noted that the Port of Gladstone supports some *'superlative natural phenomena'* including the aggregation of seabirds and other waterbirds, migrating whales and the presence of other threatened and migratory species such as turtles and dolphins. Impacts to these features may result in a consequent negative impact on the aesthetic value associated with such natural phenomena. The potential for flow on impacts to aesthetic values associated with such superlative natural phenomena will be an important consideration in the assessment of impacts on the GBRWHA and have assessed as such in Chapter 21 (cumulative impacts) and Appendix P.

4.5.3.2 Great Barrier Reef World Heritage Area aesthetic attributes within the Port of Gladstone

An independent review of the Port of Gladstone was conducted in 2013, with the findings documented in the *Independent Review of the Port of Gladstone – Report on Findings*, July 2013 (SEWPaC 2013). The independent review identified OUV of the GBRWHA present within the Port of Gladstone, which included Connectivity, Geological features, Biological diversity, and Human interaction.

The independent review identified the following OUV attributes, relevant to criterion (vii), found in the Port of Gladstone and surrounds:

- Continental islands
- Fringing reefs
- Island plant species diversity
- Total species diversity
- Whales
- Beaches
- River deltas
- Seagrass
- Mangroves
- Dolphins
- Dune systems
- Marine faunal groups diversity
- Coral species – diversity and extent
- Marine turtles
- Seabirds

Furthermore, the independent review states:

> *"The Narrows is a shore-parallel mud-dominated tidal exchange channel between the mainland and the island chain of Curtis Island and Facing Island. The channel runs north-northwest becoming shallower and narrower from v-shaped Port Curtis towards the substantial complex of tidal mud flat fronted by mangrove vegetation of the Fitzroy River delta.*
>
> *The Narrows is an important mangrove-vegetated channel between a bedrock island the mainland, providing sheltered water and connectivity. It is a locally and nationally significant geoheritage feature and a distinctive attribute of the southern GBRWHA.*
>
> *Curtis Island is the largest island in the GBRWHA. Detailed geoheritage analysis indicates that Curtis and Facing Islands are an internationally significant island complex, and a distinctive physical element of the southern GBRWHA.*

The shallow sedimentary seabed and sheltered waters of the Port Curtis Basin with linked mudflat, mangrove, sandy beach and intact vegetated shoreline areas are core physical attributes in the Port of Gladstone.

The extensive mangroves to the north of the Western Basin and associated saltmarsh/saltflat habitats link through the Narrows to Port Alma and beyond. That complex is regionally and whole-of-property significant because it and Hinchinbrook Channel are the only large areas of narrow coastal channel sheltered by large continental islands".

4.5.3.3 Priority Port of Gladstone master planning

Under the Ports Act, the Port of Gladstone is defined as one of four priority ports in Queensland, requiring a port master plan to ensure sustainable development of the Port into the future.

Priority port master planning is a commitment in the Reef 2050 and will ensure the OUV of the GBRWHA is an intrinsic consideration in the future port development, management and governance (TMR 2018b).

The Port of Gladstone is a declared priority port under the Ports Act and in late 2018, the Master plan for the priority Port of Gladstone 2018 was released by the Queensland Government.

As part of the master planning process, an assessment was undertaken (Aurecon 2017) to identify the presence and local expression of OUV within the priority Port of Gladstone master planned area and surrounding areas, and the contribution they make to the OUV of the GBRWHA.

The assessment included:

- Identifying the OUV of the GBRWHA attributes that occur within the Port of Gladstone and surrounds. The independent review (refer Section 4.5.3.2) utilised key attributes to determine the relevant local attributes within the master planned area and surrounds that contribute to the OUV of the GBRWHA.
- Defining the environmental values that are included in the OUV of the GBRWHA attributes for the Port
- For the OUV of the GBRWHA attributes, analysing the presence of these attributes in the Port of Gladstone
- Classifying the contribution level of the locally expressed attributes, in the context of their contribution to the OUV of the GBRWHA.

Table 4.8 provides a summary of the findings, where relevant to criterion (vii).

Table 4.8 Contribution of local attribute of the OUV of the GBRWHA for the Port

Category	Local attribute	Contribution classification to OUV criteria (vii)	Key environmental values
Coral reefs	Fringing reefs	■ Minor presence ■ Minor contribution	Fringing coral reefs
	Inshore turbid reefs	-	Inshore turbid coral reefs
	Coral species diversity and extent	■ Minor presence ■ Minor contribution	Various coral species
Marine water quality	Marine water quality	-	Marine water quality

Category	Local attribute	Contribution classification to OUV criteria (vii)	Key environmental values
Fish	Fish species and diversity	■ Minor presence ■ Minor contribution	Colosseum Inlet FHA De-ral-li (Calliope River) FHA Coral reefs, seagrass meadows, mangrove communities, hard and soft benthic substrates, beach habitats, estuaries, creeks and rivers
Marine megafauna	Dugong	-	Dugong species Seagrass meadows
	Species of whales	-	Minke whales Sperm whales Humpback whales
	Migrating whales	■ Minor presence ■ Minor contribution	Humpback whales and calving habitat
	Species of dolphins	■ Moderate presence ■ Minor contribution	Australian humpback dolphins
Marine turtles	Breeding colonies of marine turtles	■ Moderate presence ■ Moderate contribution	Flatback turtle rookery on Curtis Island Nesting beaches on Facing and Curtis Islands
	Green turtle breeding	■ Moderate presence ■ Minor contribution	
	Marine turtle rookeries	■ Moderate presence ■ Moderate contribution	
	Nesting turtles	■ Moderate presence ■ Minor contribution	
Seagrass and macroalgae	Seagrass	■ Moderate presence ■ Minor contribution	Seagrass meadows
	Beds of *Halimeda* algae	-	Beds of *Halimeda* algae
Shorebirds and migratory seabirds	Seabirds	■ Minor presence ■ Minor contribution	Potential foraging habitat
	Shorebirds and migratory birds	-	Threatened migratory shorebird species Shorebird habitat and important roost sites (note these vary from year to year)
Flora, fauna and ecological communities	Threatened and endangered flora and fauna species (including threated ecological communities)	■ Minor presence	Coastal saltmarsh threatened ecological community
	Vegetated mountains	■ Minor presence ■ Minor contribution	Mount Larcom
	Mangroves	■ Minor presence ■ Minor contribution	Various mangrove sp.

Category	Local attribute	Contribution classification to OUV criteria (vii)	Key environmental values
	Mangrove species diversity	-	Various mangrove sp.
	Vast mangrove forests	■ Minor presence ■ Moderate contribution	Mangrove sequences at The Narrows
Continental islands	Continental islands and green vegetated islands	■ Significant presence ■ Moderate contribution	Curtis Island
	Plant species diversity and endemism (species being unique to a defined geographic location)	-	Curtis Island
	Vegetation of the continental islands	-	Curtis Island
Geomorphology	Beaches	■ Minor presence ■ Minor contribution	Curtis Island beaches Facing Island beaches Boyne Island beaches
	Dune systems	■ Minor presence ■ Minor contribution	Parabolic dunes Curtis Island
	River deltas	■ Minor presence ■ Minor contribution	Marine tidal sand deltas (Curtis Island, Boyne River, Colosseum Inlet)
	Connectivity: cross-shelf, longshore and vertical	-	The Narrows tidal passage
Cultural heritage values	Traditional Owner interaction with the natural environment	-	Indigenous cultural heritage sites and values
Marine fauna	Diversity supporting marine fauna species (global conservation significance)	■ Moderate presence ■ Minor contribution	A diverse range of marine fauna species
Total species diversity	Total species diversity	■ Moderate presence ■ Moderate contribution	A diverse range of marine, intertidal and terrestrial flora and fauna species

Of the OUV attributes identified within the Port, those which are specifically relevant to aesthetic values, being the second part of criterion (vii) **'areas of exceptional natural beauty and aesthetic importance'** includes:

- Fringing coral reefs
- Vegetated mountains
- Mangroves
- Vast mangrove forests
- Continental islands and green vegetated islands
- Beaches
- Dune systems
- River deltas

4.5.3.4 Assessment of the visual amenity impacts of the Project

The primary visual amenity impacts of the Project, with respect to the magnitude of the impact, will occur from the creation of the BUF and WBE reclamation area. This area is located within Port marine and intertidal waters within proximity to The Narrows. Due to the nature of the reclamation area, there will be a permanent change to the visual landscape and amenity, particularly when viewed from within close proximity of the reclamation area.

In assessing the impact of the Project on the OUV attributes relevant to aesthetic values, the following points are noted:

- There are no local attributes within the Project impact areas that have a significant contribution to criterion (vii)
- The local attributes which have a moderate contribution to criterion (vii) relate to breeding colonies of marine turtles, marine turtle rookeries, vast mangrove forests, and continental islands and green vegetated islands. It is not considered that the Project will have an adverse impact on these attributes, as discussed below:
  - The impact assessment on marine turtles (refer Section 9.19) found that the Project will not have a significant residual adverse impact on marine turtles. The area of seagrass and inshore habitat to be disturbed during the Project is relatively small, with indirect impacts likely to be short term. Potential indirect Project impacts will not have a significant impact on marine turtle life cycle.
  - The impact assessment on terrestrial and intertidal flora and wetlands (refer Section 9.5) found that the Project will not result in direct loss of mangrove communities. Potential indirect impacts on mangrove communities associated with the Project (such as erosion, sedimentation and decreased water quality), will be managed through the implementation of mitigation measures.
  - The continental islands and green vegetated islands predominantly relate to Curtis Island and Facing Island which are not anticipated to be impacted by the Project.

Industrial and port-related development is a major feature of the visual landscape of the Port of Gladstone. It is noted that the Port was established in 1914, 67 years prior to the Great Barrier Reef being inscribed on the World Heritage List in 1981. The location of the BUF and WBE reclamation area is adjacent to the main Port activities, and while development in this area is more recently established and not as widespread, it has recently been exposed to industrial and port-related development with the development of the Fisherman's Landing and the establishment of the WB reclamation area, the establishment of industrial development on Curtis Island, and projects such as the WICT. Curtis Island comprises LNG operations associated with the APLNG, QCLNG and GLNG plants. Fisherman's Landing reclamation area comprises developed and undeveloped port-related industrial land and marine based infrastructure (i.e. wharves and barge ramps). WICT also includes infrastructure like wharves, large scale machinery, stockpiles, rail movements, long jetties, and ships at berth. These developments have further influenced the industrial character of the landscape, and have changed the naturalness and scenic integrity of the landscape.

The area surrounding the proposed BUF and WBE reclamation area is designated within the GSDA which dedicates land for industrial development and materials transportation infrastructure. Land adjacent to the BUF and WBE reclamation area is within the 'Medium-High Impact and Port Related Industry Precinct', 'Industry Investigation Precinct', 'Materials Transportation and Services Corridor' and the 'Curtis Island Industry Precinct'. With this designation comes a reasonable expectation that this area will be developed for industrial and port-related infrastructure. Chapter 3 (land use and tenure) provides further details on the preferred land use development intents for each of these precincts.

The visual amenity of this part of the GBRWHA has been modified by the existing industrial and port-related development and the introduction of the BUF and WBE reclamation area needs to be viewed in the context of the broader existing port industrial area, which consequently lowers the magnitude of the change than from the introduction of the Project into a pristine landscape setting.

It is also noted that a number of existing factors largely mitigate visual impacts of the proposed BUF and WBE reclamation area. These factors include the low elevation of the proposed BUF and reclamation area, their co-location with the existing reclamation areas to the south, and the distance and available screening by vegetation and the built environment from highly sensitive visual receptors. In addition, while the BUF and WBE reclamation area are proposed within proximity of The Narrows, the BUF and reclamation area will not result in direct clearing of mangrove vegetation, or mud-flats at Friend Point and through The Narrows (there is a potential for indirect impacts addressed in Chapter 9 (nature conservation)). Furthermore, the BUF and WBE reclamation area proposed as part of this Project are to be a maximum height of +7m LAT and +8m LAT, respectively, ensuring that the distinctive physical elements of Curtis and Facing Islands will remain and not be obscured by the BUF and WBE reclamation area when viewed from the mainland. The BUF and WBE reclamation area will not alter the existing skyline or variety of landscapes within the Port, however the reduction in the area of open water in the Port will have an unavoidable visual impact in views of the Western Basin area of the Port.

On this basis, it is considered that the Project needs to be seen in the context of the existing industrial character of the Port noting that the broader visual aesthetic values of the GBRWHA will be maintained beyond the Port limits. It is also noted that the Project direct impact area is less than 0.1% of the GBRWHA and therefore it is not considered that the Project would result in the significant decline in the OUV of the GBRWHA.

4.5.4 Viewpoints and visual context

4.5.4.1 Zone of theoretical visibility assessment

The primary visual amenity impacts with respect to the magnitude of the impact will occur from the creation of the BUF and WBE reclamation area. Due to the nature of the WBE reclamation area, there will be a permanent change to the visual landscape and amenity when viewing this area. As such, land that may potentially be visually connected with the final Project landform for the WBE reclamation area was identified and mapped, illustrating those areas which may experience the largest magnitude of impact. This zone of theoretical visibility (ZTV) mapping provides a visual effects baseline, an area in which the Project may have an influence or effect upon visual amenity, and was used as a tool to select representative viewpoints for more detailed assessment. The ZTV mapping has been undertaken for a 16km radius from the proposed WBE reclamation area. A radius of 16km was considered appropriate as at this distance textures are no longer visible and the Project activities when viewed beyond this distance are considered likely to be of little visual concern to viewers.

To map the ZTV the Environmental Systems Research Institute (ESRI) ArcGIS (v10.3.1) and ESRI Spatial Analyst software were used. A digital elevation model (DEM) created from a Light Detection and Ranging (LIDAR) Survey was used as the base topography layer for the analysis. The DEM has a cell size of 5m x 5m; this translates to the model having a unique z-axis height for every 5m x 5m unit on the ground in the area.

The ZTV assessment was run off this DEM and assigned z-axis heights of the proposed WBE reclamation area (the Project activity with the highest visibility) at their proposed maximum heights (+8m LAT). The observer eye height was set to 1.5m above ground level (nominal eye-level height of a person). The software used digitally determines the theoretical extent over which the WBE reclamation area would be visible.

In interpreting the ZTV, the following matters were considered:

- The ZTV is only accurate to the resolution of the DEM, in this case this resolution is 5m x 5m. This translates to every 5m x 5m cell on the ground giving a binary value of seeing the WBE reclamation area or not seeing the WBE reclamation area.

- The DEM is a filtered ground surface and does not take into account intervening vegetation, buildings or other view obstructions. Therefore, as it only uses the landform, the resultant visibility maps represent the greatest extent of potential impact on visual amenity possible, and do not show the extent that the Project may be screened by vegetation or buildings. The mapping should be used as a guide only as to the maximum area from which the Project may be visible.

The ZTV for the WBE reclamation area is shown on Figure 4.3, Figure 4.4 and Figure 4.5. The ZTV reaches the ridges and high points of the Gladstone urban areas and incorporates residential, industrial and commercial development, recreation areas and lookouts, as well as views from boats using the Port.

4.5.4.2 Representative viewpoints

Field assessment further confirmed the locations within the surrounding landscape where Project activities were visible and locations from which detailed VIA will be undertaken. A series of representative viewpoints have been selected to illustrate existing environmental values and the potential visual influence of the Project activities.

The general viewpoint locations include:

- Yarwun and Friend Point provide immediate views to the WBE reclamation area
- Port of Gladstone, in particular, the marine area between the WBE reclamation area and Curtis Island
- Elevated urban areas of Gladstone, including the Radar Hill, Round Hill and Auckland Point lookouts, and residential areas
- Waterfront residential areas of Tannum Sands and Gatcombe Heads.

4.5.4.3 Viewpoints and sensitive receptors

The viewpoints are areas where full or screened views of the Project activities are possible and there is human activity being undertaken. This human activity may include residential, business or recreational uses. In addition, viewpoints also include areas where the only views are transient, such as vehicles using a road, views from trains or views from vessels using Port of Gladstone waters.

While there are several residences with potential views to the WBE reclamation area or the shipping channel (or both), views from nearby roads (where access was publicly available) were selected and photographed as representative of such views.

The viewpoints that have been identified and assessed in this chapter are listed below and are shown on Figure 4.6.

Viewpoints

1. Yarwun, corner Landing Road and Forest Road
2. Friend Point
3. Mount Larcom
4. Port of Gladstone, near The Narrows
5. Port of Gladstone
6. Auckland Point
7. Round Hill Lookout
8. Corner Goondoon Street and Eden Street
9. Upper Piper Street
10. Birmingham Close
11. Mercedes Street
12. Watt Street
13. Barney Point Beach
14. Tannum Sands
15. Gatcombe Heads, Facing Island

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Growth, Prosperity, Community.

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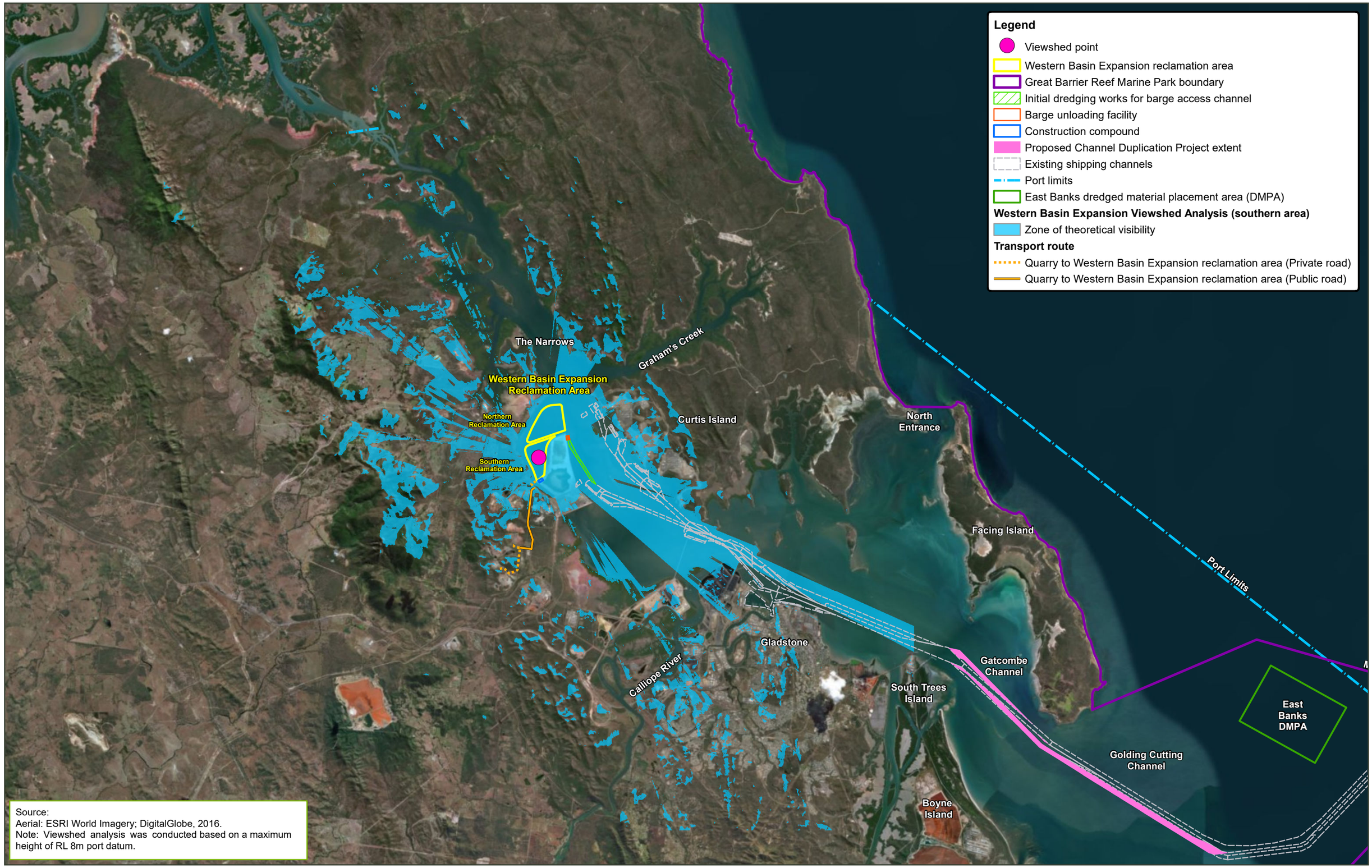

Source:
Aerial: ESRI World Imagery; DigitalGlobe, 2016.
Note: Viewshed analysis was conducted based on a maximum height of RL 8m port datum.

Map by: SR P:\GIS\Projects\237374_GPC_Channel_Duplication_EIS\237374_EIS_185.mxd 10/12/2018 17:25

0 1,900 3,800 Metres

Date: 10/12/2018 Version: 6 Job No: 237374

Coordinate system: GDA_1994_MGA_Zone_56

Gatcombe and Golding Cutting Channel Duplication Project

Figure 4.3: Western Basin Expansion reclamation area (southern) viewshed analysis

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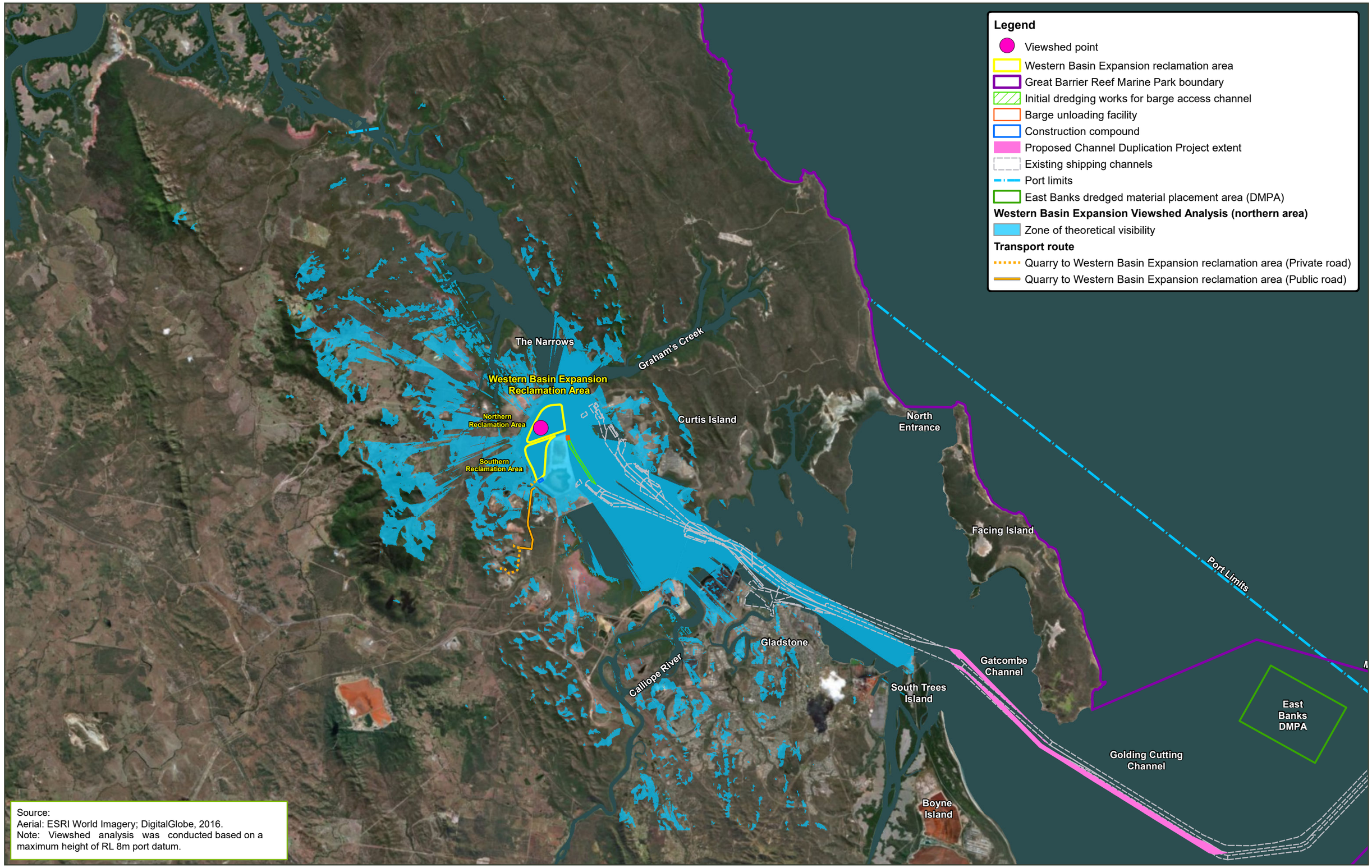

Source:
Aerial: ESRI World Imagery; DigitalGlobe, 2016.
Note: Viewshed analysis was conducted based on a maximum height of RL 8m port datum.

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Date: 10/12/2018 Version: 5 Job No: 237374

Coordinate system: GDA_1994_MGA_Zone_56

Gatcombe and Golding Cutting Channel Duplication Project

Figure 4.4: Western Basin Expansion reclamation area (northern) viewshed analysis

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Legend

- Viewshed point
- Western Basin Expansion reclamation area
- Great Barrier Reef Marine Park boundary
- Initial dredging works for barge access channel
- Barge unloading facility
- Construction compound
- Proposed Channel Duplication Project extent
- Existing shipping channels
- Port limits
- East Banks dredged material placement area (DMPA)
- Zone of theoretical visibility for Western Basin Expansion (southern and northern areas)

Transport route

- Quarry to Western Basin Expansion reclamation area (Private road)
- Quarry to Western Basin Expansion reclamation area (Public road)

The Narrows
Graham's Creek
Western Basin Expansion Reclamation Area
Northern Reclamation Area
Southern Reclamation Area
Curtis Island
North Entrance
Facing Island
Port Limits
Gladstone
Calliope River
Gatcombe Channel
South Trees Island
East Banks DMPA
Golding Cutting Channel
Boyne Island

Source:
Aerial: ESRI World Imagery; DigitalGlobe, 2016.
Note: Viewshed analysis was conducted based on a maximum height of RL 8m port datum.

Map by: SR P:\GIS\Projects\237374_GPC_Channel_Duplication_EIS\237374_EIS_187.mxd 10/12/2018 17:32

0 1,900 3,800 Metres

Date: 10/12/2018 Version: 6 Job No: 237374

Coordinate system: GDA_1994_MGA_Zone_56

Gatcombe and Golding Cutting Channel Duplication Project

Figure 4.5: Zone of theoretical visibility for Western Basin Expansion reclamation area

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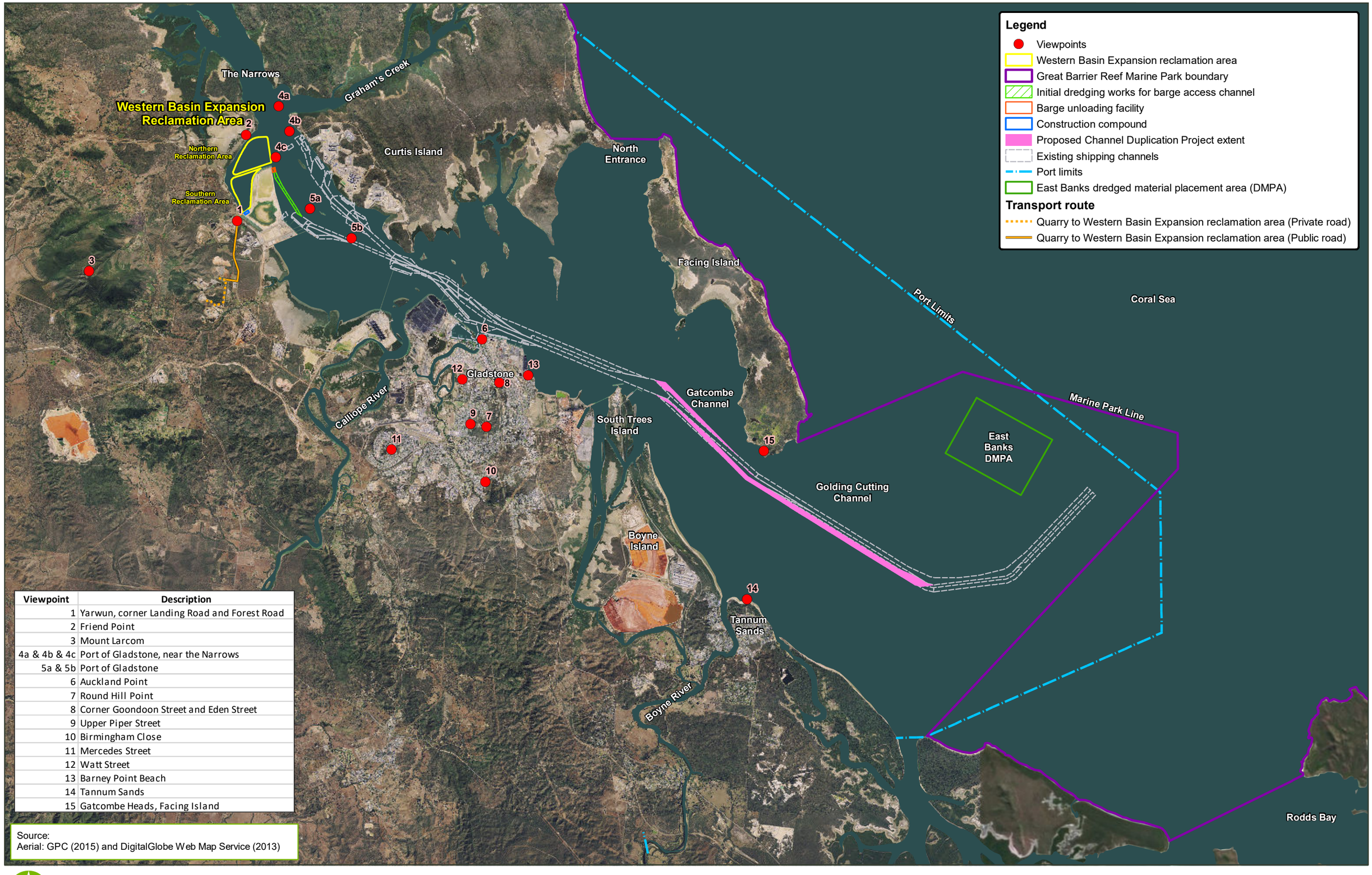


Viewpoint	Description
1	Yarwun, corner Landing Road and Forest Road
2	Friend Point
3	Mount Larcom
4a & 4b & 4c	Port of Gladstone, near the Narrows
5a & 5b	Port of Gladstone
6	Auckland Point
7	Round Hill Point
8	Corner Goondoon Street and Eden Street
9	Upper Piper Street
10	Birmingham Close
11	Mercedes Street
12	Watt Street
13	Barney Point Beach
14	Tannum Sands
15	Gatcombe Heads, Facing Island

Source:
Aerial: GPC (2015) and DigitalGlobe Web Map Service (2013)

Map by: NKM/RB P:\GIS\Projects\237374_GPC_Channel_Duplication_EIS\237374_EIS_197.mxd 10/12/2018 17:37

0 1,800 3,600 Metres

Date: 10/12/2018 Version: 5 Job No: 237374

Coordinate system: GDA_1994_MGA_Zone_56

Gatcombe and Golding Cutting Channel Duplication Project

Figure 4.6: Western Basin Expansion reclamation area - viewpoints overview

Viewpoint 1 – Yarwun, corner Landing Road and Forest Road

Properties within proximity to Yarwun will have views of the WBE reclamation area and the water beyond. The visual context of this viewpoint is detailed in Table 4.9.

Table 4.9 Viewpoint 1 – Yarwun, corner Landing Road and Forest Road visual context

Typical local landscape character	 Looking north towards the WBE reclamation area with low to mid height vegetation dominating the foreground. Curtis Island forms the backdrop.
Landform	The land surrounding this viewpoint is generally flat and incorporates the low lying areas immediately adjacent to the coast. The topography of the land rises along Landing Road.
Vegetation	The vegetation adjacent to this viewpoint is characterised by relatively low shrubs and trees adjoining the road corridors.
Land use	Land within vicinity of this viewpoint consists of industrial development and large undeveloped properties. The QER refinery immediately adjoins the viewpoint to the south, Cement Australia facility to the southeast and Port development associated with Fisherman's Landing to the east.
Visual context	This viewpoint overlooks Fisherman's Landing within an area that is comprised of vegetated areas and industrial development. From this location the existing facilities of the Fisherman's Landing Port area are visible, as well as the Cement Australia facility to the south, and the existing industrial developments on Curtis Island. The existing industrial developments are visible at night due to operational and security lighting provided as part of these land uses. The ridges on Curtis Island provide a dominant backdrop within this view. Views from this location are experienced by: ■ Road users passing through the area ■ Onsite workers associated with the industrial activity in the immediate vicinity.

Viewpoint 2 – Friend Point

The marine areas near to Friend Point and the existing WB reclamation area are popular locations for both recreational and commercial water based activities. Vessels accessing this area have views of the water, the proposed WBE reclamation area and the surrounding built and natural environment.

This viewpoint relates specifically to the area south of Friend Point, across the proposed WBE reclamation area and existing WB reclamation area to Fisherman's Landing. Table 4.10 identifies the existing visual context.

Table 4.10 Viewpoint 2 – Friend Point visual context

Typical local landscape character	 Looking south towards existing WB reclamation area with mudflats and coastal vegetation dominating the foreground. The Cement Australia facility is a distinguishing feature in the middleground.
Landform	This viewpoint is immediately adjacent to the coast and is low-lying.
Vegetation	The vegetation adjacent to this viewpoint is characterised by mangroves and intertidal vegetation.
Land use	The land in the vicinity of this viewpoint is largely undeveloped. This viewpoint is adjacent to the coast and overlooking the WB reclamation area to the south, and heavily vegetated undeveloped land to the west.
Visual context	This viewpoint is located at Friend Point within the coastal mudflats overlooking the water and the WB reclamation area to the south. The immediate area is predominantly comprised of mudflats, marine waters and intertidal vegetation. From this location the existing facilities of the Fisherman's Landing Port area and Cement Australia are visible, as well as the existing industrial developments at Curtis Island. The existing industrial developments at Fisherman's Landing and Curtis Island are visible at night due to operational and security lighting provided as part of these land uses. Other strong visual elements within the landscape include the vegetation in the foreground and the mountainous ranges of southern Gladstone forming the backdrop. Views from this location are experienced by: ■ Water based recreation users, including people fishing and using recreational water craft ■ Commercial water based users.

Viewpoint 3 – Mount Larcom

Mount Larcom is located west of the existing Fisherman's Landing reclamation area and due to its elevation, provides expansive views of Gladstone and the surrounding area. The summit of Mount Larcom is accessible via a public walking track. The existing visual environment from Mount Larcom is outlined in Table 4.11.

Table 4.11 Viewpoint 3 – Mount Larcom visual context

Typical local landscape character	 View to the east from the top of Mount Larcom. This location provides extensive views of the region and is accessible via walking tracks.  Intermittent views of the water and the existing WB reclamation area are available through vegetation along the walking track.
Landform	Mount Larcom forms a visual backdrop to Gladstone through being a dominant landscape feature. The mountain provides for extensive views over Gladstone and the surrounding region.
Vegetation	Mount Larcom and its foothills are densely vegetated, providing a vegetated visual backdrop to the region. The vegetation on Mount Larcom is predominantly eucalypt species.
Land use	Mount Larcom is zoned Rural by the GRC Planning Scheme and is within the Environmental Management Precinct of the Master Plan for the Priority Port of Gladstone. Mt Larcom is surrounded by the GSDA which identifies the surrounding land for industry, infrastructure corridor and major public works. Land immediately surrounding Mount Larcom is within the Low-Medium Impact Industry and Medium-High Impact Industry precincts.

Visual context	Access to the top of Mount Larcom is available via a public walking track. This track also provides access to a telecommunication facility located at the top of the mountain. Mount Larcom provides extensive expansive views incorporating Gladstone and the surrounding area. Views from this viewpoint are experienced by: ■ Recreation users who have accessed the viewpoint from the walking track. The interest in the landscape may incorporate both the built and natural environment. These viewing opportunities would largely be of short duration. ■ Activity focused workers servicing the telecommunications device located on the mountain.

Viewpoints 4a, 4b and 4c – Port of Gladstone, near The Narrows

The Port of Gladstone waters surrounding the existing WB reclamation area is a popular location for both recreational and commercial water based activities. Vessels accessing this area have views of the water, the proposed WBE reclamation area and the surrounding built and natural environment. The existing visual environment from Port of Gladstone, near The Narrows, is detailed in Table 4.12.

Table 4.12 Viewpoints 4a, 4b and 4c – Port of Gladstone, near The Narrows visual context

Typical local landscape character	 View to the southwest from a vessel in the Port of Gladstone, near The Narrows. This location provides expansive water views.

	 View to the southwest from a vessel in the Port of Gladstone, near The Narrows. This location provides expansive water views.
	 Closer view to the southwest from a vessel in the Port of Gladstone, near The Narrows. This location provides a closer view of the existing WB reclamation area; and expansive water views.
Landform	Water
Vegetation	Nil
Land use	Port of Gladstone

Visual context	The view from this location consists predominantly of the Port of Gladstone waters and port-related industrial land uses. Mount Larcom provides a visual backdrop. Views from this viewpoint are experienced by: ■ Water based recreation and tourism users, including people fishing and using recreational and tourism vessels ■ Commercial water based users.

Viewpoints 5a and 5b – Port of Gladstone

The Port of Gladstone waters surrounding the existing WB reclamation area is a popular location for both recreational and commercial water based activities. Vessels accessing this area have views of the water, the proposed WBE reclamation area and the surrounding built and natural environment. The existing visual environment from Port Curtis, near The Narrows, is detailed in Table 4.13.

Views from this viewpoint would be experienced by vessels and similarly by personnel at Curtis Island.

Table 4.13 Viewpoints 5a and 5b – Port of Gladstone visual context

Typical local landscape character	 View to the northwest from a vessel in the Port of Gladstone. This location provides expansive water views.

	 View to the northwest from a vessel in the Port of Gladstone. This location provides expansive water views and views of the wharves which extend out from Fisherman's Landing.
Landform	Water
Vegetation	Nil
Land use	Port of Gladstone
Visual context	The view from this location consists predominantly of the Port of Gladstone waters and port-related industrial land uses. Mount Larcom provides a visual backdrop. Views from this viewpoint are experienced by: ■ Water based recreation and tourism users, including people fishing and using recreational and tourism vessels ■ Commercial water based users.

Viewpoint 6 – Auckland Point

Auckland Point comprises James Cook Park that includes a popular lookout point over the Port, Curtis Island, northern Gladstone and the mountains to the west. The location provides some visitor amenities, including parking, café, picnic facilities and toilets. The WBE reclamation area is located approximately 11.5km northwest. The existing visual context when viewed from Auckland Point is described in Table 4.14.

Table 4.14 Viewpoint 6 – Auckland Point visual context

Typical local landscape character	 View to the northwest from the Auckland Point lookout. This location provides views of the water, the Port of Gladstone, the Gladstone Marina and port-related industrial uses. The WB reclamation area is located behind the RG Tanna Coal Terminal.
Landform	Auckland Hill is an elevated lookout, at approximately 34m Australian height datum (AHD). Auckland Hill is one of the highest points along the coastline and forms part of a ridgeline that extends through northern Gladstone.
Vegetation	Urban landscape planting.
Land use	James Cook Park and lookout with associated facilities.
Visual context	Auckland Hill is an elevated lookout. Foreground views from this location are dominated by industrial and port-related development to the northwest, including the Gladstone Marina and the RG Tanna Coal Terminal. These uses are visible at night due to operational and security lighting provided as part of these land uses. The ridges of Mount Larcom and Curtis Island provide a visual backdrop. It is unlikely that the WBE reclamation area will be visible in the background behind the existing land uses such as the RG Tanna Coal Terminal. Views from this location are experienced by: ■ Visitors and recreation users of the lookout whose interest is focused on the surrounding landscape and water ■ Road users travelling to the lookout.

Viewpoint 7 – Round Hill Lookout

Round Hill is one of the highest points in the urban area of Gladstone and provides a vehicle accessible lookout for residents and visitors. There is a telecommunications facility also located on the hill. Due to the elevation, the lookout provides extensive views of Gladstone and the surrounding area. This viewpoint is located approximately 14km southeast from the WBE reclamation area. A description of the existing visual context from this viewpoint is detailed in Table 4.15.

Table 4.15 Viewpoint 7 – Round Hill Lookout visual context

Typical local landscape character	 Existing view to the northwest from the Round Hill lookout. The urban areas of Gladstone can be seen in the foreground and middleground from this viewpoint. The ridges of Mount Larcom provide a visual backdrop.  Intermittent views towards the WBE reclamation area are available through vegetation. The urban areas of Gladstone can be seen in the foreground and middleground from this viewpoint.
Landform	Round Hill is one of the highest points in the urban area of Gladstone, having an elevation of 125m AHD. This site forms part of a ridgeline that extends through northern Gladstone.
Vegetation	Round Hill is located within an area of native bushland.
Land use	The site contains a lookout with associated vehicle parking. There is also a telecommunications facility located on the hill.

Visual context	Round Hill is an elevated viewpoint that provides 360º views of Gladstone. The lookout provides foreground and middleground views of the northern and southern suburbs of Gladstone with middleground views of the QAL refinery, South Trees Wharf and industrial development at Barney Point, as well as the existing telecommunications facility. Background views extend across the Port to Curtis Island to the north, and Facing Island to the east. The existing industrial development located within the visual outlook from this viewpoint are visible at night due to operational and security lighting provided as part of these land uses. Views from this location are experienced by: ■ Visitors and recreation users of the lookout whose interest is focused on the surrounding landscape ■ Road users travelling to the lookout.

Viewpoint 8 – Corner of Goondoon Street and Eden Street

This viewpoint is one of many elevated locations within the Gladstone urban area identified as having potential views of the WBE reclamation area. This viewpoint is located approximately 13.3km southeast of the WBE reclamation area.

The existing visual environment from this location is outlined in Table 4.16.

Table 4.16 Viewpoint 8 – Corner of Goondoon Street and Eden Street visual context

Typical local landscape character	 View to the northwest from the corner of Goondoon and Eden Streets. Due to the elevation at this location, this location provides expansive views of Gladstone's urban areas and beyond to the Port of Gladstone.
Landform	This viewpoint is along a ridgeline that extends through Gladstone.
Vegetation	Urban landscape planting.
Land use	Primarily residential land uses.

Visual context	Elevated viewpoint that provide foreground and middleground views of the suburbs of Gladstone. Background views extend across the Port of Gladstone to the northwest to Mount Larcom and Curtis Island. The existing industrial developments located within the visual outlook from this viewpoint (e.g. RG Tanna Coal Terminal, WICT, and Cement Australia) are visible at night due to operational and security lighting provided as part of these land uses. Views from this viewpoint are experienced by: ■ Residents with prolonged viewing opportunities ■ Road users passing through the residential area.

Viewpoint 9 – Upper Piper Street

This viewpoint is one of many elevated locations within the Gladstone urban area identified as having potential views of the WBE reclamation area. This viewpoint is located approximately 13.5km southeast of the WBE reclamation area.

The existing visual environment from this location is outlined in Table 4.17.

Table 4.17 Viewpoint 9 – Upper Piper Street visual context

Typical local landscape character	 View to the northwest from Upper Piper Street. Due to the elevation at this location, this location provides views of Gladstone's urban areas and beyond to the Port of Gladstone.
Landform	This viewpoint is oriented along a ridgeline that extends through Gladstone.
Vegetation	Urban landscape planting.
Land use	Primarily residential land uses. Upper Piper Street backs onto bushland to the south and east.

Visual context	Elevated viewpoint that provide foreground and middleground views of the suburbs of Gladstone. Background views extend across the Port of Gladstone to the northwest to Mount Larcom. The existing industrial developments located within the visual outlook from this viewpoint (e.g. RG Tanna Coal Terminal, WICT, and Cement Australia) are visible at night due to operational and security lighting provided as part of these land uses. Views from this viewpoint are experienced by: ■ Residents with prolonged viewing opportunities ■ Road users passing through the residential area.

Viewpoint 10 – Birmingham Close

This viewpoint is one of many elevated locations within the Gladstone urban area identified as having potential views of the WBE reclamation area. This viewpoint is located approximately 15.8km southeast of the WBE reclamation area.

The existing visual environment from this location is outlined in Table 4.18.

Table 4.18 Viewpoint 10 – Birmingham Close visual context

Typical local landscape character	 View to the northwest from Birmingham Close. Due to the elevation at this location, this location provides views of Gladstone's urban areas and beyond to the Port of Gladstone.
Landform	This viewpoint is along a ridgeline that extends through Gladstone.
Vegetation	Urban landscape planting.
Land use	Primarily residential land uses. Birmingham Close backs onto elevated bushland to the south and east which also houses a telecommunications facility at the top.

Visual context	Elevated viewpoint that provide foreground and middleground views of the suburbs of Gladstone. Background views extend across the Port of Gladstone to the northwest to Mount Larcom. The stacks of the Gladstone Power Station are a prominent feature in the background. The existing industrial developments located within the visual outlook from this viewpoint (e.g. RG Tanna Coal Terminal, WICT, and Cement Australia) are visible at night due to operational and security lighting provided as part of these land uses. Views from this viewpoint are experienced by: ■ Residents with prolonged viewing opportunities ■ Road users passing through the residential area.

Viewpoint 11 – Mercedes Street

This viewpoint is one of many elevated locations within the Gladstone urban area identified as having potential views of the WBE reclamation area. This viewpoint is located approximately 12.2km southeast of the WBE reclamation area.

The existing visual environment from this location is outlined in Table 4.19.

Table 4.19 Viewpoint 11 – Mercedes Street visual context

Typical local landscape character	 View to the northwest from Mercedes Street. Due to the elevation at this location, this location provides views of Gladstone's urban areas and beyond to the Port of Gladstone.
Landform	This viewpoint is along a ridgeline that extends through Gladstone.
Vegetation	Urban landscape planting.
Land use	Primarily residential land uses.

Visual context	Elevated viewpoint that provide foreground and middleground views of the suburbs of Gladstone. Background views extend across the Port of Gladstone to the northwest to Mount Larcom. The stacks of the Gladstone Power Station are a prominent feature in the background. The existing industrial developments located within the visual outlook from this viewpoint (e.g. RG Tanna Coal Terminal, WICT, and Cement Australia) are visible at night due to operational and security lighting provided as part of these land uses. Views from this viewpoint are experienced by: ■ Residents with prolonged viewing opportunities ■ Road users passing through the residential area.

Viewpoint 12 – Watt Street

This viewpoint is one of many elevated locations within the Gladstone urban area identified as having potential views of the WBE reclamation area. This viewpoint is located approximately 12km southeast of the WBE reclamation area.

The existing visual environment from this location is outlined in Table 4.20.

Table 4.20 Viewpoint 12 – Watt Street visual context

Typical local landscape character	 View to the northwest from Watt Street. Due to the elevation at this location, this location provides views of Gladstone's urban areas and beyond to the Port of Gladstone. The ridgeline of Mount Larcom forms the backdrop.
Landform	This viewpoint is along a ridgeline that extends through Gladstone.
Vegetation	Urban landscape planting.
Land use	Primarily residential land uses.

Visual context	Elevated viewpoint that provide foreground and middleground views of the suburbs of Gladstone. Background views extend across the Port of Gladstone to the northwest to Mount Larcom. The existing industrial developments located within the visual outlook from this viewpoint (e.g. RG Tanna Coal Terminal, WICT, and Cement Australia) are visible at night due to operational and security lighting provided as part of these land uses. Views from this viewpoint are experienced by: ■ Residents with prolonged viewing opportunities ■ Road users passing through the residential area.

Viewpoint 13 – Barney Point Beach

This viewpoint represents easterly views from Barney Point Beach across the Port of Gladstone, including views of the shipping channel. The beach location comprises two mid-rise accommodation buildings mixed with single and double-storey dwellings, a foreshore parkland, and the beach. The beach and parklands are accessible to the public; offering a swimming beach, parkland with picnic facilities, play equipment and walking tracks, and views across the water and the Port of Gladstone.

A description of the existing visual context from this viewpoint is detailed in Table 4.21.

Table 4.21 Viewpoint 13 – Barney Point Beach visual context

Typical local landscape character	 Looking directly east from the south end of Barney Point Beach. This viewpoint allows for expansive views of the water and the Port of Gladstone. Curtis Island and Facing Island provide a scenic backdrop. The shipping channel traverses the middleground as evident by the vessel and navigational aids visible in the above photograph.

	 Looking southeast from the southern end of Barney Point Beach. This viewpoint allows for expansive views of the Port of Gladstone and Barney Point headland. The South Trees Wharf is a prominent feature in the middleground views while Facing Island provides a scenic backdrop.
Landform	Beachfront and water.
Vegetation	Urban landscape planting within the Barney Point parklands and sparse coastal vegetation.
Land use	Land in the immediate vicinity of this viewpoint consists of Barney Point Beach and associated mid-rise accommodation buildings and residential areas which front onto the beach.
Visual context	This site is located on low-lying coastland being Barney Point Beach. The foreground and middleground views from this location are dominated by expansive views across Port of Gladstone. The South Trees Wharf is a prominent feature in the middleground views while Facing Island provides a scenic backdrop. This site is located within close proximity to the shipping channel and therefore offers views of extensive vessel movements. In the opposite direction, Barney Point Beach adjoins the Barney Point Terminal and associated calcite stockpiles. Views from this location are experienced by: ■ Visitors of the beach and parkland recreation users, including people fishing and using recreational vessels ■ Residents along Barney Point Esplanade with prolonged viewing opportunities to the southeast ■ Land based recreation users ■ Road users passing through the residential area.

Viewpoint 14 – Tannum Sands

Tannum Sands is a residential area located south of Gladstone. This viewpoint represents northeasterly and northwesterly views from Tannum Sands beach across the Port, including views of the shipping channel. The beach location comprises landscaped parkland and recreation facilities along the coastal foreshore. At the southern end of the viewpoint is Wild Cattle Island – a National Park sand island separated from the mainland by Wild Cattle Creek. The beach and parklands are accessible to the public; offering a swimming beach, parkland with picnic facilities, play equipment and walking tracks, and views across the Port of Gladstone.

A description of the existing visual context from this viewpoint is detailed in Table 4.22.

Table 4.22 Viewpoint 14 – Tannum Sands visual context

Typical local landscape character	 Looking northwest from Tannum Sands Beach. This viewpoint allows for expansive views of the water and the Port of Gladstone. The Boyne Smelter Limited aluminium smelter can be seen in the background views.  Looking north from Tannum Sands Beach. This viewpoint allows for expansive views of the water and the Port of Gladstone with Facing Island forming the backdrop.

	 Looking northwest from Tannum Sands Beach. This viewpoint allows for expansive views out to sea. The shipping channel traverses the background as evident by the ships visible along the horizon in the above photo.
Landform	Beachfront and water.
Vegetation	Urban landscape planting within the Tannum Sands parklands and coastal vegetation.
Land use	Land in the immediate vicinity of this viewpoint consists of Tannum Sands Beach and parklands. Land behind the coastal foreshore consists of residential areas and low-rise accommodation buildings.
Visual context	This site is located on low-lying coastland being Tannum Sands Beach. Views from this location are dominated by expansive views across the Port of Gladstone. The QAL refinery can be seen to the northwest and Facing Island provides a scenic backdrop when viewing north. The site is within proximity to the shipping channel and therefore offers views of vessel movements. Views from this location are experienced by: ■ Visitors of the beach and parkland recreation users, including people fishing and using recreational vessels ■ Residents with water views ■ Land based recreation users.

Viewpoint 15 – Gatcombe Heads, Facing Island

Gatcombe Heads is a residential area located at the south end of Facing Island. The residential dwellings at Gatcombe Heads are predominantly oriented towards the west across the shipping channel and Port of Gladstone towards Boyne Island, with some residences oriented south towards Tannum Sands. With the exception of the small residential community, this area is largely undeveloped.

A description of the existing visual context from this viewpoint is detailed in Table 4.23.

Table 4.23 Viewpoint 15 – Gatcombe Heads, Facing Island visual context

Typical local landscape character	 Looking south southwest from Gatcombe Heads. This viewpoint allows for expansive views of the water and the Port of Gladstone with Tannum Sands and Boyne Island seen in the background views.  Looking northwest from Gatcombe Heads. Views from these residential dwellings expand over the water and the Port of Gladstone and shipping channel within the foreground and middleground views. South Trees Island, the QAL refinery and the urban areas of Gladstone are seen in the background views.

	 Looking northwest from Gatcombe Heads. Views from these residential dwellings expand over the water and the Port of Gladstone and shipping channel within the foreground and middleground views. South Trees Island, the QAL refinery and the urban areas of Gladstone are seen in the background views.
Landform	Waterfront
Vegetation	Coastal vegetation along the waterfront, and undisturbed bushland to the east
Land use	Land in the immediate vicinity of this location consists of a small residential community along the waterfront at Gatcombe Heads. Land behind the residential community consists of bushland and open space.
Visual context	This site is located on low-lying coastland being Gatcombe Heads on Facing Island. Views from this location are dominated by expansive views across the the Port of Gladstone and towards Boyne Island and Tannum Sands. The mountainous areas at the back of Gladstone provide a backdrop from this viewpoint. The site is within close proximity to the shipping channel and therefore offers views of vessel movements. Views from this location are experienced by: ■ Residents with water views ■ Tourists or recreational users of Facing Island and the surrounding reefs such as Oyster Rock (i.e. diving/snorkelling).

4.6 Potential impacts

4.6.1 Detailed visual amenity impact assessment

The potential visual amenity impacts of the Project activities have been considered in the context of the nature of the visual effects – determined by considering the size or scale, the geographical extent of the area influenced, and its duration and reversibility – and the nature of the visual receptors. The methodology is provided in Section 4.2.

The potential visual amenity impacts of both the construction and operational phases of the Project have been assessed for each viewpoint. These impacts are assessed in Table 4.24 to Table 4.38.

Lighting impacts to marine and terrestrial fauna species are addressed in Chapter 9 within the relevant ecological value section.

Viewpoint 1 – Yarwun, corner Landing Road and Forest Road

Table 4.24 Viewpoint 1 – Yarwun, Corner Landing Road and Forest Road visual impact assessment

Visible Project elements	**Construction** ■ Increased traffic from material being transported from the Targinnie/Yarwun quarry area along Landing Road and to the WBE reclamation area and BUF ■ Construction of bund walls, and BUF sheet piling or similar earth retaining structure: construction equipment, including a number of excavators, trucks and/or dozers; and establishment of a construction compound, including a site office and a car park ■ Dredging vessels and operations associated with the establishment of the barge access channel and duplicating the Gatcombe and Golding Cutting Channels ■ Barge movements and activity associated with unloading and placement of dredged material ■ Lighting associated with night-time dredging, unloading and placement operations ■ Managing dredged material within the WB and WBE reclamation areas, including excavators, trucks and dozers, and increased turbidity from licenced discharge points ■ Increased turbidity during dredging operations **Operation** ■ WB and WBE reclamation areas – with some portions at final surface level; some partially full ■ Outer bund and BUF wall warning lights every 100m along the outer seaward reclamation area walls (for maritime safety) ■ Maintenance dredging vessels and operations
Photomontage	 Existing visual outlook

	 Location of reclamation areas shown in yellow
	 Visual outlook following completion of the Project
Visual impact (construction and operation)	This viewpoint is located at the corner of Landing Road and Forest Road, looking north at the existing WB reclamation area within the middleground of the view. The visual environment from this viewpoint will be altered during both construction and operational phases. It is considered that the nature of the visual effect (magnitude) at this location will be **moderate** during construction and **low** in operation**.** This viewpoint is located adjacent to the haulage route for the material to be used for the bund wall. The landscape will therefore be disrupted by an increase in truck movements during construction of the bund walls (duration of approximately 3 years for construction of both southern and northern reclamation areas). It is noted that this locality comprises existing industrial land uses, and heavy industrial practices and vehicle movements are an already established part of the landscape.

	Due to the close proximity of this viewpoint to the WBE reclamation area, construction activities associated with the creation of the reclamation area will also be visible within the foreground and middleground views from this location, including construction equipment, the construction compound, and dredging vessels and operations. The impact on visual amenity will occur over an extended timeframe with construction activities associated with the southern and northern reclamation areas likely to be undertaken over a minimum period of 3 years. On the basis that construction activities are temporary in nature, no permanent or detrimental changes to the visual amenity or landscape character will arise from these activities. In operation, the introduction of the WBE reclamation area and BUF will result in a loss of the foreground and middleground 'water views', noting that these views are currently partially screened by low vegetation in the foreground. The elevation at this viewpoint is similar to that of the WB reclamation area and therefore the background views of Curtis Island should not be impeded upon. While it is acknowledged that the WBE reclamation area and BUF will be an addition to the landscape, it is also noted that reclamation areas are already an established aspect of the landscape when viewed from this location, with the establishment of Fisherman's Landing and WB reclamation areas. Notwithstanding this, the introduction of the WBE reclamation area and BUF will result in a further reduction in naturalness of the landscape and the proposed reclamation area will increase the area's engineered appearance. It is considered that the sensitivity of receptors at this location would be **negligible** as the receptors at this location are primarily industrial workers who therefore have temporary views and a vested interest in industrial uses. The activity experienced by receptors at this location is predominantly associated with the existing Cement Australia facility to the southeast and port development associated with Fisherman's Landing to the east, including the permanent ferry terminal on Fisherman's Landing used to transport staff to Curtis Island. The extent to which their attention or interest is focused on the views and visual amenity they experience at this particular location, and therefore their sensitivity to visual impacts, is considered to be negligible. Given the nature of the existing industrial use of the area and on the basis that the receptors are of negligible sensitivity, the proposed increase in heavy vehicle movements, construction activities and dredging operations within this area will not significantly impact on the receptors, nor will it result in an adverse altered landscape character or present unacceptable visual impacts. It is also noted that lighting associated with the outer bund wall warning lights and dredging activities are unlikely to cause an undue visual impact on this viewpoint given the nature of the industrial land uses at this viewpoint and absence of residential uses.
Significance of impact (construction)	**Not significant**
Significance of impact (operation)	**Not significant**

Viewpoint 2 – Friend Point

Table 4.25 Viewpoint 2 – Friend Point visual impact assessment

Visible Project elements	**Construction** ■ Construction of bund walls, and sheet piling or similar earth retaining structure: construction equipment, including a number of excavators, trucks and/or dozers; and establishment of a construction compound, including a site office and a car park ■ Dredging vessels and operations associated with the establishment of the barge access channel and duplicating the Gatcombe and Golding Cutting Channels, and transferring material to the BUF ■ Barge movements and activity associated with unloading and placement of dredged material ■ Lighting associated with night-time dredging, unloading and placement operations ■ Managing dredged material within the WB and WBE reclamation areas, including excavators, trucks and dozers; and increased turbidity from licenced discharge points ■ Increased turbidity during dredging operations **Operation** ■ WB and WBE reclamation areas – with some portions at final surface level; some partially full ■ Outer bund and BUF wall warning lights every 100m along the outer seaward reclamation area walls (for maritime safety). ■ Maintenance dredging vessels and operations
Visual impact (construction and operation)	This viewpoint is located on the intertidal mudflats at Friend Point, looking south over the Port of Gladstone with the existing WB reclamation area within the middleground of the view. It is considered that the nature of the visual effect (magnitude) at this location will be **high** during construction and **moderate** in operation**.** The visual environment from this viewpoint will be altered during both construction and operational phases. Due to the close proximity of this viewpoint to the WBE reclamation area and BUF, construction activities associated with the creation of the reclamation area and BUF will be visible within the middleground views from this location, including construction equipment, the construction compound, and dredging vessels and operations, including increased water turbidity. The impact on visual amenity will occur over an extended timeframe with construction activities associated with the WBE reclamation area and BUF likely to be undertaken over a minimum period of 3 years. On the basis that construction activities are temporary in nature, no permanent or detrimental changes to the visual amenity or landscape character will arise from these activities. The introduction of the reclamation areas and BUF will occupy a large extent of the view as seen from this location. The loss of the water view and introduction of land would result in a reduction of the existing naturalness of the landscape and cause a permanent adverse impact on the value of the receptor. Other strong visual elements within the landscape include the vegetation in the foreground and the ridgelines which traverse through the northern suburbs of Gladstone which form the backdrop. Neither of these visual elements will be impacted upon as a result of the Project works. Views from this location are experienced by recreation and commercial water based users. The sensitivity of the receptors at this location is considered to be **moderate** as the receptors are primarily users of the waterways whose views are temporary in nature and whose interest is in part influenced by the scenic amenity of the landscape. It is also noted that lighting associated with the outer bund wall warning lights and dredging activities are unlikely to cause an undue visual impact on this viewpoint given the nature of the land uses at this viewpoint and absence of residential uses.
Significance of impact (construction)	**High significance**

Significance of impact (operation)	**Moderate significance**

Viewpoint 3 – Mount Larcom

Table 4.26 Viewpoint 3 – Mount Larcom visual impact assessment

Visible Project elements	**Construction** ■ Construction of bund walls, and sheet piling or similar earth retaining structure: construction equipment, including a number of excavators, trucks and/or dozers; and a construction compound, including a site office and a car park ■ Dredging vessels and operations associated with the establishment of the barge access channel and duplicating the Gatcombe and Golding Cutting Channels, and transferring material to the BUF ■ Barge movements and activity associated with unloading and placement of dredged material ■ Lighting associated with night-time dredging, unloading and placement operations ■ Managing dredged material within the WB and WBE reclamation areas, including excavators, trucks and dozers; and increased turbidity from licenced discharge points ■ Removal, installation and relocation of navigational aids: a floating barge will be required for removal, relocation and installation of navigational aids via pile driving ■ Increased turbidity during dredging operations **Operation** ■ Additional or relocated navigational aids ■ Maintenance dredging vessels and operations ■ Lighting associated with night-time dredging operations ■ WB and WBE reclamation areas – with some portions at final surface level; some partially full ■ Outer bund and BUF wall warning lights every 100m along the outer seaward reclamation area (for maritime safety).
Photomontage	 Existing visual outlook

	 Location of reclamation areas and BUF shown in yellow  Visual outlook following completion of the Project
Visual impact (construction and operation)	Views from the Mount Larcom lookout are expansive and extend across the urban areas of Gladstone and the Port of Gladstone, across Curtis and Facing Islands. All Project works will be visible from the lookout however due to large separation distances will vary in their degree of magnitude. The WBE reclamation area and BUF are approximately 7km east-northeast and are within the middle to background of the view. The shipping channel is within the background view, approximately 25km in the southeast. It is considered that the nature of the visual effect (magnitude) at this location is **low** both during construction and in operation**.** The WBE reclamation area in particular will be a discernible change in the landscape due to the partial loss of view of the water. The WBE reclamation area will narrow the waters between the coastline and Curtis Island. The view from this location however is a sweeping 180^{o} view and on this basis, the proportion of the view that is occupied by the proposed WBE reclamation area is not significant. It is also noted that reclamation areas are an already established aspect of the landscape when viewed from this location, with the establishment of Fisherman's Landing and WB reclamation areas.

	Dredging vessels and ships of larger size are a frequent aspect of the shipping channel when viewed from this location. These vessels are consistent with the character of the industrial and port-related operations of the Port of Gladstone and the dredging vessels would provide a transient and temporary point of interest in this view. The sensitivity of receptors at this location is considered to be **high** as the interest of receptors at this lookout is specifically focused on the scenic amenity of the landscape. It is noted however that this viewpoint is a public lookout at the top of Mount Larcom. Access to this location is a 5 hour return trip via a challenging walking track. This limits the number of people who access this location and in turn view the WBE reclamation area. The viewing duration from this location is also temporary with no facilities provided at the lookout, further reducing the sensitivity of the receptors. It is also noted that lighting associated with the outer bund wall warning lights and dredging activities are unlikely to cause an undue visual impact on this viewpoint given the nature of the existing land uses at this viewpoint and absence of residential uses.
Significance of impact (construction)	**Moderate significance**
Significance of impact (operation)	**Moderate significance**

Viewpoints 4a and 4b – Port of Gladstone, near The Narrows

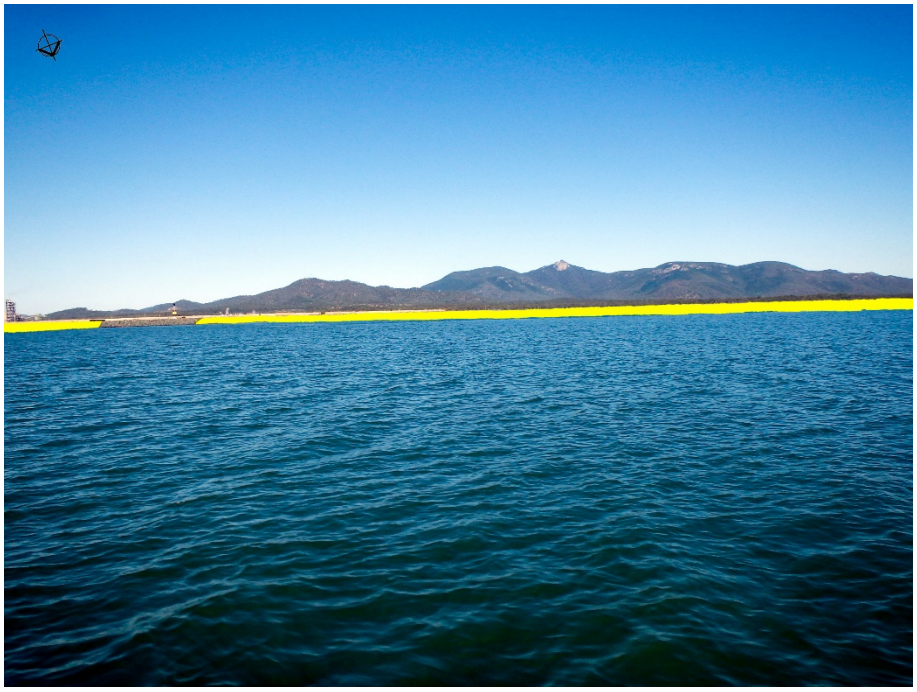
Table 4.27 Viewpoints 4a and 4b – Port of Gladstone, near The Narrows visual impact assessment

Visible Project elements	**Construction** ■ Construction of bund walls, and sheet piling or similar earth retaining structure: construction equipment, including a number of excavators, trucks and/or dozers; and a construction compound, including a site office and a car park ■ Dredging vessels and operations associated with the establishment of the barge access channel and duplicating the Gatcombe and Golding Cutting Channels, and transferring material to the BUF ■ Barge movements and activity associated with unloading and placement of dredged material ■ Lighting associated with night-time dredging, unloading and placement operations ■ Managing dredged material within the WB and WBE reclamation areas, including excavators, trucks and dozers; and increased turbidity from licenced discharge points ■ Increased turbidity during dredging operations **Operation** ■ WB and WBE reclamation areas – with some portions at final surface level; some partially full ■ Outer bund and BUF wall warning lights every 100m along the outer seaward reclamation area (for maritime safety). ■ Maintenance dredging vessels and operations

Photomontage	 Existing visual outlook  Location of reclamation areas shown in yellow

Visual outlook following completion of the Project

Existing visual outlook at closer proximity

	 Location of reclamation areas shown in yellow  Visual outlook following completion of the Project
Visual impact (construction and operation)	This viewpoint is located within the Port of Gladstone, overlooking the existing WB reclamation area within the middleground view. The visual environment from this viewpoint will be impacted upon during both construction and operational phases. It is considered that the nature of the visual effect (magnitude) at this location is **moderate** during construction and **low** in operation**.**

	Due to the elevation and close proximity of this viewpoint to the WBE reclamation area and BUF, all construction activities associated with the creation of the WBE reclamation area and BUF will be visible within the foreground and middleground views from this location, including construction equipment, the construction compound, and dredging vessels and operations. The increased water turbidity during dredging operations is likely to cause an adverse temporary impact on the value of the receptors from this location. The impact on visual amenity will occur over an extended timeframe with construction activities, including dredging operations, likely to be undertaken over a minimum period of 5 years. Due to the close proximity of this viewpoint to the WBE reclamation area and BUF, the introduction of the reclamation area and BUF will result in discernible changes to the landscape with the partial loss of water, affecting a substantial part of the view. The loss of the water view and introduction of land, would cause a permanent change in the landscape as viewed from this viewpoint and likely to cause a direct adverse permanent impact on the value of the receptor. Views from this location are experienced by recreation and commercial water based users. The sensitivity of the receptors at this location is considered to be **moderate** as the receptors are primarily users of the waterways whose interest is in part influenced by the scenic amenity of the landscape. It is noted these views are temporary. Other receptors at this location include those industrial land uses on Curtis Island however the sensitivity of these receptors is considered to be **negligible**. The industrial workers have a vested interest in industrial uses and the activity experienced by people at this location is predominantly associated with industry. The extent to which their attention or interest is focused on the views and visual amenity they experience at this particular location, and therefore their sensitivity to visual impacts, is considered to be negligible. Other strong visual elements within the landscape include Mount Larcom which forms the backdrop. This visual element will not be impacted upon as a result of the Project works. It is also noted that lighting associated with the outer bund wall warning lights and dredging activities are unlikely to cause an undue visual impact on this viewpoint given the nature of the industrial land uses at this viewpoint and absence of residential uses.
Significance of impact (construction)	**Moderate significance**
Significance of impact (operation)	**Minor significance**

Viewpoints 5a and 5b – Port of Gladstone

Table 4.28 Viewpoints 5a and 5b – Port of Gladstone visual impact assessment

Visible Project elements	**Construction** ■ Construction of bund walls, and sheet piling or similar earth retaining structure: construction equipment, including a number of excavators, trucks and/or dozers; and a construction compound, including a small site office and a car park ■ Dredging vessels and operations associated with the establishment of the barge access channel and duplicating the Gatcombe and Golding Cutting Channels, and transferring material to the BUF ■ Barge movements and activity associated with the unloading and placement of dredged material ■ Lighting associated with night-time dredging, unloading and placement operations ■ Managing dredged material within the WB and WBE reclamation areas, including excavators, trucks and dozers; and increased turbidity from licenced discharge points ■ Increased turbidity during dredging operations **Operation** ■ WB and WBE reclamation areas – with some portions at final surface level; some partially full ■ Outer bund and BUF wall warning lights every 100m along the outer seaward reclamation area (for maritime safety). ■ Maintenance dredging vessels and operations.

Visual impact (construction and operation)	This viewpoint is located within the Port of Gladstone, overlooking the existing WB reclamation area within the middleground view. The visual environment from this viewpoint will be impacted upon during both construction and operational phases. It is considered that the nature of the visual effect (magnitude) at this location is **moderate** during construction and **low** in operation**.** Due to the elevation and close proximity of this viewpoint to the WBE reclamation area and BUF, all construction activities associated with the creation of the WBE reclamation area and BUF will be visible within the foreground and middleground views from this location, including construction equipment, the construction compound, and dredging vessels and operations. The increased water turbidity during dredging operations is likely to cause an adverse temporary impact on the value of the receptors from this location. The impact on visual amenity will occur over an extended timeframe with construction activities, including dredging operations, to be undertaken over a period of 3 years for construction of the WBE reclamation area (including the BUF), 33 weeks for Stage 1 dredging and 25 weeks for Stage 2 dredging. Due to the close proximity of this viewpoint to the WBE reclamation area and BUF, the introduction of the reclamation area and BUF will result in discernible changes to the landscape with the partial loss of water, affecting a substantial part of the view. The loss of the water view and introduction of land, would cause a permanent change in the landscape as viewed from this viewpoint and likely to cause a direct adverse permanent impact on the value of the receptor. Views from this location are experienced by recreation and commercial water based users. The sensitivity of the receptors at this location is considered to be **moderate** also as the receptors are primarily users of the waterways whose interest is in part influenced by the scenic amenity of the landscape. It is noted that these views are temporary. Other receptors at this location include those industrial land uses on Curtis Island, however the sensitivity of these receptors is considered to be **negligible**. The industrial workers have a vested interest in industrial uses and the activity experienced by people at this location is predominantly associated with industry. The extent to which their attention or interest is focused on the views and visual amenity they experience at this particular location, and therefore their sensitivity to visual impacts, is considered to be negligible. Other strong visual elements within the landscape include Mount Larcom which forms the backdrop. This visual element will not be impacted upon as a result of the Project works. It is also noted that lighting associated with the dredging activities at night are unlikely to cause an undue visual impact on this viewpoint given the nature of the industrial land uses at this viewpoint and absence of residential uses.
Significance of impact (construction)	**Moderate significance**
Significance of impact (operation)	**Minor significance**

Viewpoint 6 – Auckland Point

Table 4.29 Viewpoint 6 – Auckland Point visual impact assessment

Visible Project elements	**Construction** ■ Dredging vessels associated with dredging and duplicating the Gatcombe and Golding Cutting Channels and transferring material to the BUF ■ Lighting associated with night-time dredging, and barge movements ■ Removal, installation and relocation of navigational aids: a floating barge will be required for removal, relocation and installation of navigational aids via pile driving **Operation** ■ Additional or relocated navigational aids ■ Maintenance dredging vessels and operations ■ Lighting associated with night-time dredging operations.

Visual impact (construction and operation)	It is considered that the nature of the visual effect (magnitude) at this location is **negligible** both during construction and in operation**.** The majority of the Project works will not be visible from the elevated lookout of Auckland Point. The WBE reclamation area and BUF are located 11km northwest of this viewpoint and are unlikely to be visible in the background beyond the existing land uses such as the RG Tanna Coal Terminal. The dredging operations associated with the establishment of the barge access channel, including an increase in water turbidity, may be visible but is unlikely to be discernible from this distance. There will be an introduction of features (dredging vessels) which will be visible from this location however there will be a barely perceptible change to a very small part of the view and vessels are an already established aspect of the view. Vessel movements are consistent with the character of the industrial and port-related operations of the Port of Gladstone and the dredging vessels would provide a transient and temporary point of interest in this view. On this basis, there will be little to no loss or change to the features or characteristics of the landscape, and therefore the existing landscape quality will be maintained. The timeframe of this visual impact is of a short term nature being greater than one year but less than 5 years (approximately 58 weeks). Notwithstanding the above, the sensitivity of the receptors at this location is considered to be **high** as the interest of receptors at this lookout is specifically focused on the scenic amenity of the landscape. It is also noted that lighting associated with the dredging activities at night are unlikely to cause an undue visual impact on this viewpoint given the nature of the industrial land uses at this viewpoint and absence of residential uses.
Significance of impact (construction)	**Minor significance**
Significance of impact (operation)	**Minor significance**

Viewpoint 7 – Round Hill Lookout

Table 4.30 Viewpoint 7 – Round Hill Lookout visual impact assessment

Visible Project elements	**Construction** ■ Construction of bund walls and sheet piling or similar earth retaining structure: construction equipment, including a number of excavators, trucks and/or dozers; and a construction compound, including a small site office and a car park ■ Dredging vessels and operations associated with the establishment of the barge access channel and duplicating the Gatcombe and Golding Cutting Channels, and transferring material to the BUF ■ Barge movements and activity associated with unloading and placement of dredged material ■ Lighting associated with night-time dredging, unloading and placement operations ■ Removal, installation and relocation of navigational aids: a floating barge will be required for removal, relocation and installation of navigational aids via pile driving ■ Increased turbidity during dredging operations **Operation** ■ Additional or relocated navigational aids ■ Maintenance dredging vessels and operations ■ Lighting associated with night-time dredging operations ■ WB and WBE reclamation areas – with some portions at final surface level; some partially full.

Visual impact (construction and operation)	Round Hill is an elevated lookout with views that expand across the urban areas of Gladstone and out across the Port of Gladstone to Facing Island, Curtis Island and Mount Larcom. The majority of the Project works will be visible from the lookout however due to large separation distances will vary in their degree of magnitude. The WBE reclamation area and BUF are approximately 14km northwest and are within the background of the view. The shipping channel is also within the background view, approximately 7.5km in the east-southeast. It is considered that the nature of the visual effect (magnitude) at this location is **negligible** both during construction and in operation**.** While there will be an introduction of features which will be visible from this location, they will be a barely perceptible change to a very small part of the view. Dredging vessels and ships of larger size are a frequent aspect of the shipping channel when viewed from this location. Vessel movements are consistent with the character of the industrial and port-related operations of the Port of Gladstone and the dredging vessels would provide a transient and temporary point of interest in this view. While it is acknowledged that the WBE reclamation area and BUF will be an addition to the landscape, it is also noted that reclamation areas are an already established aspect of the landscape when viewed from this location, with the establishment of Fisherman's Landing and WB reclamation areas. Furthermore, due to the large separation distance from this location, there will be little to no loss or change to the features or characteristics of the landscape, and therefore the existing landscape quality will be maintained. It is also noted that lighting associated with the dredging activities at night are likely to cause a minor short term visual impact on this viewpoint given the presence of residents at this viewpoint. The sensitivity of the receptors at this location is considered to be **high** as the interest of receptors at this lookout is specifically focused on the scenic amenity of the landscape.
Significance of impact (construction)	**Minor significance**
Significance of impact (operation)	**Minor significance**

Viewpoint 8 – Corner of Goondoon Street and Eden Street

Table 4.31 Viewpoint 8 – Corner of Goondoon Street and Eden Street visual impact assessment

Visible Project elements	**Construction** ■ Dredging vessels and operations associated with the duplication of the Gatcombe and Golding Cutting Channels, and transferring material to the BUF ■ Barge movements and activity associated with unloading and placement of dredged material ■ Lighting associated with night-time dredging, unloading and placement operations ■ Removal, installation and relocation of navigational aids: a floating barge will be required for removal, relocation and installation of navigational aids via pile driving ■ Increased turbidity during dredging operations **Operation** ■ Additional or relocated navigational aids ■ Maintenance dredging vessels and operations ■ Lighting associated with night-time dredging operations ■ WB and WBE reclamation areas – with some portions at final surface level; some partially full.

Visual impact (construction and operation)	This viewpoint is one of many elevated residential areas within Gladstone with middleground views that expand across the urban areas of Gladstone and background views out across the Port of Gladstone. It is considered that the nature of the visual effect (magnitude) at this location is **negligible** both during construction and in operation**.** Many elements of the Project works will be visible from this location, however due to large separation distances, will vary in their degree of magnitude when seen from this viewpoint. The WBE reclamation area and BUF are approximately 13km northwest and are within the background of the view. The shipping channel is also within the background view, approximately 6.5km in the east-southeast. While the WBE reclamation area, BUF, dredging vessels and increased water turbidity during dredging operations may be visible, they will not be readily discernible in the context of the wider landscape. The expansive views available from this viewpoint ensures the Project works will be a barely perceptible change to a very small part of the view, lessening the overall visual impact. Furthermore, dredging vessels and ships of larger size are a frequent aspect of the landscape when viewed from this viewpoint. Vessel movements are consistent with the character of the industrial and port-related operations of the Port of Gladstone and the dredging vessels would provide a transient and temporary point of interest in this view. The addition of the dredging vessels as a result of this Project would not be out of scale with the landscape. While it is acknowledged that the WBE reclamation area and BUF will be an addition to the landscape, it is also noted that reclamation areas are an already established aspect of the landscape when viewed from this location, with the establishment of Fisherman's Landing and WB reclamation areas. Furthermore, due to the large separation distance from this location, there will be little to no loss or change to the features or characteristics of the landscape, and therefore the existing landscape quality will be maintained. It is also noted that lighting associated with the dredging activities at night are likely to cause a minimal visual impact on this viewpoint given the presence of residents at this viewpoint. The sensitivity of the receptors at this location is considered to be **high** as the receptors are residents with proprietary interest and prolonged uninhibited viewing opportunities across the Port of Gladstone.
Significance of impact (construction)	**Minor significance**
Significance of impact (operation)	**Minor significance**

Viewpoint 9 – Upper Piper Street

Table 4.32 Viewpoint 9 – Upper Piper Street visual impact assessment

Visible Project elements	**Construction** ■ Dredging vessels and operations associated with the duplication of the Gatcombe and Golding Cutting Channels, and transferring material to the BUF ■ Barge movements and activity associated with unloading and placement of dredged material ■ Lighting associated with night-time dredging, unloading and placement operations **Operation** ■ WB and WBE reclamation areas – with some portions at final surface level; some partially full. ■ Maintenance dredging vessels and operations

Visual impact (construction and operation)	This viewpoint is one of many elevated residential areas within Gladstone with middleground views that extend across the urban areas of Gladstone. It is considered that the nature of the visual effect (magnitude) at this location is **negligible** both during construction and in operation**.** The shipping channel is unlikely to be visible from this location due to the ridgeline that extends through the northern suburbs of Gladstone to the east of this location (e.g. Round Hill). Project works associated with the WBE reclamation area and BUF may be visible from this location, however may not be discernible in the context of the wider landscape due to large separation distances. The WBE reclamation area and BUF are approximately 13.5km northwest and are within the background of the view. While the WBE reclamation area, BUF, dredging vessels and increased water turbidity during dredging operations may be visible, the expansive views available from this viewpoint ensures the Project works will be a barely perceptible change to a very small part of the view, lessening the overall visual impact. Furthermore, dredging vessels and ships of larger size are a frequent aspect of the landscape when viewed from this viewpoint. Vessel movements are consistent with character of the industrial and port-related operations of the Port of Gladstone and the dredging vessels would provide a transient and temporary point of interest in this view. The addition of the dredging vessels as a result of the Project would not be out of scale with the landscape. While it is acknowledged that the WBE reclamation area and BUF will be an addition to the landscape, it is also noted that reclamation areas are an already established aspect of the landscape when viewed from this location, with the establishment of Fisherman's Landing and WB reclamation areas. Furthermore, due to the large separation distance from this location, there will be little to no loss or change to the features or characteristics of the landscape, and therefore the existing landscape quality will be maintained. It is also noted that lighting associated with the dredging activities at night are likely to cause a minor short term visual impact on this viewpoint given the presence of residents at this viewpoint. The sensitivity of the receptors at this location is considered to be **high** as the receptors are residents with proprietary interest and prolonged uninhibited viewing opportunities across the Port of Gladstone.
Significance of impact (construction)	**Minor significance**
Significance of impact (operation)	**Minor significance**

Viewpoint 10 – Birmingham Close

Table 4.33 Viewpoint 10 – Birmingham Close visual impact assessment

Visible Project elements	**Construction** ■ Barge movements and activity associated with unloading and placement of dredged material **Operation** ■ Maintenance dredging vessels and operations (within barge access channel)

Visual impact (construction and operation)	This viewpoint is one of many elevated residential areas within Gladstone with middleground views that extend across the urban areas of Gladstone. It is considered that the nature of the visual effect (magnitude) at this location is **negligible** both during construction and in operation**.** The dredging operations within the channel are unlikely to be visible from this location as the view is blocked by the topography of the nearby Reserve to the east. The WBE reclamation area and BUF, located approximately 15.5km to the northwest from this viewpoint, are also unlikely to be visible as they will be located beyond the Gladstone Power Station when viewed from this location. From this viewpoint there are intermittent views of the Port of Gladstone between the built environment and vegetation, and therefore the vessels transferring material from the channel to the BUF, and an increase in water turbidity, may be visible. These views however are unlikely to be readily discernible in the context of the wider landscape due to the large separation distances. Those parts of the Port visible from this viewpoint are located at a minimum distance of approximately 6.5km to the northeast. Furthermore, dredging vessels and ships of larger size are a frequent aspect of the landscape when viewed from this viewpoint. Vessel movements are consistent with the character of the industrial and port-related operations of the Port of Gladstone and the dredging vessels would provide a transient and temporary point of interest in this view. The addition of the dredging vessels as a result of this Project would not be out of scale with the landscape. While the dredging vessels may be intermittently visible, the limited views of the Port available from this viewpoint ensures the Project works will be a barely perceptible change to a very small part of the view. It is also noted that lighting associated with the dredging activities at night are likely to cause a minor short term visual impact on this viewpoint given the presence of residents at this viewpoint. The sensitivity of the receptors at this location is considered to be **high** as the receptors are residents with proprietary interest and prolonged uninhibited viewing opportunities across the Port of Gladstone.
Significance of impact (construction)	**Minor significance**
Significance of impact (operation)	**Minor significance**

Viewpoint 11 – Mercedes Street

Table 4.34 Viewpoint 11 – Mercedes Street visual impact assessment

Visible Project elements	**Construction** ■ Dredging vessels and operations associated with the duplication of the Gatcombe and Golding Cutting Channels, and transferring material to the BUF ■ Barge movements and activity associated with unloading and placement of dredged material ■ Lighting associated with night-time dredging, unloading and placement operations **Operation** ■ WB and WBE reclamation areas – with some portions at final surface level; some partially full. ■ Maintenance dredging vessels and operations

Visual impact (construction and operation)	This viewpoint is one of many elevated residential areas within Gladstone with middleground views that extend across the urban areas of Gladstone. It is considered that the nature of the visual effect (magnitude) at this location is **negligible** both during construction and in operation**.** The dredging operations within the channel are unlikely to be visible from this location due to the ridgelines which extend through the northern suburbs of Gladstone (e.g. Round Hill). Project works associated with the WBE reclamation area and BUF may be visible from residential properties near this viewpoint, however are unlikely to be discernible in the context of the wider landscape due to large separation distances. The WBE reclamation area and BUF are approximately 12km northwest and are within the background of the view. While the WBE reclamation area, BUF, dredging vessels and increased water turbidity during dredging operations may be visible, the expansive views available from this viewpoint ensures the Project works will be a barely perceptible change to a very small part of the view, lessening the overall visual impact. Furthermore, dredging vessels and ships of larger size are a frequent aspect of the landscape when viewed from this viewpoint. Vessel movements are consistent with the character of the industrial and port-related operations of the Port of Gladstone and the dredging vessels would provide a transient and temporary point of interest in this view. The addition of the dredging vessels as a result of this Project would not be out of scale with the landscape. While it is acknowledged that the WBE reclamation area and BUF will be an addition to the landscape, it is also noted that reclamation areas are an already established aspect of the landscape when viewed from this location, with the establishment of Fisherman's Landing and WB reclamation areas. Furthermore, due to the large separation distance from this location, there will be little to no loss or change to the features or characteristics of the landscape, and therefore the existing landscape quality will be maintained. It is also noted that lighting associated with the dredging activities at night are likely to cause a minor short term visual impact on this viewpoint given the presence of residents at this viewpoint. The sensitivity of the receptors at this location is considered to be **high** as the receptors are residents with proprietary interest and prolonged uninhibited viewing opportunities across the Port.
Significance of impact (construction)	**Minor significance**
Significance of impact (operation)	**Minor significance**

Viewpoint 12 – Watt Street

Table 4.35 Viewpoint 12 – Watt Street visual impact assessment

Visible Project elements	**Construction** ■ Dredging vessels and operations associated with the duplication of the Gatcombe and Golding Cutting Channels, and transferring material to the BUF ■ Barge movements and activity associated with unloading and placement of dredged material ■ Lighting associated with night-time dredging, unloading and placement operations ■ Increased turbidity during dredging operations **Operation** ■ Maintenance dredging vessels and operations ■ Lighting associated with night-time dredging operations ■ WB and WBE reclamation areas – with some portions at final surface level; some partially full.

Visual impact (construction and operation)	This viewpoint is one of many elevated residential areas within Gladstone. It is considered that the nature of the visual effect (magnitude) at this location will be **negligible** both during construction and in operation**.** The dredging operations within the channel are unlikely to be visible from this location due to the ridgelines which extend through the northern suburbs of Gladstone. Project works associated with the WBE reclamation area and BUF may be visible from residential properties near this viewpoint, however are unlikely to be discernible in the context of the wider landscape due to large separation distances. The WBE reclamation area and BUF are approximately 12km northwest and are within the background of the view. While the WBE reclamation area, BUF, dredging vessels and increased water turbidity during dredging operations may be visible, the expansive views available from this viewpoint ensures the Project works will be a barely perceptible change to a very small part of the view, lessening the overall visual impact. Furthermore, dredging vessels and ships of larger size are a frequent aspect of the landscape when viewed from this viewpoint. Vessel movements are consistent with the character of the industrial and port-related operations of the Port of Gladstone and the dredging vessels would provide a transient and temporary point of interest in this view. The addition of the dredging vessels as a result of this Project would not be out of scale with the landscape. While it is acknowledged that the WBE reclamation area and BUF will be an addition to the landscape, it is also noted that reclamation areas are an already established aspect of the landscape when viewed from this location, with the establishment of Fisherman's Landing and WB reclamation areas. Furthermore, due to the large separation distance from this location, there will be little to no loss or change to the features or characteristics of the landscape, and therefore the existing landscape quality will be maintained. It is also noted that lighting associated with the dredging activities at night are likely to cause a minor short term visual impact on this viewpoint given the presence of residents at this viewpoint. The sensitivity of the receptors at this location is considered to be **high** as the receptors are residents with proprietary interest and prolonged uninhibited viewing opportunities across the Port.
Significance of impact (construction)	**Minor significance**
Significance of impact (operation)	**Minor significance**

Viewpoint 13 – Barney Point Beach

Table 4.36 Viewpoint 13 – Barney Point Beach visual impact assessment

Visible Project elements	**Construction** ■ Dredging vessels and operations associated with the duplication of the Gatcombe and Golding Cutting Channels, and transferring material to the BUF ■ Lighting associated with night-time dredging operations ■ Removal, installation and relocation of navigational aids: a floating barge will be required for removal, relocation and installation of navigational aids via pile driving **Operation** ■ Additional or relocated navigational aids ■ Maintenance dredging vessels and operations ■ Lighting associated with night-time dredging operations.

Visual impact (construction and operation)	It is considered that the nature of the visual effect (magnitude) at this location will be **negligible** both during construction and in operation**.** This viewpoint is located at Barney Point Beach, looking east with foreground and middleground views out across the Port, and Facing Island forming the backdrop. Construction activities at WB and WBE reclamation areas will not be visible from this location. There will be an introduction of features such as dredging vessels and one additional navigational aid may be visible from this location within the middleground view, however the vessels and navigational aid will result in a barely perceptible change to a very small part of the view and they are an already established aspect of the view. An increase in water turbidity during dredging operations may be visible however from this distance is unlikely to be readily discernible. Vessel movements are consistent with the character of the industrial and port-related operations of the Port of Gladstone and the dredging vessels would provide a transient and temporary point of interest in this view. On this basis, there will be little to no loss or change to the features or characteristics of the landscape, and therefore the existing landscape quality will be maintained. It is also noted that lighting associated with the dredging barges lights are likely to cause a minor short term visual impact on this viewpoint given the presence of residents at this viewpoint. The sensitivity of the receptors at this location is considered to be **high** as the receptors include residents with proprietary interest and prolonged uninhibited viewing opportunities across the Port, and users of the beach whose interest is specifically focused on the scenic amenity of the landscape.
Significance of impact (construction)	**Minor significance**
Significance of impact (operation)	**Minor significance**

Viewpoint 14 – Tannum Sands

Table 4.37 Viewpoint 14 – Tannum Sands visual impact assessment

Visible Project elements	**Construction** ■ Dredging vessels and operations associated with the duplication of the Gatcombe and Golding Cutting Channels ■ Lighting associated with night-time dredging operations ■ Removal, installation and relocation of navigational aids: a floating barge will be required for removal, relocation and installation of navigational aids via pile driving **Operation** ■ Additional or relocated navigational aids ■ Maintenance dredging vessels and operations ■ Lighting associated with night-time dredging operations.
Visual impact (construction and operation)	It is considered that the nature of the visual effect (magnitude) at this location will be **negligible** both during construction and in operation**.** While there will be an introduction of features such as dredging vessels and navigational aids, and an increase in water turbidity, which may be visible within the middleground and background views from this location, they will not be uncharacteristic within the existing landscape. Dredging vessels and ships of larger size are a frequent aspect of the landscape when viewed from this viewpoint. Vessel movements are consistent with the character of the industrial and port-related operations of the Port of Gladstone and the dredging vessels would provide a transient and temporary point of interest in this view. Furthermore, due to the large separation distances between this viewpoint and the shipping channel, being approximately 4.5km at its closest point, the dredging vessels, navigational aids and increase in water turbidity will be a barely perceptible change to a very small part of the view. There will be little to no loss or change to the features or characteristics of the landscape; and therefore, the existing landscape quality will be maintained.

	It is also noted that lighting associated with the dredging barges lights are likely to cause a minor short term visual impact on this viewpoint given the presence of residents at this viewpoint. The sensitivity of the receptors at this location is considered to be **high** as the receptors include residents with proprietary interest and prolonged uninhibited viewing opportunities across the Port, and users of the beach whose interest is specifically focused on the scenic amenity of the landscape.
Significance of impact (construction)	**Minor significance**
Significance of impact (operation)	**Minor significance**

Viewpoint 15 – Gatcombe Heads, Facing Island

Table 4.38 Viewpoint 15 – Gatcombe Heads, Facing Island visual impact assessment

Visible Project elements	**Construction** ■ Dredging vessels and operations associated with the duplication of the Gatcombe and Golding Cutting Channels ■ Lighting associated with night-time dredging operations ■ Increased turbidity during dredging operations ■ Removal, installation and relocation of navigational aids: a floating barge will be required for removal, relocation and installation of navigational aids via pile driving **Operation** ■ Maintenance dredging vessels and operations ■ Lighting associated with night-time dredging operations ■ Additional or relocated navigational aids.
Visual impact (construction and operation)	It is considered that the nature of the visual effect (magnitude) at this location will be **low** during construction and **negligible** in operation. During construction, there will be an introduction of dredging vessels within the foreground and middleground views and an increase in water turbidity caused by dredging operations. Given the nature of maritime vessels already using these waters (including existing night time activities), the proposed dredging activities are unlikely to adversely impact on the visual amenity of receptors at this viewpoint. The increased water turbidity during dredging operations however is likely to cause an adverse temporary impact on the value of the receptors from this location. Dredging vessels and ships of larger size are a frequent aspect of the landscape when viewed from this viewpoint. Vessel movements are consistent with the character of the industrial and port-related operations of the Port of Gladstone and the dredging vessels would provide a transient and temporary point of interest in this view. Furthermore, the viewpoint is located approximately 1km from the shipping channel where dredging is proposed. The addition of the dredging vessels and increase in water turbidity as a result of this Project will not result in discernible adverse impacts to the landscape. There would not be a noticeable change in the amenity of views from this coastal setting. On the basis that the dredging activities are temporary in nature, no permanent or detrimental changes to the visual amenity or landscape character will arise from these activities. In operation, there will be additional navigational aids which will be visible within the foreground and middleground views from this location. These however will not be uncharacteristic within the existing landscape. It is also noted that lighting associated with the dredging barges lights are likely to cause a minor short term visual impact on this viewpoint given the presence of residents at this viewpoint. The sensitivity of the receptors at this location is considered to be **high** as the receptors are residents with proprietary interest and prolonged uninhibited viewing opportunities across the Port, and users of the beach or nearby reefs (such as Oyster Rock) whose interest is specifically focussed on the scenic amenity of the landscape.

Significance of impact (construction)	**Moderate significance**
Significance of impact (operation)	**Minor significance**

4.6.2 Summary of visual amenity impact assessment

The anticipated visual amenity impacts of the Project on each of the specified viewpoints is summarised in Table 4.39.

Table 4.39 Summary of visual amenity impact assessment

Viewpoint	Nature of effects (magnitude)	Nature of receptors (sensitivity)	Significance of unmitigated impact
1. Yarwun, corner of Landing Road and Forest Road	Moderate	Negligible	Not significant
2. Friend Point	Moderate	Moderate	Moderate significance
3. Mount Larcom	Low	High	Moderate significance
4. Port of Gladstone, near The Narrows	Low	Moderate	Minor significance
5. Port of Gladstone	Low	Moderate	Minor significance
6. Auckland Point	Negligible	High	Minor significance
7. Round Hill Lookout	Negligible	High	Minor significance
8. Corner Goondoon Street and Eden Street	Negligible	High	Minor significance
9. Upper Piper Street	Negligible	High	Minor significance
10. Birmingham Close	Negligible	High	Minor significance
11. Mercedes Street	Negligible	High	Minor significance
12. Watt Street	Negligible	High	Minor significance
13. Barney Point Beach	Negligible	High	Minor significance
14. Tannum Sands	Negligible	High	Minor significance
15. Gatcombe Heads, Facing Island	Low	High	Moderate significance

In determining the residual impacts potentially associated with the Project, the sensitivity of the receptors remains the same. As a result of applying the mitigation measures outlined in Section 4.6, the magnitude of the change may decrease and therefore reduce the significance of the resulting visual impacts.

However, and as discussed above, given the permanent nature of the WB and WBE reclamation areas and BUF, being the creation of new Port land, there are limited opportunities to mitigate the resulting visual amenity impacts. The mitigation measures identified in Section 4.6 primarily seek to reduce and manage adverse visual impacts during construction and on this basis, reducing the magnitude of the operational impact on visual amenity is unlikely to be achieved.

4.7 Mitigation measures

Due to the permanent nature of the WB and WBE reclamation areas and the BUF, being the creation of new Port land, there are limited opportunities to mitigate the resulting visual amenity impacts.

A number of existing factors largely mitigate the visual impacts of the proposed WB and WBE reclamation areas and the BUF. These factors include the low elevation of the reclamation area, their co-location with the existing reclamation areas, and the distance and available screening from highly sensitive visual receptors.

Once the WB and WBE reclamation areas are at full capacity and stabilised from Project and other Port dredged material, the area is available for Port development uses in the future. However, as it is unknown at this stage what uses may or may not be proposed for this area, built form mitigation measures cannot and have not been identified as part of this Project.

Following completion of the Project and subject to completion of placement to approved levels, the WB and WBE reclamation area will be vegetated and landscaped with locally endemic and native grass species, in areas not required for Port purposes. This is unlikely to reduce the visibility of the Project, but would assist to integrate the Project into the surrounding landscape as far as possible. The BUF is not proposed to be vegetated but will remain as earthen material to be reused for future Port dredging campaigns. When it is no longer required for unloading dredged material from Port dredging campaigns, the majority of the BUF is proposed to be reused as a wharf line for a future shipping berth for the WB port land.

To assist in reducing and/or managing adverse impacts on visual amenity during construction of the WBE reclamation area, the following mitigation measures will be implemented:

- Implement control measures during construction to ensure construction activities do not disturb or destroy the existing vegetation along the shoreline
- The Project site is to be kept tidy at all times. Materials and machinery are to be stored tidily during works and should be removed in a timely manner when no longer required. Roads providing access to the site and work areas should be maintained free of dust and mud as far as reasonably practicable.
- Implement control measures to manage water turbidity. Key sources of potential impact include the placement of material into the WBE reclamation area, dredging operations, and the licenced discharge of water from the decant ponds. Control measures are included in the Dredging EMP (refer Appendix Q1).
- Dredging vessels will have minimal and low-glare lighting, consistent with maritime safety standards.

4.8 Risk assessment

4.8.1 Methodology

To assess and appropriately manage the potential visual amenity risks to visual amenity values as a result of Project activities, a risk assessment process has been implemented (herein referred to as ‘risk assessment’). The risk assessment methodology adopted is based on principles outlined in the:

- AS/NZS ISO 31000:2009 Risk management – Principles and guidelines
- HB 203:2012 Handbook: Managing environment-related risk.

The risk assessment identifies and assesses the potential visual amenity impact risks to visual values and receptors for the establishment of the BUF and WBE reclamation area, dredging activities, installing navigational aids and operational management of the reclamation area.

The purpose of this risk assessment is to identify potential impacts to visual values/receptors, prioritise environmental management actions and mitigation measures, and to inform the Project decision making process.

The risk management framework incorporates the Australian/New Zealand Standard for Risk Management (AS/NZS 4360:2004) and contains quantitative scales to define the **likelihood** of the potential impact occurrence and the **consequence** of the potential impact should it occur.

An overview of the interaction between Project activities (drivers/stressors), sensitive values/receptors and the risk impact assessment process is provided in Figure 4.7.

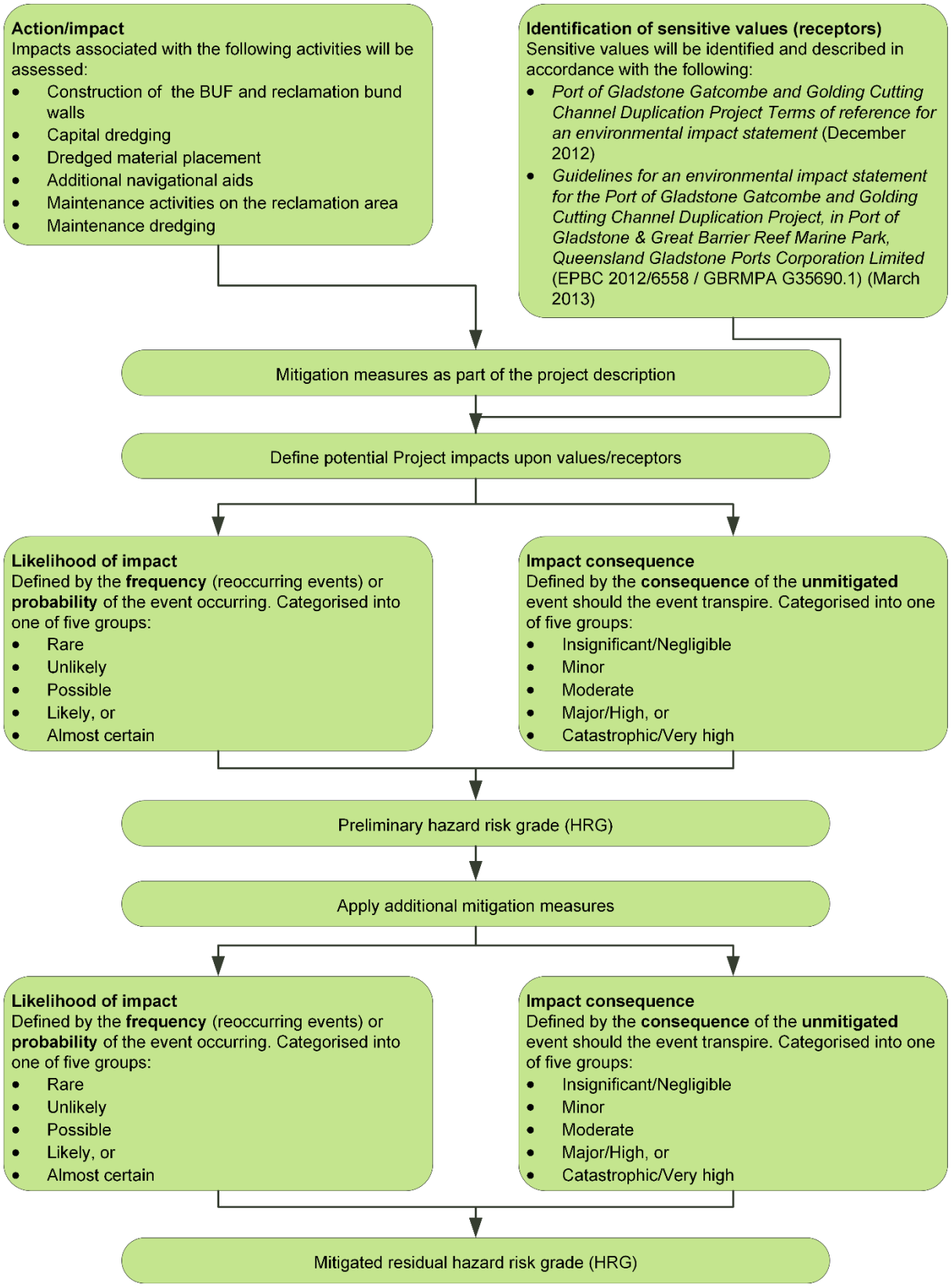


Figure 4.7 **Risk assessment framework**

Criteria used to rank the **consequence** and **likelihood** of potential impacts are provided in Table 4.40 and Table 4.41, respectively.

Table 4.40 Consequence categories with respect to visual amenity

Description	Definition/quantification[1]
Negligible (insignificance)	Change to the landscape that is barely perceptible, at a very large separation distance, or is temporary in nature. The change complements or is not out of scale with the existing landscape.
Low (minor)	Minor change to the landscape which is visible to a small number of receptors or to receptors of low sensitivity. The change is a small part of the view or is short term in nature. The change is not out of scale with the existing landscape.
Moderate	Perceptible change to the landscape which is visible to a medium number of receptors or to receptors of moderate sensitivity. The change is not within keeping with the existing characteristics of the landscape, and/or is medium-term in nature.
High (major)	Major change to the landscape which is visible to a large number of receptors or to receptors of high sensitivity. The change is large in scale and is out of scale with the existing landscape. The change is long term.
Very high (catastrophic)	Catastrophic change to the landscape to a very large number of receptors spanning a large geographical extent. The change is at complete odds with the existing landscape and is visible to a large number of receptors with high sensitivity. Change is permanent and irreversible.

In Table 4.40, the time periods referred to (duration of impact) are specified in Table 4.4.

Table 4.41 Likelihood categories with respect to visual amenity

Description	Frequency	Probability
Rare	Expected to occur once or more over a timeframe greater than 101 years	0-5% chance of occurring
Unlikely	Expected to occur once or more in the period of 11 to 100 years	6-30% chance of occurring
Possible	Expected to occur once or more in the period of 1 to 10 years	31-70% chance of occurring
Likely	Expected to occur once or many times in a year (e.g. 1 to 250 days per year)	71-95% chance of occurring
Almost certain	Expected to occur more or less continuously throughout a year (e.g. more than 250 days per year)	96-100% chance of occurring

Once the likelihood and the consequence has been defined, determination of the HRG of the potential hazard is determined through the use of a five by five matrix (refer Table 4.42).

Table 4.42 Hazard risk assessment matrix (adapted from GBRMPA 2009)

Likelihood	Consequence rating				
	Negligible (insignificant)	Low (minor)	Moderate	High (major)	Very high (catastrophic)
Rare	Low	Low	Medium	Medium	Medium
Unlikely	Low	Low	Medium	Medium	High
Possible	Low	Medium	High	High	Extreme
Likely	Medium	Medium	High	High	Extreme
Almost certain	Medium	Medium	High	Extreme	Extreme

Table note:

Hazard risk categories identified in Table 4.42 are defined in Table 4.43.

Table 4.43 Risk definitions and actions associated with hazard risk categories

Hazard risk category	Hazard risk grade definition
Low	These risks should be recorded, monitored and controlled. Activities with unmitigated environmental risks that are graded above this level should be avoided.
Medium	Mitigation actions to reduce the likelihood and consequences to be identified and appropriate actions (if possible) to be identified and implemented.
High	If uncontrolled, a risk event at this level may have a significant residual adverse impact on MNES, MSES, GBRWHA and scenic amenity values. Mitigating actions need to be very reliable and should be approved and monitored in an ongoing manner.
Extreme	Activities with unmitigated risks at this level should be avoided. Nature and scale of the significant residual adverse impact is wide spread across a number of MNES, MSES GBRWHA and scenic amenity values.

4.8.2 Summary of risk assessment

The potential visual amenity impacts risk assessment is summarised in Table 4.44.

The likelihood of each event occurring has been assumed to be ‘almost certain’, to identify the possible worst-case scenario (that is that the Project will proceed as proposed and will impact on visual amenity).

As discussed in Section 4.5, the Project activities will be permanent and the identified mitigation measures are not likely to reduce the magnitude of the change with particular respect to the creation of new Port land. Therefore, the residual visual amenity impact or consequence from each viewpoint has not been reduced. Accordingly, all viewpoints, with the exception of viewpoint 2, are considered to have a medium risk. Viewpoint 2 which represents views from Friend Point is considered to have a high risk.

Table 4.44 Potential visual amenity impacts risk assessment

Viewpoint	Risk description	Preliminary HRG			Post mitigation HRG		
		Likelihood	Consequence	HRG	Likelihood	Consequence	HRG
Yarwun, corner of Landing Road and Forest Road	Viewpoint 1 represents views from the industrial area along Landing Road. The impact of construction and operation of the WBE reclamation area and BUF has an almost certain likelihood, but with a low consequence for visual amenity.	Almost certain	Low	Medium	Almost certain	Low	Medium
Friend Point	Views from viewpoint 2 represent the temporary views experienced by water based users at and surrounding Friend Point. The visual impact of the construction and operation of the WBE reclamation area and BUF has an almost certain likelihood, but with a moderate consequence for visual amenity.	Almost certain	Moderate	High	Almost certain	Moderate	High
Mount Larcom	All Project activities will be visible from Viewpoint 3. Due to the expansive views experienced from the Mount Larcom lookout, the proportion of the view that is occupied by the visual impact of Project activities is not significant, resulting in a low consequence for visual amenity.	Almost certain	Low	Medium	Almost certain	Low	Medium
Port of Gladstone, near The Narrows	Views from viewpoint 4 represent the temporary views experienced by water based users within the Port, near The Narrows. The visual impact of the construction and operation of the reclamation areas and BUF has an almost certain likelihood, but with a low consequence for visual amenity.	Almost certain	Low	Medium	Almost certain	Low	Medium
Port of Gladstone	Views from viewpoint 5 represent the temporary views experienced by water based users within the Port. The visual impact of the construction and operation of the WBE reclamation area and BUF has an almost certain likelihood, but with a low consequence for visual amenity.	Almost certain	Low	Medium	Almost certain	Low	Medium
Auckland Point	The majority of the Project works will not be visible from viewpoint 6. Dredging vessels transferring material from the shipping channel to the BUF will be visible, however it is noted that these would be a transient and temporary impact, and consistent with the character of the Port. The visual impact of Project activities has an almost certain likelihood, but with a negligible consequence for visual amenity.	Almost certain	Negligible	Medium	Almost certain	Negligible	Medium

Viewpoint	Risk description	Preliminary HRG			Post mitigation HRG		
		Likelihood	Consequence	HRG	Likelihood	Consequence	HRG
Round Hill Lookout	Majority of the Project works will be visible from viewpoint 7 however it is noted that due to large separation distances, the introduction of Project works will be a barely perceptible change to a very small part of the view. The impact has an almost certain likelihood, but with negligible consequence for visual amenity.	Almost certain	Negligible	Medium	Almost certain	Negligible	Medium
Corner Goondoon Street and Eden Street	Viewpoint 8 represents one of many elevated residential areas within Gladstone. Due to large separation distances between this viewpoint and Project works, works are unlikely to be readily discernible in the context of the wider landscape.	Almost certain	Negligible	Medium	Almost certain	Negligible	Medium
Upper Piper Street	Viewpoint 9 represents one of many elevated residential areas within Gladstone. The expansive views available from this viewpoint ensures the Project works will be a barely perceptible change to a very small part of the view, resulting in a negligible consequence for scenic amenity.	Almost certain	Negligible	Medium	Almost certain	Negligible	Medium
Birmingham Close	Viewpoint 10 represents one of many elevated residential areas within Gladstone. Majority of the Project works will not be visible from this viewpoint due to the topography of the nearby Reserve to the east, and the location of industrial land uses (e.g. the Gladstone Power Station) which blocks the WBE reclamation area and BUF from view. The impact has an almost certain likelihood, but with negligible consequence for visual amenity.	Almost certain	Negligible	Medium	Almost certain	Negligible	Medium
Mercedes Street	Viewpoint 11 represents one of many elevated residential areas within Gladstone. Project works within the shipping channel are unlikely to be visible from this location due to the ridgelines which extend through the northern suburbs of Gladstone (e.g. Round Hill). Furthermore, due to large separation distances between this viewpoint and Project works, works are unlikely to be readily discernible in the context of the wider landscape.	Almost certain	Negligible	Medium	Almost certain	Negligible	Medium
Watt Street	Viewpoint 12 represents one of many elevated residential areas within Gladstone. Project works within the shipping channel are unlikely to be visible from this location due to the ridgelines which extend through the northern suburbs of Gladstone. Furthermore, due to large separation distances between this viewpoint and Project works, works are unlikely to be readily discernible in the context of the wider landscape.	Almost certain	Negligible	Medium	Almost certain	Negligible	Medium

Viewpoint	Risk description	Preliminary HRG			Post mitigation HRG		
		Likelihood	Consequence	HRG	Likelihood	Consequence	HRG
Barney Point Beach	Viewpoint 13 represents the views experienced by residents and visitors to Barney Point Beach. Dredging vessels and the addition and relocation of navigational aids will be visible from this viewpoint, however these Project elements are an already established part of the landscape and while the visual amenity impact has an almost certain likelihood, but with negligible consequence for visual amenity.	Almost certain	Negligible	Medium	Almost certain	Negligible	Medium
Tannum Sands	Viewpoint 14 represents the views experienced by residents and visitors to Tannum Sands. Dredging vessels and the addition and relocation of navigational aids will be visible from this viewpoint, however these Project elements are an already established part of the landscape. Furthermore, the large separation distances between this viewpoint and the shipping channel further reduces the visual impact likely to be experienced at this viewpoint.	Almost certain	Negligible	Medium	Almost certain	Negligible	Medium
Gatcombe Heads, Facing Island	Viewpoint 15 represents the views experienced by residential properties and visitors to Gatcombe Heads on Facing Island. Dredging operations and the addition and relocation of navigational aids will be visible within foreground and middleground views. These elements are an already established part of the landscape. The impact likely to be experienced at this viewpoint has an almost certain likelihood, but with a low consequence for visual amenity.	Almost certain	Low	Medium	Almost certain	Low	Medium

4.9 Summary

The potential visual amenity impacts of the Project are assessed as being of moderate significance.

The primary visual amenity impacts with respect to the magnitude of the impact will occur from the creation of the WBE reclamation area and BUF. Due to the nature of the WBE reclamation area and BUF, they will be a permanent change to the visual landscape and amenity, particularly when viewed from within close proximity of the reclamation area such as from Yarwun, Friend Point, The Narrows and the Port near the existing WB reclamation area. The WBE reclamation area and BUF will also alter the landscape and visual experience to a low degree from receptors at Mount Larcom.

The visual receptors within close proximity to these areas are of low to moderate sensitivity. The visual receptors at these locations are primarily workers associated with surrounding industrial land uses who therefore have a vested interest in industrial uses; or commercial and recreational water-based users whose interest is in part influenced by the scenic amenity of the landscape. Views experienced by these visual receptors are temporary.

Where views of these areas are experienced from visual receptors of high sensitivity, such as residences with proprietary interest and prolonged viewing opportunities across the Port, these views are experienced from large separation distances and therefore the scale of change in the view with respect to the proportion of the view occupied by the WBE reclamation area and BUF, is minimised.

The Port of Gladstone is located within the southern part of the GBRWHA and the assessment of the Project's potential impacts on the GBRWHA visual aesthetic values found that while the introduction of the WBE reclamation area and BUF would impact on the visual aesthetic values of the section of the GBRWHA within the Port of Gladstone, this needs to be considered in the context of the existing industrial character of the Port, which consequently lowers the magnitude of the change than from the introduction of the Project into a pristine landscape setting. The broader visual aesthetic values of the GBRWHA will be maintained beyond the Port limits.

Due to the permanent nature of the WBE reclamation area and BUF, being the creation of new Port land, there are limited opportunities to mitigate the resulting visual amenity impacts. Therefore, significantly reducing the magnitude of the impact through the use of mitigation measures is unlikely to be achieved other than to help reduce and manage adverse visual amenity impacts during construction of the Project. These measures will include using locally endemic and native grass species to vegetate the area once full capacity is achieved. This will help integrate the WBE reclamation area into the existing landscape as much as possible, particularly when seen from a distance. The BUF is not proposed to be vegetated but will remain as earthen material to be reused for future Port dredging campaigns. When it is no longer required for unloading dredged material from Port dredging campaigns, the majority of the BUF is proposed to be reused as a wharf line for a future shipping berth for the WB port land.

The primary visual amenity impacts arising from construction-related activities associated with the Project will occur as a result of the dredging operations. Dredging vessels, barges and ships of larger size are a frequent aspect of the landscape and therefore the dredging and barge vessels associated with the Project are not considered to be out of character with the existing Port landscape. Vessel movements are consistent with the character of the industrial and port-related operations of the Port of Gladstone and the dredging vessels would provide a transient and temporary point of interest. The plumes and increased water turbidity during dredging and pumping operations may be visible however it is noted that these impacts will also be short-term. Control measures to manage water turbidity are included in the Dredging EMP (refer Appendix Q1).

There will be an increase in truck movements to transport the material for the construction of the bund walls however this is unlikely to result in an adverse visual amenity impact as the proposed haulage route is short in distance and within a modified receiving environment and the visual receptors along the route are of negligible sensitivity.

Industrial and port-related development is a major feature of the visual landscape of Gladstone. Recent industrial development north of Gladstone, including the establishment of the Fisherman's Landing and WB reclamation areas, the industrial development along the western coast of Curtis Island, and recent projects such as WICT, have significantly influenced the industrial character of the landscape. Furthermore, it is noted that the area surrounding the WBE reclamation area and BUF are designated within the GSDA which dedicates land for industrial development and materials transportation infrastructure. Land adjacent to the WBE reclamation area and BUF are within the Medium – High Impact and Port Related Industry Precinct, and the Industry Investigation Precinct. With this designation comes a reasonable expectation that this area will be developed for industrial and port-related infrastructure, such as is proposed by the Project.

The changes to the landscape from the Project are considered to be consistent with the character of the existing industrial dominant landscape of the Port of Gladstone.