

# Visual Amenity

<b>9.1. Introduction</b>	<b>261</b>	<b>9.5. Assessment of Lighting Effects</b>	<b>283</b>
9.1.1. Policy and Guidance	261	9.5.1. Visual Sensitivity of the Study Area at Night	283
9.1.2. Planning Context	261	9.5.2. Visual Modification of the Project at Night	284
9.1.3. Methodology	262	9.5.3. Assessment of Representative Locations at Night	285
9.1.4. Assumptions and Technical Limitations	263	<b>9.6. Mitigation Measures</b>	<b>287</b>
<b>9.2. Existing Landscape and Visual Conditions</b>	<b>263</b>	<b>9.7. Summary of Visual Effects</b>	<b>287</b>
<b>9.3. Description of Significance Criteria</b>	<b>270</b>	9.7.1. Daytime Visual Effects	287
<b>9.4. Assessment of Daytime Landscape and Visual Effects</b>	<b>270</b>	9.7.2. Night-time Visual Effects	289
9.4.1. Visual Sensitivity of the Study Area	270		
9.4.2. Visual Modification of the Project	271		
9.4.3. Assessment of Representative Viewpoints	272		

## 9. VISUAL AMENITY

### 9.1. Introduction

The purpose of this Chapter is to identify the potential impact of the Project on the visual amenity of the site and surrounding areas. The aim of this study is to recognise this potential impact so that mitigation measures can be incorporated into the design and management of the Project to reduce these where possible.

This study begins with a review of relevant policies and guidance, and setting the methodology. This assessment uses a viewpoint-based assessment approach, beginning with identification of the existing landscape and visual conditions of the study area; description of Project specific significance criteria; an assessment of the daytime landscape and visual impacts; and assessment of lighting effects. Visual mitigation measures are then identified and the views are re-assessed to identify areas where the impact has been mitigated.

#### 9.1.1. Policy and Guidance

##### Guidance for Visual Impact Assessment

A range of guidance is available for the assessment of landscape and visual impact. In Australia, the industry typically refers to the guidance offered by:

- » The Guidelines for Landscape and Visual Impact Assessment (GLVIA), Third Edition, 2013, prepared by the Landscape Institute and Institute of Environmental Management & Assessment
- » The US Forestry Service, Scenic Management System (SMS) as described in the publication 'Landscape Aesthetics: A Handbook of Scenery Management', US Forestry Service, 1996.

The methodology used for this Project is described in **Section 9.1.3**, and conforms to the direction offered by both of these documents.

### 9.1.2. Planning Context

#### State Planning Guidance

The *Eyre and Western Region Plan*, a part of the *South Australian Planning Strategy* (Department of Planning, Transport and Infrastructure (DPTI), 2012a) covers an area extending from Whyalla in the east to the border with Western Australia in the west. The three main objectives of this plan are to:

- » Maintain and improve liveability
- » Increase competitiveness
- » Drive sustainability and increase resilience to climate change.

The planning strategy includes specific policies relating to the protection and management of the region's scenic landscapes, particularly in coastal areas. These policies state the following:

"1.16 Identify, protect and manage areas of scenic value, including landscapes that form attractive backgrounds and entrances to towns and tourist developments."

"1.17 Manage development that may detract from significant landscapes that can be viewed from tourist routes, walking trails, the beach and/or the sea to:

- » Protect views to, from, and along the ocean and scenic coastal areas
- » Minimise the alteration of natural land forms
- » Be visually compatible with the character of surrounding areas
- » Restore and enhance visual quality in visually degraded areas where feasible."

"1.18 Avoid adverse impacts on identified scenic landscapes through appropriate development, siting, design and landscaping choices."

#### Local Planning Conditions

The Project site falls within the Whyalla Local Government Area. The planning scheme for this area does not designate any specific view or landscape protection area within proximity of the Project.

The General Planning Conditions (Whyalla City Council, 2006) for development within this area, however, include some guidance in relation to visual amenity. The Whyalla Planning Conditions has the objective of protecting the natural character of the area, particularly; the undulating hills, natural dunes and large expanses of low lying native flora which characterise this area. Specifically, for construction, commercial / industrial development, landscaping, and infrastructure, the Planning Conditions require that the visual amenity of the locality be maintained and enhanced.

### 9.1.3. Methodology

The following steps were undertaken in the assessment of the visual impacts of the Project.

#### Identification of Existing Visual Conditions

A site inspection was carried out during February of 2013. This inspection was used to evaluate the existing visual character of the area and photograph the site.

In order to appreciate the baseline condition, a series of representative viewpoints have been selected to comprehensively illustrate the visual influence of the site. These views represent publicly accessible viewpoints from a range of locations and viewing situations. Particular attention was paid to coastal areas, designated viewing locations, and places where viewers are expected to congregate.

#### Visual Sensitivity

Visual sensitivity refers to the nature and duration of views. Locations from which a view would potentially be seen for a longer duration, where there are higher numbers of potential viewers and where visual amenity is important to viewers can be regarded as having a higher visual sensitivity. Distance also contributes to the sensitivity of a view, generally, the greater the distance, the less sensitive the viewpoint.

In order to ensure the assessment of impact is reasonable, the sensitivity of a viewpoint should be considered in the broadest context of possible views, from those of national importance through to those considered to have a less than local visual importance. For this reason the following terminology is used to describe the level of visual sensitivity, refer to **Table 9.1a**.

#### Assessment of Visual Impact

##### Visual Modification

Visual modification refers to the change to the landscape that will occur as a result of development from a given viewpoint. Visual modification describes the extent of change and identifies elements which are removed or added, changed in scale, form, shape, pattern, colour and texture, and compatibility of new elements with the existing landscape. Visual modification can result in an improvement or reduction in visual amenity.

A high degree of visual modification will result if the development contrasts strongly with the existing landscape. A low degree of visual modification occurs if there is minimal visual contrast and a high level of integration of form, line, shape, pattern, colour or texture values between the development and the environment in which it sits. In this situation the development may be noticeable, but does not markedly contrast with the existing modified landscape.

**Table 9.1b** lists the terminology used to describe the level of visual modification.

#### Assigning Visual Impact Levels

The visual impact for each representative viewpoint has been assessed. Although there are no recognised standards for determining the significance of visual impact, there is a need to assign significance to this assessment so that there can be a clear and consistent means of evaluating visual impact. Significance criteria will be used to assign visual impact levels; these are further explained in **Section 9.3** of this Chapter.

#### Mitigation and Residual Effects

For those areas identified as likely to result in a visual impact, as a result of the Project, methods for reducing these impacts have been considered and specific mitigation approaches recommended. These mitigation techniques may include the use of vegetation for screening, materials selection, colour and treatment of structures, and adjustments to the location of elements for example.

Incorporating these proposed mitigation approaches into the assessment, impacts of specific viewpoints are then re-assessed and the residual effects of the Project can then be identified.

**Table 9.1a: Visual sensitivity levels**

Visual Sensitivity	Description
National	Heavily experienced view to a national icon, e.g. view to Parliament House Canberra along Anzac Parade.
State	Heavily experienced view to a feature or landscape that is iconic to the State, e.g. View along King William Road, Adelaide to the twin spires of the St Peters Cathedral.
Regional	Heavily experienced view to a feature or landscape that is iconic to a major portion of a city or a non-metropolitan region, or an important view from an area of regional open space, e.g. Views across the Spencer Gulf from the Hummock Hill Lookout, Whyalla.
Local	High quality view experienced by concentrations of residents and/or local recreational users, and/or large numbers of road or rail users. E.g. expansive urban or bushland views from residential areas or local open space.
Neighbourhood	Views where visual amenity is not particularly important, such as lesser quality views briefly glimpsed from roads.

**Table 9.1b: Visual modification levels**

Visual modification	Description
Considerable reduction or improvement in visual amenity	Substantial part of the view is altered
Noticeable reduction or improvement in visual amenity	Alteration to the view is clearly visible
No perceived reduction or improvement in visual amenity	Either the development is not visible, or if it is, the change in the view is generally unlikely to be perceived by viewers.

**Assessment of Night Time Impacts**

The assessment of night time impacts has been undertaken in a similar methodology, however, rather than assessing particular viewpoints, this assessment draws upon the guidance of the Institution of Lighting Engineers (UK), and their ‘Guidance for the reduction of obtrusive light’ (2005). This guidance note identifies environmental zones, useful for the categorising of night time landscape settings. These zones are:

- » E1: Intrinsically dark landscapes – National Parks, State Forests
- » E2: Low district brightness areas – Rural, small village, or relatively dark urban locations
- » E3: Medium district brightness areas – Small town centres or urban locations
- » E4: High district brightness areas – Town/city centres with high levels of night-time activity.

For the purpose of this assessment, it is considered that areas of industrial development within a relatively dark location will be considered to be E3 an area of medium district brightness.

Specific features of the lit landscape are then described in terms of:

- » Sky glow – the brightening of the night sky above our towns, cities and countryside
- » Glare – the uncomfortable brightness of a light source when viewed against a dark background
- » Light Trespass – the spilling of light beyond the boundary of the property or area being lit.

From this analysis, the level of impact is assessed according to the impact levels that are identified in **Section 9.3** of this Chapter.

**9.1.4. Assumptions and Technical Limitations**

The following assumptions and technical limitations have informed this study:

- » The night time assessment is based on assumptions from daytime field work
- » 3D modelling of the area (including this Project), currently being prepared by the State Government, was not available during the time of assessment.

**9.2. Existing Landscape and Visual Conditions**

The following section describes the existing visual conditions of the Project area.

Whyalla is located approximately 400km northwest of Adelaide, on the western side of the Upper Spencer Gulf. A town with an industrial history, founded in 1901, Whyalla was established as a port to ship iron ore from the nearby Middleback Ranges, and has a dominating industrial character on its foreshore, and outlying areas. Surrounding Whyalla, the landscape comprises of a broad semi-arid plain and low undulating hills. The vegetation is predominantly low, with isolated geological features, such as Wild Dog Hill, rising abruptly from the surrounding plains.

The Lincoln Highway travels north from Whyalla paralleled in part by an existing railway line and transmission lines, which traverse the open landscape. Port Bonython Road connects the Lincoln Highway, around False Bay, to Port Bonython and Point Lowly, located on a small peninsular protruding into the Gulf.

Landform in the vicinity of Port Bonython rises from the coastline with a series of low cliffs, rocky headlands and small bays. At the end of Port Bonython Road, Point Lowly comprises a cluster of historic buildings, including a whitewashed stone lighthouse. The Freycinet trail loops around the peninsula, and includes a series of interpretive signs that describe the surrounding landscape and history of the local area. A cluster of houses (a mix of coastal homes, holiday homes and some permanent dwellings) located adjacent to the beach on the western side of the peninsula are located adjacent to an existing industrial development.

The Santos Refinery, a hydrocarbon processing plant was established in 1984, and includes both land based industrial development and a jetty structure extending some two kilometres into the Gulf (the BCEF jetty extends seaward of the Santos jetty to reach 20m depth). The peninsula is roughly divided from east to west by a localised ridgeline. To the east of the peninsula the dramatic coastline is spotted with residences, however, these areas are beyond the visual catchment of the Project due to this landform.

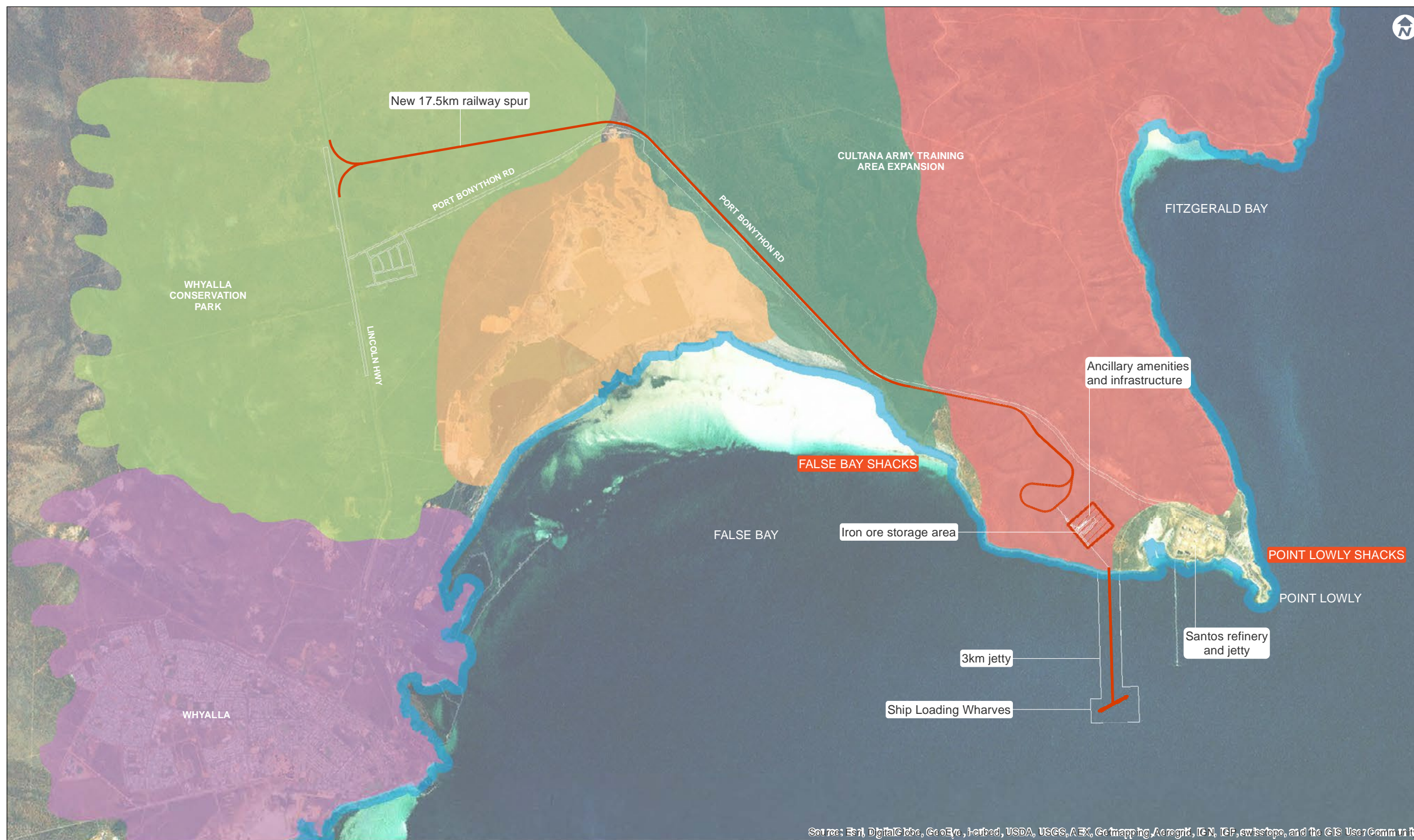
Beyond this and on the eastern side of the Gulf are distant views of the Flinders Ranges, including Mt Remarkable, which can be seen as a background to some easterly views.

False Bay comprises a broad saltmarsh and dune landscape with a small cluster of coastal homes located directly on the shoreline. From this location there are uninterrupted views across the Gulf to the industrial coastline of Whyalla.

Generally, there were six landscape character areas observed in the study area, namely:

- » Whyalla / Industrial & Urban
- » Lincoln Highway / Scattered Open Woodland
- » False Bay / Salt marsh & Dunes
- » Port Bonython Road / Low Open Woodland
- » Point Lowly / Low Shrubland
- » Spencer Gulf / Open Water (refer to Figure 9.2a).

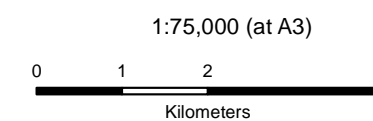
Figure 9.2a: Landscape Character Zone Map



Port Bonython EIS  
Spencer Gulf Port Link

- Legend**
- Coastal
  - Low Open Woodland
  - Low Shrubland
  - Salt Marshes & Dunes
  - Scattered Open Woodland
  - Whyalla

Figure 9.2a -  
Landscape Character Zones



Map Projection: Transverse Mercator  
Horizontal Datum: Geographic Datum of Australia  
Grid: Map Grid of Australia 1994, Zone 53

The following section describes each of these landscape character areas in greater detail.

### Lincoln Highway, Scattered Open Woodland



View from Wild Dog Hill lookout



Scattered woodland vegetation

#### Visual Features:

- » Distinctive rocky outcrops and hills, including Wild Dog Hill
- » Open landscape with scattered woodland vegetation
- » High Voltage Power Lines, pipelines and rail corridors crossing and running parallel with the Highway.

#### Key Viewing Locations:

- » Wild Dog Hill Lookout, Whyalla Conservation Park
- » Lincoln Highway.

#### At Night:

E1: Intrinsically dark landscapes

- » Predominantly dark, uninhabited areas
- » Lit vehicular movement on Highway.

### Port Bonython Road, Low Open Woodland



Port Bonython Road



Low woodland vegetation

#### Visual Features:

- » Low woodland, thicker vegetative cover
- » Existing pipeline (aligned parallel to Port Bonython Road) largely screened by vegetation
- » Elevated ridgeline visible as a backdrop to the east.

#### Key Viewing Locations:

- » Port Bonython Road.

#### At Night:

E1: Intrinsically dark landscapes / E2 Low district brightness

- » Predominantly dark
- » Lit vehicular movement Port Bonython Road.

## False Bay, Salt Marsh and Dunes



False Bay Beach



Salt Marsh



Port Bonython Road

### Visual Features:

- » Small cluster of residences located on the dunes
- » Broad, open beach
- » Scattered, low vegetation
- » Views to Whyalla and foreshore development across the Gulf, in the background
- » Existing pipeline (aligned parallel to Port Bonython Road) visible.

### Key Viewing Locations:

- » False Bay Beach
- » Residences at False Bay
- » Port Bonython Road.

### At Night:

E1: Intrinsically dark landscapes / E2 Low district brightness

- » Predominantly dark
- » Limited habited properties
- » Lit vehicular movement Port Bonython Road
- » Whyalla brightly lit in the distance
- » Scattered lights from tankers and other Cape-size vessels at a distance in the Gulf.



Residences at point Lowly beach



Lighthouse at Point Lowly



Port Bonython Road



Rocky beaches

**Visual Features:**

- » Historic lighthouse and buildings
- » Small cluster of residences located on the dunes
- » Varied coastline – cliffs, rocky beaches, sandy beaches, small coves
- » Scattered, low vegetation
- » Views to Whyalla and foreshore development across the Gulf, in the background
- » Existing Santos refinery (processing facility, distillation towers and four white bulk storage buildings; 2.4km jetty).

**Key Viewing Locations:**

- » Freycinet Trail
- » Point Lowly Lighthouse
- » Residences on Point Lowly Beach
- » Point Lowly Beach
- » Port Bonython Road
- » Stony Point, Cuttlefish boardwalk
- » Black Point, viewing area.

**At Night:**

E3 Medium district brightness

- » Lights from the refinery and surrounding infrastructure brightly lit
- » Lights on the Santos jetty
- » Lights from clusters of habited properties
- » Lighthouse visible at night (The lighthouse operates from dusk till dawn and is fully automated. It does not use a navigational light, rather a dull yellow light for effect)
- » Lit vehicular movement Port Bonython Road
- » Scattered lights from tankers and other Cape-size vessels at a distance in the Gulf
- » Whyalla brightly lit in the distance.



## Spencer Gulf, Open Water



View to the Port Bonython Coastline



Views east to Santos Port Bonython



Views east to Santos Port Bonython jetty



Views west to Whyalla

### Visual Features:

- » Historic lighthouse and buildings visible at Port Lowly
- » Small clusters of residences visible on the coast at Point Lowly and False Bay
- » Varied coastline – cliffs, rocky beaches, sandy beaches, small coves
- » Existing Santos refinery visible at Port Bonython (processing facility, distillation towers and four white bulk storage buildings; 2.4km jetty)
- » Whyalla and foreshore development visible across the Gulf to the west.

### Key Viewing Locations:

- » Recreational boats using the Gulf.

### At Night:

E2 Low district brightness

- » Predominantly dark
- » Lights from clusters of habited properties on the Port Bonython peninsula
- » Lighthouse visible at night (The lighthouse operates from dusk till dawn and is fully automated. It does not use a navigational light, rather a dull yellow light for effect)
- » Lighting associated with the Santos refinery
- » Lights on the Santos jetty
- » Scattered lights from ships in the Gulf
- » Whyalla brightly lit in the west.



Industrial foreshore development



Hummock Hill Lookout in view

**Visual Features:**

- » Existing industrial character on the waterfront
- » Historic viewpoints located on prominent hills
- » Broad views to the Spenser Gulf and surrounding coastline
- » Port Bonython, the Santos facility and approaching ships are visible in the middle ground
- » Foreshore developed with rock groins, jetties, sand bars and beaches.

**Key Viewing Locations:**

- » Hummock Hill Lookout
- » Flinders Lookout
- » Beaches and foreshore areas
- » Elevated residential areas.

**At Night:**

E4: High district brightness areas

- » Brightly lit industrial areas
- » Moderately lit residential area
- » High level of nighttime activity in town.

**Table 9.3a: Visual impact significance levels**

Significance Level	Description
Very High Adverse	Noticeable reduction in the amenity of a view of National sensitivity Considerable reduction in the amenity of a view of National or State visual sensitivity Considerable reduction in the amenity of an E1: Intrinsically dark landscape.
High Adverse	Noticeable reduction in the amenity of a view of State sensitivity Considerable reduction in the amenity of a view of regional sensitivity Noticeable reduction in the amenity of an E1: Intrinsically dark landscape Considerable reduction in the amenity of an area of E2: Low district brightness.
Moderate Adverse	Noticeable reduction in the amenity of a view of regional sensitivity Considerable reduction in the amenity of a view of local sensitivity Noticeable reduction in the amenity of an area of E2: Low district brightness Considerable reduction in the amenity of an area of E3: Medium district brightness.
Minor Adverse	Noticeable reduction in the amenity of a view of local sensitivity Considerable reduction in the amenity of a view of neighbourhood sensitivity Noticeable reduction in the amenity of an area of E3: Medium district brightness Considerable reduction in the amenity of an area of E4: High district brightness.
Negligible	No perceived change Noticeable reduction or improvement to the amenity of a view of neighbourhood sensitivity.
Beneficial	Noticeable improvement to a view of any sensitivity (both night-time and daytime)

### 9.3. Description of Significance Criteria

The following significance criteria have been developed specifically for this Project. The purpose of these criteria is to ensure there is a clear and consistent means of evaluating visual impact.

For the assessment impacts during construction and operation during the day, and night, the criteria in **Table 9.3a** will be used.

### 9.4. Assessment of Daytime Landscape and Visual Effects

#### 9.4.1. Visual Sensitivity of the Study Area

The sensitivity of the study area is highly variable. Some parts of the study area are influenced by a number of historic properties and designated viewing points, resulting in a higher visual sensitivity. Others, including the highly industrialised landscapes of the Whyalla coast and Santos Facility at Port Bonython change the user type and reduce the sensitivity.

In this landscape there is an argument, particularly in Whyalla, that the industrial landscapes are a visual feature, which is of interest to some viewers. These include views from designated viewpoints, such as Hummock Hill, where the industrial buildings are visual landmarks, and the history and function of these activities are interpreted in signage and tourist brochures. This tourist interest adds to its visual sensitivity. Some examples

of the area are shown in **Figure 9.4a**. The following list summarises the assessment of visual sensitivity for the main viewing areas across the study area:

- » In Whyalla, the Hummock Hill and Flinders & Freycinet Lookouts are considered to have regional visual sensitivity. They are designated viewpoints, identified on local tourist maps, and have historic significance with interpretive signage
- » The Whyalla Foreshore and recreational boats in the Spencer Gulf are considered to be of local visual sensitivity, and viewers are participating in recreation activity and appreciation of the view contributes to the experience. These views are considered to be of local visual sensitivity
- » Wild Dog Lookout, in the Whyalla Conservation Park is a local destination, located within the park and accessed by a dirt road. A short track leads to the top of this rocky outcrop, which has interpretive signage and panoramic 360 degree views across the landscape. Views from this location are considered to be of local visual sensitivity
- » At Point Lowly the historic properties and Freycinet trails network, fringing the scenic coastal landscapes of the point are recreational and tourist areas and are therefore more sensitive to changes in visual amenity. From these locations, particularly at designated viewing areas, the sensitivity of viewers is greater. These are considered to be viewing locations of local visual sensitivity

- » Port Bonython Road and other local roads are considered to be of local visual sensitivity, as although it has a small amount of traffic it forms the main arrival point for the peninsular, and offers scenic views to the Gulf and surrounding landscapes. The Lincoln Highway is a more heavily trafficked road and connects Port Augusta with Whyalla, and is therefore considered to be of local visual sensitivity
- » Residential properties at False Bay and Point Lowly form small communities, oriented toward coastal views of varied quality and amenity. These views are considered to be of neighbourhood visual sensitivity.

**Figure 9.4a: Wild Dog Hill Lookout, Whyalla Conservation Park; and Hummock Hill Lookout**



There are also indigenous cultural heritage values associated with the coastal areas of Point Lowly. However, the cultural impacts will be considered separately in **Chapter 11, Cultural Heritage**.

#### 9.4.2. Visual Modification of the Project

Visual modification describes the extent of change resulting from the Project and the compatibility of these new elements with the surrounding landscape. There are some general principles which determine the level of visual modification; these include elements relating to the view itself such as distance, landform, backdrop, and contrast. There are also characteristics of the development itself which are: scale, form

and line/alignment. The following section describes the visual characteristics of the Project which will inform the assessment of modification.

The Project comprises of three main components, each of which has a different visual character, these are:

- » Railway spur from the existing Whyalla to Port Augusta rail line (Railway Spur)
- » Buildings, materials handling and storage facility (Facility)
- » Offshore Facilities (jetty).

The visual character of each of these components will be as follows:

#### Railway Spur

The 17.5km rail spur with a 6.1km rail loop will branch from the existing Port Augusta to Whyalla Railway line, just north of Whyalla and Port Bonython Road. The railway alignment will meet and then run in parallel with Port Bonython Road. It will then cross Port Bonython Road via a grade separated crossing (final design to be determined in the detailed design phase) and run parallel to the southern side of the road, in the vicinity of the Fitzgerald Bay Drive, before veering off to the proposed storage facility in the form of a balloon loop.

The railway corridor will be constructed on a small embankment, and will be similar scale to the existing rail line running parallel to the Lincoln Highway, refer to **Figure 9.4b**. The balloon loop requires cut and fill and will be fenced. The grade separated crossing over the Port Bonython Road will contrast with the surrounding landscape being of a larger scale to the surrounding road infrastructure.

A grade separated crossing will be built where the rail line intersects with Port Bonython Road. Small scale level crossings will be installed between the existing Rail Network and the balloon loop to accommodate local access. It is anticipated that the construction corridor for the railway construction will typically be 50m wide. In areas of large cuts and fills, the construction corridor will extend beyond the typical 50m corridor to the extent necessary.

**Figure 9.4b: Existing rail line running parallel to the Lincoln Highway on a small embankment**



### Buildings, Materials Handling and Storage Facility

The buildings, materials handling and storage facility includes a number of built structures including: an administration building, maintenance shed, hazardous goods store/storage, material storage facilities, amenities and car-parking. Refer to **Figure 9.4c** for an image of the existing Santos Facility. Each of these facilities will be large in scale, including:

- » Administration building 15m x 8m and amenities building 9m x 8m, up to 6m high
- » Enclosed conveyor belt adjoining the rail loop and three storage sheds. Three large sheds (two 270,000t hematite lump and fines sheds with a footprint of approximately 70 x 250m and one 225,000t magnetite storage shed with a footprint of approximately 70 x 190m both with an overall height of approximately 30m) These structures will be simple shed structures, finished in neutral colours.

**Figure 9.4c: Existing Santos Facility**



### Offshore Facilities

A jetty, of approximately 5m wide and 3km long will extend from the site into the Gulf. This jetty will include a 3m wide roadway and two enclosed conveyor systems running along the length of the jetty. The deck slabs will sit upon approximately one metre diameter piles at approximately 30m centres along the jetty. This reduces to 16m centres as you approach two berthing wharves. These two generally 20m wide, 250m long berthing wharves will be located at the end of the jetty, with operational overhead lighting (of up to 50 lux) covering the entire wharf area. The berthing wharf will be an open steel structure with shiploader crane and conveyor. Up to two receiving vessels will berth adjacent to the wharf area, generally once a day. The shiploader crane will rise up approximately 40m above wharf level and extend generally 40m over the receiving vessel.

### Construction Method

The overall construction process is anticipated to take up to 30 months. This is a significant Project, and will require a temporary administration buildings; maintenance sheds; hazardous good storage; amenities and car-parking. Of particular note, the jetty will require the construction of a platform on the foreshore to facilitate the use of a purpose built canti-traveller. The traveller, which will weigh in excess of 450 tonne, has been designed to carry out all jetty construction operations including: Piling; Crosshead and beam installation;

and Pre-cast concrete deck installation. Construction of the railway will require a cleared corridor of up to 50m minimum width.

This assessment has been undertaken using the construction methodology described in **Chapter 2, Project Description**.

### 9.4.3. Assessment of Representative Viewpoints

#### Selection of Representative Viewpoints

A site visit was undertaken during February of 2013. The following viewpoints were selected as representative of the range of views to the site and the proposed development:

#### *False Bay and Point Lowly*

Viewpoint 1: Freycinet Trail, Point Lowly

Viewpoint 2: Beachfront Coastal Homes, Point Lowly

Viewpoint 3: Stony Point Cuttlefish diver's platform

Viewpoint 4: Black Point

Viewpoint 5: False Bay Beach

#### *Port Bonython Road*

Viewpoint 6: Port Bonython Road, near Santos Facility

Viewpoint 7: Port Bonython Road, South

Viewpoint 8: Fitzgerald Bay Drive

Viewpoint 9: Port Bonython Road (Enclosed Vegetation)

Viewpoint 10: Port Bonython Road (Adjacent to Saltmarsh)

Viewpoint 11: Port Bonython Road

#### *Whyalla and Lincoln Highway*

Viewpoint 12: Whyalla Foreshore jetty

Viewpoint 13: Hummock Hill Lookout

Viewpoint 14: Flinders & Freycinet Lookout

Viewpoint 15: Wild Dog Hill Lookout

Viewpoint 16: Lincoln Highway

#### *Spencer Gulf*

Viewpoint 17: View from Recreational Boat

Refer to **Figure 9.4d** for a visual representation of the viewpoints.

Figure 9.4d: Representative Viewpoint Locations

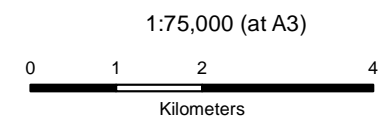


Port Bonython EIS  
Spencer Gulf Port Link

Legend

- 1. Representative Viewpoint Locations

Figure 9.4d -  
Representative Viewpoint Locations



Map Projection: Transverse Mercator  
Horizontal Datum: Geographic Datum of Australia  
Grid: Map Grid of Australia 1994, Zone 53

The following sections summarise the daytime visual impacts identified in the representative viewpoint assessment and site visit observations. For a summary of the viewpoint assessments, refer to **Table 9.4a**.

**Views from False Bay and Point Lowly**

Recreational users of the Freycinet trail and visitors to the historic buildings at Point Lowly, currently view the Santos Refinery complex and offshore facilities in the middle and background of the view. (Refer **Figure 9.4e**) During the day, these structures are visually prominent in north westerly views, across the beach and dunes. These views are currently characterised by industrial development, and the Project (onshore and offshore facilities at a distance of 3.3km) will largely be obscured by the Santos facilities which are located between the Project and the viewer. This location is of local visual sensitivity and there is unlikely to be any perceived change in visual amenity. This results in a **negligible** visual impact during both construction and operation.

Similarly, the character of views from the residential properties adjacent to the beach at Point Lowly are heavily influenced by the existing industrial facility, which will largely obscure views to the Project, located beyond. (Refer **Figure 9.4f**) This location is of local visual sensitivity and there is unlikely to be any perceived change in visual amenity. This results in a **negligible** visual impact during both construction and operation.

The Stony Point Cuttlefish Diver’s platform is located to the west of the Santos facility and is located within approximately 750m of the proposed jetty, and 1.4km to the sheds. (Refer **Figure 9.4g**) It is a recreational area, currently accessed by an unsurfaced track, and provides access across the rocky shore for divers, interpretive signage and seating area. The Santos facility is clearly visible to the east within the context of these views. This view is considered to be of local visual sensitivity due to the recreational use.

During construction, work will include temporary earthworks to create a platform from which the jetty structure will be erected. This will create a considerable reduction in the amenity of views in this area of local visual sensitivity. This results in a **moderate adverse** visual impact during construction.

During operation, the jetty will be clearly visible in the middle ground of the view, and will further erode the visual amenity of this location for recreational users. The impact is considered to be a considerable reduction in the amenity of a view of local visual sensitivity. This results in a **moderate adverse** visual impact during operation.

Moving northwest, the unsurfaced track will be diverted during construction but remain open. Recreational users will travel along the track diversion during construction, and under the jetty structure upon its completion. It is considered that views from this portion of the track, an area of local visual sensitivity, will experience a considerable reduction in amenity, resulting in a moderate adverse visual impact during construction, and operation.

Of particular interest is the pebble dune, which is visually prominent in views from this location. Views to the pebble dune, which are currently possible along the coastal track between the Stony Point Cuttlefish Diver’s platform to the southern side of Black Point, as well as from those using the beach itself, will experience **moderate adverse** visual impacts as there will be a considerable change in the character of these views in an area of local visual sensitivity.

The Black Point viewing area is located to the north of the Santos facility and is located within approximately 2.7km from the proposed jetty, 2km to the sheds, and 1.2km to the rail loop. (Refer **Figure 9.4h**) This is a recreational area, accessed by an unsurfaced track. At this location there is a designated area for vehicle parking, interpretive signage and access is provided to the beach via timber stairs. This view is considered to be of local visual sensitivity due to its recreational use. The Santos facility is not visible from this location. It is likely that the intervening landform will largely obscure views to the proposed rail and sheds. However, it is likely that the tip of the jetty will visibly protrude beyond the headland, and there will be vessels visible as they approach and use the Port facilities. It is also likely that the sheds may be visible protruding above the local ridgeline in the middle to background of the view. It is expected that views from this location of local visual sensitivity, will experience a noticeable reduction in the amenity in views. This results in a **minor adverse** visual impact during both construction and operation.

Figure 9.4e: Viewpoint 1; Freycinet Trail, Point Lowly



Figure 9.4f: Viewpoint 2; Beachfront Coastal Homes, Point Lowly



Figure 9.4g: Viewpoint 3; Stony Point Cuttlefish Diver's Platform



Figure 9.4h: Viewpoint 4; Black Point





False Bay is accessed by unsurfaced roads and is located further northwest, within approximately 4.5km from the proposed jetty, 3km of the sheds, and 2km of the rail loop. (Refer **Figure 9.4i**) Views from the beach and coastal homes include the coast of the Gulf and Whyalla is visually prominent on the horizon with its hills and industrialised foreshore. The Santos facility is not visible in views from this location. It is likely that the intervening landform will largely obscure views to the proposed rail and sheds. It is also unlikely that the jetty will be visible due to the protruding headland, filtering by foreground elements, and the mitigating effects of distance. From this location it is likely that there will be vessels visible on the horizon as they approach and use the Port facility. Due to the visual context of industrialised landscapes, and existing use of the Gulf, it is unlikely that the changes to this view will alter its character. It is therefore expected that from this location of neighbourhood visual sensitivity there will be no perceived change in amenity. This will result in a **negligible** visual impact during both construction and operation.

#### Views from Port Bonython Road

Road users travelling on the Port Bonython Road, approaching the site from the north west, currently view the Santos Refinery complex and offshore facilities in the middle to background of the view. (Refer **Figure 9.4j**) During the day and at night, these structures are visually prominent in views from this location, with little filtering offered by surrounding landform or vegetation. Views at this location generally mark the arrival at Point Lowly. These views are currently characterised by industrial development, and the Project (onshore facilities at a distance of 1.7km, and rail loop at 900m) will be somewhat obscured by local landform. It is expected that there is likely to be a noticeable reduction in visual amenity from this location of local visual sensitivity. This will result in a **minor adverse** visual impact during both construction and operation.

Further northwest along Port Bonython Road and approaching the Project site, road users currently view a largely undeveloped landscape. (Refer **Figure 9.4k**) The vegetation is low and open, and the coast is not visible from this location. During both construction and operation of the facility it is expected that the Project will be visually prominent in views, with little opportunity for filtering by landform or vegetation. The proposed onshore facilities at a distance of 300m, and rail loop running alongside the road will be visible. From this location there is likely to be a considerable reduction in visual amenity to a view of local visual sensitivity, resulting in a moderate adverse visual impact during both construction and operation. This impact is likely to reduce to a **minor adverse** visual impact over time as vegetation recolonises the rail corridor.

Further north in views from Fitzgerald Bay Drive, and approaching the Project site, road users currently view a broad open landscape, with the Santos facility visually prominent in the centre background of the view. (Refer **Figure 9.4l**) The vegetation is low and open, and coastal waters are visible on the horizon from this location. During both construction and operation of the Project it is expected that the Project will be visible, with little opportunity for filtering by landform or vegetation. The Project (onshore facilities and rail loop at a distance of approximately 1km) will be somewhat mitigated by distance and landform. From this location there is likely to be a noticeable reduction in visual amenity to a view of neighbourhood visual sensitivity, resulting in a **negligible** visual impact during both construction and operation.

Further northwest, on Port Bonython Road at approximately 9km from the Project site, road users currently view a largely undeveloped roadside landscape. (Refer **Figure 9.4m**) The vegetation is taller and includes some large shrubs and small trees reducing the depth of views into the surrounding landscape. The coast is not visible from this location and the main facility and jetty will not be visible, however, the rail will be running alongside the road to the north, and set within a 50 metre cleared corridor. The removal of vegetation will be noticeable and the rail clearly visible with limited filtering by roadside vegetation. During both construction and operation of the railway spur it is expected to be visually prominent in views, with little opportunity for filtering by landform or vegetation. This scale of road infrastructure is not currently seen on the peninsula and therefore expected to result in a considerable change in the visual amenity of views of local sensitivity. This will result in a **moderate adverse** visual impact during both construction and operation. This impact is likely to reduce to a minor adverse visual impact over time as vegetation recolonises the rail corridor.

Figure 9.4i: Viewpoint 5; False Bay Beach



Figure 9.4j: Viewpoint 6; Port Bonython Road, near Santos



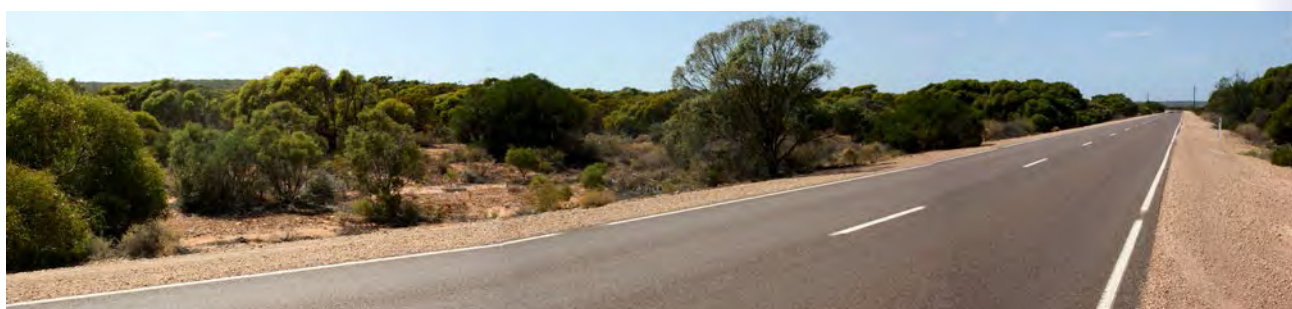
Figure 9.4k: Viewpoint 7; Port Bonython Road, south



Figure 9.4l: Viewpoint 8; Fitzgerald Bay Drive



Figure 9.4m: Viewpoint 9; Port Bonython Road (Passing through low vegetation)



In views from Port Bonython Road, at approximately 13.5km from the Project site, road users currently appreciate a largely undeveloped roadside landscape. (Refer **Figure 9.4n**) The vegetation is low salt marsh with some taller shrubland vegetation visible in the background. Views across the landscape are open and broad. The main facility and jetty will not be visible from this location. The rail corridor will run parallel alongside the northern side of the road, and set within a 50 metre cleared corridor. The removal of vegetation will be noticeable and the trains clearly visible with limited filtering by roadside vegetation. Trains using the rail line will block views to the ridgeline beyond as they pass.

During both construction and operation it is expected that the rail corridor construction will be visually prominent with little opportunity for filtering by landform or vegetation. It is expected that there is likely to be a noticeable reduction in visual amenity to a view of local visual sensitivity, resulting in a **minor adverse** visual impact during construction. During operation, when large and trains of over a kilometre in length are using the track, it is expected that there will be a considerable reduction in visual amenity and therefore a moderate adverse visual impact. This impact is likely to reduce to a minor adverse visual impact over time as vegetation recolonises the rail corridor.

Views from Port Bonython Road at approximately 15km from the Project site, road users currently view a largely undeveloped roadside landscape, with some existing infrastructure visible such as a roadside pipeline and high voltage power lines. (Refer **Figure 9.4o**) The vegetation is low and includes with scattered trees, allowing for long views into the surrounding landscape. The coast, main facility and jetty will not be visible. The rail corridor will be running alongside the road to the north, and following the road as it curves to the south. This rail corridor is set within a 50 metre cleared corridor, and raised on a small embankment. The removal of vegetation will be noticeable and the rail clearly visible with limited filtering by roadside vegetation. During both construction and operation it is expected that the rail corridor construction will be visually prominent with little opportunity for filtering by landform or vegetation. It is expected that there is likely to be a noticeable reduction in visual amenity to a view of local visual sensitivity, resulting in a minor adverse visual impact during both construction. During operation, when large and trains of over a kilometre in length are using the track, it is expected that there will be a considerable reduction in visual amenity and therefore a moderate adverse visual impact. This impact is likely to reduce to a **minor adverse** visual impact over time as vegetation recolonises the rail corridor.

#### Views from Whyalla and the Lincoln Highway

The Whyalla Foreshore Jetty is located off Buttingarra Way, and connects to the foreshore parklands along Beach Road. It offers views across the Gulf, at a distance of approximately 13.5km from the proposed jetty, and 15km to the sheds. (Refer **Figure 9.4p**) This is a recreational facility used as a viewpoint and for fishing. This view is considered to be of local visual sensitivity due to its recreational use. The Santos facility and its jetty are visible on the horizon from this location. Large shipping vessels are also visible in the background of the view, travelling across the Gulf. From this location it is likely that the proposed facility and jetty will be visible alongside the Santos development, and ships will be visible on the horizon as they approach and use the facility. Due to the visual context of industrialised landscapes, and existing use of the Gulf, and mitigating effects of distance, it is expected that there will not be a noticeable change in the character of these views. Therefore, it is expected that views from this location will experience a negligible visual impact during both construction and operation due to there being no reduction in the amenity in views from a location of local visual sensitivity.

The Hummock Hill Lookout, located in the town of Whyalla, was opened by Queen Elizabeth II and comprises a series of lookout points, with historic artefacts and signage interpreting the history of the town and its mining industry. (Refer **Figure 9.4q**) The structure itself was a fortified gun turret built during WWII. From this location there are 180 degree views across the Gulf. The site is visible on the horizon at a distance of approximately 15km to the proposed jetty, and 17km to the sheds. This is a designated viewpoint identified on local tourist maps and brochures. This view is considered to be of regional visual sensitivity due to its recreational and tourist importance to the community. The Santos facility and its jetty are visible on the horizon and large shipping vessels can be seen travelling across the Gulf. From this location it is likely that the proposed facility and jetty will be visible alongside the Santos development, and ships will be visible on the horizon as they approach and use the Port facility. Due to the visual context of industrialised landscapes, and mitigating effects of distance, it is expected that there will not be a noticeable change in the character of these views. It is therefore expected that views from this location will experience a **negligible** visual impact during both construction and operation due to there being no reduction in the amenity of a view of regional visual sensitivity.

Figure 9.4n: Viewpoint 10; Port Bonython Road (Passing through saltmarsh)



Figure 9.4o: Viewpoint 11; Port Bonython Road View to rail intersection



Figure 9.4p: Viewpoint 12; Whyalla Foreshore Jetty

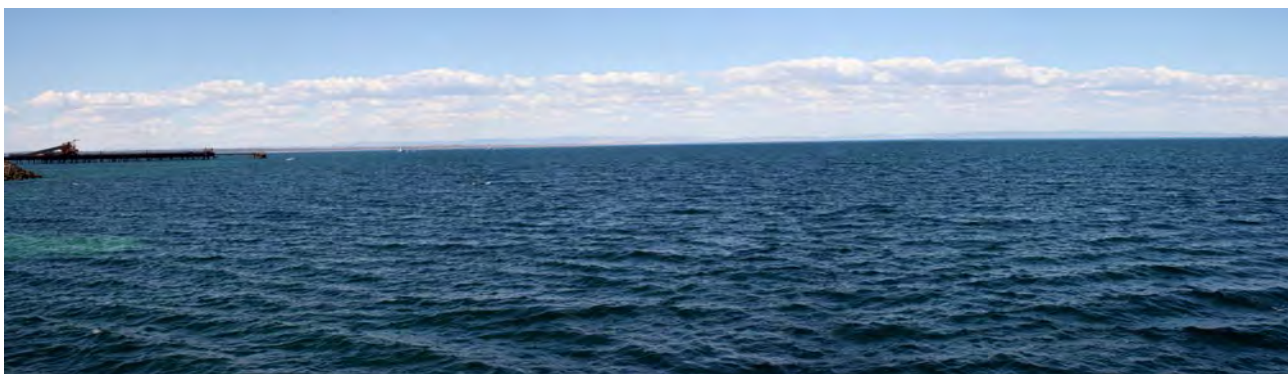


Figure 9.4q: Viewpoint 13; Hummock Hill Lookout



The Flinders and Freycinet Lookout, located in the town of Whyalla, commemorate these European explorers with flagpoles, statues and signage interpreting the history of the region. (Refer **Figure 9.4r**). From this location there are 180 degree views across the Gulf and historic centre of Whyalla. The site is visible on the horizon at a distance of approximately 20km to the proposed jetty, and 17km to the sheds. This is a designated viewpoint identified on local tourist maps and brochures and is considered to be of regional visual sensitivity due to its recreational and tourist importance. The Santos facility and jetty, and large shipping vessels are visible on the horizon in the far distance. From this location it is likely that the proposed facility and jetty will be visible alongside the Santos development, and ships will also be visible on the horizon as they approach and use the Port facility. Due to the visual context of industrialised landscapes, and mitigating effects of distance, it is expected that there will not be a noticeable change in the character of these views. It is therefore expected that views from this location will experience a **negligible** visual impact during both construction and operation due to there being no reduction in the amenity in views from a location of regional visual sensitivity.

Wild Dog Lookout, in the Whyalla Conservation Park is a local recreation area located over 20km from the site. (Refer **Figure 9.4s**) The lookout is located on a rocky outcrop a short walk from a day use area accessed by a dirt road. The lookout is not formalised, but is marked by an interpretive sign and offers panoramic 360 degree views across the outback landscape. Predominantly covered in natural vegetation, the view includes the Lincoln Highway, High Voltage Power Lines, pipelines and rail corridors; and a number of industrial developments visible on the horizon located on the Gulf. The Santos facility and jetty, is visible in the far distance. From this location it is likely that the proposed facility and jetty will be visible alongside the Santos development. Due to the visual context of industrialised landscapes, and mitigating effect of the considerable distance, it is expected that there will not be a noticeable change in the character of this view. It is therefore expected that views from this location will experience a **negligible** visual impact during both construction and operation due to there being no reduction in the amenity in views from this location of local visual sensitivity.

The existing Port Augusta to Whyalla rail line is visible from the Lincoln Highway. In the vicinity of the proposed rail spur, Road users currently view a largely undeveloped roadside landscape, with some existing infrastructure visible such as signage and power lines. (Refer **Figure 9.4t**) The vegetation is scrubby and includes scattered trees which filter views into the surrounding landscape. In the vicinity of this location, the rail spur will connect with the existing rail corridor and will be running away from the road towards Port Bonython Road to the south east. The proposed rail corridor is set within a 50 metre cleared corridor, and raised on a small embankment. The removal of vegetation will be noticeable and the rail will be visible with limited filtering by roadside vegetation. During both construction and operation it is expected that the rail corridor construction will be visually prominent with little opportunity for filtering by landform or vegetation. Due to the visual precedence of the existing rail line and lengthy freight trains, it is not expected that there will be a noticeable reduction in visual amenity of this view of local visual sensitivity. This results in a **minor adverse** visual impact during construction or operation.

#### Views from Spencer Gulf

The Spencer Gulf is a popular area for recreational fishing, diving, and boating. Views from recreational boats in the vicinity of the site are considered to be of local visual sensitivity due to the importance of this activity to the local community. (Refer **Figure 9.4u**) The Santos facility and its jetty are visible on the horizon from boats using this area. Large shipping vessels are also visible using the Santos facility and travelling across the Gulf to other nearby ports. From recreational boats in the vicinity of the site, it is likely that the proposed facility and jetty will be visible alongside the Santos development, and vessels will be visible on the horizon as they approach and use the Port facility. Due to the visual context of industrialised landscapes, and existing use of the Gulf, it is expected that there will be a noticeable change in the character of these views. It is expected that viewers will experience a **minor adverse** visual impact during both construction and operation from this location of local visual sensitivity.

Figure 9.4r: Viewpoint 14; Flinders & Freycinet Lookout



Figure 9.4s: Viewpoint 15; Wild Dog Hill Lookout

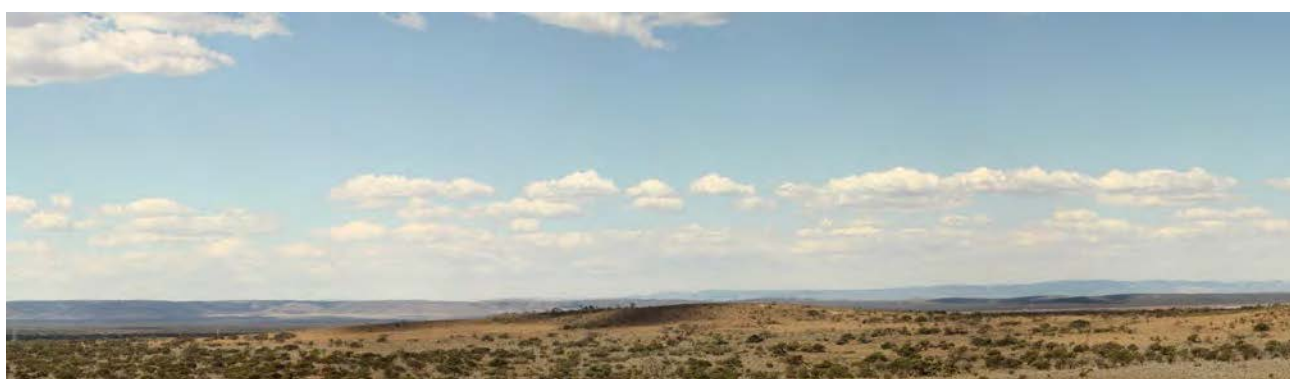


Figure 9.4t: Viewpoint 16; Lincoln Highway



Figure 9.4u: Viewpoint 17; View from Recreational Boat

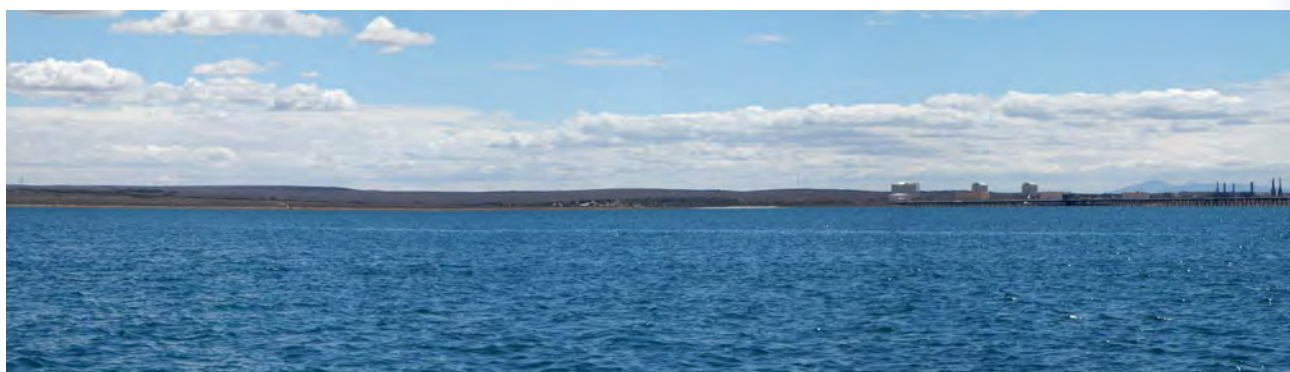


Table 9.4a: Summary of Viewpoint Assessment

VP	Location	Construction			Operation		
		Visual Modification	Visual Sensitivity	Visual Impact	Visual Modification	Visual Sensitivity	Visual Impact
1	Freycinet Trail, Point Lowly	No perceived change	Local sensitivity	Negligible	No perceived change	Local sensitivity	Negligible
2	Beachfront Coastal Homes, Point Lowly	No perceived change	Neighbourhood Sensitivity	Negligible	No perceived change	Neighbourhood Sensitivity	Negligible
3	Stony Point Cuttlefish diver's platform	Considerable reduction	Local sensitivity	Moderate Adverse	Considerable reduction	Local sensitivity	Moderate Adverse
4	Black Point	Noticeable reduction	Local sensitivity	Minor Adverse	Noticeable reduction	Local sensitivity	Minor Adverse
5	False Bay Beach	No perceived change	Local sensitivity	Negligible	No perceived change	Local sensitivity	Negligible
6	Port Bonython Road, Near Santos	Noticeable reduction	Local	Minor Adverse	Noticeable reduction	Local	Minor Adverse
7	Port Bonython Road, south	Considerable reduction	Local	Moderate Adverse	Considerable reduction	Local	Moderate Adverse
8	Fitzgerald Bay Drive	Noticeable reduction	Neighbourhood sensitivity	Negligible	Noticeable reduction	Neighbourhood sensitivity	Negligible
9	Port Bonython Road (enclosed vegetation)	Noticeable reduction	Local	Minor Adverse	Considerable reduction	Local	Moderate Adverse
10	Port Bonython Road (Saltmarsh)	Noticeable reduction	Local	Minor Adverse	Considerable reduction	Local	Moderate Adverse
11	Port Bonython Road View to rail intersection	Noticeable reduction	Local	Minor Adverse	Considerable reduction	Local	Moderate Adverse
12	Whyalla Foreshore Jetty	No perceived change	Local sensitivity	Negligible	No perceived change	Local sensitivity	Negligible
13	Hummock Hill Lookout	No perceived change	Regional sensitivity	Negligible	No perceived change	Regional sensitivity	Negligible
14	Flinders & Freycinet Lookouts	No perceived change	Regional sensitivity	Negligible	No perceived change	Regional sensitivity	Negligible
15	Wild Dog Hill Lookout	Noticeable reduction	Local sensitivity	Negligible	Noticeable reduction	Local sensitivity	Negligible
16	Lincoln Highway	Noticeable reduction	Local sensitivity	Minor Adverse	Noticeable reduction	Local sensitivity	Minor Adverse
17	View from Recreational Boat	Noticeable reduction	Local sensitivity	Minor adverse	Noticeable reduction	Local sensitivity	Minor adverse

## 9.5. Assessment of Lighting Effects

### 9.5.1. Visual Sensitivity of the Study Area at Night

At night the study area is predominantly dark with lit areas being restricted primarily to the clusters of coastal homes on the coastline and the Santos Refinery at Point Lowly. The Highway, roads and railway in the region are not generally lit and carry low levels of traffic. The township of Whyalla is the brightest area of the landscape, emitting the greatest amount of light and skyglow. Figure 9.5a illustrates the predominant darkness of the study area. The main light sources can clearly be identified in this figure as being the township of Whyalla, with a smaller light source seen around Point Lowly.

The following list summarises the assessment of the existing lit conditions for the main viewing areas across the study area:

- » In Whyalla, the Hummock Hill and Flinders & Freycinet Lookouts are considered to be located in areas of **high district brightness**
- » The Whyalla Foreshore and recreational boats in the Spencer Gulf are also located in an area of **high district brightness**
- » Wild Dog Lookout, in the Whyalla Conservation Park is **intrinsically dark landscape**, and is not accessible to the public at night
- » At Point Lowly the residential properties and Freycinet trails network, are located within an area of **moderate district brightness**
- » Port Bonython Road and other local roads are also located in areas of **low district brightness**.
- » The Lincoln Highway is a more heavily trafficked road and for this reason it is considered to be an area of **moderate district brightness**
- » Residential properties at False Bay and Point Lowly are also located in areas of **low district brightness**.

Figure 9.5a: Night Time Air Photograph of the Study Area





### 9.5.2. Visual Modification of the Project at Night

Visual modification describes the extent of change resulting from the Project and the compatibility of these new elements with the surrounding landscape. At night, there are some considerations which determine the level of visual modification; these include the character of the view i.e. viewing distance and lit context. There are also characteristics of the development itself which at night are: lit elements, sky glow, glare and light trespass. The following paragraphs describe the visual characteristics of the Project which will inform the assessment of modification.

There will be additional lighting introduced into the landscape as a result of the Project. Generally, the daytime working hours for construction, are between 6am and 6pm. Night time hours are those beyond these times. The following paragraphs describe these changes and resulting predicted visual impacts. The Project comprises of three main components, each of which has a different visual character at night, these are:

- » Railway spur
- » Buildings, Materials handling and storage facility
- » Offshore Facilities.

The visual character of each of these components will be as follows:

#### ***Railway Spur from the Existing Whyalla to Port Augusta Rail Line***

There will be very limited lighting associated with the construction and operation of the railway spur. Construction will be predominantly during the day; however, there may be some activity which extends into the evening. This work will require sufficient lighting to ensure a safe working environment. The limited lighting required for the operation of the railway spur should not create any additional sky glow, or direct light spill onto adjacent properties.

It is expected that trains will be operational at night, at a frequency of up to one train every four hours. These trains will have headlights only. Some lighting may be required where at-grade crossings are provided for local roads, but this should be minimal. The limited lighting required for the operation of the railway spur should create minimal additional sky glow, and no direct light spill onto adjacent properties.

#### ***Buildings, Materials Handling and Storage Facility***

During construction there will be some laydown and delivery areas which may function 24 hours a day (up to seven days a week) to accommodate after hours deliveries, yard lighting will be provided at these areas. In addition, if required, there may be some construction activity that extends into the evening. This will require sufficient lighting to ensure a safe working environment.

During operation, the administration buildings, storage facility, and conveyor belts will be used at night if required. Most activity will occur inside the sheds, and therefore there will be mainly lighting visible in staff access areas such as around the administrative building and car parking area. When the Project is not in use, there will be some permanent security lighting required. The limited lighting required for the operation of the facility should create minimal additional sky glow, and no direct light spill onto adjacent properties.

#### ***Offshore Facilities***

The jetty and wharf structures will be lit at night. During operation, Ship Loader berth lighting will include overhead lighting of minimum 50 Lux required on the entire wharf area. Shielded lights will be used to ensure minimal spill onto marine areas. All floating equipment will have navigation lights as per requirements. When there is no activity on the offshore facilities, it is expected that some lighting will be turned off and the lighting effects will be reduced.

Construction of the offshore facilities may require work to be undertaken during evening hours. This work will necessitate sufficient lighting to ensure a safe working environment. There will be a Light Management Plan developed for the Project as part of the Construction Environmental Management Plan prepared by the Construction Contractor.

### 9.5.3. Assessment of Representative Locations at Night

For a summary of the visual assessment at the representative locations at night, refer to **Table 9.5a**.

#### *Views from False Bay and Point Lowly*

From the beachfront coastal homes at Point Lowly, additional lighting from the Project is likely to be visible in the context of the Santos facility, lighting from occupied coastal homes and the decorative light of the Historic Point Lowly Lighthouse, and brightly lit industry and urban area of Whyalla across the Gulf. Views will include some additional light sources on the site, and additional light sources and an overall increased sky glow visible above the offshore area. As this is an area of medium district brightness, these elements will not create a noticeable reduction in amenity and result in a negligible impact.

The beachfront coastal homes at False Bay are located at a greater distance from the site, and direct light sources will be largely screened by landform in views from this location. There may be some lighting visible on the jetty and some sky glow visible above the site. This additional light will be visible in the context of the brightly lit industry and urban area of Whyalla across the Gulf. It is not expected that the Project will not have a noticeable effect on the character of this area of low district brightness, and will therefore result in a negligible visual impact.

Views from the Freycinet Trail, Stony and Black Point recreation areas are not night use areas, and therefore impacts will not be experienced from these locations.

#### *Views from Port Bonython Road*

Views to the Railway Spur from Port Bonython Road are located within an intrinsically dark landscape. There will be mainly temporary lighting associated with the operation of trains on the railway spur. During operation, these elements will create a noticeable reduction in amenity and result in a **high adverse** visual impact. These impacts are for a short duration intermittently during the night.

During construction there will be limited lighting required. There will only be impacts on the occasion of there being night time construction activity (if required). During these times there will be sufficient temporary lighting provided to ensure a safe working environment. It is expected that on these occasions there will be a noticeable reduction in the amenity of localised views from Port Bonython Road that will result in a **high adverse** visual impact.

Views to the Project site from Port Bonython Road will include additional visible light sources and an increased sky glow seen above both the shore and offshore areas. Visible in the context of the Santos facility, there is likely to be additional light sources seen and possibly a perceived increase in sky glow above the site. Generally, as this is an area of low district brightness, these elements will create a noticeable reduction in amenity and result in a **moderate adverse** visual impact.

Views to the Project from Fitzgerald Bay Drive are elevated and will include additional light sources and sky glow from the Project and offshore areas. In the context of these elements is the similarly lit Santos facility, lights from occupied coastal homes and the historic Light House at Point Lowly, and Whyalla will be visually prominent on the horizon in these views. Generally, as this is an area of low district brightness, these elements will create a noticeable reduction in amenity and result in a moderate adverse visual impact.

#### *Views from Whyalla and the Lincoln Highway*

Views to the Facility and jetty from Whyalla are located in an area of high district brightness and view an intrinsically dark landscape. Due to the foreground lit areas, and distance it is unlikely that there will be any perceived change in the amenity of the view from this location. During construction and operation there will not be a noticeable reduction in amenity and therefore a **negligible** visual impact.

In views from the Lincoln Highway, there will be limited lighting required for the construction and operation of the railway spur. Lit trains already use the existing track. During operation it is expected that there will be no perceived change in amenity. This results in a **negligible** visual impact.

There is likely to be impacts on the occasion of there being night time construction activity. During these times there will be sufficient temporary lighting provided to ensure a safe working environment. It is expected that on these occasions there will be a noticeable reduction in the amenity of localised views from the Lincoln Highway that will result in a minor adverse visual impact.

Views from the Whyalla Foreshore Jetty and Wild Dog Hill Lookout are not night use areas, and therefore impacts will not likely to be experienced from these locations.

#### *Views from Spencer Gulf*

Recreational boats are active in the Gulf at night; however, it is unlikely that any impact on amenity will be perceived from these locations.

**Table 9.5a: Summary of Night Time Viewpoint Assessment**

VP	Location	Construction			Operation		
		Visual Modification	Visual Sensitivity	Visual Impact	Visual Modification	Visual Sensitivity	Visual Impact
2	Beachfront Coastal Homes, Point Lowly	No perceived reduction	Medium district brightness	Negligible	No perceived reduction	Medium district brightness	Negligible
5	False Bay Beach	No perceived reduction	Medium district brightness	Negligible	No perceived reduction	Medium district brightness	Negligible
1, 3, 4	Freycinet Trail, Point Lowly Stony & Black Point	Not accessible at night	Low district brightness	N/A	Not accessible at night	Low district brightness	N/A
6, 7	Port Bonython Road to the main Facility	Noticeable reduction	Low district brightness	Moderate Adverse	Noticeable reduction	Low district brightness	Moderate Adverse
8	Fitzgerald Bay Drive to the main facility	Noticeable reduction	Low district brightness	Moderate Adverse	Noticeable reduction	Low district brightness	Moderate Adverse
9, 10, 11	Port Bonython Road to the Railway Spur	Noticeable reduction	Intrinsically dark landscapes	High Adverse	Noticeable reduction	Intrinsically dark landscapes	High Adverse
12	Whyalla Foreshore Jetty	Unlikely to have night use	High district brightness	N/A	Unlikely to have night use	Not accessible at night	N/A
13, 14	Hummock Hill, Flinders & Freycinet Lookouts	No perceived change	High district brightness	Negligible	No perceived change	High district brightness	Negligible
15	Wild Dog Hill Lookout	Unlikely to have night use	Intrinsically dark landscapes	N/A	Unlikely to have night use	Intrinsically dark landscapes	N/A
16	Lincoln Highway	Noticeable reduction	Medium district brightness	Minor Adverse	No perceived change	Moderate district brightness	Negligible
17	View from Recreational Boat	No perceived change	Intrinsically dark landscapes	Negligible	No perceived change	Intrinsically dark landscapes	Negligible

## 9.6. Mitigation Measures

Due to the nature of the site and surrounding landscape, and potential impacts identified, there are few mitigation options available that will be sympathetic with the surrounding low vegetation, and natural character. In summary, the following mitigation measures are to be implemented.

### Day time

- » Existing vegetation around the perimeter of the site will be retained to act as a visual screen
- » Where feasible the elements within the construction site will be located to minimise visual impact, e.g. setting equipment back from site boundaries
- » The colour of the sheds will be neutral and reflect the colours of the surrounding landscape to make them recede visually
- » Jetty colour selected to allow it to visually recede
- » Treatment of rail grade separated crossing bridge designed so that they blend with the surrounding landscape; this will include the selection of appropriate colours and design treatments

- » Car parking will be designed so that it follows the natural topography of the site, and is broken up with areas of retained vegetation to reduce the visual scale and mass
- » Storage areas and site offices required for construction will be set back from the road and site hoarding used where visually obtrusive elements are located
- » The footprint of temporary construction works on the foreshore will be minimised as much as possible and the duration of this work minimised.

### Night time

- » Cut-off and directed lighting will be used to ensure glare and light trespass are minimised
- » Preparation of a Light Management Plan for operational activities.

## 9.7. Summary of Visual Effects

### 9.7.1. Daytime Visual Effects

**Table 9.7** a summarises the daytime visual effects of the Project both with, and following the application of mitigation measures.

Table 9.7a: Summary of daytime visual effects

Element	Inherent Mitigation			Additional Mitigation				
	Mitigation	Significance of impact	Likelihood of impact	Risk Rating	Mitigation	Significance of Impact	Likelihood of Impact	Risk Rating
Views from Point Lowly	Existing Santos Facility visible; Intervening built elements and landform; Distance from viewer	Negligible	Almost Certain	Medium		Negligible	Possible	Low
Views from Stony and Black Points	Intervening built elements and landform	Moderate Adverse	Almost Certain	High		Moderate Adverse	Possible	Medium
Views from False Bay	Intervening built elements and landform; Distance from viewer	Negligible	Possible	Low	N/A	Negligible	Possible	Low
Views from Port Bonython Road to the facility	Landform reduces the visibility of the facility	Minor Adverse	Almost Certain	Medium	Minimise vegetation clearance surrounding the site Shed colour chosen so that it visually recedes	Minor Adverse	Possible	Medium
Views from Port Bonython Road to the Grade Separated Rail Crossing	Medium height vegetation provides some filtering of views	Moderate Adverse	Possible	High	Minimise vegetation clearance along the corridor	Moderate Adverse	Possible	High
Views from Port Bonython Road to the Railway		Minor Adverse	Possible	Medium	Minimise vegetation clearance along the corridor	Minor Adverse	Possible	Medium
Views from Whyalla	Distance	Negligible	Possible	Low	Shed colour chosen so that it visually recedes	Negligible	Possible	Low
Views from the Lincoln Highway	Existing rail corridor visible	Minor Adverse	Possible	Medium	Minimise vegetation clearance along the corridor	Minor Adverse	Possible	Medium
Views from Spencer Gulf	Existing Santos Facility visible	Minor Adverse	Possible	Medium	Shed colour chosen so that it visually recedes	Minor Adverse	Possible	Medium

## 9.7.2. Night-time Visual Effects

Table 9.7b summarises the night time visual effects of the Project both with, and following the application of mitigation measures.

**Table 9.7b: Summary of night time visual effects**

Element	Inherent Mitigation			Additional Mitigation				
	Mitigation	Significance of impact	Likelihood of impact	Risk rating	Mitigation	Significance of impact	Likelihood of impact	Risk rating
Views from Point Lowly	Existing Santos Facility visible at night; Intervening built elements and landform; Distance from viewer	Moderate Adverse	Possible	Medium	Minimise night time construction occurrences Minimise night time operations	Moderate Adverse	Possible	Medium
Views from Stony and Black Points	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Views from False Bay	Intervening built elements and landform; Distance from viewer	Negligible	Possible	Low	Minimise night time construction occurrences Minimise night time operations	Negligible	Possible	Low
Views from Port Bonython Road to the facility	Landform reduces the visibility of the facility	Moderate Adverse	Possible	Medium	Minimise vegetation clearance surrounding the site Minimise night time construction occurrences Minimise night time operations	Moderate Adverse	Possible	Medium

Element	Inherent Mitigation				Additional Mitigation			
	Mitigation	Significance of impact	Likelihood of impact	Risk rating	Mitigation	Significance of impact	Likelihood of impact	Risk rating
Views from Port Bonython Road to the Railway		High Adverse	Possible	High	Minimise vegetation clearance Minimise night time construction occurrences Minimise night time operations Consider visual impact in design of the grade separated crossing	High Adverse	Possible	High
Views from Whyalla	Distance	Negligible	Possible	Low	Minimise night time construction occurrences Minimise night time operations	Negligible	Possible	Low
Views from the Lincoln Highway	Existing rail corridor visible	Minor Adverse	Possible	Medium	Minimise night time construction occurrences Minimise night time operations	Minor Adverse	Possible	Medium
Views from Spencer Gulf	Existing Santos Facility visible	N/A	N/A	N/A	N/A	N/A	N/A	N/A

