OLYMPIC DAM EXPANSION

DRAFT ENVIRONMENTAL IMPACT STATEMENT 2009

APPENDIX R
VISUAL AMENITY

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APPENDIX R

VISUAL AMENITY

This appendix provides supplementary information to Chapter 20, Visual Amenity, of the Draft EIS. Information within this chapter was obtained from an assessment completed by Hassell Pty Ltd, Wax Design Pty Ltd and Swanbury Penglase Pty Ltd.

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APPENDIX R1

Detailed visual assessment of infrastructure

R1 DETAILED VISUAL ASSESSMENT OF INFRASTRUCTURE

R1.1 METHODOLOGY

The quantitative visual assessment of infrastructure items from selected viewpoints was carried out in the following way. Values were assigned to each assessment criterion as described in Tables R1.1 to R1.4. The value assigned to the final visual effect is the sum of these criteria as shown in Table R1.5.

Table R1.1 Criteria for assigning values for the per cent of landscape absorption capacity

Per cent of landscape absorption capacity (expressed as percentage of change)	Value	Description
80–100%	1	Substantial landscape absorption capacity. The existing landscape visual character from this viewpoint is able to screen and mitigate the visual effects.
60–79%	2	Increasing landscape absorption capacity. The variety of contrast complexity, scale, vegetative and topographic relief mitigate the visual effect.
40–59%	3	Moderate visual absorption capacity. Medium level of change to the landscape character. The landscape is less able to mitigate or absorb change due to the frequency or extent of the development.
20–39%	4	Limited absorption capacity. The development is noticeable within the landscape. There is minimal capacity for the landscape to absorb the development through vegetation growth and topographic relief.
0–19%	5	No or minor absorption capacity within the landscape. The development is considered to dominate the visual field and dramatically alter the existing landscape character.

Table R1.2 Criteria for assigning values for the degree of horizontal visual effect

Degree of horizontal visual effect (angle expressed as percentage of the 160° field of view)	Value	Description of visual modification
80–100% of the panorama	5	Substantial horizontal visual effect throughout the whole panorama
60–80% of the panorama	4	Increasing visual effect
40–60% of the panorama	3	Moderate visual effect
20–40% of the panorama	2	Limited effect
0–20% of the panorama	1	No or minor visual effect

Table R1.3 Criteria for assigning values for the degree of vertical visual effect

Degree of vertical visual effect (angle expressed as percentage of the 150° field of view)	Value	Description of visual modification
80–100%	5	Substantial visual effect
60–80%	4	Increasing visual effect
40–60%	3	Moderate visual effect
20–40%	2	Limited effect
0–20%	1	No or minor visual effect within the landscape

Table R1.4 Criteria for assigning values for the degree of distance of visual effect

Distance of visual effect (as measured by distance between the viewpoint and the project component)	Value	Description
0–3 km	5	Adjacent: dominant effect due to large scale, movement, proximity and number
3–6 km	4	Foreground: major effect due to proximity, capable of dominating landscape
6–10 km	3	Middle ground: clearly visible with moderate effect, potentially intrusive
10–14 km	2	Distant middle ground: clearly visible with moderate effect becoming less distinct
14 km and greater	1	Background: less distinct, size much reduced

Table R1.5 Assigning the final visual effect (method as per Wilson 2002)

Degree of visual effect	Value (total of previous criteria)
Severe	18–20
Substantial	14–17
Moderate	10–13
Slight	7–9
Negligible	4–6
None	0–3

R1.2 DESCRIPTION OF THE EXISTING LANDSCAPE CHARACTER NEAR SITES OF MAJOR DEVELOPMENT

Roxby Downs township (Photomontage viewpoint 12)

The location of viewpoints is shown in Figure R1.1. The landscape character on the northern fringe of Roxby Downs is typical of the area, with east-west oriented dunes, supporting White Cypress-pine (*Callitris glaucophylla*) woodland. The taller mine infrastructure, such as the stack, is visible between trees and from the larger dunes. The landscape character of Roxby Downs has an enclosed visual aspect, with trees and built form providing dominant elements within a fairly densely vegetated environment. The natural trees surrounding the town and trees planted for landscaping within the town provide a significant degree of screening of the distant views of the mine infrastructure. The topographic relief provided by the east-west oriented dunes limits views to the north and south.

Olympic Dam Village and airport

The Olympic Dam Village and airport are closer to the mine than Roxby Downs, the dunes are smaller and the vegetation is more open with less Cypress-pine cover. Consequently, the views across the dunes are more open and the existing mine infrastructure more visible owing to increased dominance of the scale of vertical infrastructure.

Main road near the airport (Viewpoint 13)

The landscape character adjacent to the mine site is defined by relatively small, east-west oriented dunes, with moderate vegetation cover and few Cypress pines. The views over the low dunes are open, and the major components of the existing mine infrastructure, including the smelter stack, Whenan Shaft and transmission lines, are clearly visible on the skyline for several kilometres.

Sunset Picnic Ground (Photomontage viewpoint 14)

The Sunset Picnic Ground is an important community site that is frequently used by local residents for camping, bonfires and sunset views. The site is located 2–3 km north-east of Roxby Downs, just off the main road to Olympic Dam, within a densely wooded interdune swale. The surrounding dunes and native vegetation enclose the views to the north and south.

Arid Recovery (Photomontage viewpoint 10)

The landscape within Arid Recovery is characterised by widely spaced dunes with low lying clay pans and interdune swales. The area is well vegetated with sparse White Cypress-pine defining the visual character of the landscape. From elevated areas, such as the viewing platform, the existing mine infrastructure occupies a large component of the southern skyline, and forms a relatively significant element of the current landscape character.

Large dunes running east-west across the southern sections of the Arid Recovery provide some visual screening of the mine infrastructure, particularly within dune swales and on interdune plains. The tailings storage facility comprises a large, low landform on the skyline, which is relatively natural looking compared with the adjoining mining infrastructure. Its height and scale are complementary to the horizontal forms of the surrounding landscape and similar to the mesas and buttes occurring in the region.

Andamooka Road (Photomontage viewpoint 15)

The visual character of this site contrasts markedly with dunefields surrounding Roxby Downs, comprising gibber plains with expansive vistas and distant views. However, these vistas are more contained than would initially appear, with surrounding dunes 1-2 km away screening the existing mine infrastructure.

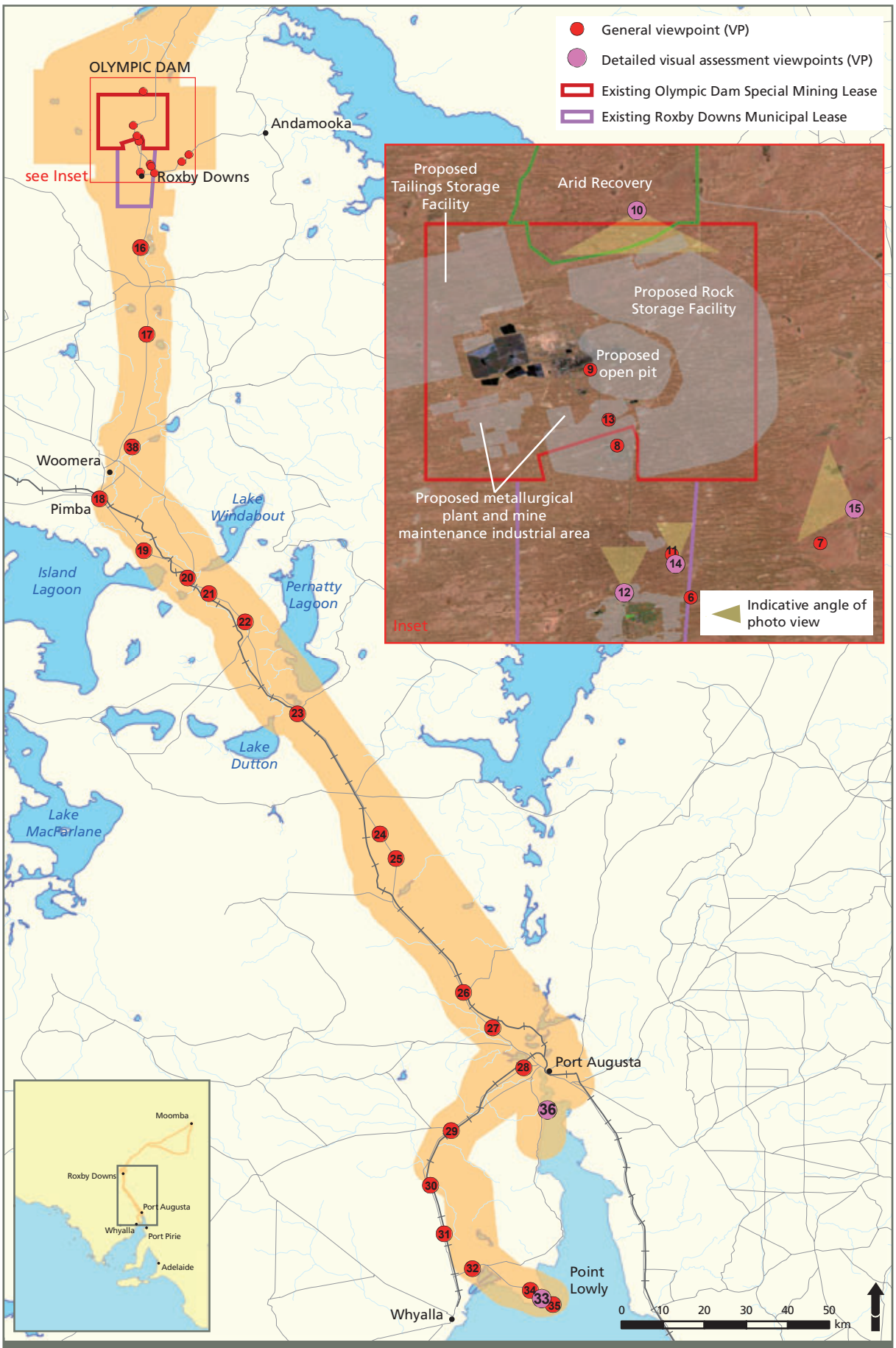

Figure R1.1 Viewpoint locations

Andamooka

Views of the existing mine infrastructure occur from the outskirts of Andamooka (30 km from Roxby Downs). The stack and refinery are clearly visible across the gibber plains.

Point Lowly (Photomontage viewpoint 33)

The Santos facility dominates the visual landscape at Point Lowly. The presence of the Santos facility has changed the visual character at Point Lowly to a significantly industrial landscape. Panoramic views across Spencer Gulf to the Flinders Ranges remain an important element of the visual landscape.

Landing facility (Photomontage viewpoint 36)

The coastal landscape in the vicinity of the landing facility is defined by mangrove woodland and a wide (shell grit) coastal dune system that extends to the foothills of Cultana. A line of shacks is located parallel to the coast and Shack Road. Inland, the vegetation is typically saltbush with sparse clumps of trees. The topography is undulating with gullies running east-west from the adjacent hills to the coast. Existing development in the area includes numerous shacks, the Port Augusta power station and transmission lines.

R1.3 DESCRIPTION OF THE SOUTHERN INFRASTRUCTURE CORRIDOR

Note that only the southern infrastructure corridor is described in detail. The proposed linear infrastructure south of Olympic Dam was considered to warrant a detailed visual assessment as it includes a transmission line and would be located close to a national highway. Conversely, it was considered the gas pipeline corridor from Olympic Dam to Moomba did not warrant a detailed visual assessment, as the pipeline would be underground and traverse extremely remote terrain.

Roxby Land System (formerly Moondiepitchnie EA) – (Viewpoint 16)

An undulating landscape replaces the dunefields typical of Roxby Downs. The visual character changes from the enclosed vertical White Cypress-pine vegetation to groundcover species and grasses common to the gibber covered swales. Consequently, the road corridor has limited visual screening and the existing transmission line becomes a notable infrastructure element within the landscape. The transmission line towers are seen as a continuous series of vertical linear elements (30-40 m in height) that extend into the distance, providing a visual contrast to the more natural, horizontal landscape (Plate R1.1).

Arcoona Land System (formerly Woomera EA) – (Viewpoints 17–19, 38)

A gibber plateau replaces the dunefields of the north, with uninterrupted views extending almost 360°, with the horizon forming a dominant visual contrast between the sky and the ground. The existing transmission line is the only vertical element in the landscape to the west of the road corridor.

Plate R1.1 Undulating vegetated dunes

Plate R1.2 Lake Windabout and Island Lagoon

About 20 km south of Woomera, the alignment of the transmission line switches to the eastern side of the road. This does not affect the visual impact, as the open landscape character extends to both sides of the road corridor and the transmission line is still seen as a linear element, punctuated by the towers.

The new rail connection to Olympic Dam at Pimba would be a continuation of the existing TransAustralian Railway corridor from Port Augusta. The low profile of the existing rail line within the landscape is screened by local undulations and vegetation. Some visual impact is created as the rail corridor crosses low-lying swales or depressions on the gibber plain.

At the southern edge of the Arcoona Land System (Woomera EA), the landscape becomes more topographically varied around Lake Windabout and Island Lagoon. Distant landforms punctuate the landscape, with views to adjacent salt lakes and hills (Plate R1.2). These features are still offset by the verticality of the transmission line.

Elevated views highlight the visual effect of the rail line traversing ridges and gullies. While the visual impact is more prominent, due to the associated embankments, the overall impact is softened by the narrow profile of the rail line (2-3 m) and screening effect of revegetation.

Roxby Land System (formerly Oakden EA) – (Viewpoints 20–22)

The southern section of the Roxby Land System is represented by a low-lying basin and salt lakes associated with Lake Windabout and Island Lagoon. The salt lakes produce large, horizontal landscapes that contrast the vertical character of the adjacent landform, creating a visual landscape character which contrasts the uniformity of the gibber plain (Plate R1.3).

The landscape character is complex, with defined foreground, mid-ground and background elements and variations in height, colour and texture. The visual effect of the existing linear infrastructure is therefore reduced.

The landscape changes at Old Oakden Hills and becomes more vegetated with wattles, mulgas and numerous grasses over a low dunefield. The dunes and adjacent vegetation constrain the visual envelope, with narrow views along the road corridor. The transmission line remains a discernible visual element in the distance, but only from elevated viewpoints or glimpses through the vegetation.

Arcoona Land System (formerly Mount Gunson EA) – (Viewpoints 22–23)

The Arcoona Land System (Mount Gunson EA) consists of an undulating plateau, comprising a gibber plain or rock surface interspersed with saltbush and bluebush. The transmission line becomes a prominent visual element within the landscape, as there is no vegetation or topography to screen the infrastructure corridor. Elevated sections of the gibber plain provide long distance views to Pernatty Lagoon (Plate R1.4).

The existing water pipeline appears as a linear element within the landscape, readily visible owing to the lack of vegetation along the pipeline easement reinforced by the easement itself and the bunding on which the pipeline rests.

Torrens Land System (Viewpoint 23)

Torrens is a small land system within the Hesso land system, characterised by a low-lying, salt-crusted depression, which forms a seasonal water body. Within the system, views are limited and confined by the surrounding densely vegetated Hesso system. The distance between foreground and background would be approximately 2 km (Plate R1.5).

Hesso Land System (Viewpoints 23–27)

The northern edge of the Hesso land system comprises a low-lying basin associated with Lake Dutton. Views extend towards the Flinders Ranges across a wide sand plain, vegetated with Myall and large areas of Mulga. The transmission line is identifiable within the landscape as a series of vertical elements set against the rising landform of the Flinders Ranges and surrounding vegetation (Plate R1.6).

This open visual landscape extends for 76 km, with low sand ridges to the south end of the environmental association. The transmission line is seen as a small visual element within an expansive landscape.

Tent Hill Land System (formerly Simmens EA) – (Viewpoint 27)

A plateau predominantly covered with bluebush, punctuated by small shrubs and trees. The plateau has an open visual character due the lack of topographical variation, providing distant views to the Flinders Ranges to the east, with the more local landforms of South Tent Hill, Horseshoe Range and Nutt Knob to the west. The visual character adjacent to the road is affected by the infrastructure corridor and the co-location of a local distribution transmission line, the pipeline and railway corridor. The existing transmission line (275 kV) can be seen further east as a distant linear element within the landscape, set against the more dominant backdrop of the Flinders Ranges (Plate R1.7).

Plate R1.3 Roxby Land System with dry lake

Plate R1.6 Hesso Land System and highway

Plate R1.4 Open plain with low shrubland

Plate R1.7 Stuart Highway and water pipeline

Plate R1.5 Torrens Land System with salt lake

Plate R1.8 Western fringe of Port Augusta

Closer to Port Augusta, the effects of human habitation increase, with farmsteads and isolated built forms, access tracks, pumping stations and boundary fences all becoming elements within a natural landscape.

Yorkey Land System (formerly Arden EA) – (Viewpoint 28)

As the plateau descends towards Port Augusta, it is punctuated with drainage channels, salt lagoons and remnant dunes. The Flinders Ranges define the visual envelope to the east with the southern end of the Gawler Ranges creating the visual envelope to the west. Views to the south are impacted by the Port Augusta Power Station, which creates a visual focus that contrasts the extensively natural surroundings.

The modification of landscape through human intervention progressively increases approaching Port Augusta. Agricultural buildings, industrial areas and other elements associated with development increase in frequency until the landscape character becomes urbanised, typical of larger regional towns (Plate R1.8).

Tent Hill Land System-Port Augusta to Whyalla (Viewpoints 29 and 36)

Continuing east, the Tent Hill land system surrounding Spinifex Gap and Lincoln Gap is generally pastoral. The southern foothills of the Gawler Ranges comprise low-lying ridgelines with views to the surrounding topography.

Numerous infrastructure corridors are located within the landscape, including the road corridor, rail line, transmission line and pipeline. The lack of vegetation cover and low-lying topography means that the infrastructure is clearly visible. However, the amount of infrastructure combines to form a 'service corridor' within the landscape in and around Spinifex Gap. Other pieces of infrastructure such as the Government Dam add to the infrastructure character of the landscape.

South of Spinifex Gap, the landscape becomes flatter with distant views to the surrounding ranges along the Eyre Peninsula and beyond. The low-lying saltbush vegetation is replaced by denser tree and shrub cover, providing an enclosed visual character. The existing infrastructure can be glimpsed through vegetation gaps (Plate R1.9).

The low-lying character of Myall Creek produces an open landscape and visual character with views to the surrounding areas and infrastructure corridors.

Around Whyalla, the landscape consists of coastal vegetation with views to the surrounding ranges east and north, and localised ridgelines. The infrastructure corridors become more defined, due to the lack of vegetation cover and low lying topography.

Yudnapinna Land System – Port Augusta to Whyalla (Viewpoints 30–31)

The Yudnapinna land system has a more enclosed visual character due to the increasing density of vegetation. The adjacent rail corridor and transmission line can be glimpsed through vegetation gaps. The existing water pipeline is within close proximity to the road corridor (Plate R1.10), although the new pipe would have minimal visual effect in the long term because it would be buried.

Yorkey Land System – False Bay (Viewpoint 32)

Around the salt lagoons of False Bay, the land system is defined by a low-lying topography with saltbush vegetation cover, providing open views towards the coast and local ridgelines. The existing pipeline forms a strong, horizontal element within a low-lying coastal area (Plate R1.11).

Bittali Land System

The Bittali is a small land system between Whyalla and Point Lowly. The increased tree cover means that the visual character of the area is more enclosed with filtered views to the adjacent landscape. A north-south oriented ridgeline provides topographic variance to the view. This land system is currently used for military training and is commonly used for artillery testing (Plate R1.12).

Yorkey Land System – Point Lowly (Viewpoints 33–36)

The landscape along the western side of Upper Spencer Gulf near the landing facility and at Point Lowly is predominantly coastal, with blue bush, patches of mallee and sparse mangroves (Plate R1.13). The topography in the area is undulating, which encloses views in certain directions. Built form becomes dominant near the end of Point Lowly, with the Santos facility being a large industrial element in the landscape. The presence of the Santos facility has changed the visual character at Point Lowly to a significantly industrial landscape.

Plate R1.9 Water pipeline adjacent to the road

Plate R1.12 Bluebush shrubland near Whyalla

Plate R1.10 Water pipeline 50 m off the road

Plate R1.13 Mangroves in Upper Spencer Gulf

Plate R1.11 Transmission line crossing the road

R1.4 ASSESSMENT OF THE VISUAL IMPACT OF THE ROCK STORAGE FACILITY, TAILINGS STORAGE FACILITY, DESALINATION PLANT AND LANDING FACILITY FROM KEY VIEWPOINTS

Tables R1.6 to R1.11 provide the results for each assessment criteria for six photomontage viewpoints: the potential visual effect of the rock storage facility (RSF) and tailings storage facility (TSF) is assessed from four viewpoints; the visual effect of the desalination plant and landing facility is assessed from one viewpoint each (Plates R1.14 to R1.19).

Table R1.6 Visual effect of the RSF and TSF from Arid Recovery (Viewpoint 10)

Viewpoint	Result (%)	Corresponding value	Comments
Landscape absorption capacity (as a percentage)	18	5	The total horizontal/vertical development form extent is 111,766 pixels. The rock storage facility and tailings storage facility would be screened by 20,221 pixels within this view, or 18% landscape absorption capacity. The limited degree is representative of the distance and elevated viewpoint with minimal topographic relief and limited vegetation cover.
Horizontal visual effect (as a percentage)	76	4	Calculated as 122° of the 160° active field of view, or 76% of the horizontal field of view
Vertical visual effect (as a percentage)	9	1	14° of the 150° vertical field of view, or 10% vertical visual change to the field of view
Distance of visual effect (km)	1.5	5	At the closest point
Visual effect		**15**	
Visual impact from viewpoint		**Substantial**	

Table R1.7 Visual effect of the RSF and TSF from the northern edge of Roxby Downs (Viewpoint 12)

Viewpoint	Result (%)	Corresponding value	Comments
Landscape absorption capacity modification (as a percentage)	66	2	Extrapolating the pixel change from the photographs and photomontages, the total vertical horizontal field is 95,152 pixels. The level of foreground screening is 62,632 pixels of the image, or 66% visual absorption.
Horizontal visual effect (as a percentage)	54	3	Calculated as 87° of the 160° of the active field of view inclusive of the tailings storage facility, (55° rock storage facility) or 54% of the horizontal field of view.
Vertical visual effect (as a percentage)	7	1	10° of the 150° vertical field of view, or 7% vertical visual change to the field of view
Distance of visual effect (km)	5.4	4	At the closest point
Visual effect		**10**	
Visual impact from viewpoint		**Moderate**	

Table R1.8 Visual effect of the RSF and TSF from the Sunset Picnic Ground (Viewpoint 14)

Viewpoint	Result (%)	Corresponding value	Comments
Landscape absorption capacity (as a percentage)	41	3	Referring to the photomontage, the total active field equates to 134,120 pixels. The rock storage facility is screened by 54,661 pixels. This equates to 41% landscape absorption.
Horizontal visual effect (as a percentage)	40	3	Calculated as 63° of the 160° of the active field of view, or 40% of the horizontal field of view
Vertical visual effect (as a percentage)	6	1	9° of the 150° vertical field of view, or 6% vertical visual change to the field of view
Distance of visual effect (km)	3.5	4	At the closest point
Visual effect		**11**	
Visual impact from viewpoint		**Moderate**	

Table R1.9 Visual effect of the RSF from along the Andamooka Road (Viewpoint 15)

Viewpoint	Result (%)	Corresponding value	Comments
Landscape absorption capacity (as a percentage)	12	5	The total active field of view comprises 64,325 pixels. From this viewpoint the rock storage facility would be screened by 7,815 pixels within the photomontage. This equates to 12% landscape absorption capacity.
Horizontal visual effect (as a percentage)	34	2	Calculated as 54° of the 160° of the active field of view, or 34% of the horizontal field of view
Vertical visual effect (as a percentage)	7	1	10° of the 150° vertical field of view, or 7% vertical visual change to the field of view
Distance of visual effect (km)	4.8	4	At the closest point
Visual effect		**12**	
Visual impact from viewpoint		**Moderate**	

Table R1.10 Visual effect of the desalination plant at Point Lowly (Viewpoint 33)

Viewpoint	Result (%)	Corresponding value	Comments
Landscape absorption capacity (as a percentage)	13	5	The total number of pixels in the vertical / horizontal extents of the development proposal is 83,600. The desalination plant would be screened and mitigated by 11,392 pixels. This equates to a landscape absorption capacity of 13%.
Horizontal visual effect (as a percentage)	10	1	Calculated as 16° of the 160° of the active field of view, or 10% of the horizontal field of view
Vertical visual effect (as a percentage)	4	1	6° of the 150° vertical field of view, or 4% vertical visual change to the field of view
Distance of visual effect (km)	1.6	5	At the closest point
Visual effect		**12**	
Visual impact from viewpoint		**Moderate**	

Table R1.11 Visual effect of the landing facility in Upper Spencer Gulf from the nearest group of houses 240 m south-west of the proposed pier (Viewpoint 36)

Viewpoint	Result (%)	Corresponding value	Comments
Landscape absorption capacity (as a percentage)	15%	5	Mangroves and other vegetation and undulating dunes provide slight landscape absorption capacity. In addition the pier in the mid-ground and the Port Augusta power station in the background would minimise contrasting landscape elements for views to the north-east.
Horizontal visual effect (as a percentage)	33%	3	The pier would form a slight to moderate horizontal visual effect.
Vertical visual effect (as a percentage)	3.2°	1	There is limited vertical visual effect as the pier is predominantly horizontal and is only 4m above sea level. From this distance the landing facility would compose 3.2° of the vertical visual effect.
Distance of visual effect (km)	200m	5	The holding area would be screened by adjacent vegetation from viewpoint 36. On the other hand the pier would provide a visual effect which would be viewed in association with the Port Augusta power station which forms a dominant mid-background visual focus.
Visual effect		**14**	
Visual impact from viewpoint		**Slight**[1]	The potential visual effect is described as 25% as the existing landscape character is dominated by the Port Augusta power station and local vegetation screens the holding lay-down area.

[1] Note that the visual assessment method for the landing facility is based on Swanbury Penglase (2008) rather than the method described in Section R1.1

Plate R1.14 Photomontage of the visual effect of the RSF and TSF from Arid Recovery (Viewpoint 10)

Plate R1.15 Photomontage of the visual effect of the RSF and TSF from the northern edge of Roxby Downs (Viewpoint 12)

Plate R1.16 Photomontage of the visual effect of the RSF and TSF from the Sunset Picnic Ground (Viewpoint 14)

Plate R1.17 Photomontage of the visual effect of the RSF from along the Andamooka Road (Viewpoint 15)

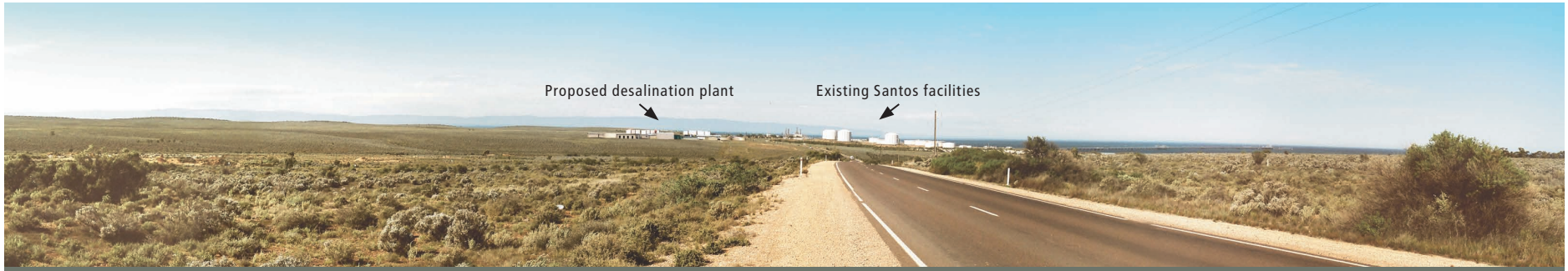

Plate R1.18 Photomontage of the visual effect of the desalination plant at Point Lowly (Viewpoint 33)

Plate R1.19 Photomontage of the visual effect of the landing facility in Upper Spencer Gulf (Viewpoint 36)

R1.5 POTENTIAL VISUAL IMPACTS

R1.5.1 Rock storage facility and tailings storage facility

The mesas within the Breakaway Reserve near Coober Pedy are examples of natural landforms that would most closely resemble the rock storage facility (RSF) and the tailings storage facility (TSF) in terms of shape, colour and vegetation communities. The Breakaways is a series of scenic mesas and hills renowned as a tourist destination. The mesas have flat tops and relatively steep sides supporting sparse vegetation in crevices and foot slopes (Plate R1.20).

Plate R1.20 A typical mesa

In this context, landforms with steep sides supporting relatively poor vegetative growth are visually acceptable. Ideally, the top surface would support vegetation, as would the lower slopes of the sides, where nodes of woodland and shrubland would occur in natural or constructed drainage depressions. Stark colour variation of the landform's sides would also be visually acceptable in the regional context.

The RSF, visible for up to 30 km, would be the most prominent feature in the local and regional landscape. The outer walls of the landform would be mainly Arcoona Quartzite, with some sandstone, shales, dolomite, limestone and conglomerate, which would range in colour from red to white and grey. The colour of the visible faces of the landform would therefore be quite variable, although the dominant colours are likely to be muted reds and pinks. The variability in colour would be consistent with natural mesas in the region.

Details of the semi-quantitative visual impact assessment from each viewpoint are summarised in Table R1.12.

Table R1.12 Visual impact assessment of the RSF, TSF, desalination plant and landing facility

Project component	Viewpoint location	Viewpoint number	Level of visual impact	Description
RSF/TSF	Arid Recovery	10	Substantial	The RSF would appear as series of terraced horizontal landforms very close to Arid Recovery. It would screen the industrial infrastructure from view, which may improve the visual amenity from the Arid Recovery viewing platform.
RSF/TSF	Roxby Downs	12	Moderate	From the northern edge of Roxby Downs, the RSF would be visible as a group of large mounded landforms.
RSF/TSF	Sunset Picnic Ground	14	Moderate	The RSF and TSF would be seen as a fragmented horizontal landform, visually prominent with a combination of a constructed plateaux and punctuated peaks. Terracing would be evident to the eastern side of the view.
RSF/TSF	Andamooka Road	15	Moderate	The RSF and TSF would be visible on the distant horizon. Variations in tonal colour due to the benching would provide a complex depth of field. The form of the RSF would reflect the horizontal nature of the landscape and dune systems.
Desalination plant	Road to Point Lowly	33	Moderate	The desalination plant is a relatively low lying form that would be situated in a depression. The topographic relief to the east and west of the proposed development provide a degree of visual enclosure. The existing Santos facility contains infrastructure of a larger vertical scale. As a consequence, the desalination plant would only be a moderate addition to an existing industrial landscape.
Landing facility	Nearest shack (200 m south of the facility)	36	Slight	The existing visual character of the landscape to the north-east is dominated by the Port Augusta power station. The proposed landing facility would be seen as an extension to the industrial landscape. Vegetation would provide some screening of the holding area. The landing facility would be visible from coastal sites up to about 1km south of the facility. Dunes and coastal vegetation would limit views from further south.

R1.5.2 Open pit

The view from the edge of the pit is likely to be spectacular in terms of the landform and context of the open pit operation, and may become a tourist attraction during the mine operation and after its closure. Views into the pit would be possible up to 1.2 km from its edge. The top sections of the pit walls would still be visible up to 1.75 km from the edge. The dunes and vegetation would effectively screen most views at greater distances. As the rock storage facility is developed, views of the pit would become obscured.

At night, illumination of the pit would produce light spill that would be visible for a considerable distance in the night sky, particularly when cloudy. This would become less evident as the rock storage facility is developed around the edge of the pit.

R1.5.3 Power station and expanded metallurgical facilities

The power station and expanded metallurgical facilities would be significant additions to the industrial landscape at Olympic Dam. However, the visual impact of the new infrastructure would only be slight, as its scale and form would be consistent with the existing metallurgical facilities at the site.

R1.5.4 Hiltaba Village

The proposed Hiltaba Village would be located off the Andamooka Road on lands dominated by gibber plains. Although it would be built in an area that currently does not support infrastructure, the visual impact is considered moderate, given the proximity to the existing township and because relatively few members of the public would view the site.

Following the construction period, the village would be reduced in capacity, with a concomitant reduction in unused infrastructure. The visual impact of the village on the public travelling along Andamooka Road would be reduced.

R1.5.5 Roxby Downs expansion

The proposed growth of the town is detailed in the Draft Roxby Downs Master Plan (see Appendix F). The plan consists of a series of residential clusters surrounding the existing township. The layout of the residential areas preserves most of the existing dunes and associated trees and shrubs, and provides continuity between the proposed urban form and surrounding desert landscape.

Implementing the Draft Master Plan would have the following effects on visual amenity:

- Preserving the dunes would enhance the visual character of the new residential areas and provide areas of natural open space that enhance the surrounding arid environment. Many of the dunes support White Cypress-pines, attractive trees that would add to the visual amenity of the proposed residential areas.
- The dunes would also divide the expanded residential areas into numerous smaller precincts, which would add to their village, rather than urban character.
- The enclosed visual character provided by the dune systems would also ensure that the visual impact of residential construction work would be limited to the immediate vicinity of the works.
- The development of the residential areas adjacent to Olympic Way would make the visual character of the road more urbanised.
- The location of the proposed new industrial area adjacent to Olympic Way on the north- western edge of Roxby Downs would have little impact on the visual amenity of the area as significant screening is provided by adjacent dunes.

R1.5.6 Transmission line

The visual impact of the proposed transmission line is considered to be slight, largely because it would be located adjacent to two existing transmission lines.

The visual impact during construction would be relatively minor. Access would be provided along existing tracks, with only short extensions required for the new tower sites.

Table R1.13 lists the visual impact of the transmission line in each of the land systems traversed, from north to south.

Table R1.13 Potential visual effects along the transmission line

Land system	Potential impact	Description
Roxby	Negligible	The dunes and relatively dense vegetation create an enclosed visual character that would restrict the views of the transmission line. The transmission line would pass approximately 5 km west of Roxby Downs and would be visible from western areas of the town. South of Roxby Downs the transmission line would generally be located 1–2 km west of the main road and would be predominantly screened by vegetation.
Arcoona and Torrens	Slight	On the flat gibber plains the transmission line would be clearly visible from the main road, and would cross the road about 14 km north of Woomera. The potential visual impact of the transmission line at the road crossing would only be slight due to the presence of the two existing transmission lines. Further south, as the distance from the road increases to 4–5 km, the visual impact would decrease significantly. At the southern end of the Land System the visual impact of the transmission line would increase slightly due to its location on top of a ridgeline.
Hesso	Negligible/Slight	This land system is well wooded and therefore views of the transmission line, averaging 2–4 km east of the road, would be limited. On the more elevated sections where the transmission line would traverse a number of ridgelines, there would be occasional views of distant towers against the Flinders Ranges.
Tent Hill and Yorkey	Slight	Generally located 6–10 km west of the Stuart Highway, the transmission line towers would only be visible as very minor features against the Flinders Ranges. The line would be more visible in the open areas near Port Augusta.

R1.5.7 Airport

The proposed airport is to be located on a gibber plain about 15 km north east of Roxby Downs off the Andamooka Road and would have a moderate visual impact. However, the dominant feature in this area would be the nearby Hiltaba Village.

R1.5.8 Rail line / Pimba intermodal

The development of a rail line from a site approximately 8 km south-east of Pimba to Olympic Dam would have a slight visual impact. Although much of the rail line would lie adjacent to the main road to Olympic Dam, its impact would be slight as it would have a low profile, and it would be screened from view for much of its length by the relatively dense dunefield vegetation.

The development of the intermodal facility south-east of Pimba would have a moderate effect on the visual amenity of the local landscape. The buildings would be visible for at least several kilometres as there is little vegetation on the open gibber plain. The increase in frequency of train activity would have a minimal effect due to the transient nature of the trains and rolling stock passing through the landscape.

R1.5.9 Water supply pipeline

The water supply pipeline would have very little impact on the visual amenity of the landscape because:

- it would be buried for most of its 320 km length, with the exception of 1,500 m of elevated sections at watercourses and salt lakes
- the longest elevated section (about 500 m at Lake Windabout) would be located adjacent to an existing elevated water pipeline
- the most visible components of the infrastructure would be three pumping stations that would be located at least several hundred metres from main roads.

The most significant visual impact associated with the water pipeline would occur during construction, when a right-of-way would be cleared, a large trench excavated and large amounts of pipe and other infrastructure temporarily stored within or adjacent to the right-of-way. However, this would be for a short time only, and would quickly disappear once construction was completed and the disturbed areas were rehabilitated and revegetated.

R1.5.10 Gas supply pipeline

The gas supply pipeline would have very little impact on the visual amenity of the landscape because:

- it would be buried for its entire length, except for occasional risers for valves and pigging facilities
- It traverses extremely remote country that would be seldom visited by members of the public

As with the water pipeline, the most significant visual impact associated with the gas supply pipeline would occur during construction, when a right-of-way would be cleared. The visual impact would be for a short time only, and would quickly disappear once the disturbed areas were rehabilitated and revegetated.

R1.5.11 Desalination plant

From the main road into Point Lowly the visual impact of the desalination plant would be moderate, although the visual character of the area is dominated by the Santos facility at Port Bonython, which would absorb some of the visual impact of the desalination plant.

The low shrub land on Point Lowly provides very little screening of either the desalination plant site or the Santos facility. The undulating topography provides some visual enclosure of the site, restricting views from the main road to the west for a distance of about 1.5 km. Similarly, views of the site from the recreational sites at the lighthouse and shacks further east along Point Lowly are effectively screened by the topography and built form of the Santos facility.

The desalination plant would add to the existing industrialised character of the landscape in the local vicinity of the Santos facility at Point Lowly. The visual impact of the plant on nearby areas such as Fitzgerald Bay and Black Point would be negligible due to topographic relief.

R1.5.12 Port facilities

The development of port facilities at Port Adelaide and the Port of Darwin would occur within existing ports and industrial infrastructure. The visual impact of the expanded port facilites at Port Adelaide and the Port of Darwin would be negligible as the facilities would be consistent with the existing industrial use and character of the ports.

R1.6 REFERENCES

Swanbury Penglase 2008, *Proposed Landing Facility, Port Augusta Visual Assessment*. Report for Arup–HLA, Adelaide.

Wilson, S 2002, *The Landscape Institute and Institute of Environmental Management and Assessment: Guidelines for Landscape and Visual Impact Assessment*, 2nd edn, E & FN Spon, London.