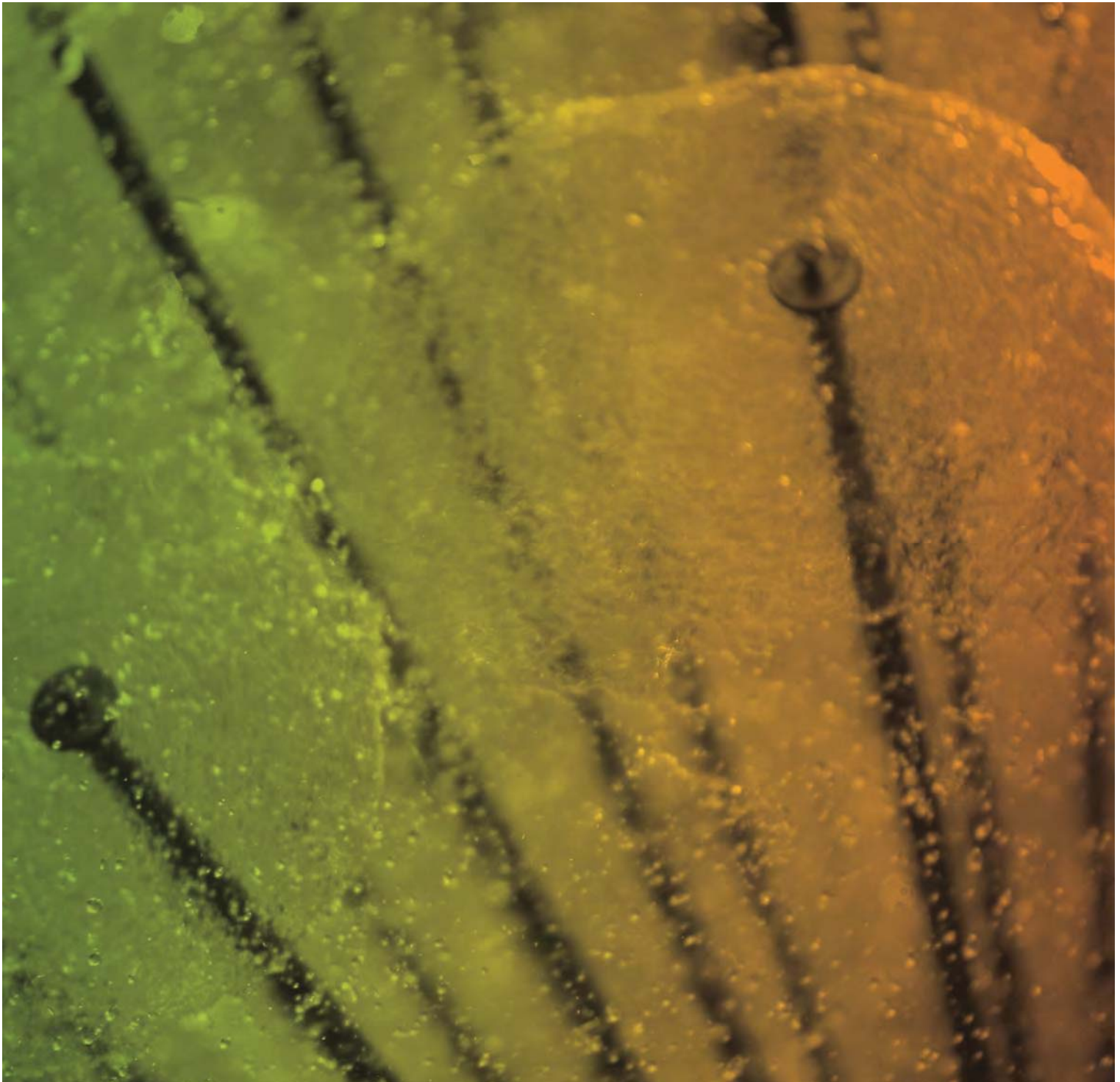


Visual Impact Assessment

Modification of Project Approval 08_0129



Visual Impact Assessment

Modification of Project Approval 08_0129

Client: Orica Australia Pty Ltd

ABN: 99004117828

Prepared by

AECOM Australia Pty Ltd

17 Warabrook Boulevard, Warabrook NSW 2304, PO Box 73, Hunter Region MC NSW 2310, Australia

T +61 2 4911 4900 F +61 2 4911 4999 www.aecom.com

ABN 20 093 846 925

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Job No.: 60306451

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1.0 Introduction

1.1 Overview

This Visual Impact Assessment (VIA) has been prepared by AECOM Australia Pty Ltd (AECOM) on behalf of Orica Australia Pty Ltd (Orica) for its proposed nitric acid tank and Ammonia Management Improvements (AMI) projects, to be undertaken on Orica's existing Kooragang Island (KI) facility (the site). The existing facility is located approximately 3km north of the Newcastle Central Business District (CBD).

The project involves the construction and operation of:

- Three flaring stacks; and
- A nitric acid storage tank.

The tank and flare stacks are referred to collectively in this report as the project. A detailed description of the project is provided in **Section 3.0**.

This VIA has been prepared to examine the potential visual impacts of the proposal on those sensitive (residential) receivers that have the potential to be impacted by the project.

1.2 Methodology

This report describes the existing environment of the KI site, the proposed activity, and the visual transformation that may result from the project. The assessment is based on the preliminary design information provided by Orica.

In addition to desktop assessment, field investigations were undertaken from sensitive receiver locations and computer simulation of view corridors prepared to determine visual impacts from the proposal.

The VIA undertakes consideration of the following:

- 1) Existing site conditions:
 - Site Context and Topography;
 - Site Description;
 - Visual context; and
 - Statutory considerations.
- 2) The nature of proposed activities:
 - Height;
 - Scale;
 - Materials and colour; and
 - Flaring.
- 3) Visual Impact:
 - A description of the existing environment of the identified sensitive receivers; and
 - A review of the potential impacts on the visual amenity of the identified sensitive receivers.
- 4) A review of measures that could be implemented to mitigate adverse visual impacts and conclusion.

2.0 Existing Environment

2.1 Site Context and Topography

The area surrounding the site is predominantly heavy industrial, chemical plants, and port related activities. The nearest residential area is Stockton. The closest residential homes are located approximately 800 metres from the site, on the opposite side of the north arm of the Hunter River.

The overall character in the area immediately surrounding the site is industrial with a range of industrial operations being undertaken on KI, which is dominated by coal loading facilities located to the north west of Orica's site. In the vicinity there are heavy trucks using Cormorant Road to the northwest; freight ships passing along the Hunter River, and loading and unloading activities occurring on KI to the west.

Access to the Orica site is via Greenleaf Road from Heron Road and Cormorant Road. Owing to the sites location on a peninsula, traffic does not pass the site frontage directly. The presence of other industrial operations and buildings means that the site is mostly out of view for commuters travelling along Cormorant Road. The exception to this is for commuters when travelling over the Stockton Bridge, the height of which allows visibility of the Orica site. Due to the height of the bridge however, the site does not dominate views from this vantage point.

Reference is made to **Figure 1** showing the site in context of the wider KI and Stockton areas.

2.2 Site Description

The Orica KI facility is situated on a large, flat site which is flanked to the east and west by the North and South arms of the Hunter River respectively. The site contains a variety of plant associated with the production of ammonia, nitric acid, ammonium nitrate and ammonium nitrate emulsion. Detail of the site including all major pieces of existing and proposed infrastructure are shown on **Figure 2**.

2.3 Visual Context

The area around the site is dominated by industrial development located adjacent to the Hunter River.

The closest viewing locations to the site are from existing industrial lots within KI's industrial area to the north.

The other well-trafficked publicly accessible road from which views to the site are possible is Cormorant Road on KI. Cormorant Road is approximately 600 metres from the site at its closest point. Views from Cormorant Road are intermittent as a result of the Coal Loaders and associated conveyor systems which operate on the northern side of the south arm of the Hunter River.

The nearest residential areas with views to the site are located on Stockton with the nearest dwelling being approximately 800m from the site.

2.4 Statutory Considerations

Project approval 08_0129 includes conditions relation to visual aspects of the original approval. Specifically conditions 45 and 46 relate to visual impacts and lighting respectively:

Condition 45, Visual:

Prior to the commencement of operations of the project, the proponent shall submit to the Director General a landscape plan providing details of native screening plants to be planted along the eastern boundary of the project site. The plan shall demonstrate that the landscaping does not compromise onsite security and shall include a program for implementation.

Condition 46, Lighting:

The proponent shall ensure that lighting associated with the Project:

- a) *Complies with the latest version of Australian Standard AS 4282(INT)-Control of Obtrusive Effects of Outdoor Lighting; and*
- b) *Is mounted, screened and directed in such a manner that it does not create a nuisance to surrounding properties or the public road network.*

Although condition 45 relates to the mitigation of visual impacts, the landscaping works were previously undertaken in accordance with the project approval. The project would not impact on any of the existing landscaping works undertaken to satisfy this condition. As this condition has already been satisfied no further landscaping is required. In relation to Condition 46, lighting for the project would be designed in accordance with AS 4282.

Although not a statutory requirement, and despite Development Control Plans not being enforceable in relation to Part 3A projects, consideration was undertaken in regards to the Newcastle Development Control Plan 2005 (DCP 2005). The DCP 2005 has provisions relating to visual impact that may concern the site namely Element 4.4 '*Landscaping*' and Element 7.1 '*Industrial Development*'.

Under Element 4.4 '*Landscaping*', *industrial development with a cost higher than \$2 million is classified with a Landscape Category of '3'*. Developments within this category require a landscape plan for the site.

As per Condition 45 of the project approval a landscaping plan was developed for the site. The project would not impact on the existing landscaping of the site.



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3.0 Description of Proposal

The proposed project involves the construction of three flare stacks and a nitric acid tank. Ancillary works would also require piping and connection of electrical control, safety and security systems. These ancillary works would be located at ground level and would not be visible offsite due to shielding from existing plant. A general description of the plant that may be visible from offsite is provided below.

3.1 Height

The heights of the main pieces of project infrastructure are detailed in **Table 1**.

Table 1 Proposed Flare Stack Heights

Flare / Tank	Approximate Height* (m)
Ammonia Plant Flare	20
Ammonia Storage Tank	5
Nitrates Plants	8
Nitric Acid Tank	25
Nitric Acid Tank Scrubber Stack	25.5

*above existing ground level.

The locations of the three proposed flare stacks and Nitric Acid tank are shown in **Figure 2**.

3.2 Scale

As detailed in **Table 1**, the highest proposed stack is 25.5m, and the nitric acid tank is 22m above the existing ground level of the site. By comparison, the highest pieces of infrastructure that currently exist on the site are approximately:

- Nitric Acid Plant 1 Stack – 84m;
- Nitric Acid Plant 2 Stack – 55m; and
- Nitric Acid Plant 3 Stack – 55m.

A range of existing infrastructure on industrial operations that neighbour the Orica site include infrastructure which are of similar heights to both existing and proposed infrastructure on the Orica site. Whilst exact heights of infrastructure on neighbouring sites are not known, visual inspections have identified the highest infrastructure on neighbouring sites as:

- Kooragang Bulk Facilities (KBF) storage tanks located to the west;
- Boral storage tanks located to the north; and
- Kooragang Wharfs 1, 2, and 3 cranes located to the west.

Approximately 500m to the northwest of the site is a number of other pieces of infrastructure of varying heights. This primarily consists of coal handling (conveyors systems, bins and reclaimers) infrastructure.

3.3 Materials and Colour

All materials associated with the project that will be visible offsite will be metallic. The nitric acid tank will have a stainless steel appearance.

The flare stacks and supporting structures will be made from metals which have been designed to have non-reflective surfaces or be painted.

3.4 Flaring

The proposed flares would not be used during the day to day operation of the facility. Flares are designed to be used during certain non-routine releases of ammonia which cannot be managed through other onsite systems such as scrubbers.

When the flares are required to operate they would produce flame height to the levels listed in **Table 2**.

Table 2 Proposed Flares

Flare	Approximate Stack Height (m)	Approximate Flame Height (m)	Approximate Flame Tip Height (m)
Ammonia Plant Flare	20	36	56
Ammonia Storage Tank	5	10	15
Nitrates Plants	8	18	24

For comparative purposes a typical hydrocarbon flame produces a bright yellow to red flame. The flame associated with the ammonia flaring is different to a typical hydrocarbon flame as it would produce a less visible blue coloured flame. The flare flame would be visible if activated in the night.

Flares would only operate during non-routine releases of ammonia with a flaring event expected to occur on average once every two years. A flaring event would typically involve a single flare in operation as each flare would manage non-routine releases in a different part of the facility. It is highly unlikely that circumstances would require all three flares to operate at any given time.

4.0 Visual Impact Assessment

Following an analysis the nearest sensitive receivers who may be visually impacted by the project, two typical receiver locations were identified for detailed analysis as part of this VIA. These locations are in **Table 3**.

Table 3 Identified Sensitive Receivers

Receiver Name	Receiver type	Distance from facility (m)	Receiver Location Description ¹
Stockton 1 (S1)	Residential	800	Fullerton St – Griffith St intersection
Stockton 2 (S2)	Residential	900	Fullerton St – Hereford St intersection

¹Location descriptions are approximate with exact locations determined to avoid local obstacles.

The receiver locations are listed in **Table 3**, and shown on **Figure 3**, along with the site line distances between the receivers and the proposed infrastructure.

It is noted that other receiver locations within approximately 5km of the KI site would also have visual access to Orica's facility. These locations include:

- Carrington industrial and residential receivers (approx. 1500m) – residential receivers in Carrington would be largely shielded by industrial facilities along the Hunter River water front;
- Certain viewpoints from the Newcastle CBD (approx. 3000m+) – commercial and residential receivers;
- Elevated Areas of Mayfield (approx. 3500m) – residential receivers; and
- Kooragang Island – adjacent industrial receivers.

In additional elevated areas at greater distances from the site may also have visual access to the site.

No further analysis is considered necessary for these other locations due to their distance. It is considered that the worst case examples analysed in the visual impact assessment in **Section 4.0** provide the greatest benefit when determining potential visual impacts.



4.1 Stockton 1

4.1.1 Existing Environment

The Stockton 1 (S1) indicative receiver location is nominally located at the intersection of Fullerton Street and Griffith Street, Stockton and represents the nearest sensitive receivers to the project. From this location there is a view due west to Orica's facility. This location consists of residential land uses with open space maintained grassland along the Hunter River Foreshore. The sensitive receiver location views to the facility are partially filtered by a low density planting of trees along the foreshore area. The area immediately surrounding S1 is topographically flat with the ground level being approximately the same as that at the KI facility.

Plate 1 shows the existing environment in the vicinity of S1. In the foreground is a car park on the Hunter River shoreline, and then across Fullerton Street are the nearest receivers to Orica.

Plate 2 details the typical foreshore arrangement in the vicinity of S1. The mixture of clustered vegetation along the foreshore allows broken views from residential properties along Fullerton Street towards the site.

4.1.2 Visual Impact

An artist's impression of the Orica facility as viewed from S1 with the proposed stacks included is shown in **Figure 4**. As can be seen from S1 the flare stacks are largely shielded by existing infrastructure or are at heights which place them within the silhouette of existing infrastructure blending them with the background. Overall the flares when viewed from S1 have a negligible visual impact.

When viewed from S1 less than half of the nitric acid tank can be seen where it protrudes above the existing plant and screening vegetation. Whilst the tank is visible, its height is consistent with other tankage on both Orica and adjoining sites. The tank is therefore within the visual context of the site and has an overall low visual impact.



Plate 1 View towards S1 from Hunter River foreshore



Plate 2 **Typical foreshore treatments near S1**



4.2 Stockton 2

4.2.1 Existing Environment

The Stockton 2 indicative receiver is located at the intersection of Fullerton Street and Hereford Street and is representative of receivers to the south of the Orica facility. From this location the Orica facility can be viewed directly north. In the immediate vicinity of S2 are a church and the Boatrowers Hotel. The area surrounding S2 is predominantly residential. The topography of S2 and surrounding areas is generally flat.

Plate 3 shows the intersection of Fullerton Street and Hereford Street, beyond which are dwellings in all surrounding directions that are representative of residential receivers in the vicinity of S2.

Plate 4 details the typical foreshore treatments along the Hunter River in proximity to S2. Similar to S1, the foreshore near S2 contains a mix of broken vegetation although S2 has a higher density of vegetation obscuring views from receivers to the harbour.

4.2.2 Visual Impact

An artist's impression of the Orica facility as viewed from S2 with the project included is shown in **Figure 5**. From S2 the flares are largely shielded by existing infrastructure or are at heights which place them within the silhouette of existing infrastructure, blending them with the background. Overall the flares when viewed from S1 have a negligible visual impact.

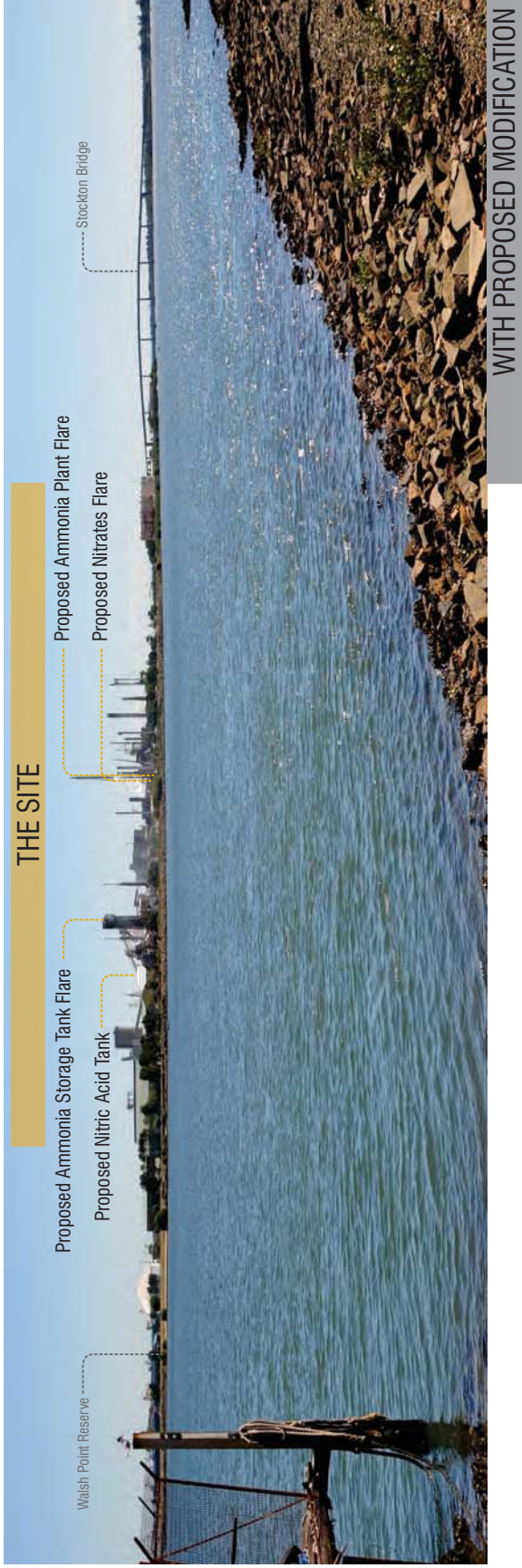
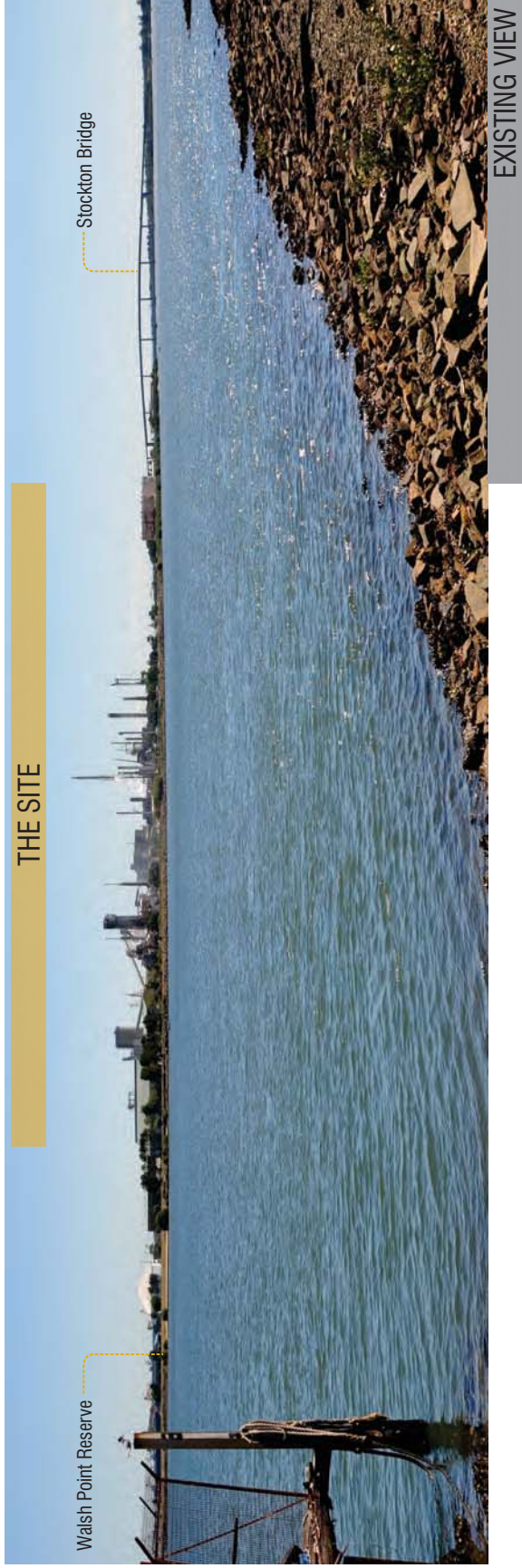
When viewed from S2 less than half of the nitric acid tank can be seen where it protrudes above the existing plant and screening vegetation. Due to the increased distance and greater amount of shielding from existing plant, the nitric acid tank is less visible from S2 than it is from S1. Whilst it is visible, its height is consistent with other tankage on both the Orica and adjoining sites. The tank is therefore within the visual context of the site and has an overall low visual impact.



Plate 3 View toward S2 from Hunter River Foreshore



Plate 4 Typical foreshore treatments near S2



5.0 Conclusion and Recommendations

The proposed project represents development associated with an existing industrial operation that is consistent with the historical land uses of the site and surrounding area. Although having only a small development footprint and being located wholly with the existing Orica site, the heights of the proposed infrastructure have potential to cause visual impacts to nearby residents.

The assessment of the potential visual impacts of the project concludes that overall, a low level of visual impact is expected to occur, due to:

- The scale of the proposed flares and their shielding by existing site infrastructure;
- The shielding of much of the nitric acid tank by existing plant and vegetation;
- The project being consistent with the industrial context of the site and surrounding land; and
- The offset distances between the site and the sensitive receivers.

The project would be compatible with the surrounding industrial development along the Hunter River, and is consistent with the nature of the port infrastructure. The appearance of the project would fit well within the existing industrial landscape of the area.

Despite this it is recommended that the following measures be implemented to minimise ongoing visual impacts:

- All lighting design should be undertaken in accordance with *AS 4282(INT)-Control of Obtrusive Effects of Outdoor Lighting*.
- All infrastructure should be maintained to a high standard and appearance with a focus on the external skin of the nitric acid tanks.
- The existing landscaping and vegetation screens of the Orica site should be subject to ongoing maintenance to maintain the effectiveness of the vegetated screen.