Scoping Report.

REQUEST FOR SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

ATTACHMENT 14

VISUAL IMPACT ASSESSMENT METHODOLOGY & SCOPING REPORT

OCTOBER 2019

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VIA

VISUAL IMPACT ASSESSMENT
Methodology Statement & Scoping Report

HANSON TWEED SAND PLANT EXPANSION

PREPARED FOR
Hanson Construction Materials Pty Ltd

OCTOBER 2019

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Methodology Statement & Scoping Report

Visual Impact Assessment Hanson Tweed Sand Plant Expansion

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0.0 Contents

1.0 Introduction

Zone Landscape Architecture (Zone, ZLA) have been engaged by Hanson Construction Materials Pty Ltd (the Proponent) to prepare a scoping analysis and methodology for a Visual Impact Assessment (VIA) assessing the proposed expansion and redevelopment of the Hanson Tweed Sand Plant located at Cudgen NSW hereon referred to as 'the project'.

This document has been prepared to outline the proposed scope and methodology of the projects VIA for authority and other stakeholder consideration as part of the projects scoping report and request for Secretary's Environmental Assessment Requirements (SEAR's). The scoping worksheet for the project has identified visual amenity as a 'key issue' that will require consideration of cumulative impact and focused engagement with stakeholders.

As this report is for scoping and methodology only, this report will not include detailed findings or associated mitigation strategies. It does however summarise initial desktop analysis findings to identify key vantage points proposed for assessment as part of future VIA and the adjoining projects proposed for inclusion as part of cumulative impact considerations.

It is the aim of this report to achieve, as far as practical, an acknowledgement and agreement at SEAR's stage of the methodology of the VIA, how the VIA will identify the extent of impacts (positive or negative); and the key vantage points and cumulative impact considerations to be assessed as part of the project VIA.

2.0 Description of Proposed Development

The project is the expansion of the existing Hanson Tweed Sand Plant that currently has an approval to operate over Lot 22 DP 1082435, Lot 23 DP 1077509 and Lot 494 DP 720450. The expansion/redevelopment site is proposed over Lot 22 DP1082435, Lot 23 DP1077509, Lot 494 DP720450, Lot 1 DP1250570, Lot 2 DP1192506, Lot 51 DP1166990, Lot 3 DP1243752, Lot 50 DP1056966. The lots comprising the project are collectively referred to as 'the subject site'. Access will be via Melaleuca Road, Pacific Hwy Road Reserve and Lot 51 DP1056966, the site and access points are illustrated in Figure 1.0 Context Plan.

Existing sand extraction occurs via dredging and is pumped to an onsite plant for washing and stockpiling for haulage. Currently, the site has approval to transport up to 500,000 tonnes of material from the site in any financial year.

As part of the expansion and redevelopment, extraction via dredging and onsite washing and stockpiling will be maintained, however total extraction and transportation is proposed to increase to 950,000 tonnes per annum and a total volume of 30 to 35 million tonnes. Life span of the project will be 30 years. Sand extraction will occur across several stages or phases with wash plant and stockpile areas to be relocated as operational requirements dictate (tbc) and the recommendations of future detailed investigations/studies relating to the 'Key Issues' and 'Other Issues' identified by the project scoping worksheet.

The project end use will create a public access, multi-use facility which will support a range of recreational activities. The layout and ultimate form this may take are still being investigated as part of project development and will continue to evolve in response to stakeholder feedback and the outcomes of detailed studies.

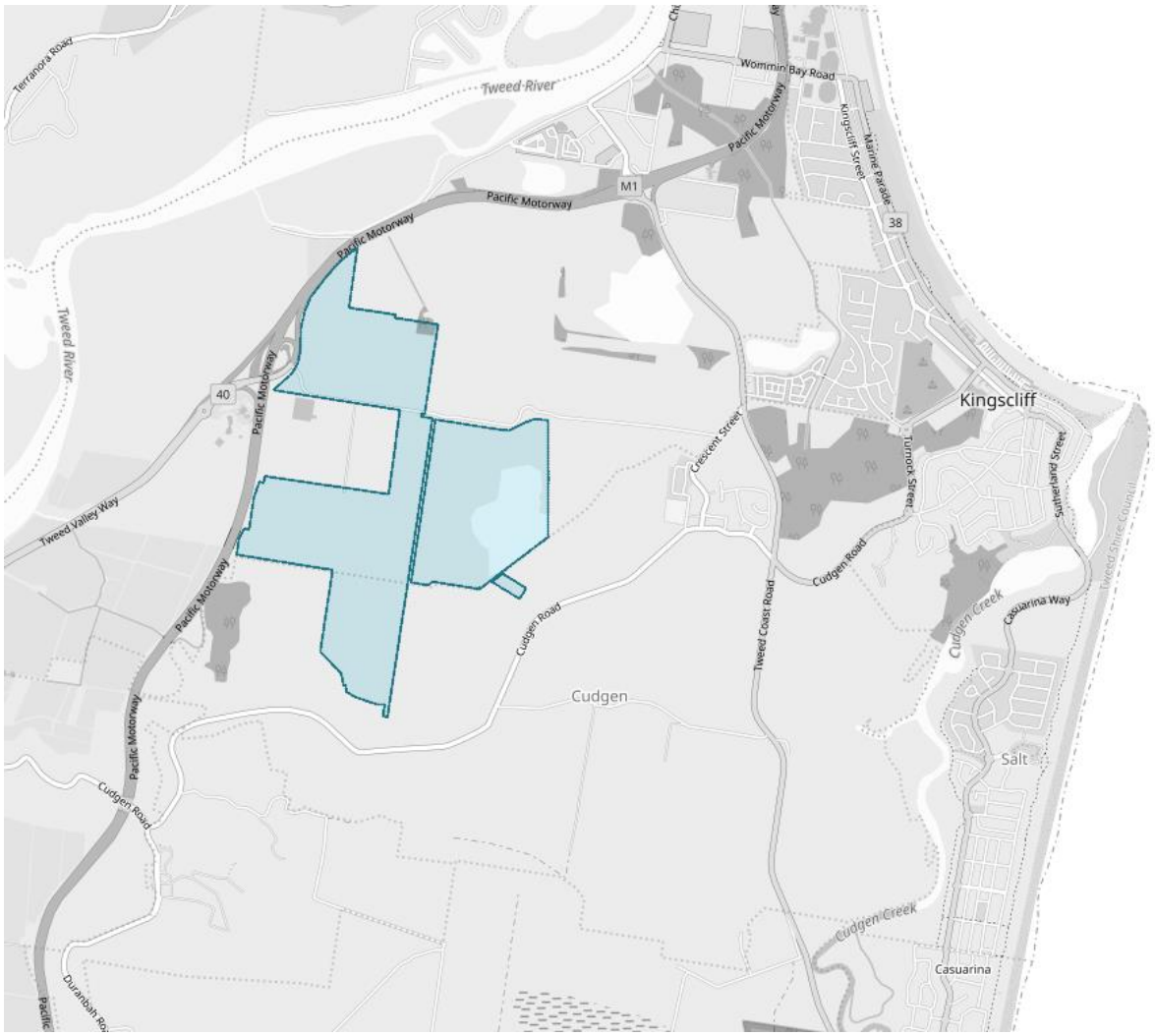


Figure 1.0 Subject Site in Local Context

3.0 Project Scoping

The scoping worksheet for the project has identified visual amenity as a 'key issue' that will require consideration of cumulative impact and focused engagement with stakeholders. In accordance with the findings of the scoping worksheet it is proposed that the VIA will consider both the cumulative impact of the projects

identified in section 3.1 below and will address / consider the relevant outcomes of stakeholder engagement that will be undertaken as discussed under 3.2.

3.1 Cumulative Impact

Key projects located within the local area proposed for inclusion as part of cumulative impact considerations are noted below.

Map Reference	Lot Description	Landuse: Operation	Proximity to Subject Site
A	1//DP1192506	Australian Bay Lobster Producers: Large scale Sheds	380m
B	2//DP216705	Cudgen Lakes Sands: Sand Extraction works	100m

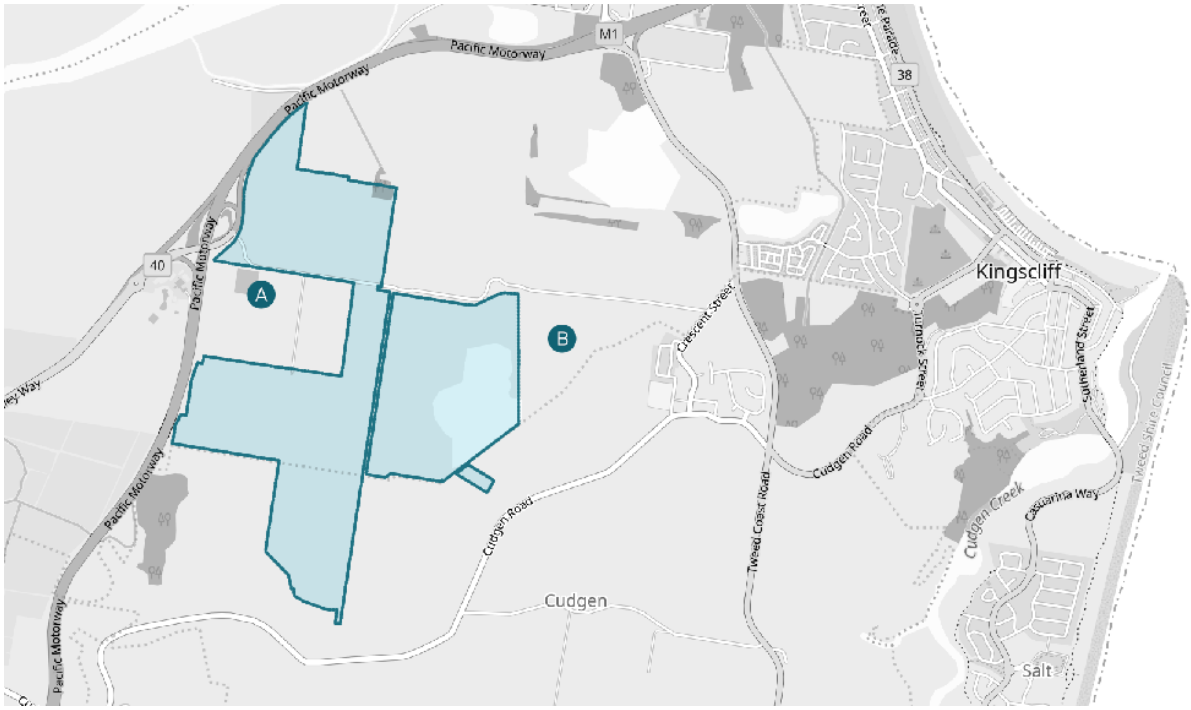


Figure 1.1
Subject Site in Local Context: Adjacent Landuses identified for assessment as part of Cumulative Impact.

3.2 Stakeholder Engagement

Steve MacRae Development Services Pty Ltd (SMDS) with the assistance of Zone Planning Group Pty Ltd have been engaged as part of the project team to undertake community and stakeholder consultation for the project. A separate scoping and methodology report for this consultation has been prepared.

This separate scoping and methodology outline the projects strategy of which entities should be consulted, why they should be consulted, and the method of consultation to be undertaken. As part of the VIA, the community and stakeholder feedback received in relation to visual amenity will be discussed and considered.

4.0 VIA Objectives

The objective of this report is to assess the potential impact of the proposed changes to the subject site and its surrounds in context with the scenic amenity of the local region.

Key visual catchment zones will be identified through both topographic and photographic studies and cross referenced with SLS TSC Visibility Mapping and Property Report tool to determine the scenic amenity of the subject site and its context. The potential visual impact of the proposal on the identified catchments will be assessed and evaluated against recognized visual assessment principals.

The objectives of the VIA will be:

- To establish the key vantage points for the project;
- To assess the potential impact of the project to the site in context with the established scenic amenity of the local region;
- To assessment the cumulative impact of the project and other projects or operations immediately adjacent to the site in context with the established scenic amenity of the local region; and
- Identify appropriate mitigation measures (if required)

5.0 Report Structure

The subsequent VIA that will follow this Methodology Statement & Scoping Report will be structured with key chapters consistent with industry standard environmental assessment documentation, generally summarized as follows;

1. Description of Proposed Development

2. Author and Qualifications

3. Regulatory Context

4. Methodology

5. Site Description and Landscape Character Analysis

6. Affected Environment and Viewers

7. Impact Analysis

8. Proposed Mitigation

9. Response to Scenic Management Principles

6.0 Identifying Key Vantage Points

The identification of viewing situations as key vantage points for assessment in the VIA will be determined via a two step process:

- Step 01: A review of the Tweed Shire Council Scenic Landscape Strategy (SLS) and associated interactive mapping will be undertaken to establish potential viewing situations applicable to the allotments which form the site.

  An overview of the SLS and its relevance to the proposed methodology is summarized in Section 6.1

- Step 02: Topographic and photographic studies to 'vet' the potential viewing situations identified by the SLS will follow. This 'vet' will apply a set of criteria to identify which of the viewing situations are Key Vantage Points for assessment, whether they are possible Key Vantage Points that will require further site investigation to rule in or out as Key Vantage Points and those which are not considered Key Vantage Points and which will not be considered by the VIA.

  The proposed methodology for determining KVP's is detailed within Section 7.0 VIA Methodology.

Initial key vantage points have been identified as part of this methodology and scoping report utilising the above processes. It is these Key Vantage Point that are proposed for analysis in the subsequent VIA or for further assessment to rule in or out of assessment.

6.1 TSC Scenic Landscape Strategy

Tweed Shire Council has been actively developing the Scenic Landscape Strategy (SLS) since 2016. The initial exercise undertaken was the mapping and assessment of the prominent landscape character types and significant public viewing locations in the region. This exercise lead to the development of the draft Scenic Landscape Strategy

Council endorsed the public exhibition of the draft SLS and supporting policies, including draft amendments to the Tweed Development Control Plan 2008 and draft Council Policy Statement. Industry consultation and public exhibition feedback submissions closed on Wednesday 19 June 2019. This strategy is under review with Implementation pending as of date of this report.

This Methodology Statement & Scoping Report recognises the importance and relevance of the SLS and reference to this strategy will be made throughout this report to ensure that the methodology, terminology and overall intent of the strategy is applied to the assessment.

6.1.1 Primary Objectives

TSC summarise the objectives of the SLS as follows:

1	Understand the visual elements and qualities of the Tweed's landscape character and scenic views that are valued and important to the community;
2	Incorporate community preferences and perceptions into landscape character narratives.
3	Understand how they may be affected by future change, and identify those most sensitive to modification;
4	Identify management strategies for the protection and/or enhancement of scenic amenity, through well informed planning decisions;
5	Recommend measures to improve and promote viewing experiences and cultural interactions within scenic landscapes in the Tweed.

Table 1.0 SLS Primary Objectives

6.1.2 VIA Level Required

A thorough risk evaluation has not been undertaken as part of this initial methodology report. It is determined however that the scale and nature of the proposed development will trigger the requirement for an Expanded Visual Impact Assessment under the TSC SLS Visual Risk Evaluation. These tables are included below for reference. A detailed risk evaluation will be undertaken as part of the Expanded VIA Report.

It is noted that this level of assessment will require community consultation. Steve MacRae Development Services Pty Ltd (SMDS) has been engaged as part of the project team to provide this Community Consultation Proposal which recommends the strategy of which entities should be consulted, why they should be consulted, and the method of consultation to be undertaken.

TSC Scenic Landscape Strategy Risk Evaluation schedule is included over for reference.

Visual Risk Evaluation				
Criteria		Variables		
A	Visibility The number of mapped priority viewsheds applicable to the site.	Routine Activities or developments that are visually consistent with the existing landscape character and surrounding land use activity or Are considered to be minor activities or development that will cause minimal visual disturbance to the existing visual character and quality of the surrounding landscape.	Intermediate Activities or development where the visual character or built form is unlike that of the dominant surrounding landscape or land use character.	Significant Large scale complex and/or controversial proposals of significant contrasting character, scale or form.
B	Visibility The number of mapped priority viewsheds applicable to the site.	1 - 2	3 - 9	> 10
C	Visual Alteration What level of visual alteration will occur? Consider the contrast of the proposal to the existing visual landscape in terms of shape, colour, scale, reflectivity, type of materials, vegetation removal, earthworks, overall character etc.	Minor / Negligible The proposal constitutes a minor component of the wider view, and is relatively compatible with the dominant landscape character. Awareness of the proposal would not have a marked effect on the overall quality of the scene.	Moderate The proposal results in visible and recognisable new elements within the overall visual landscape, yet one that is relatively compatible with the surrounding character (either existing or planned) and does not substantially detract from the visual quality of the scene.	Substantial The proposal becomes a dominant and immediately recognisable feature of the landscape to which other elements are generally subordinate. It noticeably contrasts in scale and character (either existing or planned), and is detrimental to the visual quality of the scene.
Score		1	2	3

	Overall Score	2-4	5-6	7-9
Results	Documentation Required	Statement	Standard	Expanded
	Early Community Consultation Required	No	Potentially	Yes
	Must be prepared by a professional	No	No	Yes

Table 2.0 SLS Visual Risk Evaluation

7.0 VIA Methodology

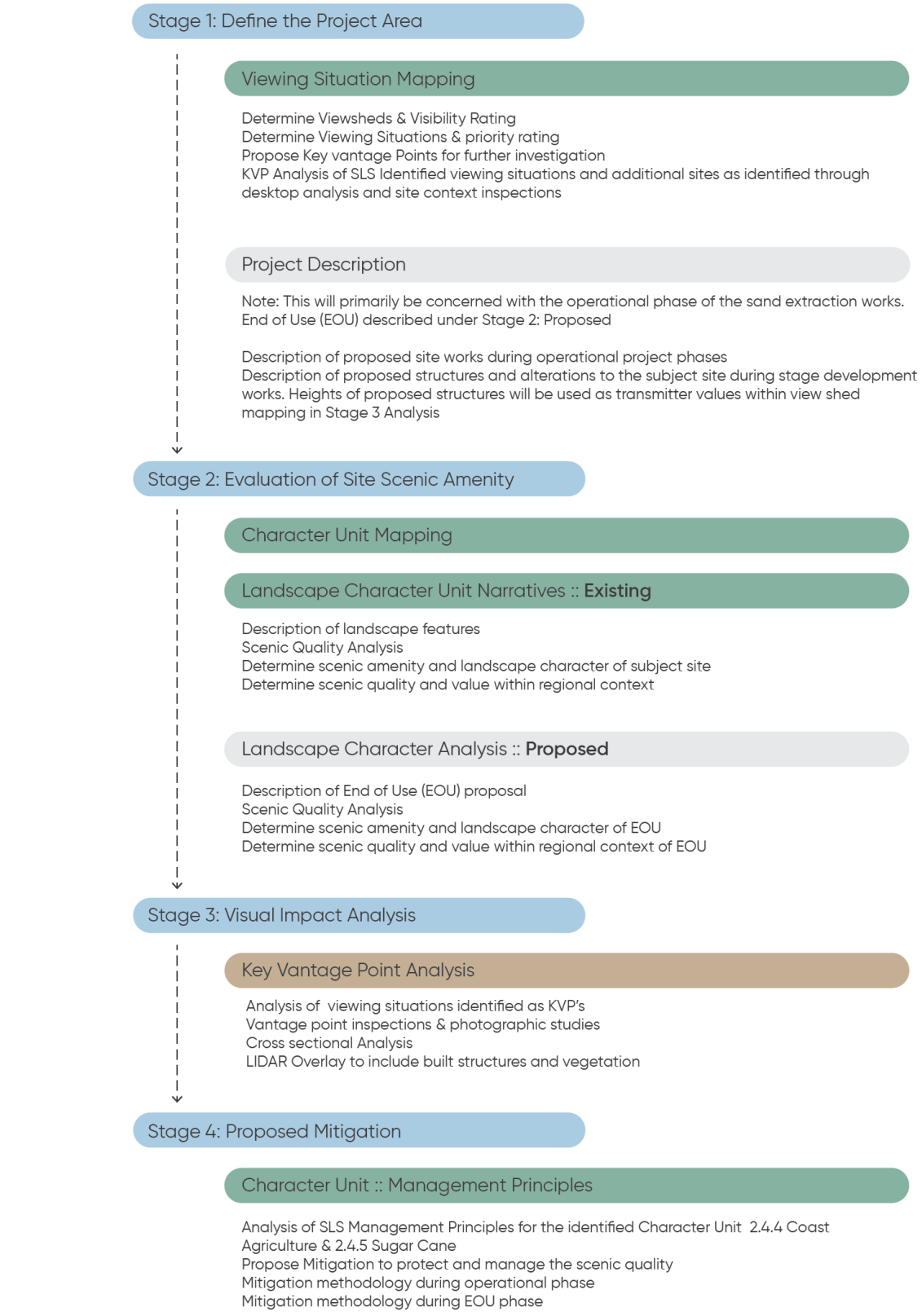
Key visual catchment zones will be identified through both topographic and photographic studies and with reference to the Tweed Shire Council's Scenic Landscape Strategy (SLS) interactive mapping. This mapping tool prototype has been developed by Tweed Shire Council for the purposes of exhibiting the spatial data and mapping associated with the draft Scenic Landscape Strategy.

Additional investigation will be undertaken to assess the impact of the proposed development through detailed topographic studies including the generation of view shed analysis presented in both 2D and 3D mapping to clearly illustrate findings.

The potential visual impact of the proposal on the identified catchments will be assessed and evaluated against recognized visual assessment principals as determined by the Institute of Environmental Management & Assessment 2019 and described by the Landscape Institute for Environmental Management and Assessment (LIIEMA).

A four-stage process is proposed in line with the methodology as described within Tweed Shire Council VIA Assessment Guide is to be applied. These stages and associated proposed methodology are summarized graphically in Figure 2.0. This Methodology Summary is also included as Attachment 02 for reference.

Figure 2.0 VIA Methodology Summary
(Refer also Attachment 02)



7.1 Stage 1: Define the Project Area

The objective of this report is to assess the potential impact of the proposed changes to the subject site and its surrounds in context with the scenic amenity of the local region.

Key visual catchment zones will be identified through both topographic and photographic studies and cross referenced with SLS TSC Visibility Map layer and Property Report tool to determine the scenic amenity of the subject site and its context. The potential visual impact of the proposal on the identified catchments will be assessed and evaluated against recognized visual assessment principals.

To determine any potential visual impacts, it will be necessary to define the visual catchment of the site. This will be undertaken utilizing the following GIS Mapping Programs and associated data resources;

- **Priority 01 & 02 Viewshed Mapping Plan**
  Generated using the SLS TSC Visibility Map layer and Property Report tool to determine the scenic amenity of the subject site and its context.

- **Viewing Situation Plan**
  Generated using the SLS TSC Ineractive Mapping to determine the number of mapped vantage points with views to the subject site.

- **Visual Catchment Boundary Plan**
  Generated using Global Mapper R15 and AutoCad and based on Digital Elevation Model (DEM)The Digital Elevation Model (DEM) Grid LiDAR 2015

- **Visual Catchment Isometric Analysis Plan**
  Generated using Global Mapper R15 and AutoCad and based on Digital Elevation Model (DEM)The Digital Elevation Model (DEM) Grid LiDAR 2015 / SRTM Elevation Data

- **Cross Sectional Analysis of Viewing Situations**
  Generated using Global Mapper R15 and AutoCad and based on Digital Elevation Model (DEM)The Digital Elevation Model (DEM) Grid LiDAR 2015 / SRTM Elevation Data

The Viewing Situations as identified through SLS viewing situation mapping and the above referenced analysis mapping will be further investigated to determine Key Vantage Points (KVP's) based on the following criteria; a) Proximity to subject site, b) Location along primary vehicular or pedestrian networks and; c) Areas of elevated topography.

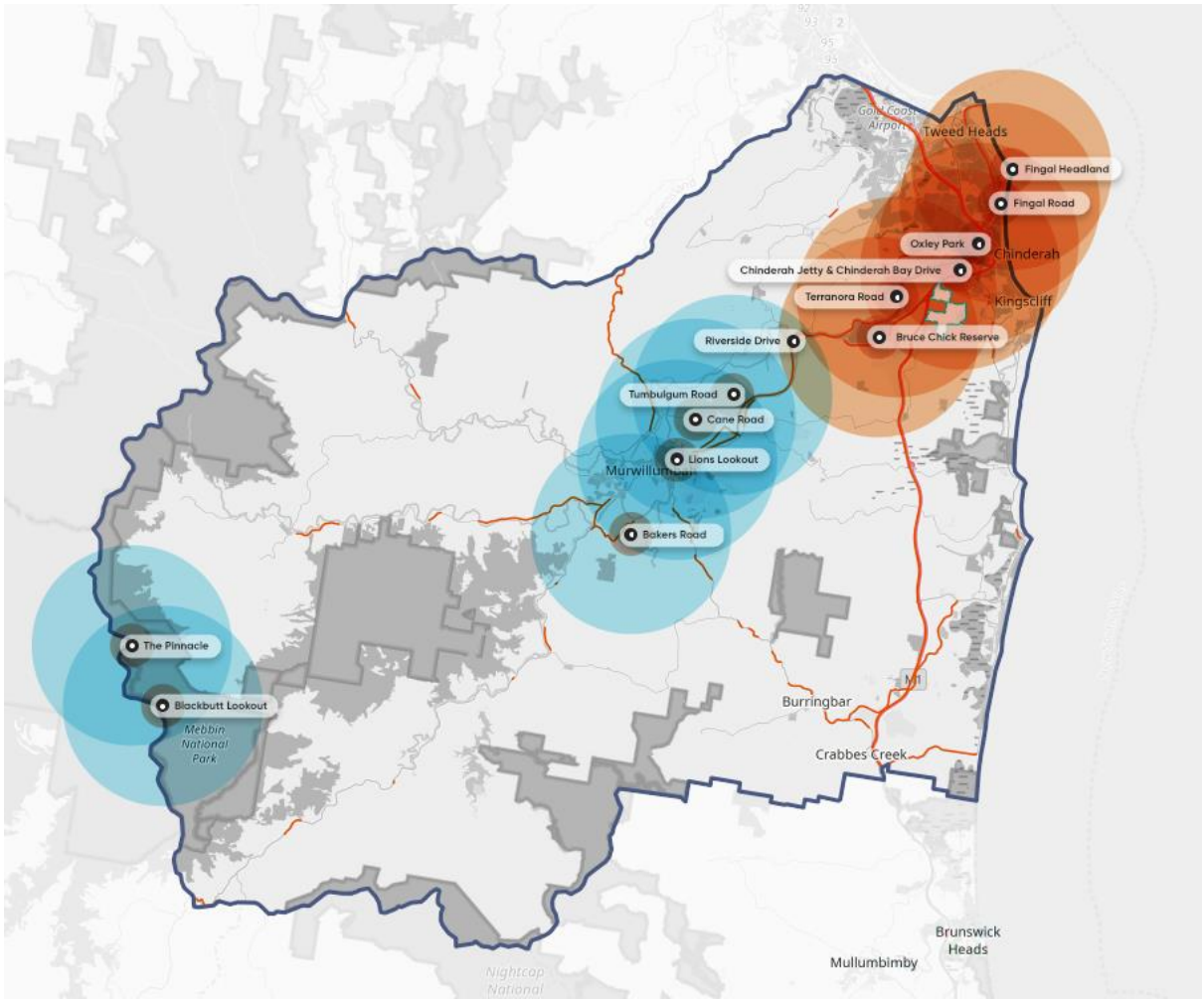
Emphasis will be placed on sensitive receptors such as areas of existing residential development within a close proximity to the subject site and areas determined to be located within the visual catchment resulting from the proposed site development. Verification of these KVP's will be made through site inspections and

photographs will be recorded where relevant to investigate any potential visual impact of the subject sites proposed development works.

The significance of impacts will be evaluated using a combination of landscape impacts and visual impacts, these are defined further in Stage 3 Analyse Visual Impacts.

Initial desktop findings based on SLS Mapping are identified in below with full schedule included as Attachment 01. Attachment 01 schedule outlines a series of viewing situations identified for further investigation in subsequent Visual Impact Assessment reporting. These viewing situations are listed below and included in Attachment 03 Plan 1.0 Viewing Situations Plan. An excerpt of this plan is included below for reference.

Plan 1.0 Viewing Situations Plan



Viewing Situation
Identified as a Key Vantage Point for Investigation
1000m | 5000m Radius Illustrated

Viewing Situation
Nil Additional Investigation Required
1000m | 5000m Radius Illustrated

Viewing Situation
Linear Viewing Situations (SLS)

Tweed Shire Boundary

Viewing Situations as identified through SLS, illustrated in Plan 1 Viewing Situations Plan:

1) Bakers Road
2) Blackbutt Lookout
3) Bruce Chick Reserve
4) Cane Road & Tumbulgum Road
5) Chinderah Bay Drive
6) Chinderah Jetty
7) Chinderah Pub & Foreshore
8) Fingal Headland (Grants Causeway)
9) Fingal Road
10) Lions Lookout
11) Oxley Park
12) Pacific Highway
13) Riverside Drive
14) Terranora Road
15) The Pinnacle Lookout
16) Tweed Coast Road
17) Tweed River Panorama
18) Tweed Valley Way

7.2 SLS Key Vantage Points

Initial investigation of the Viewing Situations as identified through SLS spatial data mapping has been undertaken to determine Key Vantage Points (KVP's) based on the following criteria;

a) Proximity to subject site
b) Area covered by the Viewshed of the Viewing Situation
c) Priority 01 & Priority 2 Status Included
d) Linear & Static Included
e) All character units included

These criteria are applied to Viewing Situations through an Assessment Matrix, refer Table 2.0.

Table 2.0 Key Vantage Point Assessment Matrix

Viewshed Site Cover	**Proximity to Site**		
	<5.0km	5.0km – 10km	>10km
<10%	Y	N	N
>10%	Y	Y	N

Through application of this matrix, a summary of Viewing Situations determined as Key Vantage Points for further investigation are listed below (Table 3.0), a full data schedule is provided in Attachment 01.

Table 3.0 Key Vantage Points Identified

Lot Description	Viewing Situation (VS) Name	% Land Covered	VS Distance from Site (km)	KVP (Y/N)
22//DP1082435	Pacific Highway	73.20%	1.12	Y
	Terranora Road	94.70%	3	Y
23//DP1077509	Tweed Coast Road	8.60%	2.32	Y
	Pacific Highway	79%	1.12	Y
	Terranora Road	76.60%	3	Y
494//DP720450	Pacific Highway	60.50%	1.12	Y
	Terranora Road	99.60%	3	Y
1//DP1250570	Pacific Highway	83.19%	1.12	Y
	Terranora Road	98.30%	3	Y
2//DP1192506	Tweed Coast Road	6.40%	2.32	Y
	Pacific Highway	64.30%	1.12	Y
	Fingal Headland (Grants Causeway)	6.10%	7.04	Y
	Terranora Road	94.20%	3	Y
51//DP1166990	Pacific Highway	72.10%	1.12	Y
	Chinderah Bay Drive	98.40%	2.3	Y
50//DP1056966	Pacific Highway	100%	1.12	Y
	Terranora Road	9.40%	3	Y
51//DP1056966	Tweed Coast Road	15.60%	2.32	Y
	Pacific Highway	85.30%	1.12	Y
	Bruce Chick Reserve	6.70%	3.89	Y
	Fingal Road	10.80%	4.51	Y
	Chinderah Bay Drive	7.2	2.3	Y
	Terranora Road	55.80%	3	Y
	Tweed River Panorama	9%	1.88	Y
	Oxley Park	12.20%	3.02	Y

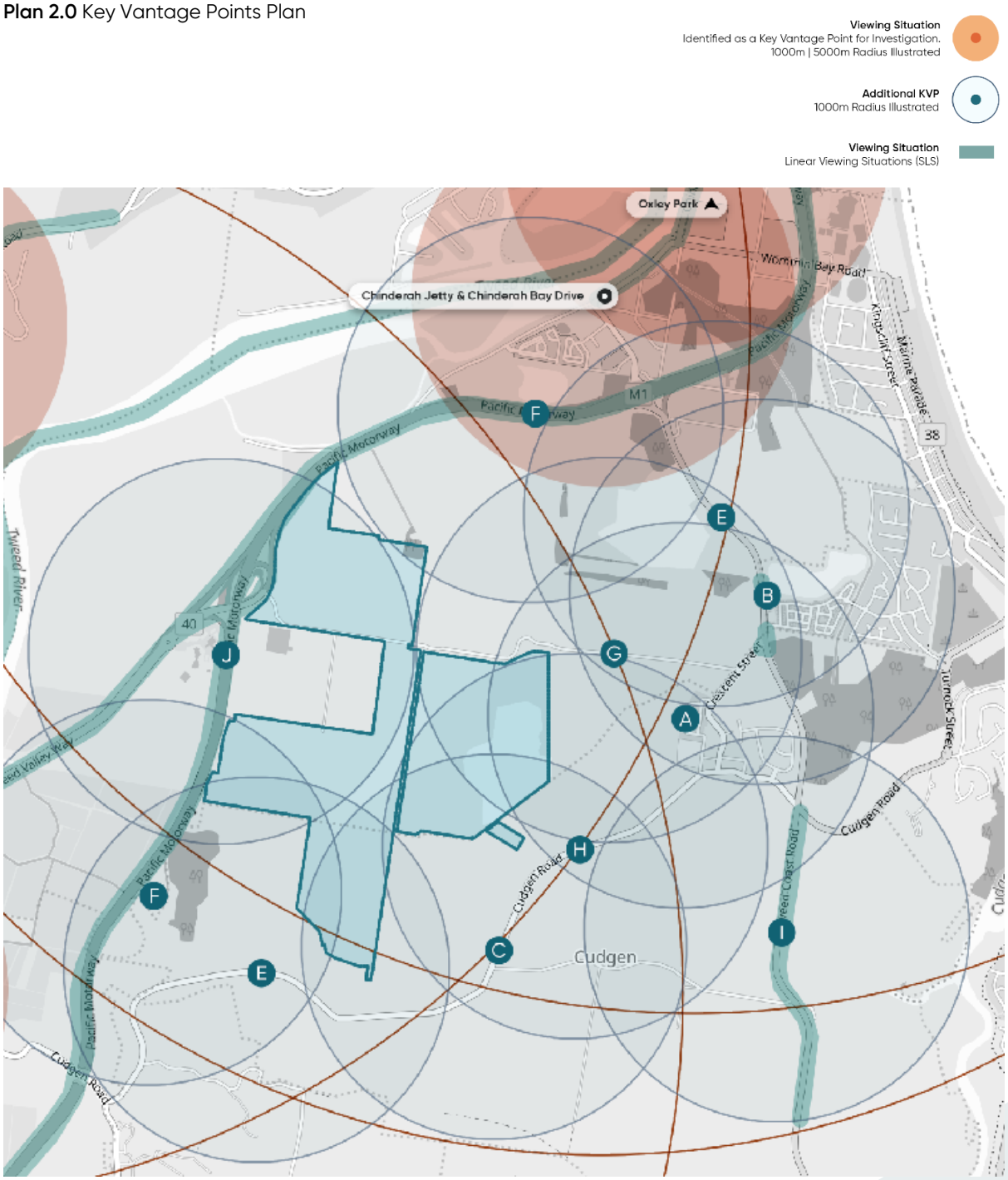
7.3 Non-SLS Key Vantage Points

The Key Vantage Points identified in Table 3.0 do not represent the KVP's in their entirety. These have been determined through desktop analysis only. Additional KVP have be identified through both topographic and photographic studies as described in this report to identify additional Viewing Situations within a regional

context and immediate site surrounds. The selection criteria and principals as identified in this report have been applied through desktop analysis to identify the below listed location as KVP.

These KVP are listed below and are included in Attachment 03 Plan 2.0 Key Vantage Points Plan. An excerpt of this plan is included below for reference.

Plan 2.0 Key Vantage Points Plan



KVP A
Collier Street Cudgen
Lat: 28°15'41.99"S
Long: 153°33'19.05"E
Distance from Site: 750m

KVP B
Les Noble Parade
Lat: 28°15'19.23"S
Long: 153°33'36.80"E
Distance from Site: 1250m

KVP C
Plantation Road
Lat: 28°16'26.90"S
Long: 153°32'37.86"E
Distance from Site: 450m

KVP D
Cudgen Road
Lat: 28°16'27.52"S
Long: 153°31'51.44"E
Distance from Site: 300m

KVP E
Tweed Coast Road
Lat: 28°16'14.39"S
Long: 153°31'24.85"E
Distance from Site: 825m

KVP F
Pacific Motorway
Lat: 28°14'44.46"S
Long: 153°32'42.73"E
Distance from Site: 1000m

KVP G
Altona Road
Lat: 28°15'29.16"S
Long: 153°33'9.02"
Distance from Site: 50m

KVP H
Cudgen Road
Lat: 28°16'5.71"S
Long: 153°32'53.14"E
Distance from Site: 350m

KVP I
Tweed Coast Road
Lat: 28°16'18.13"S
Long: 153°33'38.58"E
Distance from Site: 1500m

KVP J
Pacific Motorway
Lat: 28°15'33.26"S
Long: 153°31'41.13"E
Distance from Site: 150m

7.4 Stage 2: Evaluation of Site Scenic Amenity

This phase will determine the natural and cultural scenic amenity of the project site and landscape setting with reference to TSC Landscape Character Unit Map layer and SLS Part 2 Landscape character assessment and narratives. The evaluation of the subject site and its regional context to determine its scenic quality will assist in determining the potential impact of the proposed works and inform potential mitigation methodologies.

It is noted that the proposed expansion works will result in a change of land use from that of rural cane land and other sporadic agricultural uses to an ultimate landscape of a series of large 'blue water' lakes and community spaces. The proposed end of use can generally be described as a series of large brackish (salt) clean water lakes will be created, shorelines embellished, and the area made available for public use. The scenic amenity of this end of use will be described and evaluated is this section and evaluated against a comparable character unit narrative under the SLS. The applicant proposes to deliver staged landscaped areas surrounding the lakes that are suitable for public use.

As noted within the SLS, there are numerous visual features that give the Tweed landscape its high scenic quality and play a role in the Shire's identity and image. These were summarised within the Tweed Scenic

Landscape Evaluation (November 1995) by Catherine Brouwer, and are still considered important landscape characteristics of the Tweed Shire twenty years on:

- High diversity of landscape form and vegetation patterns;
- Predominately natural character and frequent views of water or mountains;
- Openness of the Tweed River valley with the distinctive, steeply rising Wollumbin/Mt Warning in the centre and the dramatic enclosing backdrop of the caldera rim;
- Frequent access to long, wide, highly legible views;
- Uniformity of the cane fields and forested hillsides that accentuates any visual intrusion or clearing;
- Steepness and closeness to view of the hillsides that form the prominent natural setting for views from villages and roads;
- Location of scenic historic villages and townships along main or tourist roads, with development occurring in the foreground of views of the village setting or roader landscape;
- Predominantly natural and pristine landscapes as distinct and contrasting from monoculture and high-density suburban communities.

The scenic amenity and character of the site and its regional context will be further described and evaluated through the analysis of the potential visual impact of the proposed development works.

Table 3.0 Character Units Identified

Sugar Cane	98.74%
Coastal Agriculture	1.26%

7.5 Stage 3: Visual Impact Analysis

A qualitative assessment of visual impacts forms the Stage 3 component of the assessment. The significance of impacts will be evaluated through the analysis of landscape impacts and visual impacts, as defined below.

B. Landscape Impact

Landscape impacts refer to the relative capacity of the landscape to accommodate changes to the physical landscape of the type and scale proposed that would occur as a direct result of the proposed development, through the introduction of new features or loss/modification of existing features.

Impacts have been assessed from identified viewpoints (Key Vantage Points) and consider (through professional judgement) the scale of change including:

- The extent to which the change (modification, removal and / or addition) of landscape features alters the existing landscape character visible to each Key Vantage Point;

- The extent of area from which the effect is evident;
- The duration of the effect (short/medium/long term, permanent/temporary);
- The physical state (or condition) of the landscape and its intactness from visual, functional, and ecological perspective. This includes consideration of the condition of landscape elements (eg. groups of features within the soft landscape including roadside planting, open space, recreational facilities, creek lines, tree, bush blocks), or features (eg. prominent eye-catching elements such as a distinctive building and/or its setting, significant mature specimen tree, lookout point, etc) and their contribution to landscape character. Individual features and elements make up the character of a place and influence how the landscape is experienced.

Table 4.0 Assessment of Landscape Impact (Source: Landscape Institute and Institute for Environmental Management and Assessment, 2002)

B. Visual Impact

Visual impacts arise from changes in available views of the landscape that occur as a result of the development. Visual impact is determined through the subjective assessment of sensitivity of the visual receptors (i.e. residents, outdoor recreational users) and the magnitude (scale) of the change in view. Sensitivity is dependent upon receptors' location; the importance of their view; their activity (i.e. working, recreational, or travelling through); expectations; available view; and the extent of screening of this view.

Factors that have been considered in assessing the response of receptors to changes in the visual amenity include:

- Interest in the visual environment and their distance/angle of view to the source of the impact;
- The extent of screening/filtering of the view;

Landscape impact	Definition
Large	A substantial / obvious change to the landscape due to total loss of, or change to, elements, features or characteristics of the landscape. Would cause a landscape to be permanently changed and its quality diminished.
Moderate	Discernible changes in the landscape due to partial loss of, or change to the elements, features or characteristics of the landscape. May be partly mitigated. The change would be out of scale with the landscape, and at odds with the local pattern and landform and will leave an adverse impact on a landscape of recognised quality.
Small	Minor loss or alteration to one or more key landscape elements, features, or characteristics, or the introduction of elements that may be visible but may not be uncharacteristic within the existing landscape.
Negligible	Almost imperceptible or no change in the view as there is little or no loss of / or change to the elements, features or characteristics of the landscape.The existing landscape quality is maintained but be slightly at odds to the scale, landform and pattern of the landscape.

- Magnitude of change in the view (i.e. loss/addition of features that change the view's composition);
- Integration of changes within the existing view (form, mass, height, colour and texture);
- Duration of the effect (temporary/permanent, intermittent/continuous)

Receptor sensitivity definitions used to describe this assessment have been outlined in Table 5.0.

Table 5.0 Assessment of Receptor Sensitivity
(Source: Landscape Institute and Institute for Environmental Management and Assessment, 2002)

Sensitivity	Definition
High	Occupiers of residential properties with long viewing periods, within close proximity to the proposed development
	Users of outdoor recreational area including nature reserves, and nature based recreation (walking, horse riding trails, water based activities such as swimming and fishing) where their attention is focused, in part, on the landscape and its amenity
	Communities that place value upon the landscape and enjoyment of views of their landscape setting
Medium	Outdoor workers who have a key focus on their work who may also have intermittent views of the Project Area
	Outdoor recreation users (i.e. sporting activities) where their attention is focused predominately on the activity being undertaken
	Occupiers of residential properties with long viewing periods, at a distance from or screened from the Project Area
Low	Road users in motor vehicles, trains or on transport routes that are passing through or adjacent to the study area and therefore have short term views
	Viewers indoor at their place of work
Negligible	Viewers from locations where there is screening by vegetation or structures where only occasional screened views are available and viewing times are short
	Road users in motor vehicles, trains or on transport routes that are passing through/adjacent to the study area and have partially screened views and short viewing times

C. Significance of Impact

For the purposes of this assessment, predicted impacts as a direct result of the project will be described according to their significance, which is a function of the magnitude of the impact and the sensitivity of the receptor as detailed in Table 6.0.

Table 6.0 Significance of Impact (Source: Landscape Institute and Institute for Environmental Management and Assessment, 2002)

		Landscape Impact			
		Large	Moderate	Small	Negligible
Visual Sensitivity	High	Major Significance	High Significance	Moderate Significance	Minor Significance
	Medium	High Significance	Moderate Significance	Minor Significance	Not Significant
	Low	Moderate Significance	Minor Significance	Not Significant	Not Significant
	Negligible	Minor Significance	Not Significant	Not Significant	Not Significant

7.6 Stage 4: Proposed Mitigation

The report will conclude with a summary of findings and proposed mitigation measures to help avoid, minimise, compensate (or enhance) the impacts identified with reference to the SLS Scenic Management Principles.

8.0 Limitations and Assumptions of Study

This report examines the current landscape and visual amenity of the study area through site inspections and through review of existing reports and studies including the Draft TSC Scenic Landscape Strategy.

A field inspection of the study location and identified area of interest including areas nominated by TSC for investigation will be conducted to determine amenity values and potential visual impacts. This inspection exercise will assist in gaining familiarity with the location and its landscape character and amenity values.

Whilst various data and information sources will be utilized in association with this report, various data limitations are present in such documents. As such, these limitations would also be transferrable to the information within this current report. Digital Elevation Model (DEM)The Digital Elevation Model (DEM) Grid LiDAR 2015 has been utilized for all topographic and viewshed mapping included within this report.

Interactive mapping available through the Draft Tweed Shire Council Scenic Landscape Strategy will also be used as a cross reference to all LIDAR based Viewshed mapping prepared as part of this report scope.

In this way, although Zone Landscape Architecture (ZLA) has taken every precaution in the report preparation process to ensure data accuracy, ZLA makes no representations or warranties about report suitability, accuracy or completeness for any particular purpose and disclaim all responsibility and all liability for all expenses, losses, damages and costs which may be incurred as a result of data being inaccurate or incomplete in any way and for any reason.

VIA
Attachment 01

TSC Scenic Landscape Strategy
Viewshed Mapping Analysis

OCTOBER 2019

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Visual Impact Assessment: TSC SLS Data Summary

Hanson Tween Sand Plant Expansion

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Lot Information (Subject Site)					TSC Scenic Landscape Strategy Mapping										VIA Report
Lot Description	Lot Area (Ha)	Context	Phase	Elevation (range m)	Character Unit Description	Character Unit Area	Veiwing Situation (VS) Name	Area Covered (Ha)	% Land Covered >10%= Highlighted	Priority (1 to 4)	VS Type	Visibility Map Rating	VS Distance from Site (km) <5km= Highlighted	VS Elevation	KVP Assesment (Y/N)
22//DP1082435	74.57	Existing Development	1-11	WL-3.5m	Sugar Cane	72.25	Tweed Coast Road	1.5	2.00%	Priority 1	Linear	3-5	2.32		N
					Coastal Agriculture	2.15	Tweed Valley Way	47.8	64.10%	Priority 1	Linear		16.91		N
							Pacific Highway	54.5	73.20%	Priority 1	Linear		1.12		Y
							Fingal Headland (Grants Causeway)	1.9	2.60%	Priority 1	Static		7.04	12.93m	N
							Terranora Road	70.6	94.70%	Priority 2	Linear		3		Y
							Fingal Road	0.7	0.90%	Priority 2	Linear		4.51		N
							Chinderah Bay Drive	0.8	1.10%	Priority 2	Linear		2.3		N
							Tweed River Panorama	1.5	2.50%	Priority 2	Linear		1.88		N
							Riverside Drive	1	1.30%	Priority 2	Linear		7.47		N
							The Pinnacle Lookout	30.6	41.10%	Priority 2	Static		42.8		N
							Blackbutt Lookout	2	2.70%	Priority 2	Static		43.5		N
							Oxley Park	0.6	0.80%	Priority 2	Static		3.02	1.3m	N
							Chinderah Jetty	0.7	1.00%	Priority 2	Static		2.32	WL	N
							Chinderah Pub & Foreshore	0.8	1.10%	Priority 2	Static		2.32	1.42m	N
							Lions Lookout	1.2	1.60%	Priority 2	Static		15.7	60.36m	N
23//DP1077509	2.55	Existing Development	1-11	0.5-1.2m	Sugar Cane	1.93	Tweed Coast Road	0.2182	8.60%	Priority 1	Linear	3-5	2.32		Y
					Coastal Agriculture	0.62	Tweed Valley Way	1.1	41.70%	Priority 1	Linear		16.91		N
							Pacific Highway	2	79%	Priority 1	Linear		1.12		Y
							Terranora Road	2	76.60%	Priority 2	Linear		3		Y
							Tweed River Panorama	0.0616	2.40%	Priority 2	Linear		1.88		N
							Riverside Drive	0.0397	1.60%	Priority 2	Linear		7.47		N
							The Pinnacle Lookout	0.6	23%	Priority 2	Static		42.8		N
494//DP720450	0.11	Existing Development	1-11	0.5-1.2m	Sugar Cane	0.09	Tweed Valley Way	0.071	68.10%	Priority 1	Linear	3-5	16.91		N
					Coastal Agriculture	0.02	Pacific Highway	0.0631	60.50%	Priority 1	Linear		1.12		Y
							Terranora Road	0.1039	99.60%	Priority 2	Linear		3		Y
1//DP1250570	89.29	Expansion site	6-11	0.5-1.2m	Sugar Cane	89.29	Tweed Coast Road	2.38	2.67%	Priority 1	Linear	3-5	2.32		N
							Tweed Valley Way	57.86	64.80%	Priority 1	Linear		16.91		N
							Pacific Highway	74.28	83.19%	Priority 1	Linear		1.12		Y
							Fingal Headland (Grants Causeway)	0.1362	0.15%	Priority 1	Static		7.04	12.93m	N
							Fingal Road	0.1362	0.15%	Priority 2	Linear		4.51		N
							Chinderah Bay Drive	1.98	2.22%	Priority 2	Linear		2.3		N
							Terranora Road	87.77	98.30%	Priority 2	Linear		3		Y
							Tweed River Panorama	0.1634	0.18%	Priority 2	Linear		1.88		N
							Chinderah Jetty	0.2594	0.29%	Priority 2	Static		2.32	WL	N
							Chinderah Pub & Foreshore	0.8514	0.95%	Priority 2	Static		2.32	1.42m	N
							Blackbutt Lookout	1.45	1.62%	Priority 2	Static		43.5		N
							Lions Lookout	1.32	1.48%	Priority 2	Static		15.7	60.36m	N
							Oxley Park	0.0675	0.08%	Priority 2	Static		3.02	1.3m	N
							The Pinnacle Lookout	30.67	34.35%	Priority 2	Static		42.8		N
2//DP1192506	11.12	Expansion site	7-11	0.5-1.2m	Sugar Cane	11.12	Tweed Coast Road	0.7	6.40%	Priority 1	Linear	3-5	2.32		Y
							Tweed Valley Way	5.5	49.60%	Priority 1	Linear		16.91		N
							Pacific Highway	7.1	64.30%	Priority 1	Linear		1.12		Y
							Fingal Headland (Grants Causeway)	0.7	6.10%	Priority 1	Static		7.04	12.93m	Y
							Bruce Chick Reserve	0.07	0.60%	Priority 1	Static		3.89	1.24m	N
							Terranora Road	10.5	94.20%	Priority 2	Linear		3		Y
							Cane Road & Tumbulgum Road	0.0835	0.80%	Priority 2	Linear		12.24		N
							Chinderah Bay Drive	0.1968	1.80%	Priority 2	Linear		2.3		N
							Bakers Road	0.1692	1.50%	Priority 2	Linear		19.01		N
							Blackbutt Lookout	4.7	42.40%	Priority 2	Static		43.5		N
							The Pinnacle Lookout	9.3	83.90%	Priority 2	Static		42.8		N
							Chinderah Pub & Foreshore	0.0762	0.70%	Priority 2	Static		2.32	1.42m	N
							Lions Lookout	1.7	15%	Priority 2	Static		15.7	60.36m	N
51//DP1166990	55.16	Expansion site	10-11	0.5-1.2m	Sugar Cane	55.16	Tweed Valley Way	40.1	72.80%	Priority 1	Linear	6-9	16.91		N
							Pacific Highway	39.8	72.10%	Priority 1	Linear		1.12		Y
							Fingal Headland (Grants Causeway)	0.6	1.20%	Priority 1	Static		7.04	12.93m	N
							Terranora Road	0.3855	0.70%	Priority 2	Linear		3		N
							Chinderah Bay Drive	54.2	98.40%	Priority 2	Linear		2.3		Y
							Bakers Road	4.1	7.40%	Priority 2	Linear		19.01		N
							Blackbutt Lookout	39.1	70.90%	Priority 2	Static		43.5		N
							The Pinnacle Lookout	39	70.80%	Priority 2	Static		42.8		N
							Lions Lookout	2.8	5.10%	Priority 2	Static		15.7	60.36m	N

50//DP1056966	1.09	Expansion site	N/A	0.5-1.2m	Sugar Cane	1.09	Tweed Valley Way	0.7	68.60%	Priority 1	Linear	3-5	16.91		N
							Pacific Highway	1.1	100%	Priority 1	Linear		1.12		Y
							Terranora Road	0.1022	9.40%	Priority 2	Linear		3		Y
							Bakers Road	0.2087	19.10%	Priority 2	Linear		19.01		N
							Blackbutt Lookout	0.6	53.30%	Priority 2	Static		43.5		N
							Lions Lookout	0.0545	5%	Priority 2	Static		15.7	60.36m	N
							The Pinnacle Lookout	0.4922	45%	Priority 2	Static		42.8		N
51//DP1056966	0.77	Expansion site	1-11	0.5-1.2m	Sugar Cane	0.77	Tweed Coast Road	0.1196	15.60%	Priority 1	Linear	6-9	2.32		Y
							Tweed Valley Way	0.6	78.60%	Priority 1	Linear		16.91		N
							Pacific Highway	0.7	85.30%	Priority 1	Linear		1.12	1.24m	Y
							Bruce Chick Reserve	0.0517	6.70%	Priority 1	Static		3.89		Y
							Fingal Road	0.0833	10.80%	Priority 2	Linear		4.51		Y
							Chinderah Bay Drive	0.0554	7.2	Priority 2	Linear		2.3		Y
							Terranora Road	0.4286	55.80%	Priority 2	Linear		3		Y
							Tweed River Panorama	0.0694	9%	Priority 2	Linear		1.88		Y
							Bakers Road	0.1202	15.60%	Priority 2	Linear		19.01		N
							Blackbutt Lookout	0.3612	47%	Priority 2	Static		43.5		N
							The Pinnacle Lookout	0.3086	40.20%	Priority 2	Static		42.8		N
							Oxley Park	0.0934	12.20%	Priority 2	Static		3.02	1.3m	Y

Key

Y **Key Vantage Points**

a) Proximity to subject site (<5.0km) **AND**
b) Area covered by the Viewshed of the Viewing Situation (>10%)
c) Priority 01 & Priority 2 Status Included
d) Linear & Static Included
e) All character units included

TBC **Viewing Situations TBC through site investigation**

a) Proximity to subject site (>5.0km) **OR**
b) Area covered by the Viewshed of the Viewing Situation (>10%)
c) Priority 01 & Priority 2 Status Included
d) Linear & Static Included
e) All character units included

NA **Viewing Situations Determined as Not Applicable - Nil further investigation proposed**

a) Proximity to subject site (>5.0km) **OR**
b) Area covered by the Viewshed of the Viewing Situation (<10%)
c) Priority 01 & Priority 2 Status Included
d) Linear & Static Included
e) All character units included

VIA
Attachment 02

VIA Methodology Summary

OCTOBER 2019

ZONE LANDSCAPE ARCHITECTURE

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Figure 2.0 VIA methodology Summary

Stage 1: Define the Project Area

Viewing Situation Mapping

Determine Viewsheds & Visibility Rating
Determine Viewing Situations & priority rating
Propose Key vantage Points for further investigation
KVP Analysis of SLS Identified viewing situations and additional sites as identified through desktop analysis and site context inspections

Project Description

Note: This will primarily be concerned with the operational phase of the sand extraction works. End of Use (EOU) described under Stage 2: Proposed

Description of proposed site works during operational project phases
Description of proposed structures and alterations to the subject site during stage development works. Heights of proposed structures will be used as transmitter values within view shed mapping in Stage 3 Analysis

Stage 2: Evaluation of Site Scenic Amenity

Character Unit Mapping

Landscape Character Unit Narratives :: **Existing**

Description of landscape features
Scenic Quality Analysis
Determine scenic amenity and landscape character of subject site
Determine scenic quality and value within regional context

Landscape Character Analysis :: **Proposed**

Description of End of Use (EOU) proposal
Scenic Quality Analysis
Determine scenic amenity and landscape character of EOU
Determine scenic quality and value within regional context of EOU

Stage 3: Visual Impact Analysis

Key Vantage Point Analysis

Analysis of viewing situations identified as KVP's
Vantage point inspections & photographic studies
Cross sectional Analysis
LIDAR Overlay to include built structures and vegetation

Stage 4: Proposed Mitigation

Character Unit :: Management Principles

Analysis of SLS Management Principles for the identified Character Unit 2.4.4 Coast Agriculture & 2.4.5 Sugar Cane
Propose Mitigation to protect and manage the scenic quality
Mitigation methodology during operational phase
Mitigation methodology during EOU phase

Four stage process in line with the TSCI VIA Assessment Guide
Primary Source: SLC Spatial Data Mapping & Overlays and SLS Policies
Primary Source: Landscape Institute for Environmental Management and Assessment (LIIEMA) & LIDAR mapping Analysis

VIA
Attachment 03

Plan 1.0 Viewing Situations Plan
Plan 2.0 Key Vantage Points Plan

OCTOBER 2019

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1.0 Viewing Situations Plan

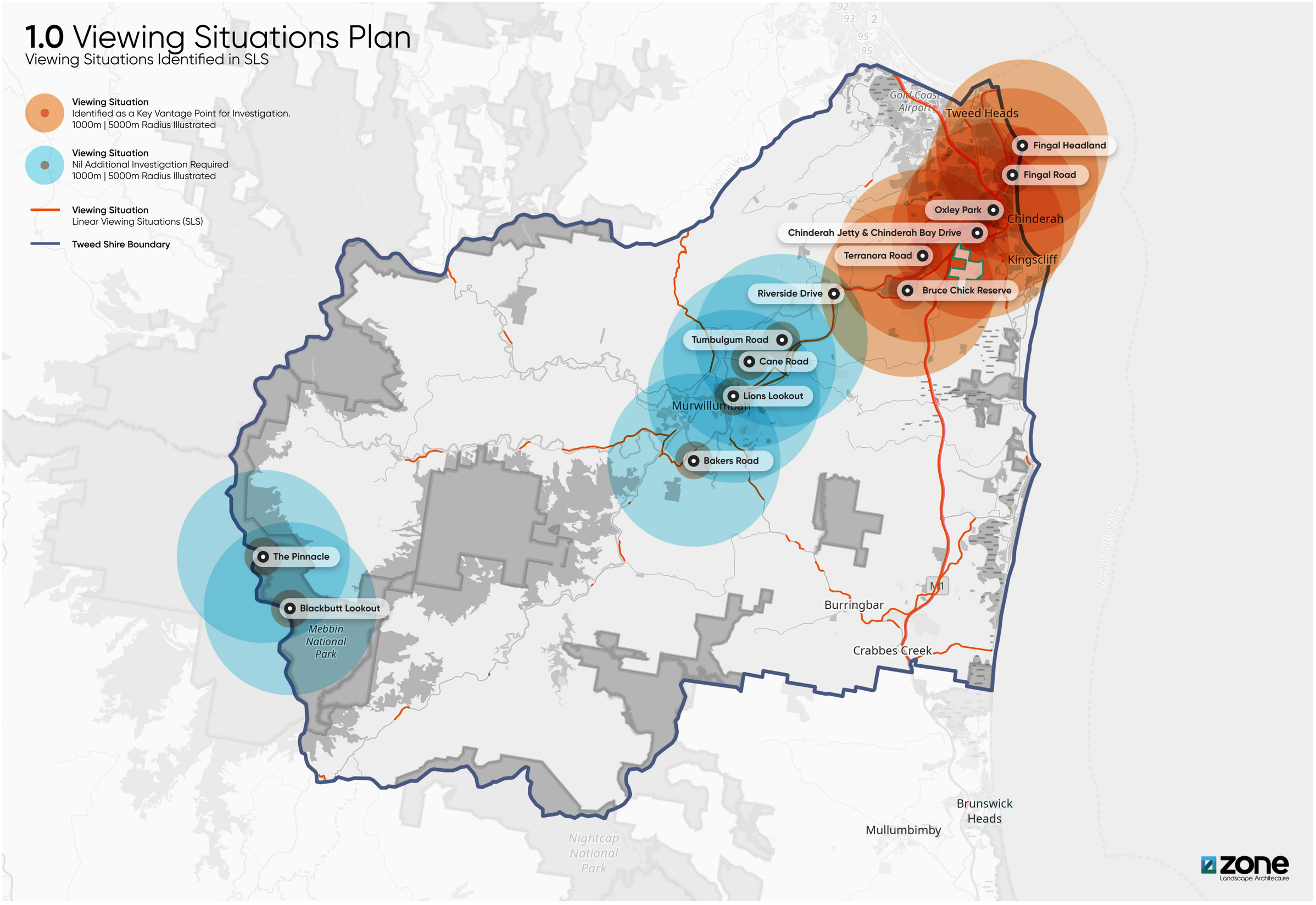
Viewing Situations Identified in SLS

Viewing Situation
Identified as a Key Vantage Point for Investigation.
1000m | 5000m Radius Illustrated

Viewing Situation
Nil Additional Investigation Required
1000m | 5000m Radius Illustrated

Viewing Situation
Linear Viewing Situations (SLS)

Tweed Shire Boundary



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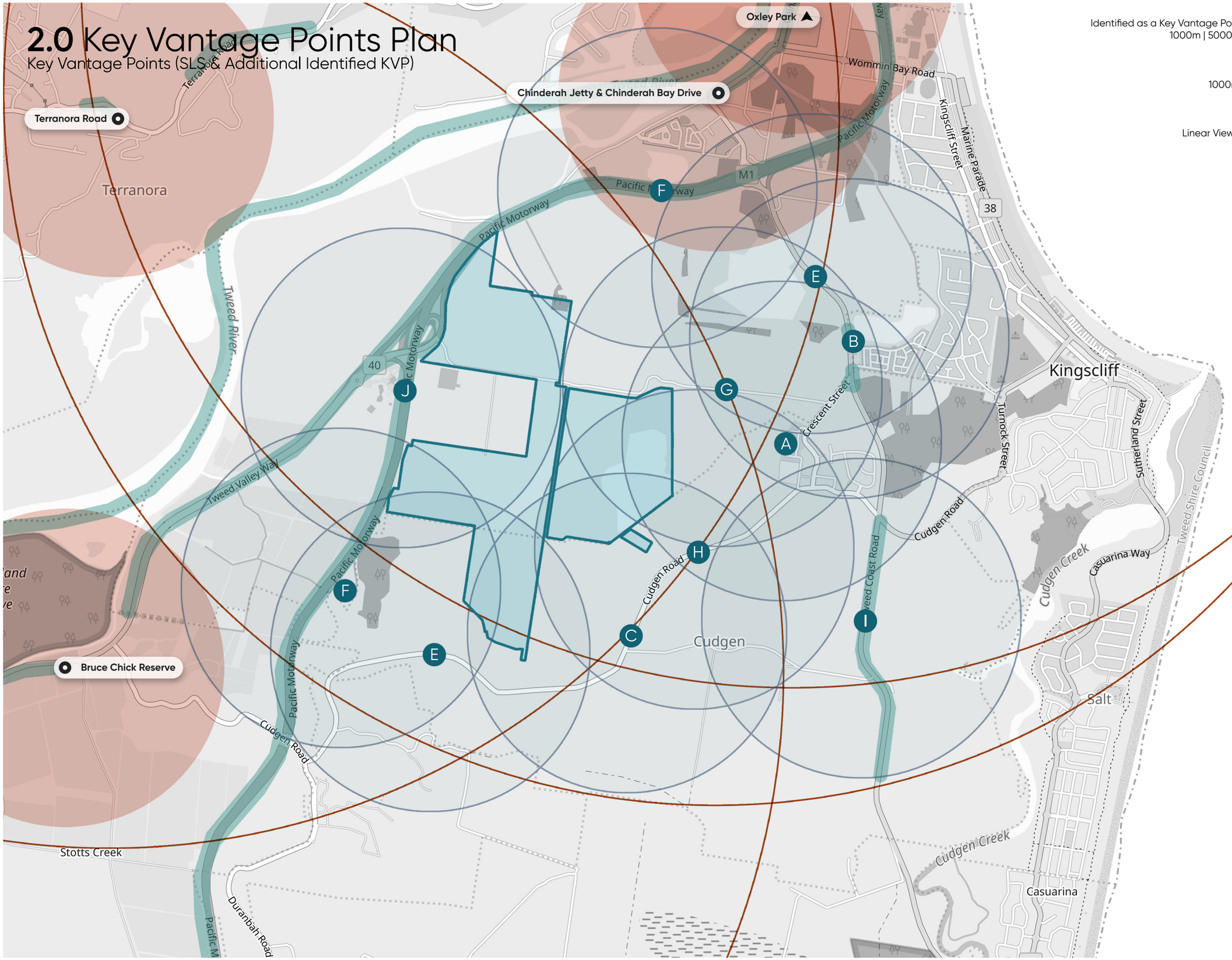
2.0 Key Vantage Points Plan

Key Vantage Points (SLS & Additional Identified KVP)



Viewing Situation
Identified as a Key Vantage Point for Investigation.
1000m | 5000m Radius Illustrated

Additional KVP
1000m Radius Illustrated

Viewing Situation
Linear Viewing Situations (SLS)

KVP A
Collier Street Cudgen
Lat: 28°15'41.99"S
Long: 153°33'19.05"E
Collier Street Cudgen
Distance from Site: 750m

KVP B
Les Noble Parade
Lat: 28°15'19.23"S
Long: 153°33'36.80"E
Distance from Site: 1250m

KVP C
Plantation Road
Lat: 28°16'26.90"S
Long: 153°32'37.86"E
Distance from Site: 450m

KVP D
Cudgen Road
Lat: 28°16'27.52"S
Long: 153°31'51.44"E
Distance from Site: 300m

KVP E
Tweed Coast Road
Lat: 28°16'14.39"S
Long: 153°31'24.85"E
Distance from Site: 825m

KVP F
Pacific Motorway
Lat: 28°14'44.46"S
Long: 153°32'42.73"E
Distance from Site: 1000m

KVP G
Altona Road
Lat: 28°15'29.16"S
Long: 153°33'9.02"
Distance from Site: 50m

KVP H
Cudgen Road
Lat: 28°16'5.71"S
Long: 153°32'53.14"E
Distance from Site: 350m

KVP I
Tweed Coast Road
Lat: 28°16'18.13"S
Long: 153°33'38.58"E
Distance from Site: 1500m

KVP J
Pacific Motorway
Lat: 28°15'33.26"S
Long: 153°31'41.13"E
Distance from Site: 150m

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