Environmental Impact Statement

New Tweed Valley Hospital (Concept Proposal and Stage 1 Works)

PO Box 119
Lennox Head NSW 2478
T 02 6687 7666

PO Box 1446
Coffs Harbour NSW 2450
T 02 6651 7666

PO Box 1267
Armidale NSW 2350
T 02 6772 0454

PO Box 229
Lismore NSW 2480
T 02 6621 6677

info@geolink.net.au

Prepared for: NSW Health Infrastructure

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Glossary of terms and acronyms

Term	*Description/ Definition*
Aboriginal Heritage Information Management System (AHIMS)	This holds information about Aboriginal objects, Aboriginal places with special significance with respect to Aboriginal culture, and archaeological reports.
Acid Sulphate soils (ASS)	Naturally acid clays, mud and other sediments usually found in swamps and estuaries. They may become extremely acidic when drained and exposed to oxygen and may produce acidic leachate and runoff that can pollute receiving waters and liberate toxins. ASS are classified as materials which are above the groundwater, are undergoing oxidation and have a pH of less than 4.0.
Amenity	The degree of pleasantness of an area or place.
Annual average daily traffic (AADT)	The total traffic in both directions at a specified location calculated from mechanically obtained axle counts.
Annual Exceedance Probability (AEP)	The chance of a flood of a given size (or larger) occurring in any one year, usually expressed as a percentage. For example, if a peak flood discharge of 500 m3 /s has an AEP of 5%, it means that there is a 5% chance (i.e. a 1 in 20 chance) of a peak discharge of 500 m3 /s (or larger) occurring in any one year (see also Average Recurrence Interval).
Archaeological site	A site with any material evidence of past Aboriginal activity that remains within a context or place that can be reliably related to that activity.
Australian height datum (AHD)	The standard reference level used to express the relative height of various features. A height given in metres AHD is essentially the height above sea level.
Average Recurrence Interval (ARI)	The long-term average number of years between the occurrence of a flood as big as (or larger than) the selected event. For example, floods with a discharge as great as (or greater than) the 20yr ARI design flood will occur on average once every 20 years. ARI is another way of expressing the likelihood of occurrence of a flood event (see also Annual Exceedance Probability).
BC Act	NSW *Biodiversity Conservation Act 2016*
Borehole	A hole produced in the ground by drilling for the investigation and assessment of soil and rock profiles.
Catchment	The area drained by a stream or body of water, or the area of land from which water is collected.
CIV	Capital investment value
Concept Proposal	Initial functional layout of a concept, such as a building, to provide a level of understanding to later establish detailed design parameters.
Concept Development Application	A development application that sets out concept proposals for the development of a site, and for which detailed proposals for the site or for separate parts of the site are to be the subject of a subsequent development application or applications
CPTED	Crime Prevention Through Environmental Design Principles
Culvert	An enclosed channel for conveying a stream below a road.
dBA	Decibels using the A-weighted scale. Decibels are used to measure sound levels. dBA measures loudness according to the human perception of sound.
Decibel	Decibels are used to measure sound levels.

Term	Description/ Definition
Earthworks	The process of extracting, moving and depositing earth during construction.
Ecologically sustainable development (ESD)	Using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained and the total quality of life, now and in the future, can be increased. ESD incorporates four key principles: ■ the precautionary principle ■ inter-generational equity ■ conservation of biological diversity and ecological integrity ■ improved valuation and pricing of environmental resources.
EIS	Environmental impact statement
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EPI	Environmental Planning Instrument
EPL	Environmental Protection Licence issued under the POEO Act
Flood immunity	Relates to the level at which a particular structure would be clear of a certain flood event.
FSR	Floor Space Ratio
Geological unit	A volume of rock of identifiable origin and age range that is readily mapped, such as a series of inter-bedded sandstone and claystone beds or a body of granite.
Geotechnical	Application of the methods of engineering and science to construction that involves natural soil and rock materials.
Grade/ gradient	Slope or steepness
Habitat	The place where an organism lives. Habitats are measurable and can be described by their flora and physical components.
Health and Education Campus	A site that allows health and education providers to collaborate, share resources and grow to their mutual benefit and benefit the community.
HI	New South Wales Health Infrastructure
HV	Heavy vehicle
IPU	In Patient Unit
KLP	Kingscliff Locality Plan (exhibition draft)
LALC	Local Aboriginal Land Council
LEP	Local environmental plan
LGA	Local government area
Longitudinal section or 'long section'	The section drawn along the length of the route showing vertical elevation.
NCRP 2036	North Coast Regional Plan 2036
OEH	Office of Environment and Heritage
POEO Act	Protection of the Environment Operations Act 1997
Project	Development of a new hospital on a greenfield site in the Tweed, referred to as the Tweed Valley Hospital.
Project Site	The location of The Project, on a portion of 771 Cudgen Road, Cudgen, legally described as Lot 102 DP 870722. The Project Site and surrounding land that is potentially affected by the Project.
SEPP	State Environmental Planning Policy

Term	Description/ Definition
SRD SEPP	State Environmental Planning Policy (State and Regional Development) 2011
SSD	State Significant Development
Threatened ecological community (TEC)	An ecological community identified by relevant legislation as having endangered status under the NSW *Biodiversity Conservation Act 2016* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*
Threatened species	Animals or plants listed as endangered or vulnerable under the NSW *Biodiversity Conservation Act 2016* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*
TTH	The (existing) Tweed Hospital at 14-34 Powell Street (Lot 628 DP755740), Tweed Heads on the far north coast of NSW

Statement of Validity

Submission of Environmental Assessment (Environmental Impact Statement)

Prepared under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act)

Environmental Impact Statement prepared by

Name	Simon Waterworth	Jacob Sickinger
Qualifications	BURP, MBA, Registered Planner Director/ Principal Town Planner	BUrbEnvPlan (Hons), MPIA Environmental Planner
Address	GeoLINK PO Box 1446 COFFS HARBOUR NSW 2450	

In respect of

Applicant and Land Details

Proponent	Health Infrastructure
Subject Site	771 Cudgen Road, Cudgen NSW
Lot and DP	Lot 102 DP 870722
Project Summary	New hospital (Concept Proposal and Stage 1 Works)

Environmental Assessment

Environmental Impact Statement (EIS) pursuant to Part 4 of the EP&A Act.

Declaration

I certify that I have prepared the contents of the EIS in accordance with the requirements of the *Environmental Planning and Assessment Act 1979* and Regulation, the EIS contains all available information that is relevant to the environmental assessment of the activity, and that, to the best of my knowledge, the information contained in this report is not false or misleading.

Signature	.....	.....
Name	SIMON WATERWORTH	JACOB SICKINGER
Date	22 October 2018	

Executive Summary

The Project

On 13 June 2017, the NSW Government announced $534 million for a new state-of-the-art hospital on a greenfield site (referred to as the Tweed Valley Hospital), including an expanded emergency department, inpatient care and enhanced surgical and outpatient services. New services, including interventional cardiology and radiotherapy, will also be provided in response to clinical service planning priorities.

The 2018/19 State Budget confirmed a $582 million investment in health for the Tweed-Byron Local Government Areas (LGAs), which will deliver the Tweed Valley Hospital as well as interim upgrades at the existing Tweed Hospital (TTH) to help meet community needs until services transfer to the new hospital.

The Project for which a staged approval is sought consists of:

- Delivery of the Tweed Valley Hospital; a new Level 5 major referral hospital to provide the health services required to meet the needs of the growing population of the Tweed-Byron region (in conjunction with the other hospitals and community health centres across the region)
- The Masterplan for the Project Site, which includes additional health, education, training and research facilities to support the Tweed Valley Hospital health services, which will be developed with service partners over time. These areas will be used initially for construction site/ compound and at-grade car parking
- Delivery of the supporting infrastructure required for the Tweed Valley Hospital, including green space and other amenities, roads and car parking, external road upgrades and connections, utilities connections, and other supporting infrastructure.

The development application pathway for the Project will consist of a staged State Significant Development (SSD) application under section 4.22 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), which will consist of:

- a concept development application (Concept Proposal) and detailed proposal for Stage 1 works (Early and Enabling works) which is addressed by this Environmental Impact Statement (EIS)
- a second development applicant for Stage 2 works, which will include detailed design, construction, commissioning and operation of the Tweed Valley Hospital (Project Application).

Health Infrastructure has also requested that the Department of Planning and Environment (DPE) prepare a site-specific State Environmental Planning Policy (SEPP), pursuant to Divisions 3.2 and 3.3 of the EP&A Act, to amend the Tweed Local Environmental Plan 2014 (TLEP 2014) to rezone part of the Project Site to SP2 Infrastructure, to facilitate the determination of the application.

The Project is to be assessed by DPE and determined by the Minister for Planning or delegate, as SSD under Part 4 Division 4.7 of the EP&A Act.

Need for the Project

Driving the case for change is the need to increase the health service delivery capacity to meet projected demand.

The draft 2018 Service Statement outlines significant projected growth in the catchment population, with the profile being an aged population as well as a significant group of children aged 0-14 years. The growing catchment population has a lower socio-economic status as well as a higher percentage of Aboriginal residents in comparison to the respective NSW averages. There are also high rates of lifestyle risk factors and there is a high burden of chronic illness.

There are significant gaps between the demand for healthcare services and the supply, accessibility and availability of services within the Tweed-Byron region. Investment in these services and models of care aims to increase self-sufficiency of the region by providing more services locally, to reduce cross-border flows to Queensland.

The Northern New South Wales Local Health District (NNSW LHD) recognises that continual examination and renewal of models of care is required to maintain optimal service delivery and performance and to meet growing community expectations for access to high quality and safe health services locally. This requires facilities substantially compliant with the Australasian Health Facility Guidelines (AusHFG) and service provision consistent with the National Safety and Quality HealthCare Standards.

The existing hospital in Tweed Heads is at capacity, with the site already built-out and congested and limited opportunity for adjacent redevelopment due to surrounding developments. TTH is below the Probably Maximum Flood level (PMF) and an engineered solution would be required in order to build critical infrastructure above the PMF. Redevelopment at TTH would result in multi-stage works, resulting in long term disruption to patients, visitors and staff as well as a significant capital and recurrent cost.

TTH does not provide equitable access for the Tweed-Byron population due to its location at the far north of the catchment area. There is no alternative road access for the southern coastal population when the M1 and Tweed Coast Road are impacted by flooding, which means that the population south of the Tweed River cannot access acute hospital services locally (where those north of the Tweed River have access to acute services in Southern Queensland if TTH is inaccessible).

The capacity constraints of TTH are such that while the Tweed Valley Hospital is being planned and delivered, a separate program of interim upgrades (referred to as ‘Holding Works’) has been approved. These works focus on the minimum works required to keep TTH safe and operational until the Tweed Valley Hospital opens, and services are transferred.

Master planning studies to redevelop TTH were conducted in 2013 and 2016. Both studies contemplated the re-use of existing building stock (built between 1972 and 2007) and new build limited by available space. Masterplans were reliant on a staged build and decant program, noting challenging operational issues during the lengthy construction program, including: noise; vibration; and access restrictions.

The master planning studies contemplated a limited planning horizon, exclusive of a further expansion or building renewal strategy. The master planning studies demonstrate the capacity restrictions of the current site in terms of delivering contemporary models of care, contemporary learning and research capability, technological innovation and sufficient built infrastructure to meet the needs of a growing and ageing population.

Tweed Valley Hospital

The Project is a strategic investment in health infrastructure for NNSW LHD. The Tweed Valley Hospital will be a contemporary purpose-built referral hospital that will meet the anticipated growth in demand and strengthen clinical networking arrangements and referral systems from acute, sub-acute,

and primary healthcare services, with a focus on integrated service provision across the continuum to support the patient journey and enhance co-ordination of care.

The Project Site will accommodate a hospital with Gross Floor Area (GFA) that is more than twice the size of TTH, as well as provide the opportunity to create a Health and Education Campus that has capacity for GFA of up to six times the size of TTH.

The objectives of the Project are to:

- Deliver the service capacity needed now and into the future for a growing and ageing population, well placed to provide equitable access to the broader Tweed-Byron region
- Improve self-sufficiency and minimise the complexity and costs associated with cross-border resident flows to services located in Queensland
- Support further development of speciality and sub-specialty clinical services
- Support contemporary models of care to improve health outcomes
- Deliver patient-centred healthcare supported by an environment that fosters integrated service delivery
- Improve utilisation of the workforce and develop an environment that will attract and retain a skilled and motivated workforce
- Support development of increased clinical capability through education, training and research opportunities
- Provide a tiered network clinical service model to support Byron Central Hospital and Murwillumbah District Hospital and community health and other out-of-hospital services across the region.

Purpose of Report

This EIS has been prepared for Health Infrastructure, to be lodged as part of the Stage 1 SSD application for the Tweed Valley Hospital. The EIS describes the Project (Concept Proposal and Stage 1 works), addresses the Secretary's Environmental Assessment Requirements (SEARs), assesses the potential impacts of the Project, and outlines how the development relates to the local, State and Federal statutory environmental assessment framework. The report also sets out the commitments made by Health Infrastructure to minimise and manage potential impacts arising from the development.

The Project Site

Selecting the right site for the Tweed Valley Hospital is vital to building the future of healthcare and servicing the health needs of the Tweed-Byron community now and into the future. More than 50 sites were assessed during a comprehensive site selection process, including extensive due diligence investigations, community consultation and consideration of alternatives.

Sites were evaluated against the same Assessment Criteria in the following categories:

- location, access and traffic
- urban context
- built forms and landscaping
- environment, heritage and culture
- time, cost and value.

The evaluation was informed by due diligence investigations undertaken by independent experts in each of the following disciplines:

- Aboriginal Heritage
- Architecture
- Bush fire
- Flooding
- Acoustic
- Surveyor
- Town Planner
- Utilities
- Aviation
- Cost Management
- Ecological and Natural Heritage Constraints
- Health Service Planning
- Traffic/ Transport
- Topography/ Stormwater
- Geotech/ Environmental/ Contamination/ HAZMAT

The Project Site was selected as suitable for the Tweed Valley Hospital and shortlisted alternative sites were discounted as not feasible for differing reasons. Further information on the site selection has been published on the project website in the Site Selection Summary Report dated July 2018.

The Project Site, located at 771 Cudgen Road, Cudgen NSW (part of Lot 102 DP 870722) is located immediately to the west of the Kingscliff urban area, opposite Kingscliff TAFE and between the existing residential areas of Kingscliff and Cudgen.

The Project Site is the southern 19.4 ha of an existing single lot (part of Lot 102 DP 870722) and fronts Cudgen Road. It has proximal access to Tweed Coast Road, which connects to the Pacific Motorway (M1) in the north. The Project Site is approximately 13.5 km south of Tweed Heads.

The Project Site includes rural land, situated on the immediate urban periphery of Kingscliff with a sliver of residential zoned land adjacent to its eastern boundary and environmental area along its northern boundary, which is mapped as Coastal Wetlands and will be preserved to protect the environmental biodiversity and to provide views and amenity for the hospital.

Other land uses in proximity to the Project Site include urban, rural and environmental uses/ zones. To the east is the main Kingscliff urban and residential area. To the north is vegetated land, including environmental protection areas and mapped Coastal Wetlands. Beyond this, further to the north is existing residential development. To the south, on the opposite side of Cudgen Road, is an educational facility in the form of the Kingscliff TAFE. To the south-west and west is rural/ farmland. The village of Cudgen is located west of the Project Site, on the western side of Tweed Coast Road.

Planning Approval Pathway

In terms of permissibility, the Project Site's existing 'RU1 Primary Production' land use zone pursuant to the TLEP 2014 (applicable to the majority of the Project Site) prohibits health services facilities. A health services facility is permissible within the 'R1 General Residential' zone, applicable to a small area of the Project Site.

Pursuant to Section 4.38 (2) of the EP&A Act, development consent cannot be given to an SSD application that is wholly prohibited by an Environmental Planning Instrument (EPI). However, pursuant to Section 4.38 (3) of the EP&A Act, it can be given to a partially prohibited development.

Notwithstanding this, Section 4.38 (5) of the EP&A Act provides that a development application in respect of a SSD, that is wholly or partly prohibited, may be considered in conjunction with a proposed EPI to permit the carrying out of the development.

To enable the determination of this SSD application, DPE will prepare a new SEPP, pursuant to Divisions 3.2 and 3.3 of the EP&A Act that amends TLEP 2014 by rezoning part of the Project Site to 'SP2 Infrastructure' (which is currently zoned 'RU1 Primary Production' and 'R1 General Residential'), and removing any building height, Floor Space Ratio (FSR) and minimum lot size controls to be consistent with other hospital sites. It is proposed that the SEPP would be repealed after TLEP 2014 has been amended.

It is proposed that the draft SEPP and SSD application be considered and determined in accordance with Division 3.5 and Section 4.38 (5) of the EP&A Act. The SSD application, would be considered in conjunction with the proposed EPI (in this case a site-specific SEPP) to permit the carrying out of the wholly or partly prohibited development on the subject land. Pursuant to Clause 3.40 of the EP&A Act, it is understood that the SSD application and proposed SEPP would be publicly exhibited at the same time.

On this basis, the SSD application would be determined using the new planning controls facilitated by the site-specific SEPP that amends the LEP, that include:

- Majority of the Project Site (RU1 Zone and sliver of R1 Zone at the eastern end) to be rezoned to SP2 Infrastructure
- No change to the zoning is required for the remainder of the Lot. This includes the vegetated environmental areas, zoned 7(l) Environmental Protection (Habitat) under the TLEP 2000 and mapped as Coastal Wetlands. This would be preserved outside of the development area to protect the environmental biodiversity and provide views and amenity for the hospital. There is also a separate area of land zoned R1 General Residential to the north of the environmental area, which is flood prone and is not required for the Project. On this basis, these areas, including Deferred Matters of the TLEP 2014 are not proposed to change
- No provision of prescriptive building height, FSR or minimum lot size (i.e. applications would be assessed on merit) would apply to the land to be rezoned SP2 Infrastructure. Any such current provisions would be removed.

Such planning controls are consistent with the LEP Standard Instrument and the typical approach for other health facility/ hospital sites.

The Project is a "hospital" with a capital investment value greater than $30 million. Accordingly, pursuant to clause 14 of Schedule 1 of the SEPP (State and Regional Development) 2011 (SRD SEPP), the Project is SSD and requires the preparation of an EIS (in accordance with Section 4.12(8) of the EP&A Act).

Environmental Impacts and Mitigation Measures

The potential impacts of the proposed development have been comprehensively assessed throughout this EIS and the appended specialist reports. Whilst some impacts may occur, they can be effectively minimised and managed. No significant adverse impacts are expected, and the Project will result in a net benefit for the local and regional community and economy. Safeguards and mitigation measures have been developed and will be implemented to ensure effective management of the works and sound environmental outcomes. A separate application and EIS for Stage 2 will present and assess the detailed design, construction, commissioning and operation of the Tweed Valley Hospital.

Justification and Conclusion

The EIS addresses the SEARs and the Project will result in a much-needed renewal, expansion and significant improvement to health services/ facilities for the Tweed-Byron population.

TTH will not meet the healthcare needs of the Tweed-Byron community into the future and a purpose-built hospital on the selected greenfield site will best achieve this.

The Project will benefit patients, carers, staff, other stakeholders and the wider Tweed-Byron community, delivering improved, greater capacity, and high-quality healthcare in a pleasant setting and contemporary and functional built form.

The Project Site is suitable, and the Project is in the public interest. The potential impacts are not expected to be significant and can be effectively minimised and managed.

On balance the Project will result in a net social and economic benefit. Given this benefit and the planning merits of the application, the Project warrants approval by the Minister for Planning or delegate.

1. Overview

1.1 Structure of the Report

The Environmental Impact Statement (EIS) has been written to address the Concept Proposal and the Stage 1 works separately. **Section 1** of the EIS provides an overall description of the site, the need for the Project and the site selection process. **Section 1** also identifies the planning approval pathway along with general information about the Project.

Section 2 of the EIS describes the Site and its context. **Section 3** of the EIS provides a detailed description of the Concept Proposal and the scope of the Stage 1 works that approval is being sought for. **Section 4** provides a detailed account of the community and agency consultation that has occurred for this Project and outlines a strategy moving forward.

Section 5 provides an assessment of the Concept Proposal against the Secretary's Environmental Assessment Requirements (SEARs) that relate to the Concept Proposal issued on 27 September 2018. Potential environmental impacts from the Concept Proposal are identified, and mitigation measures proposed.

Section 6 of the EIS deals specifically with the Stage 1 works that Health Infrastructure are seeking approval to undertake. This section addresses the Stage 1 specific SEARs and assesses the potential environmental impacts of the works proposed. Mitigation measures are also proposed for these impacts.

Section 7 provides consideration of other matters, including cumulative impacts. **Section 8** provides an environmental risk assessment. Recommended environmental management and mitigation measures are contained in **Section 9**. **Section 10** contains a conclusion to the EIS and justification for the Project.

1.2 Background and Staging

The existing Tweed Hospital (TTH) is located at 14-34 Powell Street (Lot 628 DP755740), Tweed Heads on the far north coast of NSW. TTH is a Level 5 Major Non-Metropolitan Principal Referral Hospital and is a facility of the Northern NSW Local Health District (NNSW LHD). TTH catchment includes Tweed and Byron Local Government Areas (LGAs). Murwillumbah District Hospital, a Level 3 hospital, is closely networked to TTH (24.5 km from TTH), as is Byron Central Hospital (53.2 km from TTH), which is also a Level 3 hospital. The projected health service demand within the Tweed and Byron LGAs is significant, and TTH is currently at capacity with several major constraints affecting the development of new facilities on the TTH site.

On 13 June 2017, the NSW Government announced $534 million for a new state-of-the-art hospital on a greenfield site, including an expanded emergency department (ED), inpatient care and enhanced surgical and outpatient services. New services, including interventional cardiology and radiotherapy, will also be provided in response to clinical service planning priorities. The 2018-19 State Budget confirmed a $582 million investment in health for the Tweed-Byron LGAs, which will deliver the Tweed Valley Hospital as well as interim upgrades at TTH to help meet community needs until services transfer to the new hospital.

GeoLINK has been engaged by Health Infrastructure to prepare an EIS and lodge a Staged State Significant Development (SSD) application under Part 4 Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The staged application under Section 4.37 of the EP&A Act will seek consent for a new hospital on a greenfield site in the Tweed, referred to as Tweed Valley Hospital (the Project). The Tweed Valley Hospital is to be located on a portion of 771 Cudgen Road, Cudgen, legally described as Lot 102 DP 870722 (Project Site).

The Project will be staged as follows:

1. A Concept Development Application (Concept Proposal), and detailed proposal for Stage 1 (Early and Enabling Works)
2. A second development application for Stage 2 which will include detailed design, construction, commissioning and operation of the Tweed Valley Hospital (Project Application).

This application addresses point 1 above only. A separate SSD application will be prepared and assessed for the actual construction of the hospital building and ancillary structures (Stage 2).

The staged process identified above will allow for:

- Delivery of the Tweed Valley Hospital to provide the health services required to meet the needs of the growing population of the Tweed-Byron region, in conjunction with the other hospitals and community health centres across the region
- The Masterplan for the Project Site, which includes additional health, education, training and research facilities to support the Tweed Valley Hospital health services, which will be developed with service partners over time. These areas will be used initially for construction site/ compound and at-grade car parking
- Delivery of the supporting infrastructure required for the Tweed Valley Hospital, including green space and other amenities, roads and car parking, external road upgrades and connections.

1.3 Need for the Project – Health Service Demand

The significant projected demand for healthcare services is driving the case for change in the Tweed-Byron LGAs. NNSW LHD is planning the clinical services for the future of the Tweed Valley, through the development of the 2018 Service Statement. During 2018, a comprehensive consultation process has been undertaken with senior clinicians and staff at TTH and across the Tweed-Byron network, to inform the development of the 2018 Service Statement. The 2018 Service Statement (currently a draft document) outlines the health service needs for the Tweed Valley to 2031/32 and will inform the planning for the new Tweed Valley Hospital.

1.3.1 Population Growth

Northern NSW is one of the fastest growing regions in the State, with Tweed and Byron LGAs the fastest growing areas in NNSW LHD. In 2011, the total population of the Tweed and Byron LGAs was 119,149. The 2016 Census data indicates this had grown to 122,927. Based on 2011 figures, by 2031, the population is expected to grow by 24 per cent, an increase of 28,071 people.

1.3.2 Demographic Trends

A number of significant demographic trends are occurring in the catchment:

- *An ageing population* – Number of residents aged ≥ 65 years is expected to increase by 31 per cent over a 10-year period from 2016 to 2026. By 2026 more than a quarter of the catchment population will be over 65 years
- *Children aged 0-14 years* – The population of children aged 0-4 years is projected to increase by eight per cent and 5-14 years by 10 per cent between 2016 and 2026
- Socio-economic status – Northern NSW is one of the most disadvantaged local health districts in NSW with all LGAs scoring lower than the NSW average on most measures of socio-economic status[1]
- *Continuing high rates of lifestyle risk factors* – Lifestyle risk factors continue to increase the need for healthcare services; including physical inactivity, poor nutrition, overweight and obesity, drug and tobacco use and alcohol consumption at risky levels
- *The changing nature of illness and the burden of chronic disease* – Increasing rates of cancer, diabetes, heart disease, respiratory disease and mental health issues due to ageing population, lifestyle risk factors and socioeconomic conditions. The incidence rates of cancer are significantly higher in Northern NSW compared to the NSW average
- *Aboriginal people* – The traditional custodians of the land covered by the Tweed and Byron LGAs are the Bundjalung Nations. In 2011, 4,179 people identified as having Aboriginal heritage representing four per cent and two per cent of the Tweed and Byron LGA populations and 31 per cent of the total NNSW LHD Aboriginal population. The percentage of Aboriginal people within Tweed LGA is higher than State and Australian rates (three per cent).

The NNSW LHD resident epidemiological profile highlights several health aspects where poorer health outcomes or health-related behaviours associated with adverse health outcomes are evident compared to NSW averages:

- Lower life expectancies for both men and women at birth compared to the NSW average - in 2012 78.9 years vs 80.8 years (men) and 84.3 years vs 85.2 years (women)
- High rates of avoidable deaths, NNSW LHD has significantly higher deaths for persons aged under 75 years compared to the state average in 2012/13, 130 vs 106/100,000 population
- High incidence rates of melanoma
- High rates of alcohol attributable hospitalisations
- High rates of fall related hospitalisations
- High population risk factors for chronic kidney disease and end stage kidney disease.

When the demographic trends are reviewed in the context of the health aspects above, the impetus to increase service delivery capacity is clear and urgent.

[1] . Socio-Economic Index of Areas (SEIFA) uses a broad definition of relative socio-economic disadvantage in terms of people's access to material and social resources and their ability to participate in society. A SEIFA score is an average of people and households within a given area, importantly not everyone in the given area has the same score. The SEIFA score is standardised against a mean of 1000 with a standard deviation of 100. This means that the average SEIFA score will be 1000 and the middle two-thirds of SEIFA scores will fall between 900 and 1100 (approximately).

1.3.3 Self-sufficiency

There are significant gaps between the demand for healthcare services and the supply, accessibility and availability of services locally within the Tweed Valley. This component of 'un-serviced health need', where a patient's medical condition would benefit from a referred service, but this service is not available locally, needs to be addressed through implementation of new clinical services and new models of care.

TTH sits south of the border between NSW and Queensland (the Border). This results in a number of cross-overs with the use of health services on either side of the Border, by residents of NSW and Queensland. NSW residents access John Flynn Private Hospital, Robina Hospital and Gold Coast University Hospital.

Investment in new services and new models of care will increase self-sufficiency and reduce the cross-Border flows from Queensland, with the ultimate intention of providing residents of NNSW LHD access to the right care, at the right time, by the right team and in the right place. The new services at the Tweed Valley Hospital will mean that by 2031 over five thousand patients every year will be able to remain at Tweed Valley Hospital to receive life-saving treatments, rather than travel outside of the region.

1.3.4 New Models of Care

Continual examination and renewal of models of care is required to maintain optimal service delivery and performance and to meet growing community expectations for access to high quality and safe health services locally. This requires facilities substantially compliant with the Australasian Health Facility Guidelines (AusHFGs) to support service provision consistent with the National Safety and Quality HealthCare Standards. Capacity constraints, and facilities that are not consistent with modern standards (e.g. AusHFG), restrict the NNSW LHD's ability to implement new models of care. In particular, where spaces are overcrowded or constrained, or do not have necessary support spaces and/or technologies, it becomes very challenging to introduce innovations or new models that deliver best practice contemporary healthcare services.

The service demand identified in the draft 2018 Service Statement means that the capacity of existing hospital facilities will be exceeded, and completion of the Project must take place as soon as possible. Any delay will require reliance on out-dated hospital facilities operating beyond their capacity leaving the demand for relevant hospital services unmet.

Hospitals must be planned to be around for the long term. The Tweed-Byron population requires health services that accommodate current and growing demand, with a long-term plan for how expansion will occur in future, to meet the service demand to 2031 and beyond.

1.4 Need for the Project – Constraints of TTH

TTH is a Level 5 Major Non-Metropolitan Principal Referral Hospital and is a facility of the NNSW LHD. TTH catchment includes Tweed and Byron LGAs. Murwillumbah District Hospital, a Level 3 hospital, is closely networked to TTH (24.5 km from TTH), as is Byron Central Hospital (53.2 km from TTH), which is also a Level 3 hospital. TTH provides the majority of specialist medical, surgical and other services within the Tweed-Byron network and services are predominantly provided at role delineation level 5. These include 212 overnight inpatient beds, four operating theatres plus a procedure room, emergency, intensive care, coronary care, acute mental health and a range of diagnostic services available 24 hours a day. Ambulatory care services include Specialist Outpatient

Clinics, Renal Dialysis, Chemotherapy treatments, ComPacks, Transitional Aged Care Services and Hospital in the Home.

TTH location and access

TTH is located at the far north of the Tweed LGA, which does not provide equitable access for the Tweed-Byron population; despite being readily accessible to the residents of Tweed Heads (70% of the Tweed catchment can access in under 30 minutes). Any residents attending from within the southern part of the catchment area have considerable travel distances in order to attend their major referral hospital. The location of TTH at the far northern end of the catchment also maximises the distance for hospital transfers from Byron Central Hospital and Murwillumbah District Hospitals.

Figure 1.1 TTH in context of Tweed and Byron LGAs

Flooding is a key risk across the Tweed Valley region and ensuring that the major population centres retain access to acute hospital services under 5% and 1% Annual Exceedance Probability (AEP – refer to glossary) (also referred to as Q20 and Q100) flooding events are important considerations. TTH sits approximately two to three metres below the Probably Maximum Flood (PMF) level. Retention of access to TTH during a major flooding event is a key issue for TTH, as was demonstrated during the 2017 floods.

There is no alternative road access for the southern coastal population when the M1 and Tweed Coast Road are impacted by flooding, which means that the population south of the Tweed River cannot access acute hospital services locally (where those north of the Tweed River have access to acute services in Southern Queensland if TTH is inaccessible).

TTH site analysis

The TTH site has a total area of 4.046 ha and is generally square in shape. It is bound by Florence Street to the north and Powell Street to the west, Solander Street to the south and Keith Compton Drive to the east. A narrow park separates Keith Compton Drive from the Tweed River. The Hospital is approximately 600 m from the Tweed Heads/ Coolangatta town centre.

Figure 1.2 TTH at 14-34 Powell Street, Tweed Heads

TTH provides a location with well-established transport facilities including traffic access, public transport and walk/ cycle connectivity to the surrounding Tweed Heads area. The site is within a generally residential area bounded by residential properties to the north and south and a bowling club, church and council facilities to the west.

TTH consists of a number of conjoined buildings and detached structures that occupy the majority of the site. The original buildings were constructed in 1972 and there have been numerous new buildings and refurbishments undertaken since. Unbuilt land is generally occupied by car parking. A helipad is located in the south-eastern corner.

The facilities themselves are in reasonable condition, though at capacity and undersized compared to the AusHFGs. TTH is 25,000 m^2 gross floor area (GFA) in total and if it was built as-new using today's guidelines and standards the same services would require 38,000m^2 of GFA.

Master planning studies to redevelop TTH were conducted in 2013 and 2016. Both studies contemplated the re-use of existing building stock (built between 1972 and 2007) and new build limited by available space. Masterplans were reliant on a staged build and decant program, noting challenging operational issues during the lengthy construction program, including: noise; vibration; and access restrictions.

The master planning studies contemplated a limited planning horizon, exclusive of a further expansion or building renewal strategy. The master planning studies demonstrate the capacity restrictions of the current site in terms of delivering contemporary models of care, contemporary learning and research capability, technological innovation and sufficient built infrastructure to meet the needs of a growing and ageing population.

1.5 Project Objectives

Taking into consideration the health service demand as well as the existing constraints of service delivery at TTH, the objectives of the Project are to:

- Deliver the service capacity needed now and into the future for a growing and ageing population, well placed to provide equitable access to the broader Tweed-Byron catchment
- Improve self-sufficiency and minimise the complexity and costs associated with cross-border resident flows to services located in Queensland
- Support further development of speciality and sub-specialty clinical services
- Support contemporary models of care to improve health outcomes
- Deliver patient-centred healthcare supported by an environment that fosters integrated service delivery
- Improve utilisation of the workforce and develop an environment that will attract and retain a skilled and motivated workforce
- Support development of increased clinical capability through education, training and research opportunities
- Provide a tiered network clinical service model to support Byron Central Hospital and Murwillumbah District Hospital and community health and other out-of-hospital services across the region.

1.6 Analysis of Alternatives and the Site Selection Process

1.6.1 Do Nothing

A 'do nothing' approach would not be acceptable as the region is in critical need of expanded, modernised hospital capacity and additional health services. As outlined previously, the capacity constraints of TTH are such that while the new Tweed Valley Hospital is being planned and delivered, a program of interim upgrades ('Holding Works') for TTH are required to keep it safe and operational until the new hospital becomes operational. Any delay will require reliance on out-dated hospital facilities operating beyond their capacity.

A 'do nothing' approach would fail to achieve the above project objectives (**Section 1.6**) and is unacceptable.

If the ‘do nothing’ scenario eventuates, by 2031 there will be a shortfall of services equating to in the order of 13,000 overnight patients per year not able to be treated at TTH/ Murwillumbah District Hospital. Innovative strategies would need to be employed to strive to meet demand, and more patients would be forced to seek treatment outside the local area.

1.6.2 Redevelopment and Expansion of the Existing Tweed Hospital (TTH)

Many studies have been undertaken over several years to review the capacity of TTH to be able to accommodate a major redevelopment. Earlier funding announcements considered this a viable opportunity, but they provided significantly lesser project scope than is proposed in the Project.

Planning for the future of the health services is guided by NNSW LHD’s clinical service planning. Early site studies were informed by a Clinical Services Plan that provided service requirement projections to 2022. With the continual population growth projected for the region, the draft 2018 Service Statement, which provides projections to 2031, identifies substantial growth in population and service demand beyond what was anticipated with the 2022 horizon. Any redevelopment at TTH must accommodate current and growing demand, with a long-term plan for how expansion will occur in future, to meet the service demand to 2031 and beyond.

The TTH site is already built-out and congested, with limited opportunity for adjacent redevelopment due to surrounding developments without significant disruption to hospital services.

1.6.2.1 Refurbishment

Some of the previous studies have looked at refurbishment of existing TTH buildings. Refurbishment of existing facilities is complex in any healthcare environment because there is a requirement to maintain ongoing operation of service during works. During 2018, a separate program of interim upgrades at TTH (referred to as ‘Holding Works’) has been approved. These works focus on the minimum works required to keep TTH safe and operational until the Tweed Valley Hospital opens, and services are transferred. Having done these works, the construction teams have encountered a broad range of latent conditions that need to be addressed. This is not unusual for a project within an ageing hospital, issues include fire compliance and capacity and compliance of building services (mechanical, electrical and hydraulic). Previous studies did not have the benefit of this detailed information about the TTH site, but the time and cost implications associated with the latent conditions identified during the Holding Works have reinforced that refurbishment works to increase capacity at TTH would be very challenging.

1.6.2.2 Requirement for critical facilities above the PMF level

As noted previously, TTH sits approximately two to three metres below the PMF level. Hospitals, being critical facilities, should be built above the PMF based on current local council and State policy. Major redevelopment of TTH would be contingent on an engineered solution to build critical hospital infrastructure above the PMF, this includes building the ED and hospital entry one level above ground level, requiring vehicle ramps and elevated ambulance/ access decks. A multi-deck carpark with a bridge link would also be required to provide external areas above the PMF to support disaster response and compensate for lost car parking spaces.

1.6.2.3 Adjacent Expansion

Due to the built-out nature of the existing site, recent studies undertaken include hypothetically acquiring land around the existing hospital (e.g. Tweed Heads Bowls Club); building the new hospital; decanting services and demolishing the existing buildings; and then using the TTH site for future expansion and complementary uses. This presents a feasible option to reduce the extent of staging that would be required to expand at TTH whilst keeping the hospital open, but the funds required to purchase adjacent land purchase are significant and detract from expenditure on necessary clinical services.

1.6.2.4 Cost of Redevelopment at TTH

All studies have identified that any redevelopment at TTH would result in significant capital cost due to the complex logistics required to maintain a safe and operating hospital facility through the works, as well as purchase of adjacent land.

Redevelopment of the site in stages is feasible but would result in a later *end date* for opening of new facilities and services, meaning that demand would exceed capacity for a longer period. The Tweed Valley community would experience longer waiting times for health services and would continue to need to travel to southern Queensland to access healthcare services, whilst the staged development was undertaken.

1.6.3 New Greenfield Development and the Site Selection Process

Senior clinicians campaigned for an extended period for a greenfield hospital rather than to progress with the protracted refurbishment/ redevelopment process that would be necessary on TTH.

On 13 June 2017, the NSW Government announced that the Tweed Valley Hospital will be built on a greenfield site. The service need outlined in previous sections, as well as the existing infrastructure and site constraints at TTH, strongly demonstrate the need to move to a new site.

The comprehensive work undertaken by Health Infrastructure to date, as summarised above, explains how a greenfield site in a strategic location offers the best opportunity to develop a purpose-built, high-standard health facility that can be tailored for both current and future needs within the region, more than twice the size of TTH.

A greenfield site will also will allow a seamless transition of health services from the existing hospital to the new hospital.

1.6.3.1 Site Selection Process

More than 50 sites were assessed in total during a comprehensive site selection process, including extensive due diligence investigations, community consultation and consideration of alternatives. This included sites put forward through a publicly advertised expression of interest (EOI) process and those nominated through the subsequent community consultation process.

The site selection process and a summary of the assessment sites is provided in the Site Selection Summary Report. This report is published on the Tweed Valley Hospital Project website and is attached to the Consultation Report at **Appendix H**.

1.6.3.2 The Project Site

The Project Site is located at 771 Cudgen Road, Cudgen, comprising a portion of Lot 102 DP 870722. It is located immediately to the west of the Kingscliff urban area, opposite Kingscliff TAFE and between the existing residential areas of Kingscliff and Cudgen.

The Site Selection Summary Report provides an outline of the key attributes and considerations of the Project Site and the evaluation undertaken, in terms of:

- Location, Access and Traffic
- Urban Context
- Built Forms and Landscaping
- Environment, Heritage and Culture
- Time, Cost and Value.

1.6.4 Masterplan and Siting/ Fit Options Analysis for the Project Site

Development of the Masterplan has been undertaken by the Project Architects, Silver Thomas Hanley (STH) and Bates Smart, including testing for future growth strategies and complementary uses.

The Masterplan and hospital design will be planned to meet the projected health service needs into the future, and to allow for future reconfiguration, expansion, enhancement and potential consolidation of services over time. The Masterplan considers long term renewal/ replacement strategies for key infrastructure beyond the service projections, maximising environmental opportunities, minimising disruption to existing services during construction of future services and enabling various development scenarios with minimal dependencies. In these regards, key considerations included:

- Maximising the density of the initial build within the site context to provide fit-for-purpose hospital infrastructure, while minimising travel distances and improving operational efficiencies
- Design scenarios that provide future-proofing for different service configurations and incremental expansion over time
- Strategically located on-grade car parking that can be converted in the future (if demand requires it) and provide sites for additional buildings
- Maintaining space for a future major acute services building to enable long-term replacement and redevelopment of the Project Site.

The process to develop the Masterplan has looked at a range of options based on the draft 2018 Service Statement including projections to 2022, 2026/27 and 2031/32 as well as significant expansion scenarios (e.g. +20 per cent, +50 per cent, +100 per cent of initial requirements).

The siting and arrangement is focused on achieving an optimal and functional arrangement for clinical service requirements, whilst being responsive to the Project Site's constraints and opportunities, and broader site context.

A range of Masterplan options, such as the examples at **Plates 1.1** to **1.2** below, were developed and evaluated against a set of master planning principles (see below) and criteria defined as part of the process. The options were developed to test how the slope of the site might be used (Option A) compared to a more compact building utilising the broad central plateau (Option B) as well as other constraints and opportunities on the Project Site. The master planning principles included:

- **Access** – highlight intuitive points of access for public, staff, emergency services, service vehicles and provide clear intuitive links to public transport

- **Entry** – enable an intuitive reading of entry to the building and ED
- **Expansion** – optimise position of building to allow for expansion in multiple directions
- **Scale** – create a building scale which considers the locality and its surrounds, for example maximising the use of the slope of the Project Site
- **Natural light** – align the built form to maximise access to natural light and ventilation to all departments and public spaces
- **Nature** – maximise the dialogue between built form and natural context
- **Topography** – arrange built form to minimise disruption to natural land forms, whilst utilising the sloping land to embed program
- **Social cohesion** – enable a strong sense of community through a range of connected public spaces
- **Safety** – enable passive surveillance through street design and building orientation.

Similarly, a process to determine the best building typology has also been undertaken. While this has yet to be completed, the key criteria for selecting a preferred building typology included:

- Access and circulation
- Key functional relationships
- Flexibility of building massing and form to accommodate scope options
- Future expansion capabilities
- Optimise views
- Visual impact.

The Masterplan options were considered against the above design principles and criteria to identify preferred options, that were further developed and evaluated to determine the most suitable option going forward.

Plate 1.1 Test Fit Study Option A

Plate 1.2 Test Fit Study Option B

The preferred Masterplan is shown at **Plate 1.3** (also refer to **Appendix B** for concept plans). This option locates the main hospital building centrally to the site, setback from Cudgen Road and positioned around the natural plateau in the landform. Car parking facilities are located either side of the main hospital building, with a number of access points and good circulation, catering for emergency vehicles, staff, patients and visitors.

The arrangement allows for various open space areas and public domain elements, whilst supporting future supplementary development and expansion opportunities. Adequate buffers are also provided in response to ecological values, bush fire planning and minimisation of rural land use conflict risks. The arrangement provides for a quality civic presence to Cudgen Road and overall good use of the site, accounting for constraints and opportunities as further outlined in this EIS (**Section 5.3**).

Plate 1.3 Proposed Masterplan

Building typology further discussed in **Section 5.3** and the design report at **Appendix C**. It should be noted however that the building itself does **NOT** form part of this application and only general building envelope parameters are being considered at this stage. These include maximum height and mass which is discussed further in **Section 3**. The maximum planning envelope does however reflect various design requirements for the development including clinical planning requirements, environmental constraints (e.g. flood, biodiversity, bush fire, buffers, geotechnical), utilising environmental efficiencies (solar access, ventilation, energy efficiency and amenity) and maximising operational circulation efficiencies both for patient safety and economies of movement and care that will benefit both patients and staff at the facility.

The building typology and design has also considered the visual impact and the siting allows for a built form and scale transition from the interface with Cudgen Road. Substantial setbacks and building articulation, developed at the detailed design stage, would also address amenity impacts. Development of the detailed building form, including appearance and aesthetics, will be further developed and will form the Stage 2 Development Application referred to above.

1.7 Timing and Delivery

The 2018 Service Statement confirms that the capacity of existing hospital facilities will be exceeded prior to completion of the Project and completion must take place as soon as possible. This is despite on-going investment in interim upgrades to TTH. Any delay will require reliance on out-dated hospital facilities operating beyond their capacity leaving the demand for relevant hospital services unmet, which does not provide sufficient capacity or best practice contemporary health services delivery for the Tweed-Byron community.

There is an imperative to provide access to new and expanded healthcare facilities by the end of 2022 to meet the health needs of the Tweed-Byron community. To achieve this, Preliminary Works need to commence on site before the end of 2018 and include a comprehensive suite of invasive geotechnical investigations to inform critical path design activities, as well as works to ensure appropriate environmental controls are in place before the wet season. The subsequent step in the critical path for the Project will be to undertake the package of Stage 1 Early and Enabling Works in early 2019 and the Main Works will immediately follow, to ensure the hospital is completed by the end of 2022. Adherence to these milestones for Preliminary Works, Stage 1 Early and Enabling Works and Main Works is necessary in order for the Project to be delivered on schedule. Failing to achieve these milestones will not meet the health needs of the Tweed-Byron community and critical capacity issues will continue to constrain the existing facilities servicing the Tweed-Byron community.

1.8 Planning and Environmental Approvals

1.8.1 Permissibility and Approval Pathway Overview

The Project Site's existing 'RU1 Primary Production' land use zone pursuant to the Tweed Local Environmental Plan (TLEP) 2014 (applicable to the majority of the Project Site) prohibits health services facilities. A health services facility is permissible within the 'R1 General Residential' zone, applicable to a small area of the Project Site.

Pursuant to Section 4.38 (2) of the EP&A Act, development consent cannot be granted to a SSD application that is wholly prohibited by an Environmental Planning Instrument (EPI). However, pursuant to Section 4.38 (3) of the EP&A Act, it can be given to a partially prohibited development.

Notwithstanding this, Section 4.38 (5) of the EP&A Act provides that a development application in respect of a SSD, that is wholly or partly prohibited, may be considered in conjunction with a proposed EPI to permit the carrying out of the development.

To enable the determination of this SSD application, Department Planning and Environment (DPE) are concurrently preparing a new State Environmental Planning Policy (SEPP), pursuant to Divisions 3.2 and 3.3 of the EP&A Act that would amend TLEP 2014 by rezoning part of the Project Site to 'SP2 Infrastructure', and removing any building height, Floor Space Ratio (FSR) and minimum lot size controls to be consistent with other hospital sites across the State.. It is proposed that the SEPP would be repealed after TLEP 2014 has been amended.

Pursuant to Clause 3.40 of the EP&A Act, it is understood that the SSD application and proposed SEPP would be publicly exhibited at the same time.

On this basis, the SSD application would be determined using the new planning controls facilitated by the site-specific SEPP that amends the LEP. It is understood that these will include:

- Rezoning of the majority of the Project Site (RU1 Zone and sliver of R1 Zone at the eastern end) to SP2 Infrastructure.
- The zoning of the remainder of the lot will remain unchanged. This includes the vegetated environmental areas, zoned 7(l) Environmental Protection (Habitat) under the TLEP 2000 and mapped as Coastal Wetlands. This would be preserved outside of the development area to protect the environmental biodiversity and provide views and amenity for the hospital. There is also a separate area of land zoned R1 General Residential to the north of the environmental area, which is flood prone and is not required for the Project.
- To allow any proposal to be assessed on merit, prescriptive provisions for building height, FSR or minimum lot size would not be included. Current provisions applying to the land under its current zoning would be removed

The planning approval pathway and statutory considerations are detailed further in **Section 5.1**.

Plate 1.4 provides a depiction of the proposed rezoning arrangement for the Project Site. Such planning controls are consistent with the LEP Standard Instrument and the typical approach for health facility/ hospital sites.

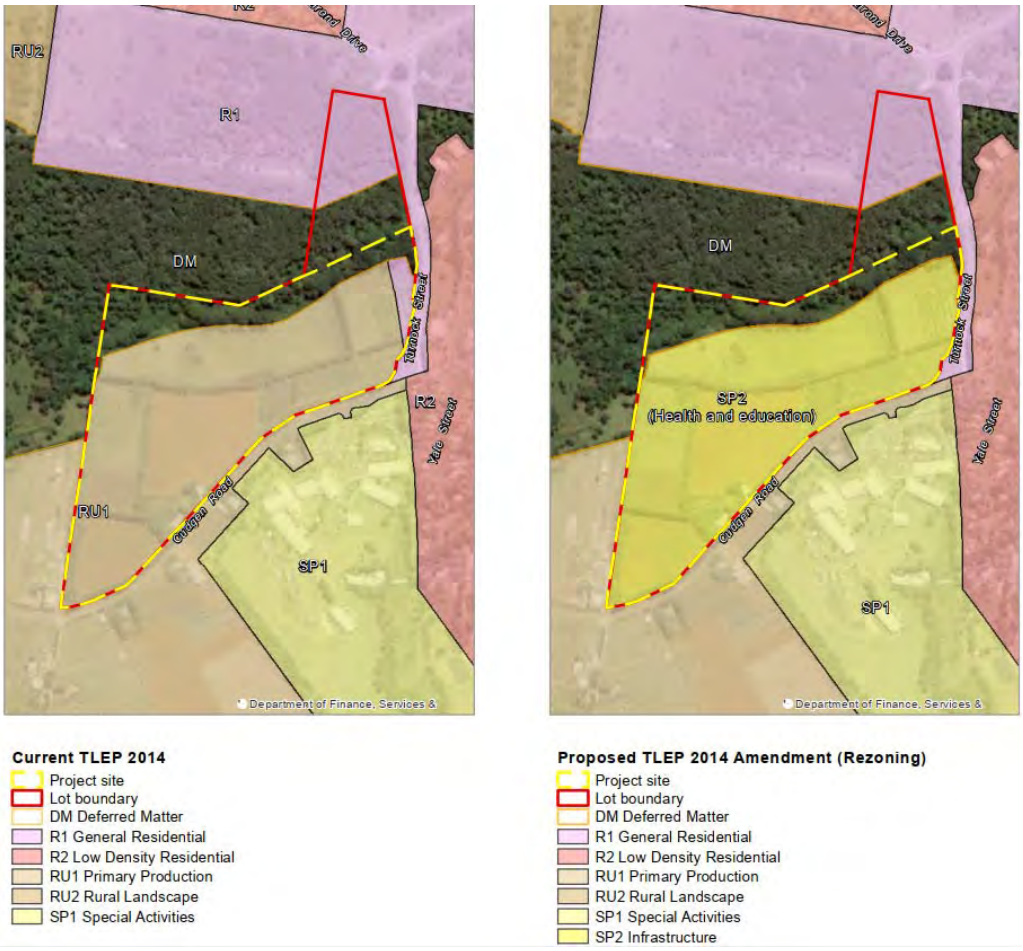


Plate 1.4 Proposed Rezoning Arrangement

1.8.2 State Significant Development (SSD)

Clause 8 of the SRD SEPP states that development is declared to be SSD for the purposes of the EP&A Act if:

- the development is not permissible without development consent under Part 4 of the EP&A Act
- the development is specified in Schedule 1 or 2.

The Project would not meet the requirements of Clause 58 of State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) as the development is not within an existing hospital. Therefore, the development would not be permissible without development consent under Part 4 of the EP&A Act.

Clause 14 of Schedule 1 of the SRD SEPP states that:

Development that has a capital investment value of more than $30 million for any of the following purposes:

(a) hospitals,
(b) medical centres,
(c) health, medical or related research facilities (which may also be associated with the facilities or research activities of a NSW local health district board, a University or an independent medical research institute).

The Project is a "hospital" with a capital investment value greater than $30 million. Accordingly, pursuant to clause 14 of Schedule 1 of the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP), the Project is SSD that requires the preparation of an EIS. In summary, the SSD process requires:

- The Secretary of DPE to issue requirements for the preparation of the EIS in accordance with Section 4.39 of the EP&A Act to Health Infrastructure
- The preparation of an EIS
- Assessment of the development application as SSD by DPE under Division 4.7 of the EP&A Act
- Determination of the development application by the Minster for Planning or delegate
- Preliminary identification of planning risks and mitigation measures.

As a separate application and EIS will be prepared for Stage 2, additional SEARS that specifically address that scope of work will need to be requested from the Secretary of DPE.

1.9 Secretary's Environmental Assessment Requirements (SEARs)

In accordance with Section 5.16 of the EP&A Act, the Secretary of DPE issued the requirements for the preparation of the EIS on 27 September 2018. A copy of the SEARs is attached as **Appendix A**.

The SEARs that apply to the Concept Proposal and the Stage 1 work are addressed separately in the relevant Part of this EIS.

Table 1.1 Summary of and Location of SEARs in the EIS

SEARs	*Location*	
General Requirements and Concept Proposal	***EIS Report***	***Appendix***
An environmental risk assessment to identify the potential environmental impacts associated with the development	**Section 8**	**N/A**
The EIS must meet the minimum requirements of Clauses 6 and 7 of Schedule 2 of the EP&A Regulation 2000	**Statement of Validity and EIS as a whole**	**N/A**
Where relevant, the assessment of key issues below, and any other significant issues identified in the risk assessment, must include: ■ Adequate baseline data ■ Consideration of the potential cumulative impacts due to other developments in the vicinity (completed, underway or proposed) ■ Measures to avoid, minimise and if necessary, offset predicted impacts, including detailed contingency plans for managing any significant risks to the environment.	**Section 7.4** **Section 8** **Section 9**	**N/A**
A report from a qualified Quantity Surveyor providing: ■ A detailed calculation of the CIV (as defined in Clause 3 of the Regulation) of the Project, including details of all assumptions and components from which the CIV calculation is derived. The report shall be prepared on company letterhead and indicate the applicable GST component of the CIV ■ An estimate of jobs that will be created during the construction and operational phases of the proposed development ■ Certification that the information provided is accurate at the date of preparation.	**Provided to DPE separate to the EIS**	
Statutory	**Sections 5.1, 5.2 & 7.4**	**N/A**
Policies and Strategic Context	**Sections 5.1 & 5.2**	**N/A**
Built Form and Urban Design	**Section 5.3**	**Appendix C**
Environmental Amenity	**Section 5.4**	**Appendix C & K**
Staging	**Section 5.5**	**N/A**
Agricultural Impact	**Sections 5.6 & 5.9**	**Appendix J & Z**
Transport and Accessibility	**Section 5.7**	**Appendix L**
Ecologically Sustainable Development (ESD)	**Section 5.8**	**Appendix M**
Social and Economic Impacts	**Section 5.9 & 5.6**	**Appendix Z**
Aboriginal Heritage	**Section 5.10**	**Appendix N**
Noise and Vibration	**Section 5.11**	**Appendix P**
Contamination	**Section 5.12**	**Appendix R**
Utilities	**Section 5.13**	**Appendix S, T and U**
Water and Soils	**Section 5.14, 5.16, 5.19**	**Appendix I, X & Y**

SEARs	***Location***	
Contributions	**Section 5.1.5 & 5.15**	**N/A**
Drainage and Stormwater	**Section 5.16**	**Appendix X**
Flooding and Coastal Hazards	**Section 5.17**	**Appendix W**
Bush fire	**Section 5.18**	**Appendix V**
Biodiversity Assessment	**Section 5.19**	**Appendix I**
Waste	**Section 5.20**	**Appendix BB**
Community Engagement Strategy	**Section 4**	**Appendix H**
Impact on Airspace	**Section 5.22**	**Appendix AA**
Underground petroleum storage system identification	**Section 5.23**	**Appendix S**
Stage 1 Works	***EIS Report***	***Appendix***
Bulk Earthworks	**Section 3.2, 6.1,**	**Appendix X & L**
Site Office Details	**Section 6.2** Note existing dwelling to be demolished separately	**N/A**
Transport and Accessibility	**Section 6.3**	**Appendix L**
Noise and Vibration	**Section 6.4**	**Appendix P**
Sediment, erosion and dust controls	**Section 6.5**	**Appendix X**
Contamination	**Section 6.6**	**Appendix R**
Ecologically Sustainable Development (ESD)	**Section 6.7**	**Appendix M**
Biodiversity Assessment	**Section 6.8**	**Appendix I**
Aboriginal Heritage	**Section 6.9**	**Appendix N**
Acid Sulfate Soil	**Section 6.10**	**Appendix Q**
Drainage and Stormwater	**Section 6.11**	**Appendix X**
Waste	**Section 6.12**	**Appendix R**
Construction Hours	**Sections 3.2.5 & 6.13**	**N/A**
Plans and Documents	***EIS Report***	***Appendix***
Architectural drawings (dimensioned and including RLs), Site Survey Plan, Site Analysis Plan, Shadow Diagrams, View Analysis/ Photomontages	**Section 3**	**Appendix B**
Sediment and Erosion Control Plan	**Section 6.5**	**Appendix X**
Landscape Plans and Tree Removal/ Preservation Plans	**Section 3**	**Appendix B & D**
Design Report	**Section 3 & 5.3**	**Appendix C**
Geotechnical and Structural Report	**Section 5.14 & 7.1**	**Appendix Q & X**
Preliminary Construction Traffic Management Plan	**Section 6.3**	**Appendix L**
Accessibility Report	**Section 7.2**	**Appendix CC**
Arborist Report	**-**	**Appendix DD**
Salinity Investigation Report	**5.14.2**	**N/A**

1.10 The Proponent and Project Team

This EIS has been prepared for Health Infrastructure with the assistance of a comprehensive project team. The project team and their responsibilities are outlined in **Table 1.2** below.

Table 1.2 Project Team and Responsibilities

Name	*Role/Responsibility*
Health Infrastructure	Proponent and Project Director
TSA Management	Project Manager
STH + Bates Smart	Architects
Turf Design	Landscape Architects
GeoLINK	Town Planner
Bonacci	Site/ Civil and Structural Engineers
Acor	Hydraulics and Service Engineering
Acoustic Studio	Acoustics
Altus Group	Cost Manager
ARC	Agronomist
Arup	Electrical Engineering
Avipro	Aviation Consultant
B& P Surveys	Surveyor
Bitzios	Traffic Engineers
BMT	Flooding Consultant
Greencap and Land and Fire Assessments	Ecology and Bush Fire
Morrison Geotechnic	Geotechnical
Niche	Heritage and Archaeology
SGS Economics & Planning	Social and Economic Assessment
Steensen Varming	Mechanical Engineering
Tim Fitzroy and Associates	Rural Land Use Conflict
OCTIEF	Contamination
ArborSafe	Arboriculture
Northern NSW Local Health District	Health Service Planning

2. The Project Site and Locality

2.1 Cadastral Description

The Project Site is located on a portion of 771 Cudgen Road, Cudgen, legally described as Lot 102 DP 870722. **Illustration 2.1** is an aerial image as it exists at present and shows the Lot boundary, the Project Site and the area proposed to be rezoned to SP2 Infrastructure.

2.2 Land Ownership/ Acquisition

The Project Site is privately owned and was put forward by the landowners in response to the EOI process. The negotiation and acquisition process is being undertaken in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*.

The area of the Project Site, shown in **Plate 2.1** as acquisition lot, is approximately 19.4 ha. It is comprised of the current agricultural land, a small sliver of land zoned General Residential fronting Turnock Street on the eastern end of the agricultural area, and a strip of the vegetated environmental area (Deferred Matter under the TLEP 2014). The vegetated environmental area will be preserved to protect the environmental biodiversity and provide views and amenity for the Tweed Valley Hospital.

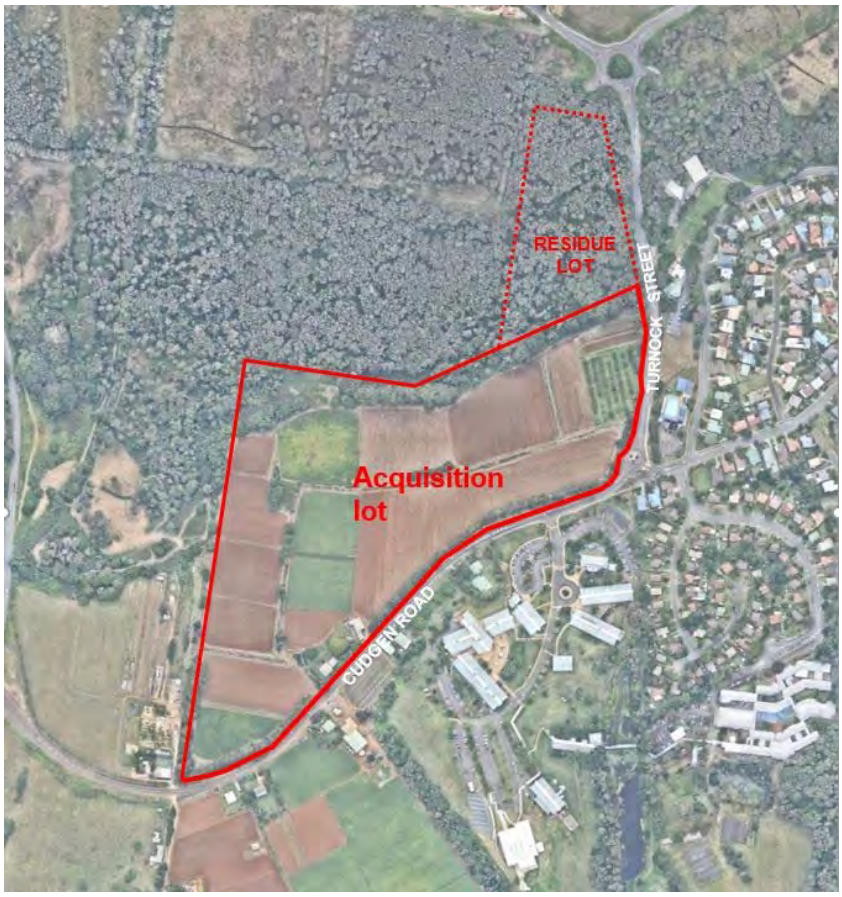


Plate 2.1 Proposed Acquisition Area (Project Site)

2.3 Site Context

The Project Site fronts Cudgen Road immediately west of the Kingscliff urban area. It has proximal access to Tweed Coast Road, which connects to the Pacific Motorway (M1) in the north. The Project Site is approximately 13.5 km south of Tweed Heads and is situated on the immediate urban periphery of Kingscliff.

Other land uses in proximity to the Project Site include urban, rural and environmental uses/ zones. To the east is the main Kingscliff urban and residential area. To the north is vegetated land, including environmental protection areas and mapped Coastal Wetlands. Beyond this, further to the north is existing residential development. To the south, on the opposite side of Cudgen Road, is an educational facility in the form of the Kingscliff TAFE. To the south-west and west is rural/ farmland. The village of Cudgen is located west of the Project Site, on the western side of Tweed Coast Road.

Immediately to the north of the environmental area is land identified in the draft Kingscliff Locality Plan (KLP), as having major development potential including a Business and Knowledge Precinct adjacent to the M1 and residential development of around 1500 dwellings.

Illustration 2.2 shows the approximate location of the Project Site in the context of the Tweed-Byron region.

Photographs of, and to, the Project Site and general surrounding landscape are shown in **Plates 2.2 - 2.9.**

Plate 2.2 Looking west from western side of site

Plate 2.3 Panorama across site plateau panning west (left) to east (right) – facing north

Plate 2.4 Looking east from lower north-western area of the site

Plate 2.5 Looking east across elevated plateau (right) and lower areas (left) of the site

Plate 2.6 Looking south to tree line and boundary with Cudgen Road

Plate 2.7 Looking east (to Kingscliff) along Cudgen Road site frontage

Plate 2.8 Looking west along Cudgen Road site frontage

Plate 2.9 Outlook from elevated area of Kingscliff (near water towers) toward Project Site

2.4 Project Site History and Current Land Use

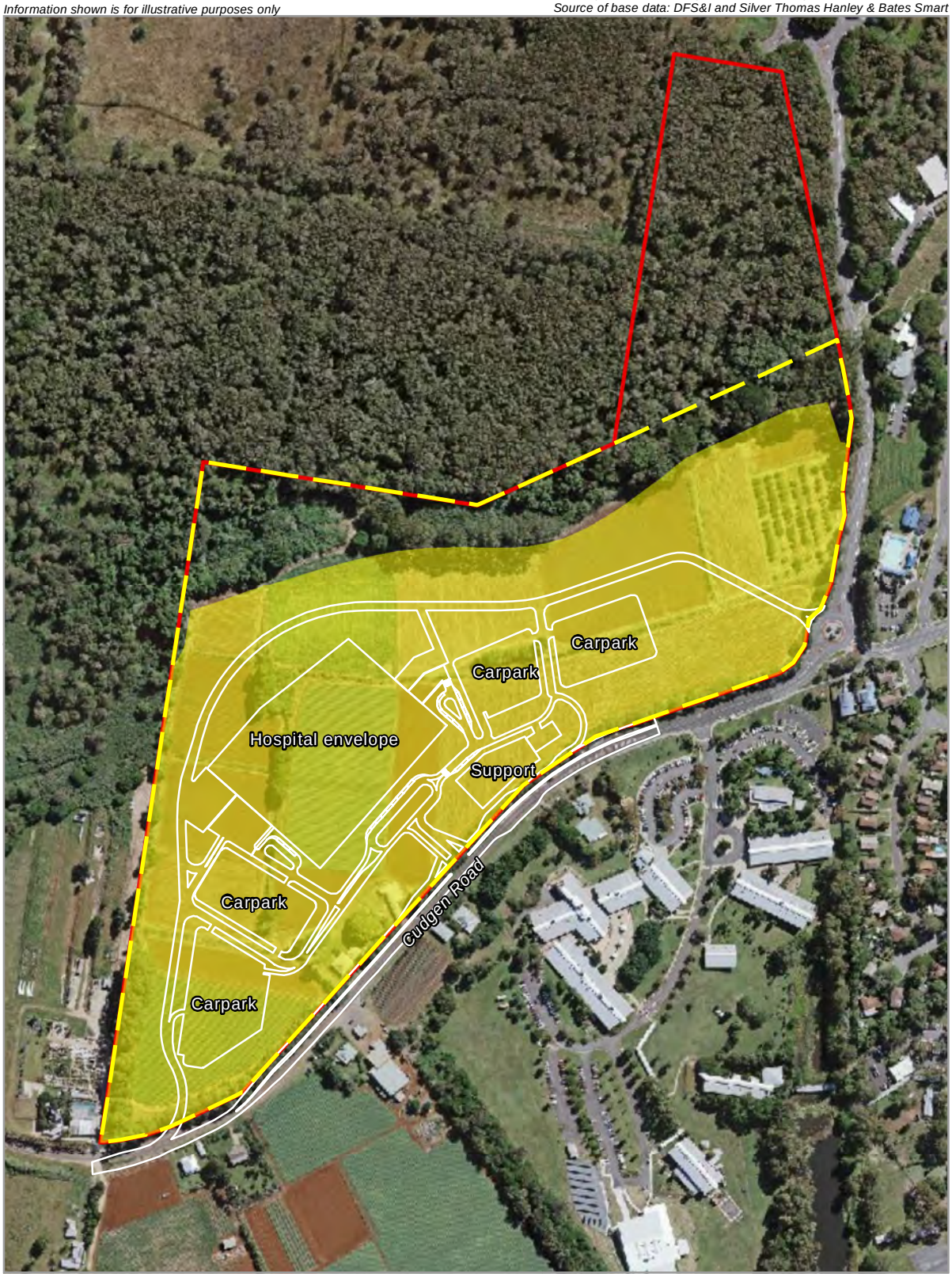
The Project Site has been used for long-term small-scale agricultural purposes, including cropping and horticulture (predominantly sweet potatoes) over the last 30 years. It is understood that no stock animals have been on-site during the time of current ownership (since 2010).

The current primary use of the site is for agricultural production. Approximately 11.24 ha of land is available for cultivation, with around eight hectares currently planted with sweet potato crops. Approximately 2.5 ha of the existing lot is zoned Residential but is currently undeveloped. This is split between a small sliver of land fronting Turnock Street on the eastern end of the agricultural area, and a larger undeveloped parcel of land in the north-eastern corner of the lot.

The remainder of the existing lot is mapped as Coastal Wetlands under the Coastal Management SEPP and is zoned Environmental Protection (Habitat) (approximately 4.2 ha), 2(c) Urban Expansion (approximately 0.8 ha) and 1(b1) Agricultural Protection (approximately 0.04 ha) under the TLEP 2000 and is a Deferred Matter of the TLEP 2014.

Information shown is for illustrative purposes only

Drawn by: AB Checked by: RE Reviewed by: JTS Date: 16/10/2018
Source of base data: DFS&I and Silver Thomas Hanley & Bates Smart



LEGEND

- Project site
- Lot boundary
- Proposed rezoning area (SP2)

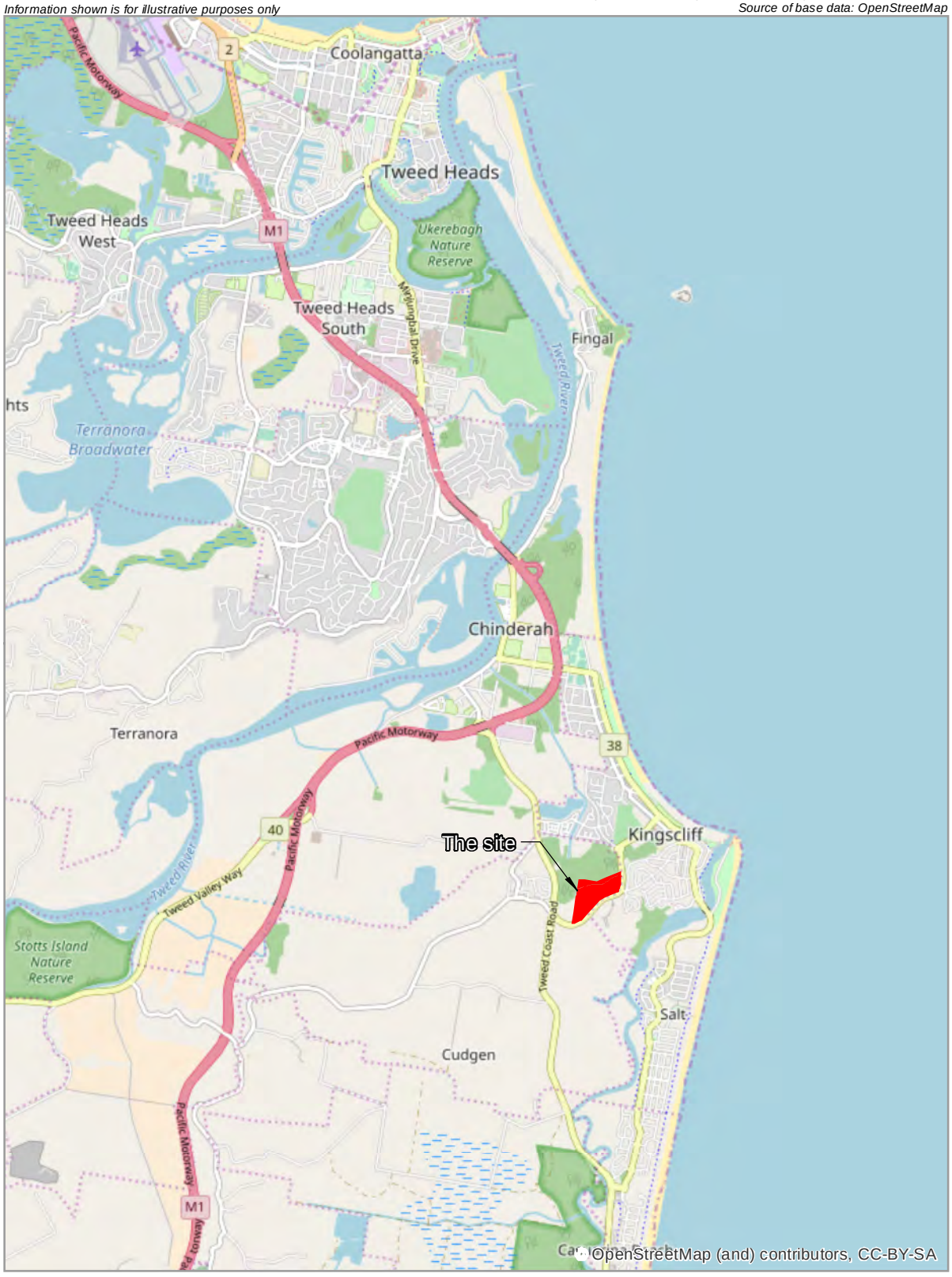
0 100

Project Site

Drawn by: AB Checked by: RE Reviewed by: JTS Date: 09/08/2018

Information shown is for illustrative purposes only

Source of base data: OpenStreetMap



0 1.5 Km

Site Context

GeoLINK environmental management and design

Environmental Impact Statement - New Tweed Valley Hospital
(Concept Proposal and Stage 1 Early Works)
2682-1084

Illustration 2.2

2.5 Site Analysis

The topography of the site is varied, including elevated relatively flat areas in the south, to sloping and low-lying in the north. The boundary to Cudgen Road represents its high point with maximum elevations of approximately 27 m Australian Height Datum (AHD). There is a relatively large plateau in this area that would support the main hospital building/ development zone. Elevations in the northern point are low-lying, down to approximately one metre AHD.

The Project Site is substantially clear of vegetation, with some sparse scatters and strands of trees. More dense vegetation occurs along its northern extent in low-lying areas, largely within the existing environmental protection zone. DPE's eSPADE website indicates the site is largely made up of Residual (Cudgen) soil landscapes. A site analysis plan has been prepared for the Project Site and is attached as **Appendix B**.

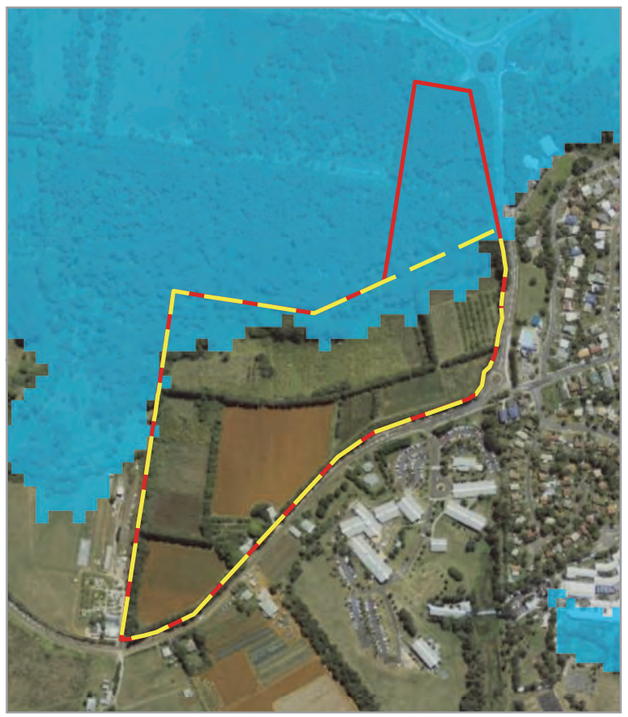
The Project Site contains a number of environmental and development constraints, including:

- Part of the Project Site supports and is adjacent to mapped Coastal Wetlands, including the Coastal Wetlands proximity buffer under the Coastal Management SEPP
- The majority of the Project Site is mapped as State Significant Farmland (SSF) (representing approximately 0.13 per cent of the total SSF mapped for the NSW Far North Coast) and Biophysical Strategic Agricultural Land
- Bush fire prone land (category 1 vegetation and buffer)
- The northern portion is flood prone, however, the majority of the Project Site including the main development area and access is above the PMF
- The majority of the Project Site is mapped as Class 5 Acid Sulfate Soils; however, the northern portion includes Classes 2 and 3
- Vegetation in the northern portion is mapped Endangered Ecological Community (EEC) and potential Koala Habitat.

Illustrations 2.3 and **2.4** provides mapping relevant to the Project Site analysis, showing constraints and environmental features present. Site analysis plans are also in **Appendix B**.

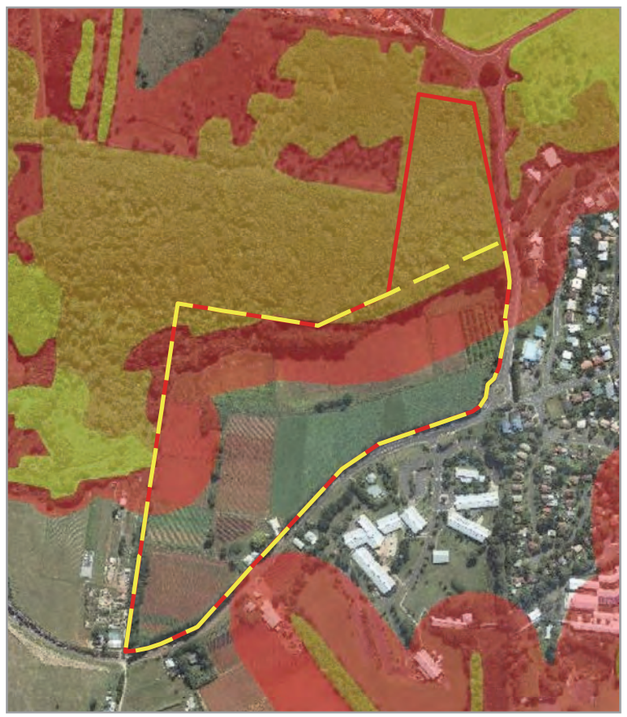
Information shown is for illustrative purposes only

Drawn by: AB Checked by: RE Reviewed by: JTS Date: 05/10/2018
Source of base data: DFS&I, BMT, Greencap and Tweed Shire



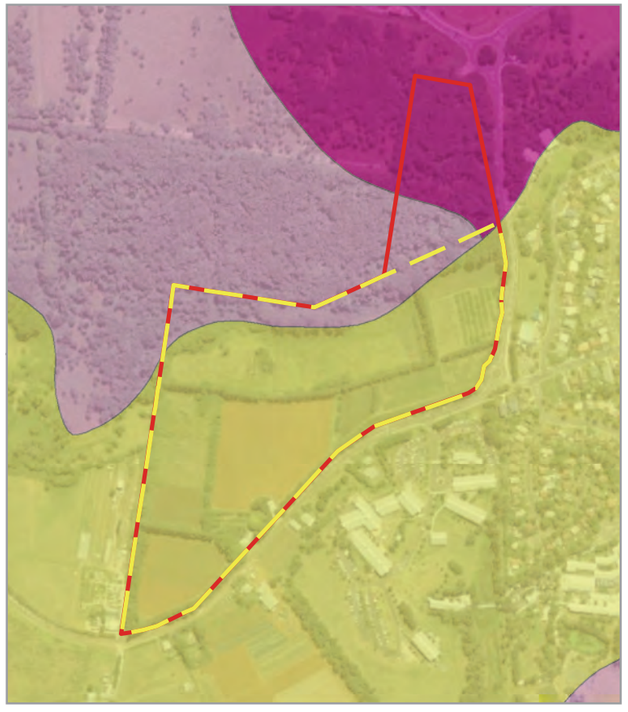
FLOOD

- Project site
- Lot boundary
- PMF inundation area



BUSHFIRE PRONE LAND

- Project site
- Lot boundary
- Vegetation Buffer
- Vegetation Category 1
- Vegetation Category 2



ACID SULFATE SOIL RISK

- Project site
- Lot boundary
- Class 2
- Class 3
- Class 5

VEGETATION

- Project site
- Lot boundary
- Zone 1 (1064 - Paperbark swamp forestof the coastal lowlands)
- Zone 2 (1302 - White Booyong - Fig subtropical rainforest)
- Zone 3 (1302 - White Booyong - Fig subtropical rainforest)
- Zone 4 (1302 - White Booyong - Fig subtropical rainforest)
- Zone 5 (1569 - Flooded Gum - Brush Box - Tallowwood mesic tall open forest)
- Zone 6 (1569 - Flooded Gum - Brush Box - Tallowwood mesic tall open forest)
- Zone 7 (1235 - Swamp Oak swamp forest of the coastal lowlands)
- Zone 8 (1302 - White Booyong - Fig subtropical rainforest)

North

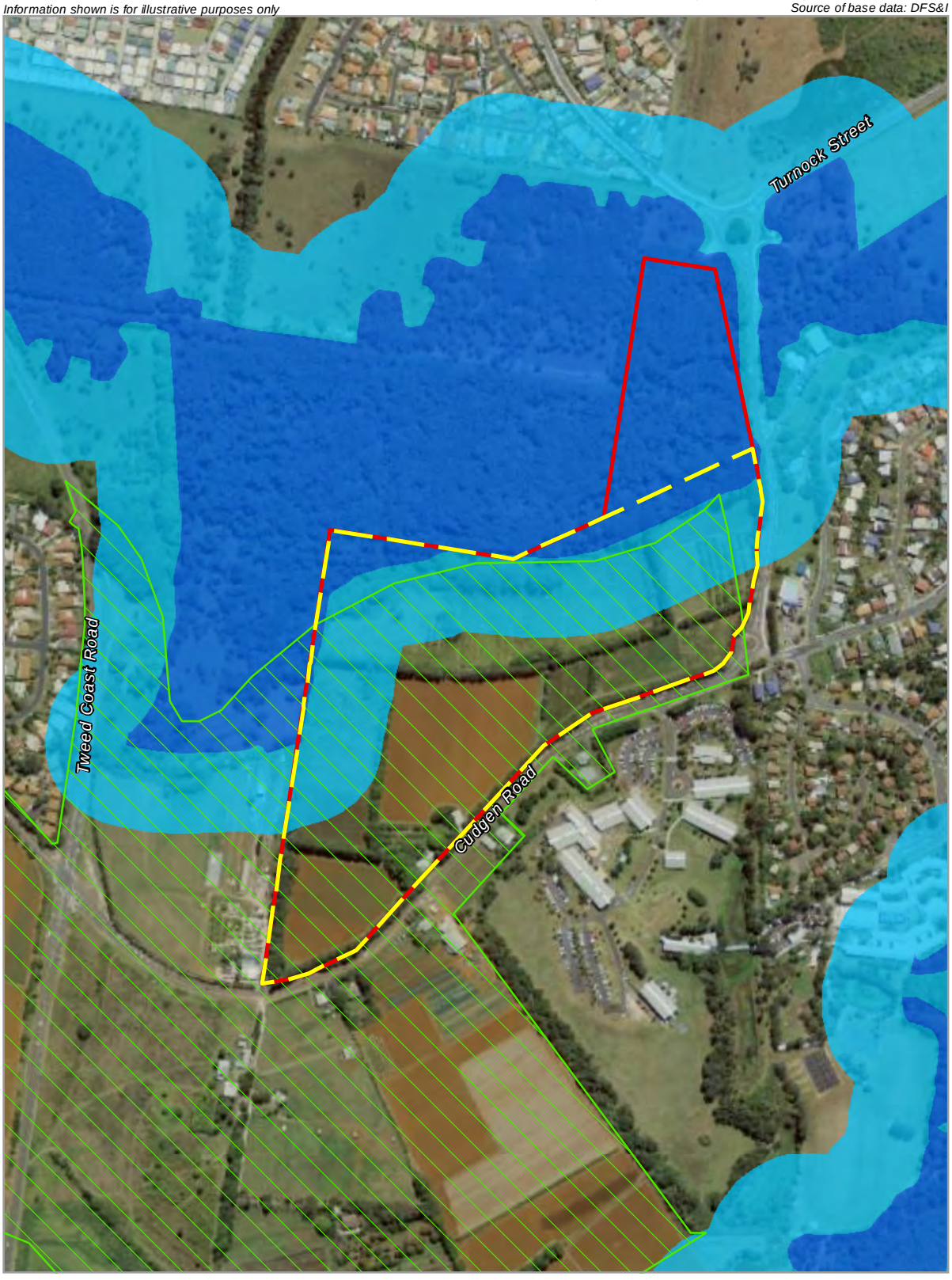
0 200

Site Analysis - Flood, Bushfire, Acid Sulfate Soils, Vegetation

Drawn by: AB Checked by: RE Reviewed by: JTS Date: 16/08/2018

Information shown is for illustrative purposes only

Source of base data: DFS&I



LEGEND

- Project site
- Lot boundary
- State significant farmland
- Proximity area for coastal wetland
- Coastal wetland

0 150

Site Analysis - Coastal Management SEPP and State Significant Farmland

3. Description of the Project

3.1 Concept Proposal

3.1.1 Description

This application seeks approval of a Concept Development Application (Concept Proposal) for the Tweed Valley Hospital. The ultimate development of the Tweed Valley Hospital will be informed by service planning to 2031/32 and has an expected gross floor area in the range of 55,000 m^2 to 65,000 m^2 (note for comparison purposes that TTH has a GFA of 25,000 m^2). At this stage, the hospital is expected to include the following components and services:

- A main entry and retail area
- Acute and Sub-Acute In-Patient Units
- Administration Services
- Ambulatory Services
- Back of House Services
- Cancer Services including Day Oncology and Radiation Oncology (new service)
- Car Parking
- Close Observation Unit
- Emergency Department
- Future-proofing and expansion
- Integrated Interventional Services including Interventional Cardiology (new service)
- Intensive Care Unit
- Maternity Unit
- Medical Imaging
- Mental Health Services
- Mortuary
- Paediatrics
- Pathology
- Pharmacy
- Renal Dialysis.

A Masterplan for the future development of the Project Site has been prepared to guide the planning of the site and is included in **Appendix B** for information. Not all of the features of the Masterplan form part of this Concept Development Application.

STH and Bates Smart Architects have prepared a Built Form and Urban Design Report (**Appendix C**) to accompany the application and plans. This, combined with the summarised description below, outlines the Concept Proposal and its features.

3.1.2 Concept Approval

Concept approval is being sought for the following:

- Maximum planning envelope for the Tweed Valley Hospital main building
- Maximum planning envelope for a support building
- General internal road network and site access points.

These are shown in the plans at **Appendix B**.

3.1.3 Design Principles

In developing the Concept Proposal for the Tweed Valley Hospital, the Integrated Project Team has undertaken a consultative process to develop the Masterplan as described previously, including a series of 11 design workshops held with Project Working Groups, Community and Consumer Reference Panel and Council Reference Groups. At a Project Aspirations workshop held in November

2017 a working group of around 50 senior hospital and project staff defined the Project Aspirations across four key themes:

1. Models of Service Delivery
2. Research and Education
3. Technology
4. Built Form and Environment.

The following Project Aspirations apply to Built Form and Environment:

- **Functionality and Flexibility** – The facility will be highly functional from the outset but will have an in-built capacity for change, flexibility and adaptation.
- **Access** – The built form will be inviting and facilitate ease of access – entry, exit and movement – throughout the facility.
- **Natural light and views** – Patient and staff rooms will have a view to bring the outside inside and to engage with the local environment.
- **Wayfinding** – The hospital will utilise colour and add depth to wayfinding methodologies through technology, landscaping and arts.
- **A sustainable facility** – The facility will incorporate sustainable design principles, including recycling, sustainable products and energy efficiency.
- **A community asset** – The Health and Education Campus will be a truly integrated community asset, including inside and outside spaces that promote lifestyle 'wellness' and 'healthy being' for the community, patients, staff and carers.

The Tweed Valley Hospital design is also required to comply with all relevant technical and operational Australian Standards, Codes, guidelines and legislation.

3.1.4 Consumer and Community Input

Members of the Project's Community Reference Panel have reviewed key aspects of the Concept Proposal and identified the following key themes to be considered in the design of the Tweed Valley Hospital and broader Health and Education Campus.

Table 3.1 Common Themes and Key Outputs

Common Themes
Facilities for families and children: ■ The facility should encourage, and provide facilities for, families and children such as playgrounds and childcare
Environmental sustainability: ■ The facility should embrace environmentally sustainable strategies such as renewable energy
Clear and easy wayfinding: ■ The site and facility should promote clear and easy navigation using visual signage and natural wayfinding strategies
Pedestrian access to environmental zone: ■ The project should consider public access to the environmental zone via boardwalks and potential therapy spaces
Short travel distances and accessibility: ■ Minimal walking distances between carparks, entry points and circulation cores should be provided
Varied retail provision:

Common Themes
■ The retail provision should provide for a choice of offerings and include external amenities
Provision of car parking:
■ The Masterplan should provide sufficient and specialised car parking in the right places to meet the needs of the hospital
Areas for spiritual care and reflection:
■ The hospital and its surrounds should provide spaces for spiritual care, reflection and grieving
Potential traffic congestion:
■ The facility should not increase traffic congestion to surrounding roads, and should take advantage of future road connections
Welcoming arrival experience:
■ The entry spaces should be welcoming whilst providing information opportunities though signage and greeting by volunteers
Provision of covered external space:
■ The landscape design should provide for covered external areas to protect from the sun and inclement weather
Security to public spaces:
■ Public spaces, particularly external spaces such as car parking, should be well lit and provide a secure environment
Provision of community farm/ garden:
■ The project could include space for agriculture such as a community farm or garden
Connection to wider community:
■ The project should integrate with the wider community though local connections
Discreet and specialised entrances:
■ The Masterplan and hospital building should consider separate entrances for services such as maternity

3.1.5 Site Layout

The Masterplan presents a future health precinct sited around the main hospital building envelope which is situated toward the centre of the site, at the northern end of the site's natural plateau. The main building, set-down and forecourt are sited parallel to Cudgen Road. Four carparks (two to the east and two to the west) provide staff and public parking and preserve future expansion space on the Project Site. These carparks are accessed via an integrated internal road network that provides for ingress, egress and circulation. A lower scale support building envelope presents to Cudgen Road and the main public entry point to the Tweed Valley Hospital.

3.1.6 Building/ Planning Envelopes

The Concept Proposal sets out a maximum probable 'planning envelope' for the main buildings on site, within which the proposed starting-case hospital and support buildings would be designed and articulated. The building design is currently being developed and will be developed in greater detail for Stage 2 submission.

The proposed hospital planning envelope is illustrated in **Plates 1.3, 3.1** and **3.2**.

The slope of the land will be used to achieve entries at different levels of optimum clinical and operational functionality and two levels of the building will be built below the main entry level from Cudgen Road.

The anticipated building typology will comprise a basement zone to service the hospital. Emergency Department on lower ground (being the ground level at the northern aspect of the site's plateau), main entry at ground level from Cudgen Road with a range of outpatient and other clinical services.

The remainder of the lower zone of the building above ground level will comprise operating theatres and other associated services.

Services to be located in the upper zone of the building will be carefully selected (taking into consideration optimal clinical functional relationships) in order to maximise the benefits of the panoramic views in all directions.

Overall, the building is proposed to include basement, lower ground and ground levels, with five levels of occupied space above of increasing articulation and reducing building density. Some engineering plant space, helipad and associated lifts will be situated on the roof of the building.

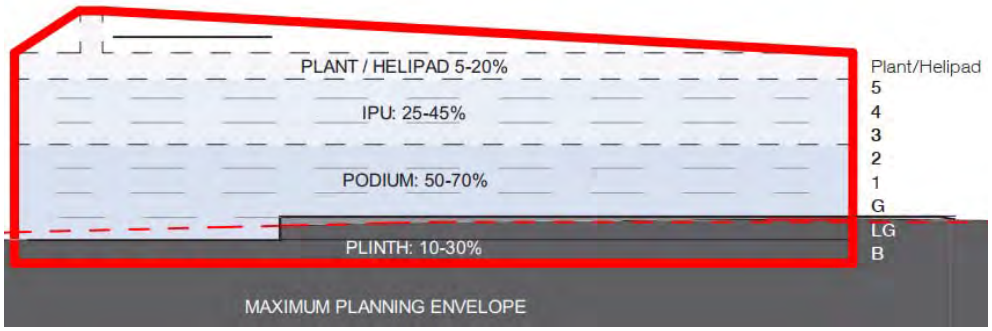


Plate 3.1 Southeast Elevation of Maximum Planning Envelope

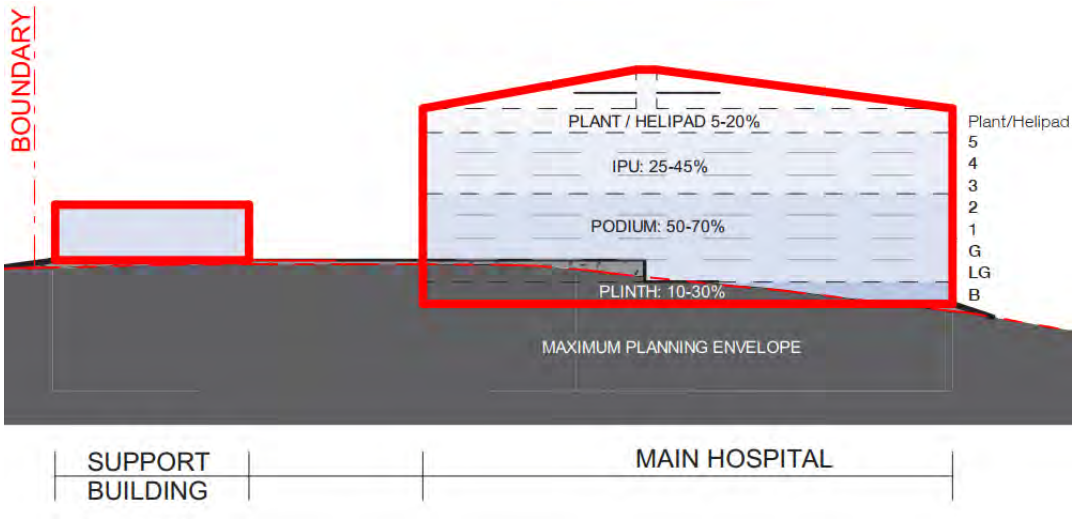


Plate 3.2 Northeast Elevation of Maximum Planning Envelope

Based on the concept plans at **Appendix B**, the proposed hospital maximum planning envelope ranges in height from AHD + 19.0 to AHD + 67.1 (Noted AHD levels reference to site survey data. Existing site survey data indicates the boundary to Cudgen Road at its high point is approximately +27 m AHD). The main ground level public entrance from Cudgen Road is to be positioned at AHD +28, with the lowest basement level at approximately AHD +19 m. The top-level plant is located at

AHD +59.1 m, with the top of the helipad access lift core being the tallest point of the envelope at AHD +67.1 m.

The planning envelope for the main building includes zones of anticipated densities as indicated on the plans. These provide general parameters for the detailed design and massing of the built form and are as follows:

- Plinth – 10-30 per cent
- Podium – 50-70 per cent
- Inpatient Units (IPU) – 25-45 per cent
- Plant – 5-20 per cent.

The Concept Proposal has an expected gross floor area in the range of 55,000 m^2 to 65,000 m^2.

The planning envelope is setback approximately 76 m from the southern property boundary, 128 m from the northern property boundary, 44 m from the western boundary and 312 m from the eastern boundary.

The support building fronting Cudgen Road would be of a low-rise scale, with the proposed envelope extending from ground level at +28 m AHD to roof level at +39.5 m AHD, with lift overruns occurring above this level. This envelope is setback 12 m from the southern boundary and approximately 253 m from the eastern boundary.

These details are shown on the concept architectural plans which are attached as **Appendix B**. Further explanation of the design approach and intent behind the Concept Proposal, including planning envelopes, is provided in the Built Form and Urban Design Report at **Appendix C** and **Section 5.3**.

3.1.7 Access and Parking

3.1.7.1 Access

The following road and access elements have been developed by the design team and traffic engineering consultant in consultation with Health Infrastructure, Tweed Shire Council, Roads and Maritime Services (RMS) and Transport for NSW (TfNSW). Approval is sought for the following access arrangements as part of the Concept Proposal:

- A primary access point on Cudgen Road. This access point will ultimately be a signalised intersection, providing the main public inward and outward access onto the Project Site.
- An inward only access point (un-signalised) off Cudgen Road at the western end of the site for a service road that would provide access for emergency vehicles, service vehicles and staff.
- A secondary access point (inward only - un-signalised) off Cudgen Road east of the main entry, providing access to the eastern carparks (bypassing the main entry).
- An eastern access point via the roundabout connecting Cudgen Road and Turnock Street, facilitating ingress and egress.

The hospital's main signalised entry point from Cudgen Road identified in the Concept Proposal will be detailed as part of Stage 2 DA.

3.1.7.2 Parking

Concept parking layouts have been developed in accordance with advice from the traffic engineer and design team (refer **Section 5.7 and Appendix L**).

Based on the Masterplan, it is proposed to provide parking areas on the east and west sides of the hospital. The proposed development is expected to provide in the order of 700 car parking spaces across four car parking areas separated into two dedicated staff carparks and two public carparks. Some additional set-down/ short-term parking would also be provided at the ED and entry points. Car parking at the hospital will likely comprise at-grade (on the surface) parking. These details will be provided with the Stage 2 Development Application. However, the locations of the carparks on the Masterplan have been identified as part of the Stage 1 works as temporary construction carparks.

Further demand and feasibility studies, as well as staff and community consultation in relation to car parking, will be undertaken prior to lodgement of the Stage 2 SSD application. This would include a full demand study and business case developed to inform Stage 2, and a Car Park Project Working Group to be formed – this includes members for the Community Reference Panel. Hence parking numbers are not included for endorsement as part of this EIS.

3.1.8 Vegetation Management, Landscaping and Public Domain

A zonal concept landscape plan has been prepared by Turf Design and can be found at **Appendix D**.

A Biodiversity Development Assessment Report (BDAR) accompanies this application (**Appendix I**) and the zonal concept landscape plan has responded to that report. Further details and an assessment of biodiversity is provided in **Section 5.19.**

At a concept level, landscaping is to be proposed throughout the site, including open spaces, courtyards, and around the new built form and boundaries of the site. This would be to provide buffers where required and visual amenity, allowing staff, patients and visitors the opportunity to have outside spaces and provide a sense of sanctuary and support a healing environment. Outdoor areas and landscaping, including public domain treatments, would be subject to Stage 2 design.

3.1.9 Crime Prevention through Environmental Design (CPTED)

The Concept Proposal has considered the Crime Prevention Through Environmental Design (CPTED) principles during the master planning process of the Tweed Valley Hospital. The four key CPTED principles are:

- Surveillance
- Access Control
- Territorial Reinforcement
- Space Management.

The Tweed Valley Hospital has adopted the CPTED principles during the development of the Concept Proposal and this will be further considered and developed at Stage 2 to ensure the design establishes a safe and secure environment for patients, visitors, staff, contractors and users of the Tweed Valley Hospital (refer to **Section 5.2.8** for further discussion).

3.2 Stage 1 Early and Enabling Works

In addition to the Concept Proposal described above, Health Infrastructure seeks approval for Stage 1 Early and Enabling Works (Stage 1 works) to establish the Project Site for future development. Specifically, the Stage 1 works comprise:

- Construction compound for Stage 1 works
- Augmentation and connection of permanent services for the new facility (water, sewer, electricity, telecommunications)
- General clearance of site vegetation within the footprint of construction works, including tree stumps
- Chipping of cleared vegetation (excluding weed species) to use on-site for ground stabilisation/ erosion control, or off-site disposal (as required)
- Bulk earthworks and recycling of materials to establish the required site levels and create a stable landform in preparation for hospital construction
- Piling and associated works
- Stormwater and drainage infrastructure for the new facility
- Rehabilitation and revegetation of part of the wetland area
- Construction of temporary internal road ways for use during construction and in preparation for final road formations in Stage 2
- Retaining walls.

3.2.1 Description

A description of Stage 1 works is provided in the following sections. The area of influence and footprint for the Project and Stage 1 works are shown in the plans and drawings at **Appendix B**. The Civil and Structural Report is at **Appendix X**.

3.2.1.1 Site Establishment and Mobilisation

These works involve:

- Installation of any additional security measures required to make the site secure for the purposes of Stage 1 works.
- Establishment of a site compound for Stage 1, including site sheds/ cribs and temporary car parking facilities for construction personnel. This may include demountable structures and facilities/ amenities for use by the early and enabling works contractor, including utilisation of any relevant facilities previously provided as part of the Preliminary Works*
- Provision of temporary services for the construction works, including utilisation of temporary services provided as part of the Preliminary Works
- Installation of exclusion fencing to delineate the limit of Stage 1 works.

**Preliminary Works are not part of this application but are described later in this section for clarity and information only.*

3.2.1.2 Establishment of Environmental Controls for Stage 1 Works

Relevant stormwater and environmental controls would be implemented as part of Preliminary Works (refer **Section 3.5**), prior to the commencement of Stage 1 works. However, any additional/specific environmental controls for Stage 1 Early and Enabling Works would be implemented as part of the Stage 1 works. Bonacci has prepared a Soil and Water Management Plan for Stage 1 which is provided at **Appendix X**.

A preliminary Construction Environmental Management Plan (CEMP) has been provided at **Appendix G,** and a detailed CEMP, including relevant sub-plans, would be prepared and implemented by the Stage 1 works contractor in accordance with relevant standards.

3.2.1.3 Site Clearance and Vegetation Removal

The development area on the Project Site is substantially clear of any significant vegetation, however vegetation removal is required to facilitate the Project. Details of vegetation requiring removal is provided in **Sections 3.2.2** and **6.8**, plus the tree removal plan at **Appendix D**. For Stage 1 works this would include:

- Identification and demarcation of which areas are to be cleared and where vegetation is to be retained
- Establishment of any tree and vegetation protection measures as required
- Removal and clearing of vegetation
- Mulching of vegetation (excluding weeds) for on-site reuse in soil stabilisation or landscaping
- Disposal of excess or unsuitable waste vegetation to a licensed green waste disposal facility
- Spraying to suppress weeds in disturbed/ exposed area of works
- Establishment of additional sedimentation and erosion controls as required
- Wet down of disturbed soil for dust suppression.

3.2.1.4 Earthworks and Piling

Bulk earthworks and piling will be undertaken in accordance with a bulk earthworks plan and methodology prepared by the relevant contractor. The Civil and Structural report at **Appendix X** provides general details of these works. Approximate volumes of cut and fill are 139,812 m^3 and 118,653 m3 respectively, resulting in excess cut volume of 21,159 m^3.

The activities involved would likely include:

- Establish methodology for cutting and filling to achieve required site levels
- Initiate bulk excavation works in areas of cut, including recycling of material and transferring spoil to areas of fill
- Any imported material to be in accordance with engineering specification and meet the relevant standards
- Grade levels to minimise stormwater ponding
- Carry out piling and associated works
- Remove excess material from the site as required and dispose to a licensed waste facility or other suitable use
- Maintain shaker grid and wash down facility to minimise tracking of materials beyond the site
- Stabilise the site progressively
- If stockpiles are required, stabilise stockpiles and install appropriate erosion and sediment controls
- Wet exposed earth for dust suppression during works.

3.2.1.5 Services and Utility Connections

Assessment of required services and utility augmentation and connections has been undertaken and is described in detail in the relevant Infrastructure Management Plans (prepared by Acor and Arup). These describe the services and utility requirements (water, sewer, telecommunications, electricity) and proposed servicing arrangements. Refer to **Appendices S, T and U**. Consolidated Stage 1 works plan set is at **Appendix B**.

Installation of permanent in-ground services would generally involve:

- Establish detailed methodology for services and utility installation
- Confirm utility connection programme and requirements with authorities
- Import any required bedding and backfill material
- Undertake trenching works
- Lay required bedding material
- Install utility infrastructure
- Arrange for inspection
- Back fill trenches
- Make and complete connection procedures.

A summary of the works include:

Hydraulic and Wet Fire Services (Water and Sewer)

- site sewerage connection to Tweed Shire Council sewerage rising main in Cudgen Road
- site trunk mains reticulation in conjunction with site access roads construction and bulk earthworks
- any further services for Stage 1 work establishment and construction.

Electrical and Communications

Appendix S outlines electrical and communication service requirements and installation. Refer to **Appendix S** and **B** (infrastructure report and electrical engineering drawing) for Stage 1 detail and works.

Stage 1 early and enabling works include installation of the following electrical and communications infrastructure:

- 11kV circuit breakers and associated protection in Cudgen Zone Station (Level 3 ASP);
- Project Site perimeter Essential Energy ring main units for electrical point of connection to the Essential Energy 11kV network (Level 3 ASP);
- Public road lighting at new intersections (Level 3 ASP);
- Private HV switching station;
- Electrical and communications infrastructure highways including pit and pipe systems;
- Communication lead-in conduits from the Project Site boundary to future intake rooms;
- Diversion of Telstra, Optus and AARNET cables along Cudgen Road;
- 11kV connection from existing above ground feeders on Cudgen Road to feed new Essential Energy temporary kiosk substation;
- Temporary construction Project Site 1000kVA Essential Energy kiosk substation;
- Temporary external LV switchboard fed from temporary 1000kVA kiosk substation to feed temporary Project Site supplies;
- External lighting and power distribution boards to supply permanent external lighting and power (not construction Project Site power);

- External distribution board temporary supplies from the temporary external switchboard and associated pit and pipe systems;
- External distribution board pit and pipe systems to facilitate future permanent supplies from the hospital building;
- Pit and pipe system to support future external communications racks/equipment and security equipment;
- Pit and pipe systems to support future small power connections.

Gas

No gas services are available in the vicinity of the Project Site, and there are no future planned works to provide natural gas to this area. The alternative is Liquified Petroleum Gas (LPG) stored on-site within gas tanks and related deliveries. Further detail and assessment of this would occur for detailed design at Stage 2.

3.2.2 Tree Removal and Protection

Various trees and vegetation require removal as shown in the tree removal/ preservation and landscape plan (conceptual zonal plan) at **Appendix B** and **D**. This includes existing grouped windrow trees and three individual trees of moderate retention value. The single high retention value tree on-site (fig) would be retained and incorporated into the design. An Arboricultural Report is at **Appendix DD**.

No landscaping or public domain works are proposed as part of the Stage 1 works.

3.2.3 Plant and Equipment

Typical plant and equipment that may be used to undertake the Stage 1 works would include:

- Hand tools (power and non-power)
- Delivery vehicles, trucks and vans
- Fork lift
- Mobile crane
- Chainsaw
- Excavators, including with hammers
- Backhoe and bobcats
- Jackhammer
- Drilling and piling rigs
- Concrete trucks, mixers and pumps
- Mulching/ chipping equipment
- Front loader
- Tip trucks
- Spraying equipment
- Water truck
- Rollers and compactors
- Crushing and screening
- Articulated grader.

3.2.4 Construction Traffic, Access and Parking

The Stage 1 Contractor will be required to prepare a CEMP prior to any work commencing on site. As part of its CEMP, the contractor will also need to prepare a Construction Traffic Management Plan (CTMP). A preliminary CEMP is located at **Appendix G**. Construction site access will be via west and east points of the site connecting to Cudgen Road and the round-about at Turnock Street respectively.

Preliminary construction parking and traffic considerations are included in **Appendix L**, including a preliminary Construction Traffic Management Plan.

Construction vehicles and parking for worker's vehicles will be provided on-site in designated areas in the form of temporary hardstand parking.

3.2.5 Construction Hours

In order to deliver this important Project, the following construction hours are proposed:

- Monday to Friday – 7.00 am to 6.00 pm
- Saturday – 8.00 am to 4.00 pm (extended)
- Sunday and public holidays – no work.

The noise assessment at **Section 6.4** and **Appendix P** includes consideration of the proposed hours, including extended construction hours.

3.2.6 Anticipated Construction Program

It is estimated that the Stage 1 works would be undertaken over a period of approximately 10 months (excluding shutdown periods).

3.3 Project Value and Job Creation

The Capital Investment Value (CIV) for the Tweed Valley Hospital is commercial-in-confidence but has been provided separately to DPE as part of the documentation associated with lodgement of the SSD application. The CIV is over the SSD threshold of $30 million.

The Social and Economic Impact Assessment (by SGS Economics and Planning) has determined that employment projections for this project can be considered in three major streams:

- Construction phase – which refers to the stimulus generated by construction and works associated with will generate 2700 Full Time Equivalent (FTE) jobs at 771 jobs per year over a 3.5-year period from 2019 to 2022
- Operations phase –which refers to the stimulus generated by the operations of an expanded hospital at Kingscliff. This includes a base staffing of 1053 FTE jobs currently, rising by an estimated 20 per cent to 2026/27, and then increasing by an estimated 1.1 per cent per annum to 2031/32. Further details of workforce planning would be developed. The operations phase will be realised in Stage 2 of the Project
- Agriculture – which refers to the loss of agricultural jobs given that the development affects utilised farmland. This amounts to four FTE jobs per annum. It is assumed that these jobs will not be relocated to any other part of the NSW economy.

3.4 Future Development

Stage 2 will include the detailed design, construction and operation of the Tweed Valley Hospital and will be subject to a separate SSD application following Stage 1.

Any subsequent stages would be subject to a separate development application(s) as required and would likely be related to works for potential future expansion of the facility. Details of this are unknown at this stage and would be developed as required.

3.5 Preliminary Works (not part of this SSD application)

Following acquisition of the Project Site, Health Infrastructure will undertake works to secure the Project Site, establish access, improve certain road infrastructure and adjust services, and ensure appropriate environmental control measures are in place.

These Preliminary Works do not form part of the SSD application for the Project and will be undertaken under the exempt development provisions of ISEPP, the exempt and complying development provisions of SEPP (Exempt and Complying Development Codes) 2008 and as Development Without Consent under ISEPP and Part 5 of the EP&A Act as set out below.

3.5.1 Exempt and Complying Development

Preliminary Works that are Exempt and Complying Development would generally comprise:

- Site establishment including fencing of Project Site
- Set-up temporary accommodation and amenities to service the Preliminary Works
- Temporary construction car parking
- Temporary stormwater drainage (for site compound)
- Temporary site electricity supply
- Demolition of existing onsite buildings and structures including remediation of contaminated land.

As referred to in **Section 5.12.1**, under the requirements of SEPP 55 – Remediation of Land, the remediation work identified in the contamination assessment is considered to be Category 2 remediation work (i.e. not needing consent). A Remediation Action Plan (RAP) would be implemented, and remediation work undertaken as Preliminary Works in accordance with the RAP and SEPP 55.

3.5.2 Development without Consent

Preliminary Works undertaken in accordance with Part 5 of the EP&A Act and the provisions of ISEPP would generally comprise:

- Soil and water management works including sediment basins and associated works to mitigate potential impacts of stormwater runoff from the unimproved site
- New site access point from Cudgen Road at south-western site boundary
- New site access point from Turnock Street roundabout, including intersection improvement works, electrical connections for street lighting and a new water main connection beneath the road/ intersection
- Upgrading the Tweed Coast Road/ Cudgen Road intersection to provide a better level of service.

Health Infrastructure will coordinate these Preliminary Works in consultation with the relevant authorities/ utility owners (as required) and the Tweed Shire Council. The Preliminary Works have been identified to be progressed once the Project Site is transferred to Health Administration Corporation's (HAC) ownership and in advance of construction of the Stage 1 SSD works. The likely impacts of applicable Preliminary Works would be assessed in the form of a Review of Environmental Factors (REF), prepared in accordance with Part 5 of the EP&A Act and the provisions of the ISEPP.

For clarity, plans attached to this EIS identify the Preliminary Works that are separate to this SSD application.

4. Consultation

Elton Consulting were engaged to prepare a Stakeholder and Community Consultation Report (refer to Volume 1 & 2 in **Appendix H**). Their assessment summarises the stakeholder and community engagement activities undertaken to support the Tweed Valley Hospital Project in developing the campus Masterplan and EIS to support the SSD application for a Concept Proposal and Stage 1 Early and Enabling Works for the new hospital.

4.1 Consumer and Community Engagement

Community engagement has been ongoing for the life of the project, including:

- Online consultation through the project website, including publication of media releases, fact sheets, supporting reports and frequently asked questions. The website also provides the opportunity to submit comments, and registration to receive updates
- A dedicated 1800 telephone line
- A comprehensive community engagement process including pop-ups and written feedback.
- The establishment of a Community Reference Panel (CRP)
- Attendance at community-led meetings and forums.

Elton Consulting was engaged by Health Infrastructure in April 2018 to manage community consultation activities relating to the site selection process for the Tweed Valley Hospital.

4.1.1 Online Engagement

The project website continues to be a key consultation channel for the Project. The following website analytics since inception of the website up to 30 July 2018 outline the reach of the project:

- Total number of sessions: 8499
- Total number of page views: 24,465
- Total number of unique users (i.e. not repeat visitors from the same device): 5395
- Time spent on the website: Average of two minutes and 44 seconds
- Number of times a contact form has been used: Form accessed 339 times.

4.1.2 Media Releases

A total of nine media releases specifically relating to the Tweed Valley Hospital Project have been published.

Copies of these media releases remain available on the project website.

A number of related media releases have been made by the local Member for Tweed, Geoff Provest and are available on the relevant website.

4.1.3 Community Reference Panel

In July 2018, advertisements were placed in local newspapers for interested community members, patients, and carers to join a CRP. The CRP would form part of the consultation during the briefing and design phases of the hospital development.

Membership of the panel includes:

- Members of the Tweed-Byron community with an interest in ensuring that the new hospital has a positive impact on the Tweed Valley and interface with the surrounding areas, maximising the public benefit of the community asset
- Users of health facilities in the Tweed-Byron region including patients, carers, family members and friends of the Tweed Hospital and other health facilities
- General members of the Tweed-Byron community.

Ongoing consultation of the CRP will ensure consistent consumer and community input throughout the planning and design stages. It will provide transparency to effectively respond to challenges, queries and comments from the community; as well providing insight on when to seek comment from the wider community on specific issues.

Members of the CRP will be invited to participate and engage in a meaningful way across a wide variety of groups. These will include but will not be limited to; Precinct Planning/ Interface with neighbours, Arts and Culture Program, Landscaping and Strategy and Interior Design.

Simultaneously, an experience-based methodology will be undertaken to capture and understand the patient and carer perspective relating to the healthcare experiences of individuals and how these can contribute to designing and delivering better quality healthcare, leading to more effective health services.

4.1.4 Focused Community Consultation Programs

There have been two rounds of focussed community consultation undertaken on the project to date, with a third round planned during the public exhibition of the EIS.

The first two rounds of focussed consultation programs are outlined below.

4.1.5 Site Selection

A six-week focused community consultation process was undertaken following the announcement of the Project Site for the Tweed Valley Hospital on 4 April 2018, running until 14 June 2018.

The consultation allowed for the community to provide feedback on the Project Site, as well as inviting submission of alternative sites for consideration.

The consultation was achieved through the following engagement tools:

- Pop-up information booths - more than 20 held at local venues and markets across the region
- Project office drop in sessions - nine community drop-in sessions
- Written submissions – feedback forms available on the project website and hospital receptions

The outcome of the consultation process resulted in:

- Approximately 100 telephone calls to the 1800 number
- 604 community members completing the Community Feedback Form or provided written feedback through the website contact form or email
- Approximately 625 people attending 19 pop-up sessions and two staff forums, at 15 locations throughout the consultation period

- Website Analytics specific to this stage in consultation:

    - 1980 site visits
    - 79 per cent new visitors, 21 per cent returning visitors
    - Community nomination form downloaded 114 times
    - Site Summary Report downloaded 472 times
    - 70 per cent of visitors accessing site via mobile, 30 per cent via desktop
    - 48.1 per cent accessed the site directly; 26.6 per cent via search engine; 23.6 per cent via social media and 1.7 per cent via referral (e.g. via a news website).

The outcomes of the consultation process were provided to NSW Health Infrastructure and the Tweed Valley Hospital Integrated Project Team to inform assessment of alternative sites, and a final decision on the hospital location.

A copy of the consultation outcomes report for this stage of consultation is attached at Appendix D (Volume 2) of **Appendix H**.

4.1.6 Masterplan and Design Concept

A two-week focussed community consultation process was undertaken in September 2018, focused on the key design concepts for the Tweed Valley Hospital.

The consultation engaged community members in developing the principles relating to master planning and design concepts for the hospital, based on themes developed by the project's CRP at a workshop session.

Community members were encouraged to share their ideas and aspirations for the new hospital using a number of engagement methods, including:

- Pop-up information booths - held at local venues and markets across the region
- Online survey – promoted at pop ups through A5 flyer, link available on project website
- Direct mail campaign to subscribed mailing list
- Project website information updates.

The outcome of the consultation program resulted in:

- nine community pop-ups, attended by 148 community members
- 509 survey responses to the online survey during the two-week period
- 494 emails sent to invite stakeholders to complete the online survey
- 71 per cent of website visitors were new to the site during the consultation period, with the community input page viewed 106 times and the Site selection report viewed 296 times.

4.1.7 Online Engagement

Proactive provision of information, and the ability for community members to contact on, complete surveys and participate in the planning process through the project website.

Collateral includes:

- Frequently asked questions
- Fact sheets
- Project specific reports
- Media releases

- News as applicable
- Video and animation.

4.1.8 Face-to-face engagement to support future development tasks

To support ongoing project awareness, as well as future stages of the project, consultation will be delivered through appropriate direct engagement options, such as:

- Community pop-ups
- Online surveys
- Four Ongoing and Future Consultation
- 30 Tweed Valley Hospital Project Elton Consulting
- Community Information Sessions
- Drop-in sessions

4.2 Stakeholder Consultation

4.2.1 Government Consultation

Health Infrastructure and appointed independent expert advisors undertook consultation with relevant government agencies. This consultation aimed to seek input and guidance from relevant authorities and clarify items likely to be identified in the SSD application. A summary of consultation is outlined in Table 1 of the Stakeholder and Community Consultation Report (Volume 1) at **Appendix H**.

Various specialist consultant reports that informed this EIS attached as Appendices also outline specific consultation undertaken with relevant agencies as applicable.

Also, SIDRA intersection models prepared for the Traffic Impact Assessment (**Appendix L**) will be provided to RMS.

4.2.1.1 NSW Government Architect

A comprehensive consultation plan for engaging the Government Architect NSW (GANSW), during the design development stages has been prepared, with the first consultation meeting having occurred.

The consultation plan will include a feedback tracking and response mechanism to ensure all recommendations are duly considered by Health Infrastructure and the project team, and actioned where deemed appropriate and feasible.

A workshop was held with the State Design Review Panel on 3 October 2018 where a work-in-progress version of the design was presented to the GANSW. The design content included site analysis and zoning proposals, Masterplan design and a work-in-progress review of the building design.

At the time of submission of the Concept and Stage 1 SSD/EIS a formal written response had not been received from the panel. However, feedback on the detailed design of the Tweed Valley Hospital was raised at the meeting and will be incorporated into the design of the Tweed Valley Hospital as part of the Stage 2 SSD application. There was no significant feedback provided by the panel on items which relate to the current Concept and Stage 1 SSD application, i.e. site zoning and Masterplan design.

4.2.2 Council Reference Group

A Tweed Shire Council Reference Group (Reference Group) was established through the site selection stage. The Reference Group comprised elected Councillors and technical staff from the Tweed Shire Council.

The Reference Group was initially established to provide input to the site selection process. During this period, the Reference Group met four times.

Following site selection, the scope of the Reference Group has been adjusted and will continue to operate as a consultation channel on an ongoing basis in relation to design, planning and construction of the Tweed Valley Hospital.

Consultation between relevant specialist consultants and Tweed Shire Council technical staff has also be undertaken to inform the Project. A summary of consultation is outlined in Table 1 of the Stakeholder and Community Consultation Report at **Appendix H**.

4.2.3 Project User Groups

A series of Project User Groups (PUGs) were established in late 2017 to consult with key members of staff, and to form a conduit for broad, two-way staff engagement.

PUGs were established to capture the following categories outlined in **Table 4.1.**

Table 4.1 Project User Group Categories

Category	*Category*
Emergency Department	Renal Services
Critical Care Services	Dental
Perioperative & Surgical Services	Pharmacy
Medical Services	Administration, Clinical Support & FOH
Maternal and Newborn Services	Food Services
Paediatrics	Security
Cardiac Services	Staff Amenities
Diagnostic Services - Medical Imaging	Engineering & Biomedical Services
Diagnostic Services- Pathology	Environmental Services/ Materials Management
Mental Health	Transport
Cancer Care Services	Clinical Information
Community Health and Outpatient Services	eHealth Services
Drug and Alcohol	Education, Training and Research

The PUGs provide valuable insight into design solutions to achieve clinical and operational outcomes. While the process is ongoing, initial feedback and project input includes:

- Development of draft models of care
- Opportunity to view and discuss the early Masterplan with the Tweed Valley Hospital design team.
- Development of macro level functional relationships to inform concept design, patient safety and operational efficiency.

4.2.4 Staff Forums & Newsletters

Staff forums are conducted regularly to inform and consult with all staff across TTH, Murwillumbah District Hospital and Byron Central Hospital.

Staff newsletters are also issued regularly, providing the latest news and information on the Tweed Valley Hospital Project, as well as TTH Holding Works updates.

4.2.5 Utility and Service Providers

Consultation with applicable utility and service providers has also occurred, including:

- Essential Energy
- Tweed Shire Council
- Telstra, AARNet, Optus and NBN Co
- Jemena (Gas).

A summary of agency consultation is outlined in Table 1 of the Stakeholder and Community Consultation Report at **Appendix H**. **Appendices S, T** and **U**, also include consultation detail in relation to infrastructure management and services.

4.3 Aboriginal Community Consultation

Niche Environment and Heritage Pty Ltd (Niche) was commissioned to prepare an Aboriginal Cultural Heritage Assessment (ACHA) for the Project. This is attached at **Appendix N**.

Section 5.10 summaries the ACHA, the assessment process and key findings, along with identifying the relevant legislation and guidelines. Consultation has been undertaken in accordance with relevant requirements, including the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (ACHCRs), draft *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DEC 2005), and also meet current industry standards for community consultation.

The ACHCRs outline a four-stage consultation process that includes detailed step by step guidance as to the aim of each stage, how it is to proceed and what actions are necessary for it to be successfully completed. The four stages are:

- Stage 1 – Notification of Project proposal and registration of interest
- Stage 2 – Presentation of information about the proposed Project
- Stage 3 – Gathering information about the cultural significance
- Stage 4 – Review of draft cultural heritage assessment report.

Niche followed the four stages of consultation and engaged with the Aboriginal community. Full details of the consultation undertaken is outlined in the ACHA at **Appendix N.**

4.4 Ongoing or Future Consultation

4.4.1 Consumer and Community Engagement

The Project has an ongoing commitment to stakeholder, consumer and community engagement. Perpetual consultation activities include the following:

4.4.1.1 Community Reference Panel

Ongoing utilisation of the CRP to ensure consistent consumer and community input throughout all stages of the Project. It will provide transparency to effectively respond to challenges, queries and comments from the community and advise of when to seek comment from the wider community on specific issues.

Members of the CRP will continue to be invited to participate and engage in a meaningful way across a wide variety of groups. Which will include but not limited to; precinct planning/ interface with neighbours, arts and culture program, landscaping and strategy and interior design.

Simultaneously an experience-based methodology will be used to capture and understand the patient and carer perspective about their healthcare experiences and how these can contribute to designing and delivering better quality healthcare, leading to more effective health services.

4.4.1.2 Online Engagement

Proactive provision of information, and the ability for community members to contact, complete surveys and participate in the planning process through the project website, including:

- Frequently asked questions
- Fact sheets
- Project specific reports
- Media releases
- News as applicable
- Video and animation.

4.4.1.3 Face-to-face Engagement to Support Future Development Tasks

To support ongoing project awareness, as well as future stages of the project, consultation will be delivered through appropriate direct engagement options, such as:

- Community pop-ups
- Online surveys
- Community Information Sessions.

4.4.2 Stakeholder Engagement

4.4.2.1 Project User Groups (PUGs)

Ongoing use of PUGs to engage clinical and operational staff across the practice areas outlined in Section 2.4 of Volume 1 consultation report (refer **Appendix H**).

4.4.2.2 Internal Engagement

Ongoing internal engagement with Integrated Project Office staff, executive staff and NNSW LHD Hospital Staff.

4.4.2.3 External Engagement

Ongoing external stakeholder engagement including:

- NSW Government Departments
- Non-government organisations and other service providers
- Landowners
- Utility and service providers
- Cross-Government Working Group.

5. Concept Proposal Assessment

5.1 SEAR 1 Statutory Planning

5.1.1 Permissibility

The subject site is located within the Tweed Shire Council LGA. Tweed Shire has three LEPs:

- the Tweed City Centre LEP 2012, applying to the Tweed Heads Central Business District area
- the TLEP 2014
- the TLEP 2000, which will continue to apply to the remainder of the Shire which has been deferred from the TLEP 2014.

The Project Site is affected by both the TLEP 2014 and TLEP 2000, however the rezoning and proposed development area is solely affected by the TLEP 2014. The following section provides an overview of the current TLEP zone controls that apply to the Project Site (**Table 5.1**) and the general permissibility of a health services facility/ hospital under these existing planning provisions (**Tables 5.2** and **5.3**).

Table 5.1 Summary of Existing Site Zoning

Planning Control	*TLEP 2014*	*TLEP 2000*
Zone	■ RU1 Primary Production (majority of Project Site) ■ R1 General Residential ■ DM Deferred Matter (TLEP 2000 applies)	■ 1(b1) Agricultural Protection ■ 2(c) Urban Expansion ■ 7(l) Environmental Protection (Habitat)

The Project potentially involves a number of uses that would have separate definitions under the standard instrument LEP (TLEP 2014). All of the uses fall under the overarching (parent) definition of a health services facility which is defined under the TLEP 2014 as:

Health services facility means a building or place used to provide medical or other services relating to the maintenance or improvement of the health, or the restoration to health, of persons or the prevention of disease in or treatment of injury to persons, and includes any of the following:

a) a medical centre,
b) community health service facilities,
c) health consulting rooms,
d) patient transport facilities, including helipads and ambulance facilities,
e) hospital.

The TLEP 2000 defines a hospital as follows:

A building or place (other than an institution) used for the purpose of providing professional health care services (such as preventative or convalescent care, diagnosis, medical or surgical treatment, care for people with developmental disabilities, psychiatric care or counselling and services provided by health care professionals) to people admitted as in-patients (whether or not out-patients are also cared for or treated there), and includes:

a) ancillary facilities for the accommodation of nurses or other health care workers, and
b) ancillary shops or refreshment rooms, and
c) ancillary accommodation for persons receiving health care or for their visitors, and
d) facilities situated in the building or at the place and used for educational or research purposes, whether or not they are used only by hospital staff or health care workers, and whether or not any such use is a commercial use.

Health services facilities, including hospitals, are not permissible in all zones. However, in instances where health services facilities are prohibited in a zone under the LEP, they can be permissible with consent under Clause 57(1) of ISEPP if they meet the applicable criterion. Clause 57(1) of ISEPP states that development for the purpose of health service facilities may be carried out by any person with consent on land in a prescribed zone. A *prescribed zone means any of the following land use zones or a land use zone that is equivalent to any of those zones:*

- *RU4 Primary Production Small Lots,*
- *RU5 Village,*
- *RU6 Transition,*
- *R1 General Residential,*
- *R3 Medium Density Residential,*
- *R4 High Density Residential,*
- *R5 Large Lot Residential,*
- *B2 Local Centre,*
- *B3 Commercial Core,*
- *B4 Mixed Use,*
- *B5 Business Development,*
- *B6 Enterprise Corridor,*
- *B7 Business Park,*
- *B8 Metropolitan Centre,*
- *SP1 Special Activities,*
- *SP2 Infrastructure.*

Based on the existing zones applicable to the Project Site the following tables indicate if a health services facility (or hospital) is permissible under the TLEP 2014 and/or 2000 zoning arrangements.

Table 5.2 TLEP 2014 Site Zoning and Permissibility

Tweed LED 2014 Zone	*Health Services Facility (or Hospital) Permissible?*
RU1 Primary Production	No - Prohibited under LEP and not an ISEPP prescribed zone or equivalent
R1 General Residential	Yes – Permitted with consent under LEP and an ISEPP prescribed zone
Part DM Deferred Matter	N/A – refer to LEP 2000

Table 5.3 TLEP 2000 Site Zoning and Permissibility

Tweed LED 2000 Zone	*Health Services Facility (or Hospital) Permissible?*
1(b1) Agricultural Protection	No - Prohibited under LEP and not an ISEPP prescribed zone or equivalent
2(c) Urban Expansion	Yes – Allowed with consent under LEP
7(l) Environmental Protection (Habitat)	No - Prohibited under LEP and not an ISEPP prescribed zone or equivalent

As per the tables above, two zones (R1 General Residential and 2(c) Urban Expansion) permit health services facilities/ hospitals. However, these zones only cover a small portion of the lot and are insufficient to support main development area of the hospital and are subject to various constraints. The remaining current TLEP zones applicable to the Lot prohibit health services facilities/ hospitals.

The Project would be accommodated within the RU1 Primary Production zone, and a small area of R1 General Residential zone at the eastern end of the Project Site. In terms of permissibility, the existing RU1 Primary Production zone pursuant to the TLEP 2014 prohibits health services facilities. A health services facility is permissible within the R1 General Residential zone.

Pursuant to Section 4.38 (2) of the EP&A Act, development consent cannot be given to a SSD application that is wholly prohibited by an EPI. However, pursuant to Section 4.38 (3) of the Act, it can be given to a partially prohibited development.

Notwithstanding this, Section 4.38 (5) of the Act provides that a development application in respect of a SSD, that is wholly or partly prohibited, may be considered in conjunction with a proposed EPI to permit the carrying out of the development.

To enable the determination of this SSD application, it is understood that DPE will concurrently prepare a new SEPP, pursuant to Divisions 3.2 and 3.3 of the EP&A Act that amends TLEP 2014 by rezoning part of the Project Site to SP2 Infrastructure (which is currently zoned RU1 Primary Production and R1 General Residential), and removing any building height, FSR and minimum lot size controls to be consistent with other hospital sites. It is proposed that the SEPP would be repealed after TLEP 2014 has been amended.

It is proposed that the draft SEPP and SSD application be considered and determined in accordance with Division 3.5 and Clause 4.38 (5) of the EP&A Act. These provisions allow a SSD application, involving development that is wholly or partly prohibited, to be considered in conjunction with a proposed environmental planning instrument (in this case a site-specific SEPP) which proposes to permit the carrying out of the wholly or partly prohibited development on the subject land Pursuant to Clause 3.40 of the EP&A Act, it is understood that the SSD application and proposed SEPP would be publicly exhibited at the same time.

On that basis, the SSD application would be determined using the new planning controls facilitated by the site-specific SEPP that amends the LEP, that include:

- Rezoning of the majority of the Project Site to SP2 Infrastructure
- No change to other zonings on the overall site, with the environmental protection zones to remain in place. These areas (including Deferred Matters of the TLEP 2014) are not proposed to change
- No provision of prescriptive building height, FSR or minimum lot size would apply to the portion of land to be rezoned SP2 Infrastructure. Any such current controls would be removed.

Illustration 5.1 current and proposed land use zones for the Project Site. Such planning controls are consistent with the LEP Standard Instrument and the typical approach for health facility/ hospital sites.

The objectives of the SP2 Infrastructure zone (as per the TLEP 2014) are:

SP2 Infrastructure Zone

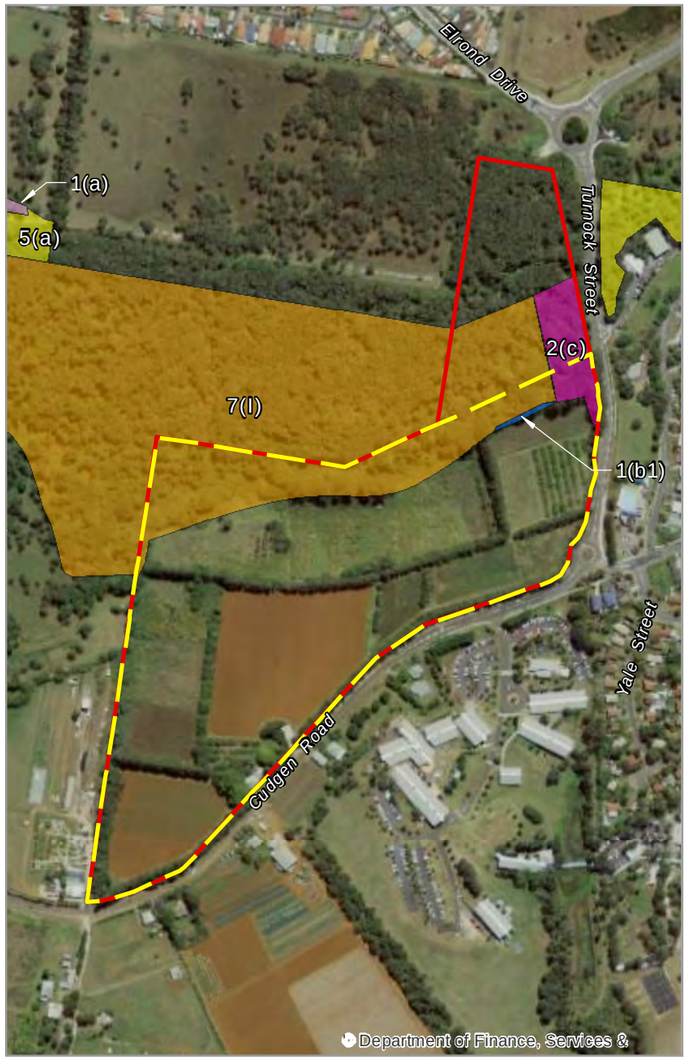
- *To provide for infrastructure and related uses.*
- *To prevent development that is not compatible with or that may detract from the provision of infrastructure.*

The Project would be consistent with these objectives. No development is proposed within the Deferred Matter areas (including environmental zone of the TLEP 2000) of the TLEP 2014 and therefore there are no other relevant consent triggers. The Tweed Valley Hospital would be accommodated fully within the proposed SP2 Infrastructure Zone (Health and Education) that would allow health services facilities with consent, including any development that is ordinarily incidental or ancillary to that purpose.

On this basis, the SSD application is to be determined using these amended controls, that would be inserted into the TLEP 2014 via a site-specific SEPP, and therefore the Tweed Valley Hospital would be permissible, and consent can be given.

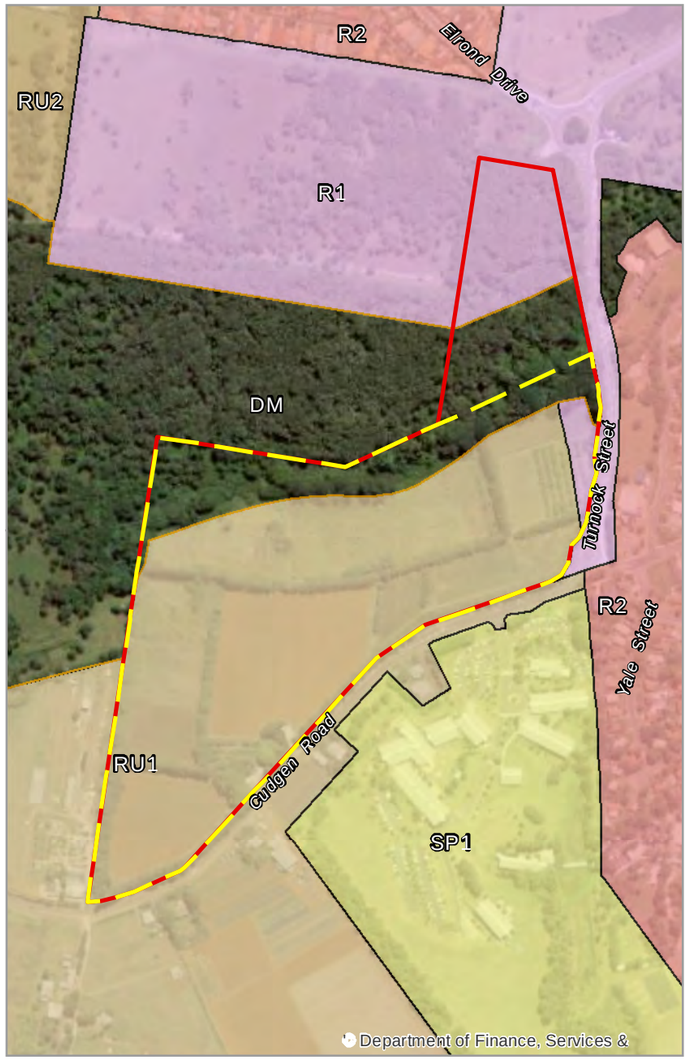
Information shown is for illustrative purposes only

Drawn by: AB Checked by: RE Reviewed by: JTS Date: 05/09/2018
Source of base data: DFS&I



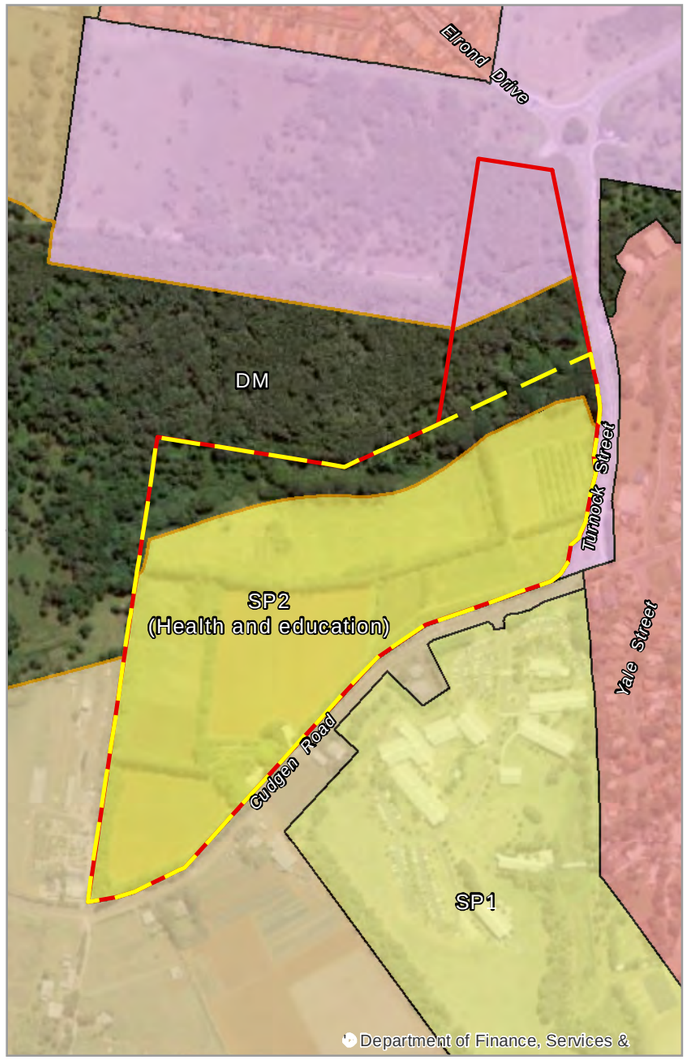
Current TLEP 2000 (no proposed changes)

- Project site
- Lot boundary
- 1(a) - Rural
- 1(b1) - Agricultural Protection
- 2(c) - Urban Expansion
- 5(a) - Special Uses
- 7(l) - Environmental Protection (Habitat)



Current TLEP 2014

- Project site
- Lot boundary
- DM Deferred Matter
- R1 General Residential
- R2 Low Density Residential
- RU1 Primary Production
- RU2 Rural Landscape
- SP1 Special Activities



Proposed TLEP 2014 Amendment (Rezoning)

- Project site
- Lot boundary
- DM Deferred Matter
- R1 General Residential
- R2 Low Density Residential
- RU1 Primary Production
- RU2 Rural Landscape
- SP1 Special Activities
- SP2 Infrastructure

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Current and Proposed Zoning Arrangements

5.1.2 State Significant Development

Clause 8 of SRD SEPP provides that development is declared to be SSD for the purposes of the EP&A Act if:

- The development is not permissible without development consent under Part 4 of the EP&A Act
- The development is specified in Schedule 1 or 2.

The development is not permissible without development consent under Part 4 of the EP&A Act (refer **Section 1.6.2**) and the development is specified in Clause 14 of Schedule 1 of the SRD SEPP. Clause 14 of Schedule 1 of the SRD SEPP provides:

"Development that has a capital investment value of more than $30 million for any of the following purposes:

(d) *hospitals,*
(e) *medical centres,*
(f) *health, medical or related research facilities (which may also be associated with the facilities or research activities of a NSW local health district board, a University or an independent medical research institute)."*

The Project has an announced budget of $534 million. The CIV is over $30 million and has been provided to DPE separately. The Project would therefore be classified as SSD.

5.1.3 State Environmental Planning Policies

5.1.3.1 State Environmental Planning Policy No. 44 – Koala Habitat

SEPP 44 encourages the conservation and management of natural vegetation areas that provide habitat for Koalas to ensure permanent free-living populations would be maintained over their present range. SEPP 44 applies to the Tweed LGA pursuant to Schedule 1 of the SEPP. Under SEPP 44, potential Koala habitat is defined as areas of native vegetation where the trees listed in Schedule 2 of the SEPP constitute at least 15 per cent of the total number of trees in the upper or lower strata of the tree component.

The proposed development has been specifically sited within an area of the site that is largely cleared and would not significantly impact flora or fauna. Surveys conducted by Greencap did not find any evidence of Koala habitation on the site and on that basis the Concept Proposal is not considered to impact on Koala habitat. A detailed Biodiversity Development Assessment Report (BDAR) is attached at **Appendix I**.

5.1.3.2 State Environmental Planning Policy No. 55 – Remediation of Land

The objective of this policy is to provide for a State-wide planning approach to the remediation of contaminated land. It aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment by:

- Specifying when consent is required, and when it is not required, for remediation work
- Specifying certain considerations that are relevant in rezoning land and in determining development applications in general and development applications for consent to carry out remediation work in particular
- Requiring that remediation work meets certain standards and notification requirements.

Pursuant to clause 7(1) of SEPP 55, a consent authority must not consent to the carrying out of any development on land unless:

a) *It has considered whether the land is contaminated; and*
b) *If the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or would be suitable, after remediation) for the purpose for which the development is proposed to be carried out; and*
c) *If the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land would be remediated before the land is used for that purpose.*

OCTIEF was engaged by Health Infrastructure to conduct a combined Preliminary Site Investigation and Detailed Site Investigation of the property at 771 Cudgen Road. Based on the results of the assessment, no significant contamination was identified at the Project Site that would preclude the proposed land use and development. OCTIEF considers that the investigation works undertaken at the Project Site have sufficiently characterised the site as suitable for the proposed purpose (hospital), subject to implementation of a RAP for a small area identified as containing asbestos impacted soil.

On the basis on the recommendations, a RAP has been prepared by OCTIEF in accordance with the relevant requirements. The works subject to the RAP are classified as Category 2 works under SEPP 55 and as such will be undertaken as part of the Preliminary Works discussed above.

The contamination report is attached as **Appendix R** and contamination is discussed in detail in **Section 5.12**.

5.1.3.3 Draft Remediation of Land State Environmental Planning Policy

SEPP 55, and *Contaminated Land Planning Guidelines*, have provided the planning framework for the management of contaminated land in NSW.

The draft Remediation of Land SEPP is part of a review program by the NSW Government. The new SEPP will retain the following objectives from SEPP 55 as they remain relevant:

- Establish a State-wide planning approach for the remediation of contaminated land
- Promote the remediation of contaminated land to reduce the potential risk of harm to human health and/or the environment by:
    - making remediation work permissible, despite anything to the contrary in another environmental planning instrument
    - specifying when development consent is, and is not required, for remediation work
    - specifying considerations that are relevant in determining development application
    - requiring remediation work meet certain standards and notification requirements.

As outlined previously under SEPP 55 above, a site assessment has occurred, and a RAP prepared by OCTIEF in accordance with relevant requirements. The RAP would be implemented to undertake the necessary remediation for a small area on the Project Site, separate to the SSD application.

Based on a review of the draft SEPP's explanation of intended effect, the remediation works are expected to remain Category 2 Works and therefore will not require consent.

5.1.3.4 State Environmental Planning Policy No. 64 – Advertising and Signage

The aim of this Policy is to improve the amenity of urban and natural settings by managing the impact of outdoor advertising. No signage is proposed as part of the Concept Proposal and there for an assessment under SEPP 64 is not required. Signage and a wayfinding strategy will form part of the Stage 2 application.

5.1.3.5 State Environmental Planning Policy (Coastal Management) 2018 (Coastal Management SEPP)

The Coastal Management SEPP aims to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objectives of the *Coastal Management Act 2016*, including the management objectives for each coastal management area, by:

- Managing development in the coastal zone and protecting the environmental assets of the coast
- Establishing a framework for land use planning to guide decision-making in the coastal zone
- Mapping the four coastal management areas that comprise the NSW coastal zone for the purpose of the definitions in the *Coastal Management Act 2016*.

The Coastal SEPP applies to part of the Project Site. An assessment of the relevant development controls contained within the SEPP and how they relate to the Concept Proposal is provided below.

Division 1 Coastal wetlands and littoral rainforests area

The Proposal does not occur on land mapped as coastal wetlands or littoral rainforest on the "Coastal Wetlands and Littoral Rainforests Area Map" (refer **Illustration 5.2**). However, low-lying areas of the Project Site, north of the development area, are mapped as Coastal Wetlands and the associated proximity buffer extends southward into the Project Site and some areas of the Concept Proposal would fall within the proximity buffer (refer **Illustration 5.2**).

Clause 11 of Division 1 - *development on land in proximity to coastal wetlands or littoral rainforest* - provides the following:

(1) Development consent must not be granted to development on land identified as "proximity area for coastal wetlands" or "proximity area for littoral rainforest" on the Coastal Wetlands and Littoral Rainforests Area Map unless the consent authority is satisfied that the proposed development will not significantly impact on:

(a) the biophysical, hydrological or ecological integrity of the adjacent coastal wetland or littoral rainforest, or

(b) the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest.

(2) This clause does not apply to land that is identified as "coastal wetlands" or "littoral rainforest" on the Coastal Wetlands and Littoral Rainforests Area Map.

Section 5 and 6 of this EIS provides a comprehensive environmental assessment of the Project, including biodiversity, stormwater and water resource considerations, and considers the nearby Coastal Wetland. The assessment undertaken has found that the Concept Proposal would not significantly impact upon the Coastal Wetland and the above Coastal Management SEPP policy requirements associated with development in proximity to Coastal Wetlands would be satisfied.

Furthermore, the Proposal would result in an improved environmental outcome for the Coastal Wetland and receiving environment by way of a reduction in sediment and pollutant impacts by effectively designing for and managing stormwater runoff quantity and quality, compared to the existing conditions where pollutant and sediment laden runoff result from agricultural activities.

Division 2 Coastal vulnerability area

The Concept Proposal does not impact on land mapped as a “coastal vulnerability area”.

Division 3 Coastal environment area

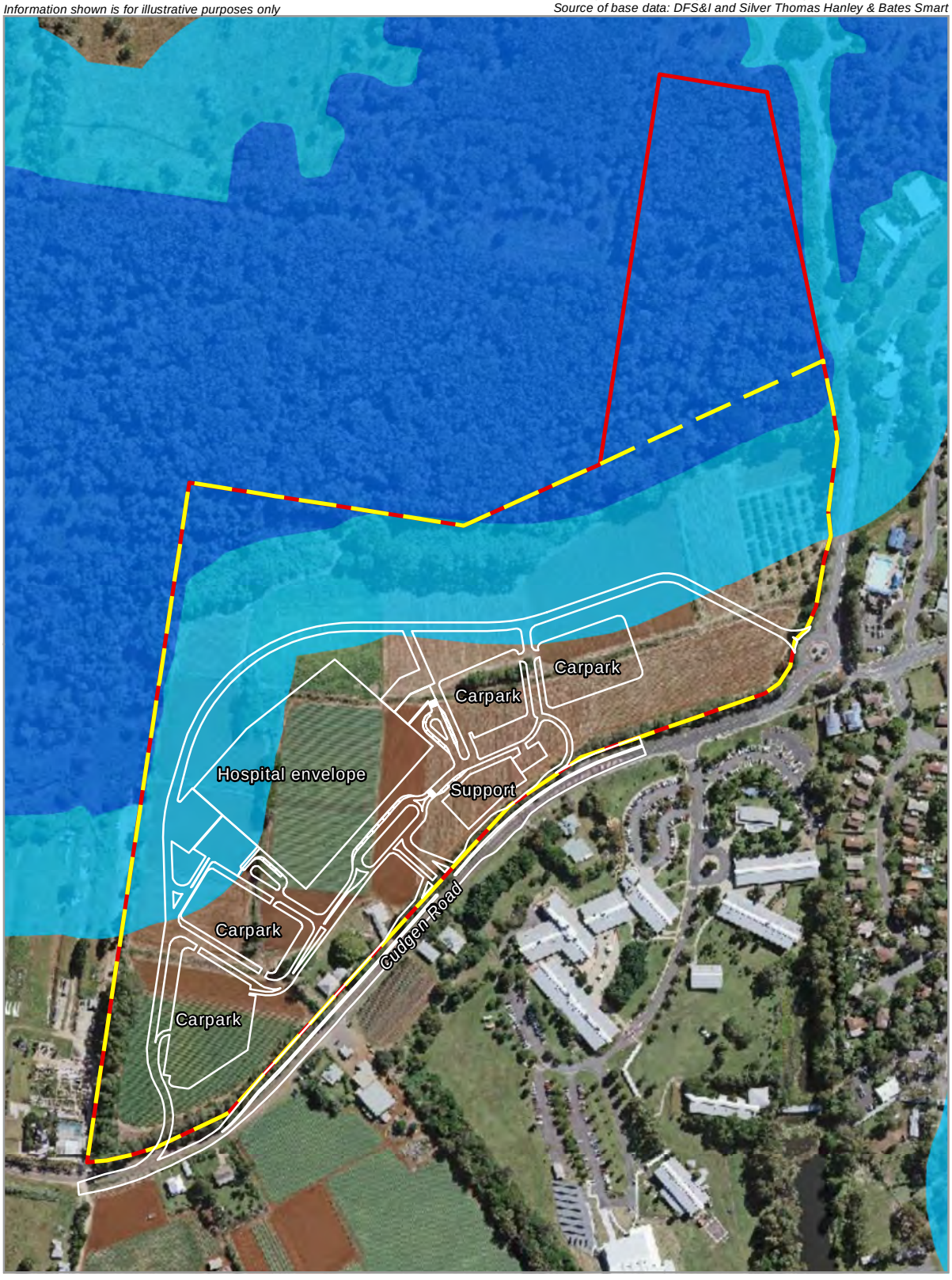
The Concept Proposal does not impact on land mapped as a “coastal environment area”.

Division 4 Coastal Use Area

The Concept Proposal does not impact on land mapped as a “coastal use area”.

Drawn by: AB Checked by: RE Reviewed by: JTS Date: 14/09/2018
Source of base data: DFS&I and Silver Thomas Hanley & Bates Smart

Information shown is for illustrative purposes only



LEGEND

- Project site
- Lot boundary
- Proximity area for coastal wetland
- Coastal wetland

0 100

Coastal Management SEPP

5.1.3.6 State Environmental Planning Policy (Infrastructure) 2007 (ISEPP)

ISEPP aims to facilitate the effective delivery of infrastructure across the State. Division 10 of the ISEPP outlines the approval requirements for health facilities. Clause 58 of the ISEPP stipulates the thresholds for health facilities that can be assessed as Development Without Consent. The Proposal does not meet these requirements and therefore requires development consent.

A matter for consideration under the ISEPP is the referral requirements for Traffic Generating Development. Clause 104 and Schedule 3 of ISEPP defines traffic generating development which requires referral to RMS for comment. The Proposal is defined as a "hospital" which is required to be referred to RMS if it has a capacity for greater than 200 beds, or 100 or more beds in the instance where its access connects to or near to a classified road. The proposed hospital development will have more than 200 beds and therefore triggers referral to RMS under the ISEPP.

RMS has been consulted throughout the planning process, including input into the development of the SEARs, and consultation with the project team, including traffic consultant, regarding the Concept Proposal and development of the Traffic Impact Assessment. This assessment is provided at **Appendix L** and the detailed traffic and access matters are addressed in **Section 5.7** of the EIS. This documentation is sufficient for the referral to RMS to occur.

5.1.3.7 State Environmental Planning Policy (State & Regional Development) 2011

The relevant provisions of this SEPP are discussed above.

5.1.3.8 State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

This SEPP includes provisions for Exempt and Complying Development. Development proposed as part of this application are not exempt or complying and on that basis this Policy does not apply.

5.1.3.9 State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

The aims of this policy are as follows:

- To amend the definitions of hazardous and offensive industries where used in environmental planning instruments
- To render ineffective a provision of any environmental planning instrument that prohibits development for the purpose of a storage facility on the ground that the facility is hazardous or offensive if it is not a hazardous or offensive storage establishment as defined in this policy
- To require development consent for hazardous or offensive development proposed to be carried out in the western division
- To ensure that in determining whether a development is a hazardous or offensive industry, any measures proposed to be employed to reduce the impact of the development are taken into account
- To ensure that in considering any application to carry out potentially hazardous or offensive development, the consent authority has sufficient information to assess whether the development is hazardous or offensive and to impose conditions to reduce or minimise any adverse impact
- To require the advertising of applications to carry out any such development.

Potentially hazardous industry as defined in SEPP 33 ***"****means a development for the purposes of any industry which, if the development were to operate without employing any measures to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality:*

a. to human health, life or property, or
b. to the biophysical environment,

and includes a hazardous industry and a hazardous storage establishment".

If a development is found to be potentially hazardous according to SEPP 33 screening, a Preliminary Hazard Analysis (PHA) is required in accordance with guidelines and circulars published by the NSW DPE. The objectives of a PHA are to:

- Identify potential hazards associated with the proposed and existing facilities
- Determine likelihood of occurrence and consequences to people and the environment of identified hazards
- Assess the risk in terms of location and land use
- Recommend safeguards and mitigation measures if required to achieve an acceptable level of risk.

In accordance with SEPP 33 the hazardous substances and dangerous goods to be held or used on-site are required to be identified and classified in accordance with a risk screening method contained within the document entitled *Applying SEPP 33 Consultation Draft July 2008*. Hazardous materials are defined in this publication as substances falling within the classification of the Australian Code for Transportation of Dangerous Goods by Road and Rail (Dangerous Goods Code).

Given the nature of the Concept Proposal and that Stage 2 would involve detailed design, including the provision of any potentially hazardous substances and dangerous goods (e.g. LPG, Oxygen, Diesel etc), a SEPP 33 assessment for the Project would be prepared and provided as part of the Stage 2 SSD application.

5.1.3.10 Draft State Environmental Planning Policy – Environment

The DPE is undertaking a review of the State's planning policies to modernise and simplify the planning system. It is proposed that the following seven existing SEPPs will be merged into one SEPP (draft SEPP Environment):

- State Environmental Planning Policy No. 19 – Bushland in Urban Areas
- State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011
- State Environmental Planning Policy No. 50 – Canal Estate Development
- Greater Metropolitan Regional Environmental Plan No. 2 – Georges River Catchment
- Sydney Regional Environmental Plan No. 20 – Hawkesbury-Nepean River (No.2-1997)
- Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005
- Willandra Lakes Regional Environmental Plan No. 1 – World Heritage Property.

None of these SEPPs have current application in the locality of the Concept Proposal and therefore the draft SEPP - Environment is not considered to be applicable.

5.1.4 Tweed Local Environmental Plan

As outlined above in "Permissibility" based on the existing zones applicable to the Project Site under TLEP 2014 and 2000 the Proposal is largely prohibited.

As outlined previously, to allow the SSD application to be considered, new planning controls, including zoning, that allows for and supports development of a health services facility on the identified portion of the Project Site have been sought and would be facilitated by a site-specific SEPP that amends the TLEP 2014. Therefore, the current TLEP controls, including permissibility and consent provisions, are not directly applicable as this Concept SSD application which would be determined against the revised planning controls contained within the SEPP.

However, other provisions of the TLEP are discussed below.

Notwithstanding that amended planning controls, including zoning, have been sought for the southern part of the Project Site, consideration of relevant TLEP 2014 clauses and objectives is provided in **Table 5.4** (applicable to the development area). It is noted where the application of some existing provisions are not directly relevant on the basis of the proposed amendment to the TLEP 2014 via the aforementioned SEPP, and therefore the objectives and application of new planning controls is the relevant consideration. Consideration of the TLEP 2000 is not required as no works are provided in areas subject to this LEP.

Table 5.4 Consideration of TLEP 2014 Clauses

Local Planning Instruments and Controls		
TLEP 2014	Clause 4.3 Height of Buildings	No prescribed height controls would apply to the SP2 Zone. This is consistent with planning controls for other hospital sites. However, the objectives and intent of the clause have been taken into account. Extensive concept analysis has been undertaken and has established an appropriate planning envelope that would balance the clinical and functional needs of the hospital whilst suitably responding to contextual, amenity and urban design considerations as is generally the intent of this clause in the LEP. This envelope would provide maximum parameters, including height, for the buildings. Visual impact and amenity considerations based on the conceptual detail are provided at **Section 5.4.1**.
	Clause 4.4 Floor Space Ratio (FSR)	No prescribed FSR would apply to the new SP2 Zone. This is consistent with planning controls for other hospital sites. As above, a suitable envelope as part of the Concept Proposal has been developed and presented in this SSD application. The design response would appropriately consider clinical needs and contextual fit.
	Clause 5.10 Heritage Conservation	The Project Site does not contain listed heritage items. Heritage is addressed at **Section 5.24**.
	Clause 7.1 Acid Sulfate Soils (ASS)	The Project Site is mapped has having potential ASS Classes 2, 3 and 5. However, the Project Site is within the Class 5 category and no works are proposed below five metres AHD or lower the water table on adjacent classes of land below one metre AHD. The ASS requirements of this

Local Planning Instruments and Controls		
		clause are therefore not triggered as discussed at **Section 6.10**.
	Clause 7.2 Earthworks	The objective of this clause is to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land. **Section 6** The assessment of Stage 1 Works proposed addresses potential environmental impacts, including those associated with earthworks and soil disturbance, and provides relevant safeguards and mitigation measures applicable to those works. As there is no physical work proposed under the Concept Proposal, this Clause does not apply.
	Clause 7.3 Flood Planning	Low-lying northern areas of the Project Site are flood prone, however the vast majority of the Project Site is not. The proposed Concept Proposal identifies the development area as above the PMF, consistent with hospital planning requirements. Flooding is addressed at **Section 5.17**.
	Clause 7.10 Essential Services	This clause requires that development consent must not be granted for development on land unless the determining authority is satisfied that any public utility infrastructure that is essential for the proposed development is available or that adequate arrangements have been made to make that infrastructure available when it is required. Services are available in the vicinity of the Project Site and can be adequately provisioned for the proposed development. Studies undertaken as part of the Concept Proposal have confirmed that Services and utilities are available or that they are proposed to be delivered as Part of the Stage 1 works.

5.1.5 Developer Contributions Plan

There are a number of developer contribution plans that apply to development within the Tweed LGA, with most being associated with residential or tourist accommodation. Advice issued from DPE states that in principle, the limitations on the imposition of developer contributions on public sector developments remain as outlined in Circular D6 – Crown Development Applications and conditions of consent (Department of Land and Water Conservation (DLWC) 2002, page 12 Section 27) which states that "*Crown developments for community services e.g. education, health, community services and law and order are exempt from general developer charges."*

Further to this, although there might not be specific provisions for exemptions for health services facilities, the Tweed Valley Hospital will provide a brand new hospital for the Tweed-Bryon Region, with a budget of around $534 million, and additional and improved services as described in **Section 3**.

The Tweed Valley Hospital will provide a significant public benefit to the local and regional community and will provide critical and valuable health services as well as local employment without creating an unreasonable demand on local infrastructure. The traffic impact assessment undertaken (**Appendix L**) has identified the need for road upgrades. All transport "enabling works" will be funded by Health Infrastructure as part of the Project.

These works include:

- the four site access intersections on Cudgen Road (note east and west access points to be undertaken as separate Preliminary Works)
- provision of the new bus stops and associated infrastructure.

Health Infrastructure will work with Tweed Shire Council and RMS on the planning and delivery of the Cudgen Road/ Tweed Coast Road intersection capacity upgrades, separation of the left-turn lane on Tweed Coast Road and how these works will affectively interface with Tweed Shire Council's planned four-lane upgrade of Tweed Coast Road from the Pacific Highway to Cudgen Road.

The Tweed Valley Hospital provides a significant investment in social infrastructure to the area and will provide a high level of community service and benefit. On that basis, Health Infrastructure is of the view that development contributions should not be levied for this Proposal.

5.1.6 Other NSW Legislation and Approvals Required

5.1.6.1 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) includes provisions relating to the protection of the environment. One of the objectives of the POEO Act is to protect, restore and enhance the quality of the environment in NSW, having regard to the need to maintain ecologically sustainable development. There are serious offences under this Act for causing pollution of air, noise, water or land. NSW Health and the appointed contractor are required to meet the waste licensing obligations of Clauses 39 to 42 of Schedule 1 of the POEO Act in relation to the proposed works.

The Contractor and Health NSW are obliged to notify the NSW Office of Environment and Heritage (OEH) when a "pollution incident" occurs that causes or threatens "material harm" to the environment.

The Stage 1 work includes bulk earthworks and the recycling of excavated material (originating from the site and excavated during earthworks) and reuse of the material on-site where suitable. Schedule 1 of the POEO Act lists the following as Scheduled Activities.

16 Crushing, grinding or separating

1) *This clause applies to crushing, grinding or separating, meaning the processing of materials (including sand, gravel, rock or minerals, but not including waste of any description) by crushing, grinding or separating them into different sizes.*
2) *The activity to which this clause applies is declared to be a scheduled activity if it has a capacity to process more than 150 tonnes of materials per day or 30,000 tonnes of materials per year.*

19 Extractive activities

1) *Land-based extractive activity, meaning the extraction, processing or storage of extractive materials, either for sale or re-use, by means of excavation, blasting, tunnelling, quarrying or other such land-based methods.*
2) *In this clause, extractive materials means clay, sand, soil, stone, gravel, rock, sandstone or similar substances that are not minerals within the meaning of the Mining Act 1992.*

This applies if it *involves the extraction, processing or storage of more than 30,000 tonnes per year of extractive materials.*

Current estimates indicate the threshold would be exceeded. Any required Environmental Protection Licence (EPL) would be sought by the relevant contractor for the Stage 1 work.

5.1.6.2 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act) provides the basis for the legal protection and management of Aboriginal sites within NSW. Sections 84 and 90 of the NPW Act provide statutory protection for any physical/ material evidence of Aboriginal occupation of NSW and places of cultural significance to the Aboriginal community. The key principles of the NPW Act in relation to Aboriginal heritage are the prevention of unnecessary or unwarranted destruction of Aboriginal objects, and the active protection and conservation of objects which are of high cultural significance. It is an offence to knowingly disturb an Aboriginal object, irrespective of its nature or significance, without the prior consent of the Director-General of OEH.

An Aboriginal Cultural Heritage Assessment was prepared by Niche Environment and Heritage (refer **Section 5.10** and **Appendix M**). The assessment found no Aboriginal cultural heritage objects. It does not indicate that there is a significant likelihood of the Aboriginal objects occurring within the area of the Concept Proposal and that it is unlikely to result in significant harm to Aboriginal Heritage. However, mitigation measures are recommended for the Project which should be adopted. Pursuant to Clause 4.41 (1) (d) of the EP&A Act, an Aboriginal heritage impact permit under section 90 of the NPW Act 1974 is not required for SSD.

5.1.6.3 Fisheries Management Act 1994

Concurrence is required from the Minister for Department of Trade and Investment, Regional Infrastructure and Services (TIRIS) (formerly Industry and Investment) for dredging and reclamation works on land that is periodically inundated by water in accordance with Section 199 of the *Fisheries Management Act 1994*. No dredge or reclamation works are proposed.

The Concept Proposal is not within a marine environment and no marine vegetation would be affected.

The works do not occur in areas that are likely to support threatened aquatic habitat for flora or fauna. Thus, the Project is considered unlikely to impact on any threatened aquatic species and communities. Pursuant to Clause 4.41 (1) (b) of the EP&A Act, a permit under section 201, 205 or 219 of the *Fisheries Management Act 1994* is not required for SSD,

5.1.6.4 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act* 2016 (BC Act) and its supporting regulations commenced on 25 August 2017. The BC Act repeals the *Threatened Species Conservation Act 1995* along with other natural resource management legislation. The BC Act sets out the assessment framework for threatened species.

The BC Act aims to maintain a healthy, productive and resilient environment for the greatest wellbeing of the community, now and into the future, consistent with the principles of ecologically sustainable development. The BC Act places obligations on proponents in relation to the consideration of threatened species and ecological communities.

The Concept Proposal would occur within an area of the site that is largely clear of vegetation and already disturbed, although the development area does occur adjacent to more sensitive environmental areas. A BDAR in accordance with the BC Act has been prepared for the Concept Proposal and Stage 1 works and concludes that the Concept development area does not present high biodiversity constraints. Impacts on native vegetation would be low due to the high levels of previous clearing and disturbance. On this same basis, no significant impact to habitat of threatened species or communities listed in the BC Act is expected. After avoiding and minimising the impact of the development on biodiversity, the residual impact of direct, indirect and prescribed impacts that cannot be avoided and minimised is negligible.

Biodiversity is addressed at **Section 5.19** and a copy of the BDAR is attached at **Appendix I**.

5.1.6.5 Heritage Act 1977

The *Heritage Act 1977* provides for the conservation of items of environmental heritage in NSW. The Act defines heritage as items or places that are of State and/or local heritage significance and include: places, buildings, works, relics, moveable objects and precincts. As part of NSW heritage protection and management the Act establishes a register including an inventory and list to protect the listed items.

No part of the Project Site is listed as an item of State Significance on the NSW State Heritage Register. Accordingly, the Concept Proposal does not require heritage approval under the *NSW Heritage Act 1977*. The archaeological provisions of the *NSW Heritage Act 1977* are applicable, however, as all “relics” are protected under the NSW Heritage Act, regardless of whether or not the place is listed as a heritage item at a local, State or National level.

A Historical (non-Aboriginal) Heritage Assessment has been prepared for the Concept Proposal and is addressed at **Section 5.24** and **Appendix O**. The assessment identifies some items on-site (dry-stone walls and trees) as being considered of local significance. Overall, the proposal is considered to be sympathetic to these local items within the Project Site.

A range of measures are recommended to mitigate any impacts on heritage including an unexpected finds protocol and contractor training.

Section 4.41 (previously 89J) of the EP&A Act outlines legislation and approvals that do not apply to SSDs. Of relevance to heritage approvals, under s4.41 the following do not apply to SSD applications:

- An approval under Part 4, or an excavation permit under s139 of the *Heritage Act 1977*
- Division 8 of Part 6 of the *Heritage Act 1977*, which relates to controlling and restricting harm to buildings, works, relics and places not subject to interim heritage orders or State Heritage Register listing.

5.1.6.6 Environmental Protection and Biodiversity Conservation Act 1999 (Cwth)

Under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), any action that has, or is likely to have, a significant impact on matters of National Environmental Significance or other aspects of the environment, such as on Commonwealth land, may progress only with approval of the Commonwealth Minister for the Environment under Part 9 of the EPBC Act. The biodiversity assessment undertaken has confirmed that there would be no significant impact to matters of National Environmental Significance or Commonwealth land. The matters of National Environmental Significance and Commonwealth land are summarised below in relation to the Project.

Table 5.5 Assessment of Matters of National Environmental Significance

	Factor	*Impact*
a	**Any Environmental Impact on a World Heritage Property?**	
	The proposed works are not in proximity to any lands listed as World Heritage Property, and therefore would have no impact on such lands. Mitigation measures stated within **Section 9** of this EIS would negate any potential environmental impacts off-site.	Nil
b	**Any Environmental Impact on National Heritage Places?**	
	A search indicated that there are no nearby National Heritage Places. Therefore, the proposed works would not have a significant impact on any such places. Mitigation measures stated within **Section 9** of this EIS would negate any potential environmental impacts off-site.	Nil
c	**Any Environmental Impact on Wetlands of International Importance?**	
	The proposed works are not in proximity to any lands listed as Wetlands of International Significance (Ramsar Sites), and therefore would have no impact on such lands. Mitigation measures stated within **Section 9** of this EIS would negate any potential environmental impacts off-site.	Nil
d	**Any Environmental Impact on Commonwealth Listed Threatened Species or Ecological Communities?**	
	It is not expected that any Commonwealth listed species would be significantly impacted by the proposed works. Biodiversity is addressed at **Section 6.8**.	Nil
e	**Any Environmental Impact on Commonwealth Listed Migratory Species?**	
	It is not expected that any Commonwealth listed migratory species would be significantly impacted by the proposed works. Biodiversity is addressed at **Section 6.8**.	Nil
f	**Any Environmental Impact on a Commonwealth Marine Area?**	
	The Project does not impact on a Commonwealth Marine Area.	Nil
g	**Any impact on the Great Barrier Reef Marine Park?**	
	The Project is distant from the Great Barrier Reef Marine Park and there would be no impact.	Nil
h	**Does Any Part of the Project Involve a Nuclear Action?**	
	The Project does not involve a nuclear action.	Nil
i	**Any impact on a water resource, in relation to coal seam gas development and large coal mining development?**	
	The Project does not involve coal seam gas or coal mining.	Nil
	Additionally, any impact (direct or indirect) to Commonwealth Land?	
	The protected matters search tool returned results for Commonwealth Land within 10 km of the Project Site; however, none occurs within one kilometre. There would be no impact to Commonwealth Land.	Nil

5.1.7 Approvals under other Legislation

Clause 7(d)(v) of Schedule 2 of the EP&A Regulation 2000 requires that an EIS list of any approvals that must be obtained under any other Act. A review of relevant legislation indicates the following approvals may be required prior to the development being carried out unless otherwise exempted:

- Approval under Tweed Shire Councils Policy - Discharge of Liquid Trade Waste to the Sewerage System
- An Environmental Protection Licence under the *Protection of Environment Operations Act 1997* (to be determined)
- Approval under Section 68 of the *Local Government Act 1993* (LG Act) unless an exemption is afforded under Section 68 LG Act.

5.2 SEAR 2 - Policies and Strategic Context

5.2.1 Development Control Plans

The Tweed Development Control Plan (DCP) 2008 supports the provisions of the LEPs and provides a set of development objectives and provisions for development within the Tweed LGA.

While the SRD SEPP excludes the consideration of DCPs for State Significant Developments an assessment of the Concept Proposal against the above policy is provided below in compliance with the SEAR.

Consultation with Tweed Shire Council and aspects of the Tweed DCP have also been utilised where relevant for guidance and to inform the design response and assessment as referenced in applicable sections and appended reports.

Table 5.6 Assessment of the Project against DCP 2008

Issue	Comment	Compliance
Tweed Development Control Plan Sections - Whole of Shire		
Section A1 - Residential and Tourist Development Code	This Section applies to all residential and tourist development within the Tweed Shire.	N/A
A2 – Site Access and Parking Code	**Section 5.7** and **Appendix L** assess the likely carparking requirements of the future proposal (Stage 2). A more detailed assessment of car parking demand will be undertaken as part of the Stage 2 SSD in conjunction with an assessment of parking controls, tariffs and concession regimes for the Tweed Valley Hospital.	Yes
Section A3 – Development of Flood Liable Land	A key consideration in selecting the site for the Tweed Valley Hospital was that it was strategically located above the PMF level. A Flooding Assessment of the Site was undertaken by BMT (**Appendix W**) and determined that the Project Site presents a minimal flood risk with the majority of the Project Site including the main development area and access being above the Tweed River PMF level.	Yes

Issue	Comment	Compliance
Section A4 – Advertising Signs Code	There is no signage proposed as part of this application. Signage will be assessed as part of the SSD Application for Stage 2 of the Project.	N/A
Section A5 – Subdivision Manual	This Section of the DCP applies to subdivisions and is not relevant to the Project.	N/A
Section A6 – Biting Midge and Mosquito Control	Mosquitos and Biting Insects are assessed in **Section 7.3**. Given the high-level Concept Proposal, specific detail or measures for mitigating against mosquitos and biting insects have not be detailed at this stage. Where required, detailed design and measures to ameliorate the potential impact of these species on staff, patients and visitors can be developed as part of the Stage 2 design.	N/A
Section A7 – Child Care Centres	This Section is not applicable to the Project.	N/A
Section A8 – Brothels Policy	This Section is not applicable to the Project.	N/A
Section A9 – Energy Smart Homes Policy	This Section is not applicable to the Project.	N/A
Section A10 – Exempt and Complying Development	This Section is not applicable to the Project.	N/A
Section A11 – Public Notification of Development Proposals	The proposal is SSD and is subject to its own statutory public notification requirements.	N/A
Section A13 – Socio-Economic Impact Assessment	A comprehensive Socio-Economic Impact Assessment has been undertaken for the Concept Proposal (refer **Section 5.9** and **Appendix Z**).	Yes
Section A15 - Waste Minimisation and Management	A preliminary Waste Management Plan has been prepared for the Proposal (refer **Section 5.20**).	Yes
Section A16 - Preservation of Trees or Vegetation	A BDAR has been prepared for the development (refer **Appendix I**) and a preliminary Arboricultural report which assess the impact of the removal of any vegetation on the Project Site.	Yes
Section A17 - Business, Enterprise Corridor and General Industrial Zones	This Section applies to all development within the B5, B6, B7 and IN1 zones and is therefore not applicable to the Project.	N/A

Issue	Comment	Compliance
Section A18 - Heritage	A comprehensive Aboriginal and Non-Aboriginal Heritage Assessment has been undertaken for the Concept Proposal which assesses all potential heritage impacts of the Project (refer **Sections 5.10 and 5.24** and **Appendices N and O**).	Yes
Section A19 - Biodiversity and Habitat Management	A BDAR has been prepared for the Concept Proposal (refer **Appendix I**) which assesses the impact of the removal of any vegetation on the site.	Yes
Tweed Development Control Plan Sections - Specific Sites (where relevant)		
Section B2 – Tweed City Centre	This Plan applies to the North and South Tweed City Centre. Although it does not cover the Project Site, it does cover the existing TTH site. The impacts of the Project on the Tweed City Centre (i.e. the relocation and expansion of the hospital) are discussed in **Section 5.9** and the Socio-Economic Impact Assessment (SEIA) at **Appendix Z**. One of the *main negative impacts identified in the SEIA relates to the reduced economic function of the Tweed Town Centre in the short to medium term. There is also a marginal risk that the vacated location in Tweed Town Centre will have reduced physical accessibility to community health services. However, the SEIA identifies that these impacts can be potentially mitigated through the provision of a range of community health and other out-of-hospital services at or near the existing hospital site and the Tweed Town Centre, as well as the improvement of public transport access between Tweed Town Centre and the new facility at Kingscliff.*	Yes
Section B4 – West Kingscliff	This Plan applies to all that land within the Shire of Tweed generally referred to as West Kingscliff. The Project Site is located within the defined West Kingscliff. The aims of this Section are to: ▪ to set out objectives for the development of West Kingscliff; ▪ to provide detailed guidance to those wishing to develop within the West Kingscliff area and to indicate Tweed Shire Council's policies with respect to that development; ▪ to provide guidelines for determination of the merits of developments within West Kingscliff as required by Section 90(1)(a) of the EP&A Act 1979. The Project Site is not identified for any development other than for agriculture due to its current zoning. The proposed rezoning of the land and its associated impacts to SSF are addressed in this EIS and the Planning Report to rezone the land via a site-specific SEPP.	Yes, subject to the land being rezoned.
Section B9 – Tweed Coast Strategy	This Section applies to all forms of development within an area specified by a map. The Project Site is located within this area. The aims of this Section of the DCP are to: ▪ Set Tweed Shire Council's policies for the management of the growth of the Kingscliff District of the Tweed Coast. ▪ Set out Tweed Shire Council's strategy for the Tweed Coast. ▪ Identify the relevant planning controls to implement the Strategy. ▪ Provide guidance to those wishing to develop within the Tweed Coast area and to indicate Tweed Shire Council's policies with respect to that development. ▪ Have clear policies for determination of the merits of developments within Tweed Coast.	Yes, subject to the land being rezoned.

Issue	Comment	Compliance
	As identified in **Section 5.1** the site of the proposed hospital is on land zoned RU1 Primary Production. Hospitals are not permissible within this zone. Health Infrastructure (HI) accordingly requested that the DPE prepare a site-specific SEPP, pursuant to Divisions 3.2 and 3.3 of the EP&A Act, to amend the Tweed Local Environmental Plan 2014 (TLEP 2014) to rezone part of the Project Site to SP2 Infrastructure to facilitate the determination of the application. Under the current zone the Project is not consistent with aspects of the Tweed Coast Strategy. These inconsistencies relate to strategies outlining the Existing and Future Urban Development Areas and identified Agricultural Lands. The Project Site is identified as Agricultural Land and not as an existing or future urban area. Justification for the rezoning of the subject land is detailed within the Planning Report prepared by the DPE.	

5.2.2 NSW State and Premier Priorities NSW

NSW State and Premier's Priorities are the strategic vision by the NSW State Government, including 12 personal priorities of the Premier and 18 State priorities being action by the NSW Government. An assessment of the Concept Proposal against relevant priorities is provided in **Table 5.7** below.

Table 5.7 Consistency with NSW State and Premier Priorities NSW

Relevant Priority	*Comment*
Premier's Priorities	
Creating Jobs	Job creation as a result of the Project has been summarised in **Section 3.3**. The Project will be a significant economic and employment generator.
Delivering Infrastructure	The Project represents a significant regional infrastructure project for the NSW Government. The Project represents a significant capital investment, with a budget of around $534 million and delivers critical infrastructure for the region.
Improving Government Services	The Project will involve the development of a purpose-built major referral hospital on a greenfield site to deliver modern, expanded and high-quality healthcare services to meet the needs of residents in, and visitors to, the Tweed-Byron region into the future.
Improving service levels in hospitals	The Project will greatly improve health services within the Tweed-Byron region.
NSW State Priorities	
Encouraging business investment	The CIV of the Project will generate significant economic multiplier effects for the local economy.
Building infrastructure	The Project represents a significant regional infrastructure project for the NSW Government. It represents one of the largest single investments in health infrastructure in regional NSW.
Better Services, including cutting wait times for planned surgeries	The Project seeks to significantly increase and improve the health services for the local and regional community. It includes an expanded emergency department, inpatient care and enhanced surgical and outpatient services. New services include interventional cardiology and radiotherapy.

The Project is therefore considered to be consistent with relevant Premier and NSW Government Priorities as it will build infrastructure, add to the creation of construction and long-term operational jobs and will improve Health Facilities for the residents of the Tweed-Byron region.

5.2.3 North Coast Regional Plan 2036

The North Coast Regional Plan 2036 (NCRP 2036) is the NSW Government's blueprint for land use planning priorities and decisions to 2036. It provides an overarching framework to guide subsequent and more detailed land use plans, development proposals and infrastructure funding decisions. While a series of directions and priority actions are included, medium and longer-term actions will be identified to coincide with population growth and economic change.

The following relevant Goals and Directions of the NCRP 2036 have been considered, with the Project directly contributing to the facilitation of many:

Goal 2: A thriving, interconnected economy

Direction 5: Strengthen communities of interest and cross-regional relationships
The Tweed Valley Hospital is a major investment in public social infrastructure that will have flow-on effects for growth of the regional economy through its delivery. This infrastructure will unlock opportunities for future economic and employment growth, consistent with this Goal and Direction of the NCRP 2036. The development of the Tweed Valley Hospital is also important to maintaining and developing cross-regional relationships. Investment in these services and models of care aims to increase self-sufficiency and reverse cross-border flows to Queensland.

Direction 6: Develop successful centres of employment
The NCRP 2036 includes objectives and directions for developing centres of employment. Notably, it outlines under Direction 6 that healthcare and education sectors will continue to deliver important services and sustain employment growth, particularly with the ageing population. These sectors will continue to provide more high-skilled job opportunities and improve access to services for residents. This is directly relevant to and consistent with the Project for the Tweed Valley Hospital and the long-term goal of developing health and education partnerships. The proximity to the Kingscliff TAFE is invaluable and offers so much potential in this regard, further demonstrating the strategic location of the Project at the Project Site. This is directly consistent with Action 6.1 as the Project and its strategic location opposite Kingscliff TAFE facilitates economic activity around industry anchors such as health and education by delivering new infrastructure that encourages and results in clusters of related activity.

The proposed major development areas identified in the draft KLP that are located to the north of the Project Site further supports this opportunity (refer **Section 5.2.13**).

Direction 11: Protect and enhance productive agricultural lands
Whilst not directly consistent with this Direction, the Planning Report for the rezoning of the land via a site-specific SEPP has addressed strategic and local planning directions in detail to justify rezoning of the land, including consideration of SSF.

The comprehensive site selection process (outlined in **Section 1.6**) and assessments undertaken have considered the importance of a range of criteria, including the impact to agricultural land. Availability of appropriate land for the Tweed Valley Hospital in a suitably accessible location is limited. This is due to a range of biophysical conditions and constraints, including extensive flooding in the region. The Project Site has been assessed as the most suitable and feasible. It balances social, economic and environmental considerations and in turn results in a net community benefit as identified in the Social and Economic Impact Assessment (refer to **Section 5.9** and **Appendix Z**).

On balance, the Concept Proposal is acceptable in the context of the NCRP 2036, and the *Northern Rivers Farmland Protection Project* (2005) given the public purpose/ infrastructure. The proposed land use and development of the Tweed Valley Hospital, subject to interface management, would not unduly affect other surrounding agricultural land (refer to **Section 5.6**). Further discussion about the impact to SSF and agriculture, including acceptability of the development in the context of the above Direction of the NRCP 2036 and the *Northern Rivers Farmland Protection Project* (2005) is provided later in this report (refer to **Section 5.2.4**).

Goal 3: Vibrant and engaged communities

Direction 14: Provide great places to live and work
The coastal settlements of the Tweed Shire have experienced some of the strongest growth on the North Coast. The popularity of the Tweed Coast is expected to continue. Kingscliff will be an important centre in this regard and will service the growth of the Tweed Coast's network of villages. The NCRP 2036 refers to Kingscliff as a growth area and the Tweed Valley Hospital will integrate into the locality and both support and be a potential driver of future growth. A precinct plan is currently being prepared by Tweed Shire Council for Kingscliff, discussed further at **Section 5.2.13**. The Project Site can be effectively integrated into the strategic direction and future development of the locality. It would align with the Direction of providing great places to live and work.

Direction 15: Develop healthy, safe, socially engaged and well-connected communities
The design response (to be further developed in Stage 2 detailed design), has considered health, social wellbeing, cohesion and safety. The NCRP 2036 states that all communities need access to social infrastructure and that this is delivered in a timely manner and relevant to community needs. The Tweed Valley Hospital is consistent with achieving this and providing the high-quality healthcare needed for the growing and ageing Tweed-Byron community.

As addressed in **Section 5.2.8**, the Project responds to crime prevention through environmental design outcomes and urban design.

Direction 16: Collaborate and partner with Aboriginal communities
Direction 18: Respect and protect the North Coast's Aboriginal heritage
A consultation process regarding the proposed land use and development has involved Aboriginal people, to ensure they have their interests and responsibilities acknowledged, respected and considered through the planning process. **Section 5.10** addresses Aboriginal heritage and the assessment undertaken has found that there would be no significant impact.

Direction 21: Coordinate local infrastructure delivery
New development should be located to take advantage of both existing and new infrastructure. The design of infrastructure should accommodate, wherever possible, the capacity for cost-effective expansion. The Concept Proposal on the Project Site is consistent with this Direction and utilises a site that is strategically placed and well suited to the development of a new major referral hospital. Its accessibility serves the target population catchment. Existing, as well as future, planned infrastructure would effectively support the development. Consistent with one of the key actions, it would maximise the cost-effective and efficient use of infrastructure by directing development towards existing infrastructure and promoting co-location of new infrastructure, including educational partnership opportunities.

5.2.4 Local Planning Directions and the Northern Rivers Farmland Protection Project (2005)

Local Planning Directions under Section 9.1(2) (previously 117(2)) of the of the EP&A Act are relevant to planning authorities (Councils) when creating/ amending LEPs, including the preparation of Planning Proposals. Relevant directions have been addressed in the Planning Report for the proposed site-specific SEPP that would amend the TLEP 2014 and in turn rezone the subject portion of land. The draft SEPP is being concurrently exhibited with the SSD application. The process to rezone the land via a site-specific SEPP, is not a Planning Proposal and Local Planning Directions are not directly relevant. The Planning Report for the draft SEPP provides general consideration of the directions, nonetheless.

The protection of SSF farmland from urban and rural residential development is provided by Local Planning Direction No. 5.3 (Farmland of State and Regional Significance on the NSW Far North Coast) under Section 9.1(2) (previously 117(2)) of the of the EP&A Act.

Any proposed change of zoning of land that has been mapped as SSF needs to be in accordance with Local Planning Direction No. 5.3.

The early version of the Direction stated that land to which it applied shall not be rezoned for urban or residential purposes. This provision was slightly amended following the adoption of the NCRP 2036 by recognising an opportunity to rezone SSF (through a planning proposal) in some circumstances.

The Direction states that SSF cannot be rezoned for urban or rural residential purposes except if the rezoning is consistent with:

- The North Coast Regional Plan 2036; or
- Section 4 of the report titled 'Northern Rivers Farmland Protection Project - Final Recommendations', February 2005, held by the DPE; in accordance with Clause (5) a) and b) of the Direction.

The *Northern Rivers Farmland Protection Project* (2005) seeks to protect important farmland from urban and rural residential development by mapping farmland and developing planning principles. In accordance with Section 4(9) of the report, public infrastructure is permitted on land mapped as State or regionally significant where no feasible alternative is available.

As has been extensively demonstrated, a rigorous site selection process, subject to a range of evaluation criteria, has determined the Project Site as suitable for the Tweed Valley Hospital. Shortlisted alternative sites were discounted as not feasible for differing reasons, including but were not necessarily limited too, the risk of the hospital being delayed through complex multi-level approvals or becoming an isolated development for an extended period due to approvals and/or the uncertainty of the housing market; or the additional costs involved would significantly impact on the budget available to build clinical space and the resulting impact on clinical services would be unacceptable. It is submitted that the relevant requirements and Directions are satisfied, and the Project on the Project Site is well justified. Further consideration of SSF and agriculture is provided at **Sections 5.6** and **5.9**.

5.2.5 NSW State Health Plan: Towards 2021

The NSW State Health Plan: Towards 2021 provides a strategic framework which brings together NSW Health's existing plans, programs and policies and sets priorities across the system for the delivery of 'the right care, in the right place, at the right time'.

The Plan includes the following Directions:

- Keeping people healthy
- Providing world-class clinical care
- Delivering truly integrated care.

The Plan includes the following Strategies:

- Supporting and developing our workforce
- Supporting and harnessing research and innovation
- Enabling eHealth
- Designing and building future-focused infrastructure.

The proposed Tweed Valley Hospital is consistent with the State Health Plan as its key objectives are aligned with the Plan's Directions and Strategies, particularly designing and building future-focused infrastructure which would in turn facilitate support for and realisation of the other Directions and Strategies in the Plan.

5.2.6 State Infrastructure Strategy 2018 – 2038 Building Momentum

The NSW State Infrastructure Strategy 2018-2038: Building Momentum sets out government priorities over the next 20 years for infrastructure. Combined with the Future Transport Strategy 2056, the Greater Sydney Region Plan and the Regional Development Framework, the Strategy brings together infrastructure investment and land-use planning across the State, with an overall objective for the Health Sector to 'plan and deliver world-class health infrastructure that supports a 21st century health system and improved health outcomes for the people of NSW'.

The Strategy forecasts that demand for healthcare will grow by over 50 per cent over the next 20 years and investment in new, expanded and renewed infrastructure would be required to meet demand, particularly for aged care and changing demographics. It also states that approximately 40 per cent of health infrastructure is 'over 50 years old and will struggle to accommodate newer models of care and technology'. The Tweed Valley Hospital is designed to replace existing outdated and at capacity facilities and to deliver expanded and better health services and improved health outcomes for the Tweed-Byron region. The Project is therefore consistent with the State Infrastructure Strategy.

5.2.7 Future Transport Strategy 2056 and Supporting Plans

Future Transport 2056 is an update of NSW's Long-Term Transport Masterplan. It is a suite of strategies and plans for transport developed in conjunction with the Greater Sydney Commission's Sydney Region Plan, Infrastructure NSW's State Infrastructure Strategy, and DPE's Regional Plans, to provide an integrated vision for the State. The Future Transport Strategy sets the 40-year vision, directions and outcomes framework for customer mobility in NSW, which will guide transport investment over the longer term. It will be delivered through a series of supporting plans. The Services and Infrastructure Plans set the customer outcomes for Greater Sydney and Regional NSW for the movement of people and freight to meet customer needs and deliver responsive, innovative services.

The plans will define the network required to achieve the service outcomes. The supporting Plans are more detailed issues-based or place-based planning documents that help to implement the Strategy across NSW.

A key outcome for the plan is to "support successful places" by creating a transport network across the State that better connects regional cities and centres and will increase access to regional jobs, services and education.

The Tweed-Byron region is located in northern NSW, adjoining the border with Queensland, with a key link being the Pacific Motorway (M1). The Project Site has proximal access to the M1 in the north and southern and eastern links to the coastal communities of Kingscliff, Casuarina and beyond. The Project Site is positioned opposite the Kingscliff TAFE and there are existing bus routes/ stops along Cudgen Road in proximity to the Project Site.

As part of the design and traffic considerations, consultation has occurred with Tweed Shire Council, RMS and TfNSW. This would be ongoing as the hospital design progresses and given the service catchment and important role of the Tweed Valley Hospital, it is vital that it is effectively serviced by a range of transport modes that would complement the hospital's development and location.

The position of the Project Site on the fringe of established and growing urban areas, with existing transport links supports the development of the Project Site, and additional transport provisions would form part of the long-term development of the Project Site. This arrangement will ensure that the new hospital has effective and efficient access to support the Tweed-Byron region and provide quality and accessible health care services.

Furthermore, the Concept Proposal has been designed to:

- Facilitate effective movement networks for people and various forms of transport.
- Ensure the Tweed Valley Hospital includes a clear and interconnected set of circulation and movement networks that support legible access and the integration of public transport and pedestrian infrastructure.

As referred to above, consultation with TfNSW and bus operating companies has and would continue to occur to ensure the integration of transport networks. Road upgrades have been proposed to ensure connectivity and access to the Tweed Valley Hospital (refer **Section 5.7**).

The Traffic Impact Assessment prepared by Bitzios Consultants (refer **Appendix L**) provides details on the pedestrian, cycling and public transport options available to provide sustainable transport infrastructure to the Project. A Green Travel Plan would be prepared for Stage 2 and promote alternative and active travel. These strategies are further discussed in **Section 5.7**.

5.2.8 Crime Prevention through Environmental Design (CPTED) Principles

There can be concerns expressed by the community that the development of the hospital in Kingscliff may bring with it the presence of non-law abiding or anti-social behaviour. Whilst such behaviour could logically be associated with any public facility such as stadiums, railway stations or even parks, there is presently no evidence which can be used to predict the likelihood or severity of this impact.

Nonetheless, there are mitigation measures which can be put in place to manage this (as yet unquantifiable) potential risk. This includes Crime Prevention through Environment Design (CPTED) guidelines, which promotes a multi-disciplinary approach to deterring criminal behaviour through environmental design and design of buildings and places that are safe and secure.

Current policies and procedures will be followed to ensure contemporary regulations, occupational health and safety, and accreditation requirements are addressed as part of the new facility. The Concept Proposal has been informed by, and the Stage 2 design would be further developed and carried out in accordance with:

- Protecting People and Property, NSW Health Policy and Standards for Security Risk Management in NSW Health Agencies, 2013
- Physical Security Management Guidelines – Australian Government, 2011
- NSW Health Policy and Standards for Security Risk Management in NSW Health Agencies, 2013
- CPTED principles.

In terms of assessing the Project's security and crime prevention measures, the most appropriate document is the Department of Planning's guideline titled *Crime Prevention and the Assessment of Development Applications (2001)*. The development of the Concept Proposal has taken into consideration the principles of CPTED as applicable to this phase of the design, which are outlined in the aforementioned guideline. CPTED principles that need to be considered when designing to minimise crime are:

- Surveillance
- Access control
- Territorial reinforcement
- Space management.

The Built Form and Urban Design Report at **Appendix C** provides a full response to CPTED principles in the context of the Project and Concept Proposal. The Tweed Valley Hospital would adopt the principles of CPTED, which have already informed the Masterplan and concept planning and would be further incorporated at the detailed design stage, to help ensure the establishment of a safe and secure environment for the range of users and neighbouring local community. **Table 5.8** below summaries the four principles of CPTED with regard to the Project and design process. This would also include consideration of nearby public land uses including Kingscliff TAFE, Kingscliff High School, bus stops, the Tweed Regional Aquatic Centre.

Table 5.8 CPTED Assessment

CPTED Principles	Comment
Surveillance - The attractiveness of crime targets can be reduced by providing opportunities for effective surveillance, both natural and technical. Good surveillance means that people can see what others are doing. People feel safe in public areas when they can easily see and interact with others. Would-be offenders are often deterred from committing crime in areas with high levels of surveillance. From a design perspective, 'deterrence' can be achieved by: ■ Clear sightlines between public and private places ■ Effective lighting of public places ■ Landscaping that makes places attractive but does not provide offenders with a place to hide or entrap victims.	The following principles will be considered to achieve this: ■ Consideration for day and night functionality and collocation, activating public spaces for longer periods. Grouping areas that provide day services for secure zonal shut-down after hours ■ Promote visual connection between spaces where possible ■ Use passing traffic including; vehicle, bicycle and pedestrian as a surveillance asset facilitation and promotion of passive surveillance into public spaces from adjacent buildings, roads and spaces ■ Designing high quality outdoor public spaces, with sun access and shelter, collocated with

CPTED Principles	Comment
	functions connected to that space. Building layout, orientation and location all play a role ■ Providing unrestricted sight lines between spaces and avoiding blind spots where possible ■ Providing lighting to ensure safe use and effective surveillance of the space after hours
Access Control - Physical and symbolic barriers can be used to attract, channel or restrict the movement of people. They minimise opportunities for crime and increase the effort required to commit crime. By making it clear where people are permitted to go or not go, it becomes difficult for potential offenders to reach and victimise people and their property. Illegible boundary markers and confusing spatial definition make it easy for criminals to make excuses for being in restricted areas. However, care needs to be taken to ensure that the barriers are not tall or hostile, creating the effect of a compound. Effective access control can be achieved by creating: ■ Landscapes and physical locations that channel and group pedestrians into target areas. ■ Public spaces which attract, rather than discourage people from gathering. ■ Restricted access to internal areas or high-risk areas (like carparks or other rarely visited areas). This is often achieved through the use of physical barriers.	The design will incorporate natural barriers such as roadways and landscaping, electronic and physical barriers through the use of the following: ■ Limit the number of public entrances to the Hospital. Improve management of these by employing passive surveillance principles. ■ Provision of CCTV monitoring of public areas to the Hospital supported by a security monitored point ■ Providing a 24-hour security station at the ED that can respond to other parts of the Hospital during occasions of duress ■ Providing a single point of public entry into the Hospital after hours ■ Providing electronic access points of entry and intercoms ■ Providing access control to clinical departments after hours ■ Providing 24-hour access restriction to engineering services areas and other back-of-house and sensitive sections of the Hospital.
Territorial Enforcement – Community ownership of public space sends positive signals. People often feel comfortable in, and are more likely to visit, places which feel owned and cared for. Well used places also reduce opportunities for crime and increase risk to criminals. If people feel that they have some ownership of public space, they are more likely to gather and to enjoy that space. Community ownership also increases the likelihood that people who witness crime will respond by quickly reporting it or by attempting to prevent it. Territorial reinforcement can be achieved through: ■ Design that encourages people to gather in public space and to feel some responsibility for its use and condition. ■ Design with clear transitions and boundaries between public and private space. ■ Clear design cues on who is to use space and what it is to be used for. Care is needed to	When designing the campus, the following principles will be considered to achieve this: ■ Clearly delineating public and back-of-house through considered departmental organisation, physical barriers or appropriate directional means. The delineation device may be subtle, such as a change in ground finish texture, sufficient to indicate a difference between one territory and another – avoiding ambiguity where possible ■ Segregation of public, patient and back-of-house activity, avoiding confusion in the diverse users of the space. Spatial design can reinforce public space from private e.g. civic square, or hospital street ■ Appropriately situate and identify control points to clinical areas ■ Ensure that circulation patterns are intuitive offering clear and simple options for travel to and between functional areas

CPTED Principles	Comment
ensure that territorial reinforcement is not achieved by making public spaces private spaces, through gates and enclosures.	■ Activating public areas by introducing amenities such as seating, landscaping and other elements, deterring anti-social activity ■ Circulation network planning accommodating secure medical operations routes without need for public route, zone cross over ■ Consistent appearance of public spaces informs a specific behavioural expectation of its users ■ A well-maintained property appearance implies an owner has sufficient resource to care for the property, which implies they will defend the space from those that would disturb it.
Space Management - Popular public space is often attractive, well maintained and well used space. Linked to the principle of territorial reinforcement, space management ensures that space is appropriately utilised and well cared for. Space management strategies include activity coordination, site cleanliness, rapid repair of vandalism and graffiti, and the replacement of burned out pedestrian and carpark lighting and the removal or refurbishment of decayed physical elements.	The following principles will be considered to achieve this: ■ Ensuring clear observation lines to open areas that would be of high risk to the public such as loading docks and staff parking zones ■ Restricting access to sensitive areas such as goods lifts and logistics yards ■ External spaces are to be designed with robust finishes requiring minimal maintenance.

It is considered that the proposed design measures will significantly reduce the risk of criminal activities. These would be further developed for Stage 2 and on that basis the Project would provide adequate public surveillance and does not provide opportunities for concealed criminal behaviour; therefore, suitably addressing principles of CPTED.

5.2.9 Planning Guidelines for Walking and Cycling

The Planning Guidelines for Walking and Cycling aim to assist land use planners and related professionals to improve consideration of and prioritise walking and cycling to create more opportunities for people to live and work in places with easy walking and cycling access to urban services and public transport. Pedestrian infrastructure is found along the frontage of the Project Site and connects to the Kingscliff urban area.

With regard to the Planning Guidelines for Walking and Cycling:

- The Traffic Impact Assessment at **Appendix L** outlines principles for a Green Travel Plan that will be prepared as part of Stage 2. It aims to reduce the environmental impact of travel to and from the development and includes measures to encourage and provide support for alternative modes of transport
- Access and circulation for pedestrians has informed the Concept Proposal and will allow for connectively to other pedestrian infrastructure in the locality
- Bicycle parking/ storage and end of trip (change/ shower) facilities would be provided to encourage and support cycling to the Project Site (this will be detailed at Stage 2)

- Appropriate weather protection along walkways or near bus stops and lighting will be considered as part of the Stage 2 design.

5.2.10 Healthy Urban Development Checklist, NSW Health

The purpose of the Healthy Urban Development Checklist is to assist health professionals to provide advice on urban development policies, plans and proposals. It is intended to ensure that the advice provided is both comprehensive and consistent. The checklist is principally about helping to answer the questions:

- What are the health effects of the urban development policy, plan or proposal?
- How can it be improved to provide better health outcomes?

The Project will enable the development of a new and expanded major referral hospital for the Tweed-Byron region. The proposed development will provide expanded and new health services and facilities whilst improving the efficiency and function of healthcare in the region.

The Project Site has good proximity to infrastructure and transport facilities and services. Provision is to be made for cycling and pedestrian access and infrastructure to encourage walking and cycling to the Project Site and in turn promote active lifestyle opportunities. The Project Site has good access to existing population centres. The Project has also adequately addressed community safety and security (refer **Section 5.2.8**). Overall the Project is considered to be consistent with the NSW Healthy Urban Development Checklist and supports the following items in the checklist:

- **Physical activity**: the development would provide opportunities for active transport and access to quality outdoor/ open space at the hospital.
- **Transport and physical connectivity**: the development would integrate with the Kingscliff urban area and provide opportunities for alternative transport modes, including public transport and walking and cycling, assisting to reduce car dependence.
- **Community safety and securing**: the design (to be developed further in Stage 2) has considered crime prevention and security and applied CPTED Principles.
- **Public open space**: the Tweed Valley Hospital will incorporate access to a range of quality open space, supporting a healing and pleasant environment.
- **Social infrastructure**: the Project responds to the current and future healthcare needs of the region, supports opportunities for collaborative education and training, and provides a significant investment in social infrastructure.
- **Environment and health**: environmental impacts have been thoroughly considered in **Section 5** and **6** of this EIS. The proposed development is not anticipated to result in significant environmental impacts and would ensure acceptable environmental outcomes are achieved.

5.2.11 Better Placed – An integrated design policy for the built environment of NSW 2017

Better Placed is an integrated design policy for the built environment of NSW. It seeks to capture our collective aspiration and expectations for the places where we work, live and play. It creates a clear approach to ensure we get good design that will deliver the architecture, public places and environments we want to inhabit now and those we make for the future.

Design response and urban design considerations are discussed in **Section 5.3** and **Appendix C**. Overall, the Tweed Valley Hospital and proposed planning envelopes respond to clinical needs, functionality and identity as a major hospital, whilst also respecting the scale of surrounding development and the broader contextual setting both in response to the adjacent urban areas of

Kingscliff and Cudgen and to the rural land to the south-west. The process to develop the Masterplan has been extensive to ensure it achieves a quality and functional layout that supports the current and future needs and opportunities for healthcare and supporting education in the region.

Although conceptual, the urban design principles considered, and the overall design response, would achieve effective integration of the development into the local setting and fulfils the operational and functional needs of a hospital facility. The urban design response will be further developed and refined at Stage 2. The new hospital, and overall Health and Education Campus, will be an accessible and welcoming facility, supported by a well-designed and purposeful built form that supports patients, staff and visitors, and suitably responds to the locality.

The Project has taken into consideration the Better Placed design objectives for the built environment and design principles relevant to the Concept Proposal, with further consideration to occur at Stage 2 design. These include the following Better Placed Objectives:

- Better Fit – Contextual, local and of its place
- Better Performance – Sustainable, adaptable and durable
- Better for community – Inclusive connected and diverse
- Better for people – Safe, comfortable and liveable
- Better working – Functional, efficient and fit for purpose
- Better Value – Creating and adding value
- Better look and feel – Engaging, inviting and attractive.

A full outline of how these objectives have been considered is provided in the Built Form and Urban Design Report at **Appendix C**. A presentation of the Tweed Concept proposal was made to the State Regional Design Panel on 3 October 2018. At the time of writing formal comments from the panel have yet to be received.

5.2.12 Greener Places

Greener Places is a draft policy produced by the Government Architect NSW to guide the design, planning and delivery of Green Infrastructure in urban areas across NSW. Green Infrastructure is the network of green spaces, natural systems and semi-natural systems including parks, rivers, bushland and private gardens that are strategically planned, designed and managed to support good quality of life in the urban environment.

The aim of the policy is to create a healthier, more liveable, more resilient and sustainable urban environment by improving community access to recreation and exercise, walking and cycling connections.

The following principles found in the Greener Places document have been considered and applied to the Landscape Principles developed for the Tweed Valley Hospital. The concept landscape strategy and zonal Masterplan is at **Appendix D**. These will be further considered in the detailed design process for the Stage 2 proposal.

- Integration:
  - ‘Greyspace’ and ‘greenspace’ working together to promote active and healthy living.
  - Understanding the physical synergies between urban green space and other infrastructure.

- Connectivity:
  - Accessible and connected green priority corridors.
  - Enhancing ecological connectivity through restoration and conservation, including a considered approach to water management.

- Multifunctionality:
  - Understanding the ecological, sociocultural and economic benefits of a multifunctional landscape.
  - Ensure infrastructure contributes to the value and understanding of place.
  - Spaces that foster interaction, stewardship, community identity and connectedness.

- Participation:
  - Improve equity of access to green spaces by considering various cultures and user groups.
  - Inclusive design: respond to needs of all people regardless of differences in ability, age, gender or culture.

- Additional considerations:
  - Assisting with recovery: green infrastructure can reduce stress and improve healing times.
  - Foster health and wellbeing: green infrastructure can reduce symptoms of depression and cardiovascular disease, foster creative play among children and walkability improves public transport inequity.
  - Resilience: promotion of biodiversity, improved air quality, flooding and temperature reduction.

5.2.13 Kingscliff Locality Plan (exhibited draft)

The KLP has been drafted by Tweed Shire Council and went on exhibition from August to September 2018. The KLP and associated DCP are intended to establish a long-term strategic planning and design framework for managing and guiding future growth, development and conservation for the locality. The plan will provide a long-term (30 years) strategic planning vision and framework for the Kingscliff and surrounding locality by identifying a clear vision and guiding set of strategies and development controls to implement the strategic framework.

The plan identifies a number of significant growth areas and precincts around Kingscliff. The Project Site is situated immediately adjacent to existing urban and future growth areas (see Figure 3.1 of the exhibited KLP and extract at **Plate 5.1** below). Given this context and being a significant social and economic anchor, it can and should be effectively integrated into the strategic direction and future development of the locality. The following outlines how the Project relates to relevant components and strategies identified in the exhibited draft KLP.

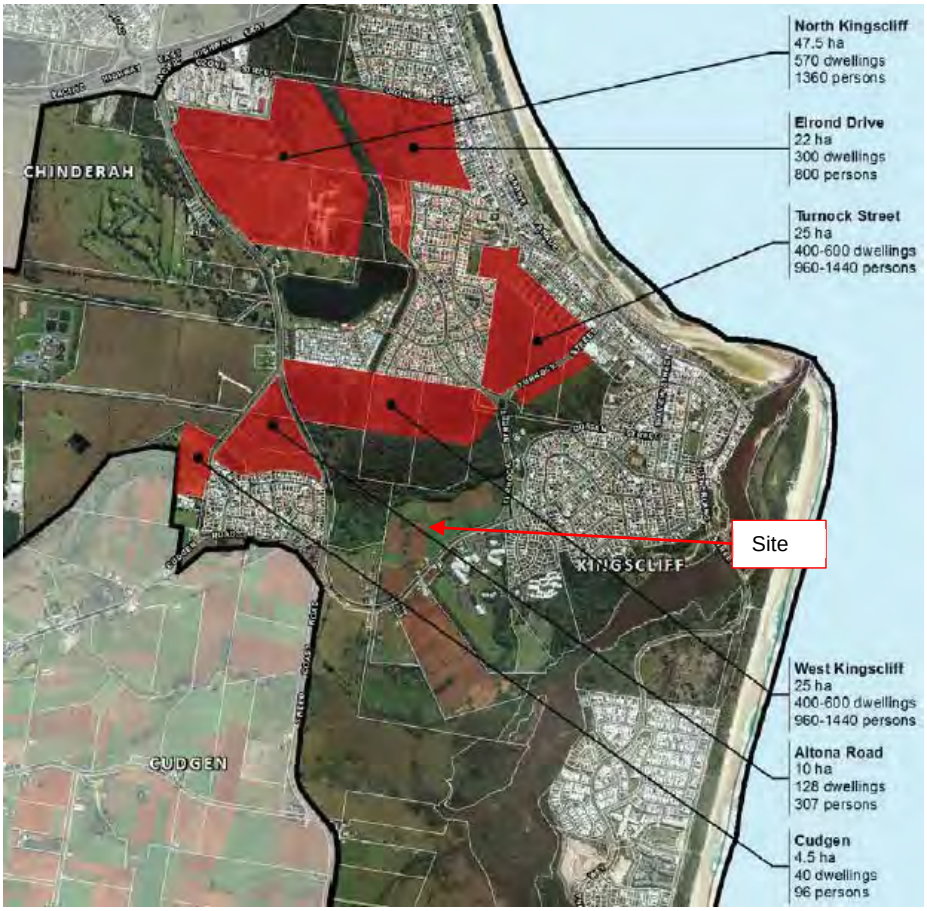


Plate 5.1 Extract of Potential Residential Release Areas from Exhibited KLP

The KLP outlines the Tweed Coast has seen exponential growth. The locality of Kingscliff in particular has been a major contributor to this growth, elevating its settlement status from a coastal village (<3000 residents), to a coastal town (3000-20,000 residents). Kingscliff's population could surpass the population threshold usually associated with a small coastal city (>20,000 residents, Coastal Design Guidelines for NSW). The KLP outlines that the existing role of the Kingscliff locality as the sub-regional centre servicing Tweeds' network of coastal villages (Fingal Head, Cudgen, Casuarina, Cabarita, Hastings Point, Pottsville and future Kings Forest) is anticipated to be reaffirmed.

This statement from the KLP clearly indicates the important and evolving role of Kingscliff as a sub-regional centre. Such attributes and future growth provide strong support for the selection of the Project Site being within this immediate locality. This allows the Tweed Valley Hospital to be established in the context of an existing urban area, supported by infrastructure and a growing locality that will deliver more housing, jobs and services.

5.2.13.1 Vision and Strategies

The KLP presents visions and strategies that aim to preserve local character and the natural environment, facilitate business and employment opportunity, encourage housing supply and diversity and recommend measures to improve the public domain to create a more contemporary place to live, work and play. The vision in the KLP reads:

"The future of Kingscliff will achieve a sustainable balance of a healthy and inclusive community life, a prosperous local economy and employment opportunities, tourism and additional housing diversity to

meet generational needs. The growing settlement will be nestled within the highly valued and protected natural environmental fringed with a working agricultural hinterland. The town centre will continue to be strengthened as the centre of community life supported by new retail, employment, education and residential opportunities within a new business and knowledge precinct."

Importantly the Tweed Valley Hospital and proposed development within the Kingscliff locality can align with the vision of the KLP. The Tweed Valley Hospital would support the economy and employment. It would be undertaken with due regard for and protection of natural environmental features and the working hinterland, including SSF, through a well resolved design, integration with the existing and growing urban areas of Kingscliff, and implementation of effective mitigation and safeguard measures as assessed in **Section 5, 6** and **9**.

Development of the Tweed Valley Hospital is directly consistent with the following key vision statement and strategy of the KLP:

Economy, employment and infrastructure:

- *Expand employment generating land uses by providing land use opportunity for larger employment generating developments such as a business park, health and/or university campus, commercial and retail uses, as well as a range of student, tourist and residential accommodation types to build upon the existing industry pillars of tourism, agriculture, health and local small business.*

The Project Site and Concept Proposal for the development of the Tweed Valley Hospital will support and stimulate employment and develop high quality and highly valued healthcare services for the community. Its strategic location opposite Kingscliff TAFE presents substantial potential and opportunities for educational partnerships and development of a health and education precinct that would further deliver employment, innovation and business. The importance of surrounding agricultural activity is acknowledged and existing farmland interfaces with residential and educational facilities show that coexistence is achievable and already occurs.

Development of the Project Site would not fragment the Cudgen Plateau and would limit flow-on impacts to other SSF, ensuring the rezoning and land use change for the Project Site would not hinder the achievement of the KLP and its vision. Furthermore, the Project promotes economic development and protects ecological areas, consistent with key principles in the KLP. Health Infrastructure are keen to work with Tweed Shire Council regarding incorporation of the Tweed Valley Hospital on the Project Site into the KLP. This would help to further coordinate infrastructure delivery over time and provide a strategic approach to planning that has due consideration for this important facility and healthcare investment.

5.2.13.2 Future Opportunities: Health and Education

The KLP identifies the Kingscliff education precinct being the NSW North Coast TAFE Kingscliff Campus and Kingscliff High School on southern side of Cudgen Road. The KLP states that:

> *'…moving eastward from the Tweed Coast Road intersection, the TAFE buildings represent the first larger 'built form' transitioning from surrounding agricultural areas to the Kingscliff township and has available land to expand'.*
>
> *'Both the high school and TAFE occupy large sites and are considered to hold the opportunity to intensify through additional or taller buildings. Despite a recent drop in enrolment numbers, Kingscliff TAFE maintains an enrolment of approximately 7600 students'.*

The KLP acknowledges these established facilities and the precinct they already form, including their transition role between urban and rural land. Growth and future expansion are envisaged and there is a recognised opportunity to intensify. The strategic siting of the Tweed Valley Hospital and additional land zoned SP2 Infrastructure immediately adjacent to the existing education uses/ precinct provides an excellent colocation of health and education land uses and significant potential for partnerships and delivery of an integrated campus. The Masterplan has confirmed that the Project Site can support a range of hospital expansion scenarios as well as complementary health-related uses to support the development of a broader Health and Education Campus over time.

The Social and Economic Impact Assessment prepared by SGS Economics and Planning (**Appendix Z**) outlines that aspirations for the new Tweed Valley Hospital site include increased education, training and research facilities. The NNSW LHD is preparing an education, training and research strategy. There is also a plan for discussions with service partners. The presence of the TAFE across the road from the Project Site presents opportunities for the future clustering of research and educational institutions, with potential for building a significant health and education precinct in the future.

The proximity to the Kingscliff TAFE and the education precinct identified in the KLP is a great benefit and reflects sound land use planning principles. It offers much potential and is directly consistent with Action 6.1 of the NCRP 2036 as the Project Site and its strategic location opposite Kingscliff TAFE facilitates economic activity around industry anchors such as health and education by delivering new infrastructure that encourages and results in clusters of related activity.

5.2.13.3 Economic, Industry and Population Growth

The KLP states that healthcare forms one of the three dominant industry sectors for the Kingscliff population. The healthcare industry has a major flow on effect to other sectors of the economy. The KLP acknowledges that given Kingscliff's proximity to Tweed Heads and the highway, with relatively constrained free land, there is good opportunity to further grow and diversify healthcare and ancillary industries within Kingscliff.

The development of the Tweed Valley Hospital supports this sentiment and further demonstrates the Project Site as being strategically placed to both support and cater for future growth around the already established infrastructure and urban area of Kingscliff.

5.2.13.4 Urban Structure, Land Use and Precincts

The Project would effectively integrate into the urban structure and land use precincts of Kingscliff. The Project Site sits at the interface of Kingscliff Hill, West Kingscliff, and Turnock Street precincts. The frontage to Cudgen Road and alternative access roads further support its integration and accessibility within and to the main urban locality of Kingscliff.

The KLP presents draft precinct strategies and controls for future growth. Of note are the Turnock Street and West Kingscliff precincts and the potential growth they will support (as indicated in **Plate 6.1** above).

The Turnock Street and West Kingscliff Precincts are likely to facilitate a mix of housing types including low and medium density residential. Adequate protection of the land identified as environmentally and/or ecologically important has also been indicated in the KLP. These aspects align with the Project.

The KLP currently indicates that the Project Site is located in the Green Edge Precinct. This precinct acknowledges the importance of surrounding farmland, the landscape character and views. Strategies of KLP include that new development incorporate adequate buffers within development sites and consider the visual character of the locality. As outlined in **Section 8**, the Project has had due regard for these aspects, amongst others. In terms of the Project Site itself being within the Green Edge Precinct of the KLP, the proposed rezoning of the land would designate it for the proposed land use change to SP2 Infrastructure, as justified in the Planning Report to rezone the land via a site-specific SEPP.

The draft Kingscliff DCP includes planning and design principles, objectives and development controls. The Project and this EIS have considered a comprehensive range of matters, including (but not limited to) contextual analysis, need for the project, design principles and urban design, SSF, Ecologically Sustainable Development (ESD), traffic, and environmental and visual amenity. **Section 8** of the EIS provides the environmental assessment of the Project. Additionally, the proposed rezoning of the land would designate the Project Site for SP2 Infrastructure related use/development (health and education) and this is also addressed in the Planning Report to rezone the land via a site-specific SEPP.

5.2.14 Tweed Sustainable Agricultural Strategy

This Strategy provides a vision and framework for sustainable agriculture. It highlights key issues affecting farm sustainability and identifies steps to overcome existing and perceived future challenges.

The Strategy identifies outcomes, objectives and actions that will increase the level of sustainable agriculture in the Tweed and can minimise land use conflict. The Land Use Conflict Risk Assessment (LUCRA) prepared as part of this EIS (refer to **Section 5.6.2**) has considered this Strategy, as relevant.

The first outcome in the Strategy is relevant to the Project, including the following objectives:

- *Objectives 1.1: Ensure the on-going protection of prime agricultural land*
- *Objectives 1.2: Minimise land use conflicts between agriculture and other land uses.*

The Strategy outlines that prime agricultural land is to be protected from inappropriate development that fragments the landscape and threatens the productive use of land and water. Differing expectations and interfacing uses can also lead to disagreements between landholders.

Conflict can result from misunderstandings about the realities of agricultural production and community expectations about how agriculture should be conducted. Due consideration to the impacts of development on agriculture when assessing development applications is required to ensure land use conflict is minimised.

Relevant actions include:

- *Develop guidelines to ensure the development of prime agricultural land is appropriately evaluated consistent with current environmental planning instrument objectives.*
- *Implement actions identified in the draft Rural Land Strategy to address conflicts at the rezoning and subdivision stage, including preparing a specific chapter in the DCP about land use conflict, buffers and setbacks to farmland.*

The Tweed Valley Hospital Project would result in the loss of approximately 16 ha of SSF (or approximately 0.13 per cent of mapped SSF on the Far North Coast, or 0.013 per cent of Biophysical Strategic Agricultural Land (BSAL) mapped for the same region). This loss is acknowledged; however,

it is justified for public infrastructure and consistent with the *Northern Rivers Farmland Protection Project 2005* in this regard.

In the context of Objective 1.1, the proposed development would not fragment the rural landscape or agricultural activity given the context of the Project Site, and the productivity of surrounding land can be adequately protected. Further assessment of the impact to farmland is provided later in this report and in **Appendices F and J**. This includes addressing potential land use conflict and providing recommended management strategies that minimise land use conflicts between agriculture and other land uses, consistent with objective 1.2. The LUCRA prepared has had due regard for relevant policy and strategies related to agricultural land and land use conflict minimisation.

5.2.15 Other Policies

The following policies have been considered in the context of the Concept Proposal and Stage 1 works (as applicable), and as relevant by the appended specialist/ technical reports that support this EIS:

- NSW Energy Efficiency Action Plan 2013
- NSW Resource Efficiency Policy (GREP)
- NSW Climate Change Policy Framework
- Sustainability Policy for NSW Government
- NSW and ACT Government Regional Climate Modelling (NARCliM) climate change projections
- Tweed Coast Comprehensive Koala Plan of Management 2015
- Tweed Flying-Fox Camp Management Plan 2017.

Ecologically Sustainable Development (ESD) has considered energy and resource efficiency, including Climate Change, sustainability and related policy. The ESD report (**Section 5.8** and **Appendix M**) sets out a sustainable design framework, measures and design principles which are currently proposed or are being considered by the respective design disciplines in the context of the Concept Proposal. This will be taken forward into the development of the detailed design for Stage 2 (main works/ construction and operation) which will further address ESD and the objectives of these policies. Relevant measures applicable to the Stage 1 works are also addressed.

Climate Change and relevant projections have also been considered in the context of the environmental assessment undertaken, including flood impacts, coastal hazards, and stormwater management to ensure this is factored into the assessment and is consistent with relevant policy aims, including to be more resilient to a changing climate.

The BDAR (**Section 5.19** and **Appendix I**) assesses biodiversity impacts and included consideration of koalas and flying-foxes. The BDAR concludes there would be no significant impact to these species.

The Project is generally consistent with the relevant provisions, goals and objectives of these policies.

5.3 SEAR 3 – Built Form and Urban Design

The Project Architects, STH and Bates Smart, have prepared a Built Form and Urban Design Report (**Appendix C**) to accompany the application and plans. This, combined with the description of the Concept Proposal at **Section 3** addresses this SEAR. A summary of development parameters, design principles and how the Concept Proposal responds to its context, as well as general built form and

urban design considerations is provided below. Visual impact and amenity are addressed further at **Sections 5.4 and 5.4.1**.

5.3.1 Surrounding Development and Concept Proposal Response

The Project Site is at the rural/urban interface with a range of surrounding land uses as outlined previously.

The siting of the proposed hospital envelope and Masterplan layout has been influenced by health planning criteria, bio-physical characteristics, constructability and access. The arrangement supports a civic identify and entry. It responds to functionality and clinical needs, whilst also respecting and being adequately sympathetic to surrounding development and the broader context. Substantial setbacks from surrounding properties and residential areas provides visual relief and a buffer to the main hospital building.

Higher elements are to be further setback from the Cudgen Road frontage, with lower scale built form presenting to Cudgen Road and providing a transition from the public realm and surrounding properties. This arrangement, combined with the entry, proposed landscaping and forecourts respond to the human scale and built form context of the locality.

5.3.2 Design Principles

As presented in the Built Form and Urban Design Report, the design process has and will continue to be based on a range of salutogenic design objectives (an approach focusing on factors that support human health and well-being), including:

- Integrated naturalistic forms
- The use of natural materials and finishes
- Design of human scaled spaces (physical and psychologically comfortable spaces)
- Cohesive, comprehensible space planning and place making
- Considering opportunities for integrating passive environmental design principles
- Integration of nature and landscape within the healing environment
- Consideration of local architectural vernacular design.

The new Tweed Valley Hospital design approach is based on delivering the best quality integrated health services and clinical outcomes for the community of the Tweed-Byron region. The approach taken has considered and addressed the seven objectives set out in the Better Placed – An Integrated Design policy as outlined at **Section 5.2.11** and in the Built Form and Urban Design Report at **Appendix C**. This will be an ongoing process that will be further developed in the future planning and design stages of the Project.

As outlined in **Section 5.2.8**, the Concept Proposal and its guiding Masterplan have regard for CPTED principles to achieve a safe and well-thought-out Health and Education Campus. The design report also outlines that a person's sense of vulnerability when experiencing a space impacts the use and subsequent success and sense of security of that space. The following principles are considered during the design process, in particular in respect to Stage 2, to achieve this:

- Effective lighting at day and night, including avoidance of lighting glare
- Clear and intuitive exit routes from all spaces, providing alternative exit options where practical (subject to location)
- Avoiding blind spots, however adopting manned camera surveillance where this occurs
- Collocate functions based on compatibility and hours of operation, ensuring spaces are adequately occupied and activated when in use.

As outlined in **Section 5.8** and **Appendix C** and **M** the design of the hospital will aim to integrate a range of ESD initiatives across all design disciplines, including architectural, mechanical services, electrical services and hydraulic services.

A consultation plan for engaging with cultural and community groups during the planning and delivery of the Tweed Valley Hospital is under development. Initial meetings have been held with a number of NNSW LHD Aboriginal staff to assist with this process. As part of this consultation it is proposed to hold a number of workshops with the project architects to integrate elements of Aboriginal Culture and Heritage holistically within the design.

A number of members of the Community Reference Panel identify as Aboriginal and Torres Strait Islander and have attended the orientation and Masterplan consultation sessions to date.

Wider stakeholder and community consultation is addressed at **Section 4**.

Engaging with the Government Architect NSW (GANSW), during the design development stages would also occur, with the first consultation meeting having taken place as described in **Section 4.2.1.1**. The ongoing strategy for consultation will include a feedback tracking and response mechanism to ensure all recommendations are duly considered by Health Infrastructure and the project team, and actioned where deemed appropriate and feasible.

5.3.3 Concept Proposal Objective and Character

The Built Form and Urban Design Report (**Appendix C**) outlines the objectives and character behind the Concept Proposal. The Masterplan design for the Project Site establishes the “starting-case” hospital concept and includes spatial strategies that accommodate future hospital expansion and renewal. Additionally, the long-term Masterplan contemplates future provision of complementary services.

The broad design principles for the Project include:

- **Functionality and Flexibility** – The facility will be highly functional from the outset but will have an in-built capacity for change, flexibility and adaptation.
- **Access** – The built form will be inviting and facilitate ease of access – entry, exit and movement – throughout the facility.
- **Natural light and views** – Patient and staff rooms will have a view to bring the outside inside and to engage with the local environment.
- **Wayfinding** – The hospital will utilise colour and add depth to wayfinding methodologies through technology, landscaping and arts.
- **A sustainable facility** – The facility will incorporate sustainable design principles, including recycling, sustainable products and energy efficiency.
- **A community asset** – The campus will be a truly integrated community asset, including inside and outside spaces that promote lifestyle ‘wellness’ and ‘healthy being’ for the community, patients, staff and carers.

Further to these, the principle planning objectives and character behind the Concept Proposal and development of the Tweed Valley Hospital are elaborated in Built Form and Urban Design Report.

5.3.4 Site Layout

The Masterplan presents a future health precinct sited around the main hospital building envelope which is situated toward the centre of the site, at the northern end of the site's natural plateau. The main building, set-down and forecourt are sited parallel to Cudgen Road. Four carparks (two to the east and two to the west) provide staff and public parking and preserve future expansion space on the Project Site. These carparks are accessed via an integrated internal road network that provides for ingress, egress and circulation. A lower scale support building envelope presents to Cudgen Road and the main public entry point to the Tweed Valley Hospital.

5.3.5 Building Typology

The Built Form and Urban Design Report at **Appendix C**, provides discussion on building typology considerations and the design approach for the Tweed Valley Hospital, including justification for the envelope, site planning and design approach.

The Concept Proposal presents the general arrangement for the Project Site, with maximum planning envelopes proposed for the main buildings on site within this arrangement. These envelopes do not represent actual built form, but rather the envelopes/parameters within which the built form would be established as design development is ongoing to resolve the detailed 'block and stack' composition of the hospital. Based on the Concept Proposal stage, the resulting building typology would be substantially informed by factors including; functionality, efficiency and flexibility, site topography and response to local urban context and will fit within the proposed maximum development envelope illustrated on the concept drawing package. As discussed in more detail in the Built Form and Urban Design report, the following matters (but not limited to) are relevant to selecting and developing an appropriate building typology and influences the envelope:

- Three principle functional elements, including: clinical, nursing and support service functions. To a large extent spatial planning and composition determines the efficiency of the hospital. This composition is important and forms part of the design strategy which also needs to be site responsive and considered within its wider setting.
- Clinical specialties, agreed models of care, state policies and/or project specific priorities.
- The Project Site's topography and the integration of built form. In this instance the preferred development zone is the triangular plateau within the site. The hospital has been located on the ridge edge at the deepest vertex of the triangular plateau, establishing the "nucleus" of the Project Site and anchoring future development to the east and west flanks of the hospital. The ridge line accommodates planning of on-grade lower ground levels located below main entry. This feature efficiently segregates functional zones from public interface. The design approach takes advantage of the ridge line, providing some floor levels below the main hospital entry level at AHD +28m. This contributes to lowering the perceived height of the hospital when viewed from the Cudgen Road and the immediate surrounding areas. The forested environmental area to the north of the Project Site helps buffer the hospital (and building mass) to the north and residential areas.
- Anticipated future capacity of the Project Site and ability to evolve over time and in response to changing needs. The building footprint to height ratio (embodied in the preferred typology) plays a significant role in safeguarding future capacity and expansion on the site, with the building proportion balanced and appropriately articulated to have regard for the local urban context.

Tested typologies include the “spine and pavilion (horizontal)”, “vertical monolith over partial podium (hybrid)” and “complex tower (also referred to as IPU zone in this EIS) on podium (vertical stacked)” typologies (refer to **Figure 5.1**). The study which included a comparative analysis determined that a complex consisting of an IPU zone on podium (stacked) typology was the most appropriate design arrangement.

The “spine and pavilion” typology, while providing a lower building height, was considered undesirable as it resulted in long inefficient clinical circulation routes. Furthermore, the large floorplate characteristic of this scheme demanded future vertical expansion to maintain proximate relationships to core hospital functional areas undermining its primary virtue. The “vertical monolith over partial podium (hybrid)” takes advantage of the topography however still resulted in long travel distances and potentially challenging mass articulation and future expansion.

The preferred arrangement, which is currently under development, will fit with the proposed maximum development/ planning envelope and takes the form of an IPU focussed zone/ complex on podium (vertical stacked) typology as described in the Built Form and Urban Design Report. This typology allows for a broad based integrated clinical and support services podium, comprising vertical lift cores from which IPU levels above the podium would be planned. The proposed scheme includes provision of a rooftop helipad located vertically above the Emergency Department (ED), operating theatre and other critical care services, directly connected with emergency ‘hot-lift’ links. The IPUs would be designed relying on shallow plan depths taking advantage of daylight access and minimising excessive circulation demand. The IPUs would be orientated to take advantage of the 360-degree panoramic views from the Project Site. Lower ground levels would accommodate segregated ED access and logistics from the main public entrance interface.

This scheme is undergoing further refinement and the details will form the basis of the Stage 2 SSD application.

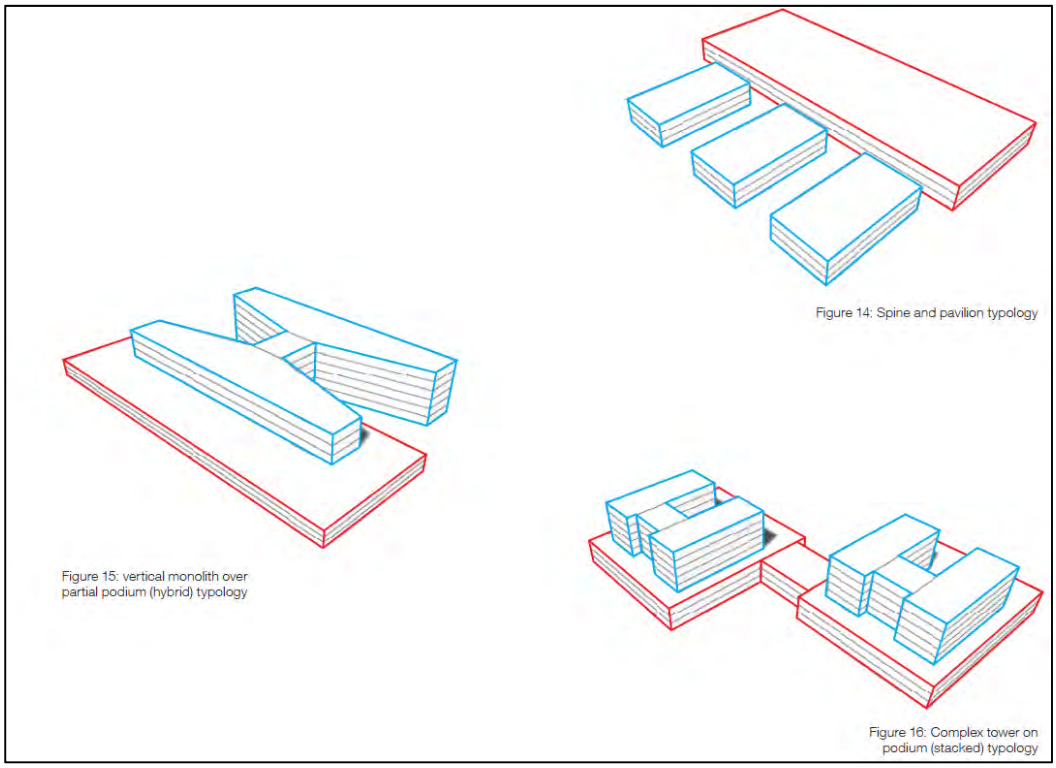


Figure 5.1 Explored Example Building Typologies (STH Bates Smart 2018)

5.3.6 Building/ Planning Envelope

The Concept Proposal sets out a maximum planning envelope, within which the proposed starting-case hospital will be designed/articulated. The intent of the maximum planning envelope, is to establish the maximum scale (width, depth and height) limits of the hospital building design, which will be entirely accommodated within this spatial volume, including varied zonal densities as depicted on the concept plans.

The proposed maximum planning envelope form accommodates provision for a building based on the IPU zone on podium (stacked) arrangement.

The Concept Proposal has an expected gross floor area in the range of 55,000m^2 to 65,000m^2.

The planning envelope is setback approximately 76m from the southern property boundary, 128 m from the northern property boundary, 44m from the western boundary and 312m from the eastern boundary.

Based on the concept plans at **Appendix B** (drawings AR-SKE-50-101, 201, 301 and 401), the proposed hospital maximum planning envelope ranges in height from AHD + 19.0 to AHD + 67.1. The main ground level public entrance from Cudgen Road is to be positioned at AHD +28, with the lowest basement level at approximately AHD +19m. The top-level plant is located at AHD +59.1m, with the top of the helipad access lift core being the tallest point of the envelope at AHD +67.1m.

The support building fronting Cudgen Road would be of a low-rise scale and provides a sensitive built form scale transition to the Project Site and interface with the public realm and frontage to Cudgen Road. The proposed envelope extends from ground level at +28m AHD to roof level at +39.5m AHD, with lift overruns occurring above this level. This envelope is setback 12m from the southern boundary and approximately 253m from the eastern boundary.

As part of the view analysis and visual impact assessment (**Section 5.4.1**) photomontages of the maximum planning envelope from various viewpoints surrounding the Project Site have been prepared and are provided in **Appendix B**.

The slope of the land will be used to achieve entries at different levels of optimum clinical and operational functionality and built two levels of the building below the main entry level from Cudgen Road. The anticipated building typology will comprise a basement zone to service the hospital. Emergency Department on lower ground (being the ground level at the northern aspect of the Project Site's plateau), main entry at ground level from Cudgen Road with a range of outpatient and other clinical services. The remainder of the lower zone of the building above ground level will comprise operating theatres and other associated services. Inpatient accommodation (IPU) will be focussed in the upper zone of the building to maximise the panoramic views in all directions.

Overall, the building is proposed to include basement, lower ground and ground levels, with five levels of occupied space above of increasing articulation and reducing building density (as below). Plant space, helipad and associated lifts would be situated on the roof of the building.

The planning envelope for the main building includes zones of anticipated densities as indicated on the plans. These provide general parameters for the detailed design and massing of the built form and are as follows:

- Plinth – 10-30 per cent
- Podium – 50-70 per cent
- IPU – 25-45 per cent

- Plant – 5-20 per cent.

The proposed envelope siting provides/has had regard for (but not necessarily limited to):

- Bio-physical characteristics of the Project Site
- Generous setbacks to the site boundary and surrounding land uses
- Built form scale transition and interface with the public realm
- Avoidance and minimisation of amenity related impacts to residential areas
- Support for future expansion and ancillary development
- Orientating the hospital in parallel alignment with Cudgen Road. This establishes an ordered entrance forecourt space and approach with centralised main public set-down
- Low-rise development closer to Cudgen Road, with taller elements setback within the Project Site, responding in a scale sensitive manner to the local built environment
- Helicopter flight paths and landing constraints
- Support privacy and provide patients with access to daylight and panoramic views
- Establishment of greenspace buffers to the north and south-west.

The hospital building envelope is well setback as described previously from all property boundaries, including the frontage, and is located at the deepest part of the developable plateau. The location has been selected to mitigate amenity impacts, including overshadowing and visual impact to surrounding properties and to accommodate future hospital expansion and facility renewal.

The hospital envelope has been orientated in parallel alignment with Cudgen Road to the south. This establishes an ordered entrance forecourt space and approach with centralised main public set-down. The Concept Proposal also currently accommodates close-proximity surface carparking to its east and west flanks, adjacent to secondary public entrances to feeding into the east-west orientated hospital street. From the east access will be from lower ground level adjacent to the Emergency Department entrance and will incorporate a public circulation connection to the main hospital street occurring at ground level. These will be further refined for the Stage 2 Application.

The development has been strategically planned (defined by the internal road network) to accommodate future low-rise development along Cudgen Road responding in a scale sensitive manner to the local built environment. The provision of a low-scale support service building located adjacent to the main entrance will be designed as an identifying landmark structure defining the main public entrance on Cudgen Road and providing civic identity.

5.3.7 Landscaping

A concept landscape zonal Masterplan has been prepared as part of the plan package at **Appendix B**.

At a concept level, landscaping is to be proposed throughout the site, including open spaces, courtyards, and around the new built form and boundaries of the site, including vegetated buffers. This would be to provide buffers where required and visual amenity, allowing staff, patients and visitors the opportunity to have outside spaces and provide a sense of sanctuary and support a healing environment. Outdoor areas and landscaping, including public domain treatments, would be subject to further consideration and design for Stage 2.

The design intent is to harness and integrate the local natural landscape context of the site and local region within the design and planning of the hospital building. Integration of landscape within the hospital enhances the healing environment and promotes a healing workplace environment. The introduction of integrated landscaping to the ground level public areas and internal hospital courtyards

and terrace spaces will be considered. Internal planning will have regard for maximising high quality distant views.

Landscaping would also respond to providing vegetated buffers, sightlines, open space, responding to security considerations and supporting a quality visual environment when viewed within and external to the Project Site.

5.3.8 Materiality and Colour

The Concept Proposal application does not address materiality and colour specifically and the Stage 2 design is currently in its early stages. Building articulation and detailed façade material selection and colour palettes are yet to be determined. As a consequence of the early stage in the design process the Built Form and Urban Design Report outlines a range of practical considerations and design philosophies that the design team intend to work through to develop the design, the detail of which will be included in the Stage 2.

The overarching building design philosophy is to develop a building form which in its spatial proportions, textures, materiality, colours, art and landscape integration is experienced as coherent and balanced, harmonising with the site and local region while promoting a high-quality therapeutic environment. There will be a preference for local materials and construction techniques (where feasible and appropriate), with a colour and material palette inspired by the site and its context as reflected in the 'Mood Board' and identified within the Built Form and Urban Design Report (Figure 18).

5.3.9 Access and Circulation

The Concept Proposal identifies access via four connection points to Cudgen Road as outlined in the project description.

The main entry will occur via provision of a new signalised intersection off Cudgen Road which will also provide for vehicle egress. Additionally, the campus road network will include a secondary access point linking to the existing round-about at the intersection of Cudgen Road and Turnock Street. Two further interspersed secondary "left-in" slip roads will be provided, accommodating ambulance, logistics (services vehicles) and staff vehicle traffic from the west (most efficient on approach from Tweed Coast Road) and direct staff/public carpark access and future growth scenario access via the east slip road. The internal road network includes provision for a north service link road, also connecting east and west staff car parking areas. The link road will also be used to maintain landscaping within the bush fire asset protection zone (APZ). The arrangement also facilitates separate of service and delivery areas.

Subject to detailed design, future bus lay-bys would be provided in front of the hospital and connected via a pedestrian crossing that would also connect to a pedestrianised hospital forecourt.

The internal road network provides for public set-down along the south edge of the hospital's main entrance approach, with service entrances to the east and west ends of the hospital. Public carparking would be provided on site with proximal access to hospital secondary entrances, leading to the east-west orientated internal hospital street. Staff car parking is situated beyond the public parking on both sides respectively.

The Masterplan arrangement also considers internal pedestrian connectively. A key design principle is to promote pedestrian permeability.

The proposed Concept Proposal layout and access arrangements provides for effective ingress, egress, circulation and a legible way-finding experience within the hospital campus for vehicles and pedestrians.

5.3.10 Services and Plant

Although concept, the design report outlines that loading dock and services related activity would be located to the north western corner at basement level anticipated to be AHD +19. The logistics yard location conceals it from general public view and access. This minimises the visual and acoustic impacts to the proposed hospital public forecourt and to surrounding properties.

Plant and equipment would be effectively integrated with the overall building and broader campus. Such areas, as far as practical, would be located away from the main public entry and/or screened or concealed from general view and surrounding properties. Relevant acoustic principles and criteria would also inform plant and service considerations.

Preliminary lighting strategy principles to ensure acceptable amenity, security, and that there would be no adverse effects of light spill are outlined in **Section 5.4**.

5.4 SEAR 4 - Environmental Amenity

Potential amenity impacts such as overshadowing, privacy, light spill, noise and solar access have been considered in the Concept Proposal and planning envelope parameters (see shadow diagrams provided as part of the plan package at **Appendix B**). Given the context of the Project Site and the physical separation distance to residential receivers (with the nearest being to the south on the opposite side of Cudgen Road), plus the generous setbacks from the main building envelope to the site boundary (refer to **Figure 5.3**), the development is not expected to adversely impact environmental amenity for sensitive land uses, including dwellings.

The Built Form and Urban Design Report (**Appendix C**) outlines a range of design principles, behind the Concept Proposal and those that would support the detailed design phase. It outlines that it is necessary when planning hospitals to maximise operational circulation efficiencies both for patient safety and economies of movement and care. Vertical compositions leverage this efficiency by providing short travel distances (relying on lifts) between the treatment levels and the IPUs.

Generally speaking, multi-storey built forms could be attributed with amenity impacts, however, in the case of the new Tweed Valley Hospital there are generous setbacks to the main development envelope and tallest forms. The proposed maximum development footprint has been sited on the ridge of the deeper northern sector of the plateau, taking greatest advantage of the site's topography. Placing the hospital deeper into the Project Site further allows spatial separation and lower built forms to front and provide a transition from Cudgen Road. This minimises amenity impacts, including visual impacts and overshadowing by siting larger forms away from neighbouring properties and integration into topography. **Figure 5.2** depicts this separation and setbacks from the site's boundaries.

The slope of the land will also be used to achieve entries at different levels of optimum clinical and operational functionality and two levels of the building will be built below the main entry level from Cudgen Road. Integrating the building into the slope of the land in this manner aids in reducing the overall height and potential amenity related impacts.

There would be minimal impact on privacy for nearby properties and surrounding residential areas. The existing forested environmental area will be retained to protect the environmental biodiversity and

provide a visual buffer between the development and the residential area substantially separated (more than 500 m) to the north (Kingscliff West Precinct). Kingscliff Hill residents living on the west orientated slope will have views of the hospital, however due to the physical separation distance from the hospital (more than 300 m to the main building envelope) there would be no adverse impacts to resident's privacy. The nearest dwellings are located south of Cudgen Road. Again, given the separation, substantial setbacks to the hospital's main built form (over 100 m to the main building envelope to properties opposite) from the boundary and landscaping proposed, no unreasonable impact to privacy or overlooking would result. Stage 2 would further consider the design response to adequately address privacy as required.

Figure 5.2 Proposed Setbacks and Separation from Surrounding Properties

Although the design remains under development, given the large and relatively open nature of the site, separation between surrounding built form, and the medium-rise scale of the concept, no adverse wind effects (e.g. wind tunnels) are expected.

Shadow diagrams have been prepared which reflect the overshadowing impact of the concept maximum planning envelopes at hourly intervals from 9.00 am to 3.00 pm during the winter solstice (June 21 – worst case) as presented in **Appendix B**.

The shadow study demonstrates that shadows cast by the proposed envelope are largely contained within the title boundary of the site. Shadows generally start to extend beyond the southern title boundary on Cudgen Road by 12.00 pm and have a minor impact the front yard of the dwelling at 792 Cudgen Road from 3.00 pm onwards. There is no impact to secluded private open space. No further overshadowing impact would occur on other neighbouring properties, including active farmland. On this basis there is no significant or unreasonable impact from overshadowing to the public realm or the secluded private open space of nearby dwellings.

Although concept, the design report recommends that all loading dock and services related activity would be located on the north western corner at basement level. This conceals it from general public view and access. This minimises the visual and acoustic impacts to the proposed hospital public entry and to surrounding properties.

The anticipated location for the helipad has been located toward the western extent of the planning envelope of the hospital and would be above the ED, operating theatre and other critical care services. Helicopter approach is possible from the south or north orientations as required by prevailing local wind conditions. A detailed study (refer to **Section 5.22**) was compiled to inform the best location taking in account flight path restrictions, noise implications and site topography. One advantage of the location is that the primary flight paths avoid directly impacting the main residential areas in the immediate locality.

The Built Form and Urban Design Report provides an overview strategy for lighting and minimising light spill, which will otherwise be further developed in Stage 2. Being a hospital certain services remain perpetually operational, e.g. ED. A well-considered, sensitive exterior lighting design would be developed to ensure key components and services of the hospital can be safely accessed and utilised, supporting public amenity and necessary functional zones of the hospital with minimal negative impact to the surrounding locality.

External lighting within the site boundary will be provided to parking, roads and public spaces in accordance with AS/NSZ 1158.

All exterior lighting will be designed to meet AS 4282 which sets out guidance to control the obstructive effects of exterior lighting. Lighting would be appropriately designed to avoid light spill, with particular regard for residential receivers.

Overall, in terms of environmental amenity and avoiding or minimising off-site impacts to other land uses, particularly more sensitive uses such as dwellings, the Project Site's context is well suited to the development. The Project Site is sufficiently large and reasonably separated from other existing land uses, with an adequate separation from dwellings and the main residential areas of Kingscliff to help avoid and minimise amenity related impacts as a result of the development. The Project Site does not have any immediate adjoining sensitive property interfaces. This ensures that potential amenity related impacts can be effectively minimised through the design response.

Traffic and noise impacts associated with access points and upgrades along Cudgen Road and near residential receivers have been addressed in the respective sections of this EIS and appended specialist reports. These aspects are not considered to significantly affect nearby residential amenity.

No significant detriment to environmental amenity based on the factors considered, including surrounding residential land uses, is expected. A high standard of amenity would be retained for surrounding residential areas. Appropriate measures to ensure adequate protection of residential amenity can be further developed at Stage 2.

Environmental amenity matters related to visual impact, noise and air quality have been assessed elsewhere in this EIS (and appended specialist reports) to address the SEARs.

5.4.1 Visual Impact and Amenity

A Visual Impact Assessment has been prepared based on the probable visual impacts of the Concept Proposal for the Project (**Appendix K**). This is based on the proposed maximum planning envelope, prior to the finalisation of built form and detailed design (Stage 2). At this stage detailed design of the Tweed Valley Hospital is not available as the design is being developed. A separate SSD application will be prepared to assess impacts associated with Stage 2, which is expected to involve the hospital design, main works and operation.

It is important to note that the assessment is based on the Concept Proposal and maximum planning envelope for the new hospital. This does not represent built form or actual massing, but rather the maximum envelope within which, through the design process, the building and form would be developed and articulated. The envelope's anticipated zonal densities (see architectural concept plans) also indicate that final built form density would be articulated and reduce toward the upper levels of the envelope. Hence the maximum planning envelope represents a worst-case scenario. The detailed design response will develop and refine the built form, including massing, articulation and appearance of the building.

The envelope has been established based on the anticipated building typology and height of the hospital. As discussed in the Built Form and Urban Design Report appended to the EIS, the building arrangement which is currently undergoing design development would fit within the proposed maximum development envelope and is expected to take the form of an IPU zone on podium (stacked typology) building arrangement. This reflects various design requirements for the Project. The planning envelope and building typology also consider the visual impact on local receivers and the scenic qualities of the locality, with substantial setbacks provided and measures to reduced perceived height. Development and articulation of the built form within the envelope would occur during the design process for Stage 2.

An example of the visual impact design consideration includes (but is not necessarily limited to):

- The project design team undertaking an extensive master planning and building typology options analysis, as outlined in the Built Form and Urban Design Report
- Providing generous setbacks between the main hospital building and site boundaries
- Preparing shadow diagrams to reflect the potential of overshadowing impact of the proposed planning envelopment (which is negligible) at hourly intervals from 9.00 am to 3.00 pm during the winter solstice (June 21)
- Responding to site topography and locating taller components to the north end of the developable site plateau, in order to minimise visual impacts (being furthest away from existing neighbouring buildings and transitioning the scale of built form in relation to the public realm) and minimising overshadowing.

More detail on the Concept Proposal and design response is provided in the Built Form and Urban Design Report (**Appendix C**).

5.4.1.1 Assessment Methodology

There are no set guidelines within Australia regarding the methodology for visual impact assessment. The methodology applied to the visual assessment of the Concept Proposal has been developed from consideration of the following key documents:

- Environmental Impact Assessment Practice Note, Guideline for Landscape Character and Visual Impact Assessment (EIA-N04) NSW RMS (2013)
- Visual Landscape Planning in Western Australia, A Manual for Evaluation, Assessment, Siting and Design, Western Australia Planning Commission (2007)
- Guidelines for Landscape and Visual Impact Assessment, (Wilson, 2002)
- Tweed Shire Scenic Landscape Evaluation Volumes 1 and 2 1995
- Visual Management System Tweed Pilot 2004 - Coastal Comprehensive Assessment.

In order to assess the visual impact of the Concept Proposal, it is necessary to identify a suitable scope of accessible visually sensitive receivers (VSRs) impacted by it, evaluate the visual sensitivity of the Concept Proposal to each VSR and determine the overall visual impact of the Concept Proposal.

Accessible VSR views that feature a prominent, direct and mostly unobstructed line of sight to the Project (referred to as the 'view frame') are used to assess the visual impact of the Concept Proposal. Impacts to each VSR as a result of the Concept Proposal are determined by evaluating the visual quality of the view frame experienced by the VSR and determining impacts to the visual sensitivity of each VSR.

View frames of high visual quality are those featuring a variety of natural environments/ landmark features, long range (distance) views and with no or minimal disturbance as a result of human development or activity. View frames of low visual quality are those featuring highly developed environments and short range (distance) views with little or no natural features. Examples of varying quality view frames are presented in **Plate 5.2** to **Plate 5.4**.

Visual sensitivity is evaluated through consideration of distance of the VSR to the Concept Proposal, quality of the view prior to the Concept Proposal, the context of existing development and natural features within the view frame and how the Concept Proposal will affect the visual quality of the view frame. Visual sensitivity provides the reference point to the potential visual impact of the Concept Proposal to receivers located within and near the VSR location.

It should be noted that the assessment methodology and structure applied within the Visual Impact Assessment has considered and applied the general process outlined in the above reference material and that this is also generally consistent with the visual assessment process outlined in the recently exhibited draft KLP. The views assessed as part of this visual assessment are considered to be reasonable representations for the locality (both public realm vantage points and those that would be attributed to residential views in the general vicinity), including relevant key view fields identified in the draft KLP that would look toward the Project Site.

Plate 5.2 High quality view

Plate 5.3 Medium quality view

Plate 5.4 Low quality view

Visual quality and visual sensitivity is measured using a 16-point scale with corresponding value statement as shown in **Table 5.8**.

Desktop surveys, supported by inspections, were undertaken to determine potential key accessible VSRs with clear lines of sight to the Project Site and Concept Proposal. VSR selection for the assessment is based on key views likely to result in the greatest level of visual impact associated within the Project and therefore does not consider all views impacted by the Project. Ten key VSR photo locations were identified to the north, east, south and west of the site (refer to **Figure 5.4**).

The process used to create the visual assessment imagery was developed and undertaken by STH + Bates Smart Architects. Photographs and land survey was undertaken on 1 August 2018 at each of the VSR locations to ensure accuracy of modelled imagery used to assess the visual impact of the Concept Proposal. The hospital planning envelope was used to create a red wireframe line over the view image, in a 3D software environment (e.g. Autodesk, 3Ds Max) with the survey information and view frame synchronised, to create an accurate montage scene illustrating the maximum planning envelope on the Project Site for the hospital building as viewed from different points and elevations surrounding the Project Site. The montage scenes and details of visual assessment imagery (prepared by STH + Bates Smart Architects) is provided as part of **Appendix K**.

The ten VSR locations assessed and key imagery details are summarised in the **Table 5.9**. The corresponding location of the VSRs are shown at **Figure 5.3.**

Table 5.9 Visual Assessment Scale

Scale	*Value*	*Visual quality*	*Visual impact*
0	**Negligible**	N/A	No negative impact on the pre-existing visual quality of the view.
1	**Low**	Predominant presence of low quality manmade features. Minimal views of natural formations (e.g. cliffs, mountains, coastlines, waterways, ridges etc). Uniformity of land form.	A minor negative impact on the pre-existing visual quality of the view. Examples: - Minor impacts on natural landscapes. - No impact on iconic views - Impacts on a small number of receivers. - Significant distance between the development and receiver.
2			
3			
4			
5			
6	**Medium**	Presence of some natural features mixed with manmade features. Some views of distinct natural formations (e.g. cliffs, mountains, coastlines, waterways, ridges etc).	A medium negative impact on the pre-existing visual quality of the view: Examples: - Moderate impacts on iconic views or natural landscapes. - Impacts on a moderate number of receivers. - Located nearby the receiver.
7			
8			
9			
10			
11	**High**	Predominantly natural features. Minimal manmade features, however if present of a high architectural standard. Significant views of distinct natural formations (e.g. cliffs, mountains, coastlines, waterways, ridges etc). Presence of iconic regional views or landmark features.	A high negative impact on the pre-existing visual quality of a view: Examples: - Loss of iconic views. - Impacts on a significant number of receivers. - Overshadowing effect. - Directly adjacent the receiver.

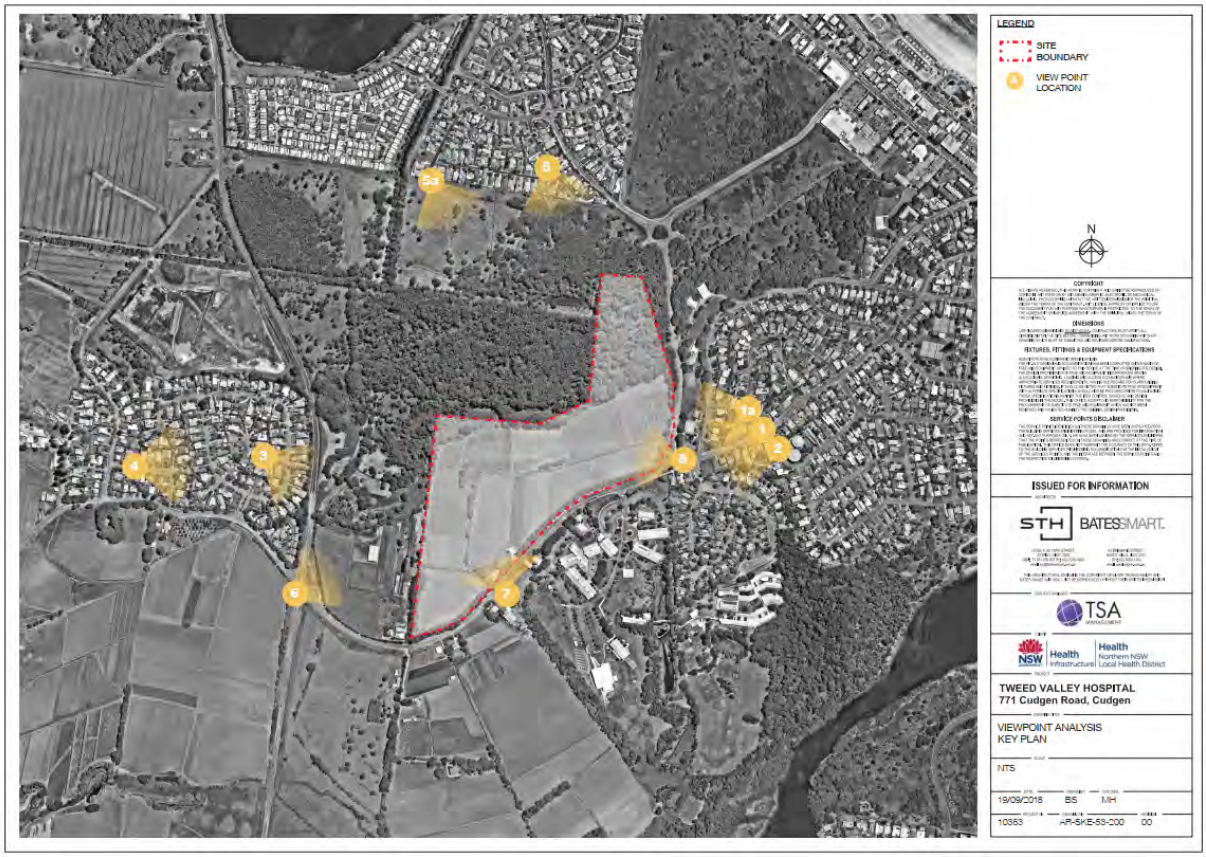


Figure 5.3 VSR Photo Locations

5.4.1.2 Visual Setting - Existing Visual Environment and Land Use Character Areas

The Project Site is rural land, located on the edge of the outer Kingscliff urban area with an elevation range of approximately one metre RL to 27 m RL. A stand of trees traverses the southern and eastern boundaries of the site along Cudgen Road and Turnock Street, providing some visual screening to the site.

East of the site is the Kingscliff urban and residential area that rises to a level of approximately 56 m RL. Some elevated residences within this area have views to the site within 330 m of the Project Site. Views orientated to the west in the direction of the Project include the immediate residential areas, Mt Warning and the distant escarpments of the Border Ranges National Park (refer to **Plate 5.5**).

Land directly north of the site is coastal wetlands and rural land. The wetland area sits at around one metre RL and provides some natural screening from residential land further north. The residential development to the north is sited at around eight metres RL. Views orientated to the south in the direction of the Project include the immediate residential areas, rural lands and vegetated coastal wetlands (refer to **Plate 5.6**).

To the south-east, on the opposite side of Cudgen Road, is Kingscliff TAFE and five residences that are situated at approximately the same level as the Project Site. Views orientated to the north and west in the direction of the Project include the immediate residential areas and trees bordering the site along Cudgen Road (refer to **Plate 5.7**).

To the south, south-west and west of the site is rural/ farmland that varies in elevation of around 10 m RL to 30 m RL. The village of Cudgen is located to the west, on the western side of Tweed Coast Road. The village varies in elevation from around RL 10 to 30 m. Areas of vegetation directly west of the site provide some visual screening of the Project and development area. Views orientated to the east in the direction of the Project include the immediate residential areas and tree line located to the west of the development area (refer to **Plate 5.8**).

A plan view of the visual landscape and land use context associated with the local area is presented in the Visual Impact Assessment.

Plate 5.5 View west from elevated areas Kingscliff urban and residential area

Plate 5.6 View south from residential areas north of the site

Plate 5.7 View north from residence directly south of the site

Plate 5.8 View east from Cudgen Village

The draft KLP and DCP identify that some of the best views within the locality are experienced from the highest points of Kingscliff Hill and include elevated views west around to Mt Warning and the Border Ranges. The Tweed Shire Scenic Landscape Evaluation (1995) identifies the high scenic value of the Cudgen district (location within which the Project is situated) as a result of the rural landscape contrasted by forested hills. Similarly, the Visual Management System for NSW Coast, Tweed Pilot (2004) identifies the site as being within the north eastern corner of the Cudgen Plateau; a high visual quality rural landscape with low capacity for change.

Overall, the quality of the visual environment of the area in which the proposed hospital is located (at the rural/ urban interface) has been assessed to be of medium value given the mix of urban and natural features generally present in view frames and being at the north eastern tip of the Cudgen Plateau with surrounding urban elements present. The visual environment associated with the Project

Site would be considered of value to both the local community and individual visual receivers with views towards the proposed hospital. The visual environment of the Project's footprint/ development area therefore has value at a local scale, including the Cudgen district.

5.4.1.3 Visual Impact Assessment Summary

The Visual Impact Assessment provides a detailed assessment of the potential visual impacts of the Project, based on the Concept Proposal, on the identified ten VSRs. Compiled images of the VSR view frames with a prepared montage scene illustrating the outline of the maximum planning envelope was used to assess how the planning envelope presents within the landscape and assessed views frames. These montages are provided in the Visual Impact Assessment at **Appendix K**.

An overview of the impact of the Concept Proposal on view frames experienced by key accessible VSRs is summarised in **Table 5.10.** For full descriptive and assessment detail, refer to the Visual Impact Assessment.

Table 5.10 VSR Assessment Summary

VSR Location	*Proximity*	*View Frame Quality*	*Visual Sensitivity Impact*	*View Frame Quality with Proposal*
VIEW 1 McPhail Avenue	RL: +39.1m Distance to Project Site: 220m	Medium (scale 10).	Medium (scale 10).	Medium (scale 8).
VIEW 1a Oceanview Crescent	RL: +35.8m Distance to Project Site: 164m	Medium (scale 10).	High (scale 11).	Medium (scale 8).
VIEW 2 Dinsey Street	RL: +44.3m Distance to Project Site: 260m	Medium (scale 10).	Medium (scale 10).	Medium (scale 8).
VIEW 3 Guilfoyle Place	RL: +15.3m Distance to Project Site: 388m	Medium (scale 7).	Medium (scale 6).	Medium (scale 6).
VIEW 4: Clarke Street	RL: +26.4m Distance to Project Site: 647m	Medium (scale 7).	Medium (scale 6).	Medium (scale 6).
VIEW 5: Kingfisher Circuit	RL: +3.2m Distance to Project Site: 231m	Medium (scale 8).	Negligible (scale 0).	Medium (scale 8).
VIEW 5a: Bellbird Drive	RL: +3.4m Distance to Project Site: 448m	Medium (scale 9).	Medium (scale 8).	Medium (scale 8).
VIEW 6: Intersection Tweed Coast road and Cudgen Road	RL: +15.5m Distance to Project Site: 280m	Medium (scale 7).	Low (scale 2).	Medium (scale 7).
VIEW 7: Cudgen Road	RL: +26.2m Distance to Project Site: 19 m	Medium (scale 8).	Medium (scale 10).	Medium (scale 7).

VSR Location	Proximity	View Frame Quality	Visual Sensitivity Impact	View Frame Quality with Proposal
VIEW 8: Intersection of Cudgen Road and Turnock Street	RL: +23.7m Distance to Project Site: 38m	Medium (scale 8).	Low (scale 5).	Medium (scale 7).

The quality of views and visual sensitivity relevant to the Concept Proposal has been assessed using a 16-point scale rating. The view frames associated with the assessed VSRs have a view quality range of medium (scale 7) to medium (scale 10) prior to development of the Project. The impact of the Concept Proposal, based on the conceptual maximum planning envelope, on visual sensitivity ranges between negligible (scale 0) and high (scale 11). The view frames associated with the VSRs post development have been assessed to have a view quality range of medium (scale 6) to medium (scale 8).

In terms of local context, the Project is located within an area that features urban development and natural features that are visible from various elevated view locations. The assessment process demonstrates a reduction in the quality of view frames for all assessed VSRs other than VIEW 5: Kingfisher Circuit (negligible). The most notable area impacted is the elevated residential area located east of the site including VIEW 1 McPhail Avenue, VIEW 1A Oceanview Crescent and VIEW 2 Dinsey Street (generally west-facing areas of Kingscliff Hill).

It is likely that distant views of Mt Warning from some residences north of VIEW 1A Oceanview Crescent and VEIW 1 McPhail Avenue would be completely obstructed by the Project based on the maximum planning envelope of the Concept Proposal; loss of the landmark view would be considered a high (scale 13) impact regarding the visual sensitivity of the Project.

At this point the limitation of the visual assessment should be acknowledged including the availability of suitable accessible locations (public spaces) to present examples of how the Project would impact the visual landscape and is based on a worst-case scenario of the proposed maximum planning envelope, prior to detailed design and articulation of built form.

The Project, based on the Concept Proposal, would result in an obvious change to the site and local landscape from various viewpoints, including a reduction in visual quality and impact to the scenic quality of the Cudgen district; particularly views west from Kingscliff Hill. The Project Site is also located at the north-eastern tip of the Cudgen Plateau landscape, at the interface with Kingscliff and urban development. This, combined with the design principles and intent outlined in the Built Form and Urban Design Report, aids in reducing the impact to the broader rural landscape qualities of the main Cudgen Plateau area to the south-west. The most affected view frames, including from Kingscliff Hill, would maintain appreciable views of various distant natural landscape features and all assessed VSRs would maintain view frame qualities in the medium rating range.

5.4.1.4 Conclusion and Mitigation Measures

This visual impact assessment assesses the probable visual impacts of the Concept Proposal based on a maximum planning envelope for the Project, prior to the finalisation of detailed design and articulation of built form. At this stage detailed design of the Tweed Valley Hospital is not available. The Concept Proposal is informed by service planning to 2031/32 and has an expected gross floor

area in the range of 55,000 m^2 to 65,000 m^2, with a maximum planning envelope height of approximately RL 67.1 m.

The visual analysis undertaken for the Concept Proposal demonstrates that the main hospital building, to be developed and articulated within the proposed planning envelope, would generally be an obvious modification within the local visual environment when viewed from various viewpoints in the surrounding locality.

The assessment process demonstrates a reduction in the quality of view frames for all assessed VSRs other than VIEW 5: Kingfisher Circuit (negligible). The most notable area impacted is the elevated residential area located east of the site including VIEW 1 McPhail Avenue, VIEW 1A Oceanview Crescent and VIEW 2 Dinsey Street (generally west-facing areas of Kingscliff Hill). It is likely that distant views of Mt Warning from some residences north of VIEW 1A Oceanview Crescent and VIEW 1 McPhail Avenue would be obstructed by the Project based on assessment of the Concept Proposal's maximum planning envelope; loss of the landmark view would be considered a high (scale 13) impact regarding the visual sensitivity of the Project. Pristine coastal views would not be impacted.

It is important to note that the assessment is based on a Concept Proposal and maximum planning envelope for the new hospital. This does not represent built form or actual massing, but rather the maximum envelope within which, through the detailed design process, the building and form would be developed and articulated. The envelope's anticipated zonal densities (see architectural concept plans) also indicate that final built form density would be articulated and reduce toward the upper levels of the envelope. Hence the maximum planning envelope represents a worst-case scenario. The detailed design response will develop and refine the building form, including massing, articulation and appearance of the building.

Based on the assessment of the Concept Proposal, an obvious change to the site and local landscape will occur and a reduction in visual quality of various view frames would be experienced, however all view frames would maintain a reasonable visual amenity standard. The most affected west-facing and elevated residential areas would also still retain appreciable distant views of natural landscape features, including bushland, hinterland and ranges, although some residences are likely to lose distant views of Mt Warning.

The draft KLP/ DCP, Tweed Shire Scenic Landscape Evaluation (1995) and Visual Management System for NSW Coast, Tweed Pilot (2004) identify the Project Site and development area as being located within the northeast corner of the high scenic value area of the Cudgen district based on the mix of rural landscape contrasted by forested hills and generally with low capacity for change. The Project is located along the ridgeline extending towards Kingscliff Hill, at the rural/ urban interface, and would impact the scenic quality of the Cudgen district; particularly views west from Kingscliff Hill.

The envelope has been established based on the anticipated building typology and height of the hospital. As discussed in the Built Form and Urban Design Report, the building arrangement which is undergoing design development would fit within the proposed maximum planning envelope and is expected to take the form of an IPU zone on podium (stacked typology) building arrangement. This reflects various design requirements for the Project including environmental constraints (e.g. flood, biodiversity, bush fire, geotechnical), utilising environmental efficiencies (solar access, ventilation, energy efficiency and amenity) and maximising operational circulation efficiencies both for patient safety and economies of movement and care that will benefit both patients and staff at the facility.

As mentioned previously, the planning envelope and building typology has also considered the visual impact on the landscape and local receivers. Substantial setbacks from the site's boundaries and surrounding sensitive land uses are provided. The Concept Proposal also includes below ground

levels to reduce height and integrates with the Project Site's topography to reduce visual impact. In this regard the main envelope and development zone is the triangular plateau within the Project Site. The hospital envelope has been located on the ridge edge at the deepest vertex of the triangular plateau. The design approach takes advantage of the ridge line, providing some floor levels below the main hospital entry level. This contributes to lowering the perceived height. Development and articulation of the built form within the envelope would occur during detailed design (Stage 2).

Furthermore, the vegetated environmental area and associated scenic amenities along the north of the Project Site, will be preserved to protect the environmental biodiversity and to provide views and amenity for the hospital. This also provides screening.

Rezoning part of the Project Site to 'SP2 Infrastructure' and removing any building height, FSR and minimum lot size controls to be consistent with other hospital sites is proposed via a site-specific SEPP prepared by DPE. As detailed above, and in the Built Form and Urban Design Report, the Concept Proposal attempts to minimise impacts on the visual landscape of the Cudgen district by reducing height, providing increasing articulation and reducing density in the upper zones of the envelope (refer to zonal densities on the proposed plans), and presenting setbacks. The draft SEPP would enable the Project to comply with the primary planning controls relevant to the site. The combination of amended planning controls, public benefit associated with the operation of the hospital within the region and design intent and measures to minimise the visual impact supports the reasonableness of the Project.

The visual assessment indicates that all assessed VSRs maintain view frame qualities in the medium rating range. The visual impact of the Project would be further considered in the design and Stage 2, including the development and incorporation of measures to assist in reducing or mitigating visual impact.

Recommendations regarding the mitigation of visual impact associated with the Project based on the Concept Proposal include:

- Development of a high-quality architectural design response, including articulated form, subject to further assessment at Stage 2.
- Materials and finishes associated with the development should be designed to be non-reflective and complimentary to surrounding natural colour palettes where possible.
- Outdoor lighting design and operation should be compliant with *AS4282 – Control of obtrusive effects of outdoor lighting*.
- Existing vegetation should be retained onsite where possible (refer to the proposed tree removal/ preservation plan and noting access point and sightline requirements) and further on-site landscaping opportunities investigated and developed (refer to concept landscape masterplan appended to the EIS) to improve visual amenity and potential screening of the development to mitigate impacts on sensitive visual receivers.

5.4.2 Surrounding Agricultural Activities

Tim Fitzroy & Associates (TFA) prepared a Land Use Conflict Risk Assessment (LUCRA) which is attached at **Appendix J** and discussed at **Section 5.6.4** due to being relevant to SEARs 4 and 6.

The LUCRA was prepared based on:

- a review of the Concept Plan and Masterplan for the Tweed Valley Hospital
- discussions with the Project Manager - TSA Management (including consultation with neighbouring residents)

- site inspection
- review of surrounding land uses.

The LUCRA included consideration of potential land use conflicts, including:

- Agricultural chemical spray drift
- Odour
- Noise (including tractors and machinery operation)
- Dust
- Surface water and sediment runoff
- Traffic and access.

Any potential land use conflicts between the proposed hospital and existing agricultural land uses and activities were considered against a risk assessment matrix to rank the potential land use conflicts in terms of significance.

Based on the proximity of the existing vegetable cropping to the south of the Tweed Valley Hospital the LUCRA recommends a series of measures, including vegetated buffers and plantings.

Overall the LUCRA has concluded that the Project Site is suitable for the proposed SSD application for the hospital subject to recommendations.

Refer to **Section 5.6.4** (full report at **Appendix J**) for a more detailed on the LUCRA and recommended measures to avoid and minimise potential for land use conflict. These would effectively address environmental amenity considerations associated with the interface between the Project and nearby agricultural uses and activity.

5.4.3 Internal Amenity

As outlined the in the Built Form and Urban Design Report (**Appendix C**) internal amenity is important to establishing a healing environment and quality setting for patients, visitors and staff. Based on the Concept Proposal planning envelope, the IPU levels will be located above in zone 2. A design strategy is to explore achieving a sense of “residential address” at the public entrance to the ward. Ward arrival and complimentary social spaces will be structured intuitively around generous landscaped balcony/terrace spaces which will provide physical access to outdoor landscape, sunlight and fresh air. The ward wings will be planned with patient rooms/beds orientated to maximise views of the surrounding 360-degree features. Shallow ward floor-plates will be considered, to reduce circulation inefficiencies and provide opportunities for reliance on daylight and passive ventilation. Interior design strategies will be informed by salutogenic inspired design philosophy (outlined previously). Design incorporating natural forms and materials provide a natural therapeutic healing environment and is known to improve patient healing outcomes.

5.5 SEAR 5 - Staging

Then Tweed Valley Hospital is proposed to be constructed over two stages. The first stage is the subject of this SSD application for approval of the Concept Proposal and for Stage 1 works which are assessed in this EIS. The second stage will consist of the detailed hospital building and ancillary infrastructure. A separate SSD application will be submitted for Stage 2.

5.6 SEAR 6 - Agricultural Impact

The most important farmland on the North and Far North Coasts of NSW has been identified and mapped to support long-term agricultural production. This land is commonly referred to as SSF. DPE has also mapped prime agricultural land and classified it as Biophysical Strategic Agricultural Land (BSAL). The mapping of SSF and BSAL generally overlap, such as on the Project Site, however, mapped BSAL is typically more extensive. The Project Site is located on SSF. This section provides an assessment of the Project's impact on SSF and its suitability for the proposed Tweed Valley Hospital.

The assessment of agricultural impact has also been specifically informed by the following specialist assessments which are also summarised within and appended to this EIS:

- Agricultural Impact Assessment (**Appendix F**)
- Land Use Conflict Risk Assessment (LUCRA) (**Appendix J**)
- Social and Economic Impact Assessment (**Appendix Z**).

5.6.1 Assessment Against the Key Policy Documents Relating to Agriculture

The *Northern Rivers Farmland Protection Project* (2005) identifies and seeks to protect important farmland from urban and rural residential development by mapping farmland and developing planning principles. The NCRP 2036, as well as local Tweed Shire Council strategies, also include directions/objectives to protect and enhance productive agricultural land. However, the NCRP 2036 also recognises an opportunity to rezone SSF (through a planning proposal) in some circumstances. It also recommends a review of the consistency, methodology and application of the *Northern Rivers Farmland Protection Project* (2005) to provide an opportunity to establish consistent standards and application for important farmland across the North Coast.

While not directly relevant to the rezoning of land by way of a site-specific SEPP, Local Planning Direction No. 5.3 (Farmland of State and Regional Significance on the NSW Far North Coast) under Section 9.1(2) (previously 117(2)) of the of the EP&A Act imposes certain restrictions on the rezoning and development of SSF farmland. Local Planning Direction No.5.3 has been considered as part of this Project.

Following the adoption of the NCRP 2036 the provision was adjusted by recognising an opportunity to rezone SSF (through a planning proposal) in certain limited circumstances.

The Direction states that SSF cannot be rezoned for urban or rural residential purposes except if the rezoning is consistent with:

- *The North Coast Regional Plan 2036; or*
- *Section 4 of the report titled 'Northern Rivers Farmland Protection Project - Final Recommendations', February 2005, held by the DPE; in accordance with Clause (5) a) and b) of the Direction.*

In accordance with Section 4(9) of the *Northern Rivers Farmland Protection Project - Final Recommendations*, public infrastructure is permitted on land mapped as State or regionally significant where no feasible alternative is available. As outlined previously, a rigorous site selection process, subject to a range of evaluation criteria and consideration of alternatives has been undertaken. The shortlisted alternative sites not mapped as SSF were discounted as not feasible for differing reasons. These included, but were not necessarily limited to, the risk of the hospital being delayed through complex multi-level approvals or becoming an isolated development for an extended period due to

approvals and/or the uncertainty of the housing market; or the additional costs involved would significantly impact on the budget available to build clinical space and the resulting impact on clinical services would be unacceptable.

It is submitted that the relevant requirements and Directions are satisfied and the proposed use of the Project Site for a health facility (namely the Tweed Valley Hospital) is justified and balances social, economic and environmental considerations and interests of the community for a net public benefit (refer to **Section 5.9**).

The NCRP 2036 also recognises that agricultural production may not be suitable on some pockets of mapped important farmland due to non-biophysical factors that make the land more suited to other uses. Whilst the land is currently farmed and of some value for agricultural production, in this instance, the site selection and community consultation process has determined the Project Site to be the most suitable site for the new Tweed Valley Hospital and the shortlisted alternative sites as not feasible for differing reasons.

As outlined in the NCRP 2036, pending a review of the existing farmland mapping, interim farmland variation criteria have been provided to consider the suitability of pockets of such land for non-agricultural land use (Appendix B of the NRCP 2036). This however is largely related to the expansion of residential and rural residential development, as development for public infrastructure can be permitted under the *Northern Rivers Farmland Protection Project* (2005). For completeness, the following outlines how the Project satisfies these criteria:

- As outlined in the Agricultural Impact Assessment (refer **Appendix F**), the Project Site affects the fringe of such mapped farmland and its location will not fragment the SSF of the Cudgen Plateau and would limit flow-on/ interface impacts to other farmland (also consistent with relevant objectives of the Tweed Sustainable Agriculture Strategy). The Project Site sits on the far north-eastern tip of the mapped important agricultural land - it is on the urban side of Cudgen Road, opposite Kingscliff TAFE and between existing residential areas of Kingscliff and Cudgen, with future residential developments planned to the north. Its large size allows for future hospital expansion and health and education developments without encroaching on surrounding rural areas as well as the provision of appropriate buffers and strategies to minimise and manage potential land use conflict. The site was selected based on a wide range of evaluation criteria as outlined in **Section 1.6** and is justified as the most suitable and feasible option.
- Potential for rural land use conflict has been assessed and can be effectively minimised and managed (refer to **Section 5.6.4** and **Appendix J**).
- Services and utilities are available in proximity to the site and infrastructure delivery is feasible and would not impact other farmland (refer **Appendix F**).
- The proposed land use would not have an adverse impact on areas of high environmental value, and Aboriginal or historic heritage significance.
- The Project Site was selected, and the hospital Masterplan developed, in response to a range of hospital related planning criteria including, but not limited to, the following criteria outlined in the NCRP 2036: avoiding flood prone land, providing adequate bush fire protection, low to no risk of acid sulfate soils, constructability, slope and geotechnical considerations.

5.6.2 Impact of the Loss of SSF

An agricultural impact assessment has been prepared for the Project by ARC Group (refer **Appendix F**). SGS Economics have also assessed the social and economic impacts of the Project on agricultural land (refer **Appendix Z**). In terms of the specific impact of the Project on the viability of the site and surrounding agricultural land and activities, the Agricultural Impact Assessment and the Socio-Economic Impact assessment made the following findings:

Impact on agricultural resources and industries from Loss of SSF and impact on Agricultural supplies in the North Coast region due to loss of SSF

- Approximately 11 ha of the Project Site is available for cultivation and eight hectares currently producing sweet potatoes with a single year of production on the land estimated to have a gross margin of $71,670. Based on this estimate, the present value of the lost agricultural production in perpetuity is estimated to be $1.02m (SGS Economics and Planning 2018).
- The Project Site comprises only approximately 0.13 per cent of SSF mapped for the Far North Coast of NSW (refer to **Figure 5.4** for mapping of State, regionally and locally significant farmland within the Tweed Shire) or approximately 0.013 per cent of BSAL mapped by DPE for the same region.
- The total area of farming land in the Cudgen Plateau SSF is approximately 476.15 ha and the total area within the Cudgen Plateau mapped as SSF is approximately 580.3 ha.
- There is only 4.22 ha that is relatively flat (the best farming land), this area is approximately 0.9 per cent of the total farming land in the Cudgen Plateau SSF.
- The Social and Economic Impact Assessment (SEIA) prepared for the Project (refer **Section 5.9** and **Appendix Z**) has determined the economic impact from the loss of agricultural land to be low, however there would be a wide range of significant social and economic benefits to the locality and region as a result of the Project. On balance, the net effect would be positive.

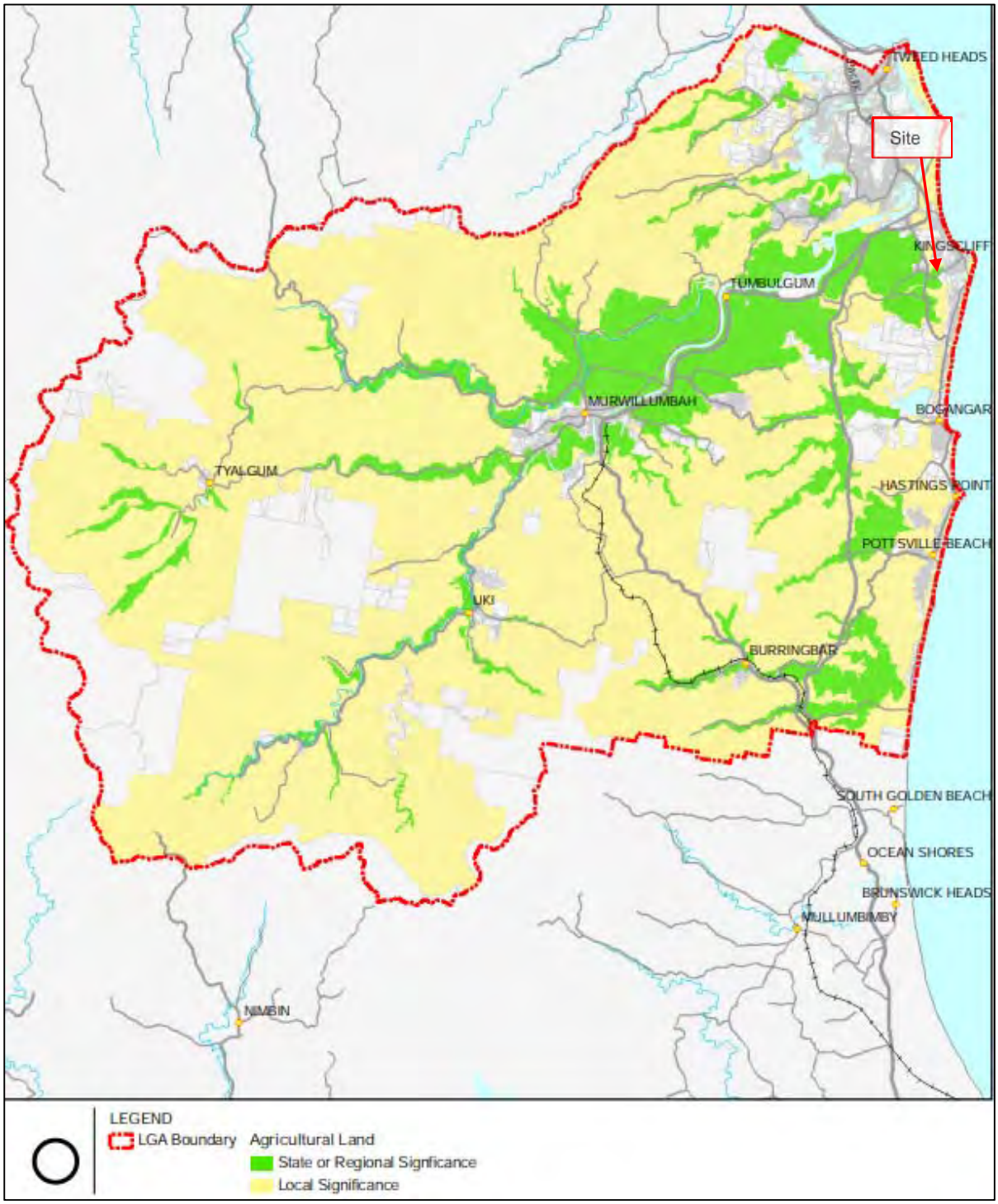


Figure 5.4 The Project Site in the Context of Agricultural Land within Tweed Shire
Source: Tweed Shire Council 2009

Fragmentation of Existing SSF in the Area and Impact on other Farmland including SSF in the Region

- As outlined in the Agricultural Impact Assessment (refer **Appendix F**) and mentioned above in **Section 5.6.1**, the Project Site affects the fringe of such mapped farmland and its location will not fragment the SSF of the Cudgen Plateau and would limit flow-on/ interface impacts to other farmland.
- The Project Site sits on the far north-eastern tip of the mapped important agricultural land - it is on the urban side of Cudgen Road, opposite Kingscliff TAFE and between existing residential areas of Kingscliff and Cudgen, with future residential developments planned to the north.
- Its large size allows for future hospital expansion and health and education developments without encroaching on surrounding rural areas as well as the provision of appropriate buffers and strategies to minimise and manage potential land use conflict.
- The south-western tip of the Project Site is adjacent to agricultural land however this is not dissimilar to current circumstances in the locality where residential and education facilities (including Kingscliff TAFE) interface with adjacent farmland and coexist. Intensive agriculture clusters, being the primary area of the Cudgen Plateau (west of Tweed Coast Road), would be adequately protected as the development is not immediately proximal to this concentrated SSF farmland area of the Cudgen Plateau.
- The Project is for public infrastructure and not residential or rural residential expansion and would not set a precedent for such development.
- Potential rural land use conflicts have been assessed in **Section 5.6.4**. Through an appropriate design response and interface management strategy, including potential land use conflict minimisation and management, the development of a health facility on the Project Site would be able to effectively coexist with surrounding land uses.

Impacts on Agricultural Productivity, Land Values and Agricultural Investment

- As discussed in the Agricultural Impact Assessment (Refer **Appendix F**) the cultivated area of the property is small relative to the total farming area on the Cudgen Plateau SSF. Its removal is unlikely to have a significant impact on agricultural productivity especially given it contains partly sloping land which is not ideal for agricultural production and a rocky sub soil which would result in yields of sweet potatoes being lower than average. It would also make harvesting of the sweet potatoes less efficient than non-rocky soil.
- As the Project is for a public purpose/ infrastructure it is not considered that the Project would set a precedent which could allow further urban development to occur on SSF. Therefore, it is unlikely that the Project would result in any increase in the value of agricultural land or reduce investment in agriculture in the region. The draft SEPP and rezoning process by DPE would also ensure that rezoning of the Project Site to SP2 Infrastructure does not have any unintended land value consequences beyond the Project Site.

Impacts to Key Support Infrastructure/ Services including Transport Routes

- Impacts of the Project on infrastructure and services and transport routes are addressed in **Sections 5.6.4, 5.7 and 5.13**. It is not considered that the Project will have any significant impacts with regard to these matters.

Impacts to Water use from Agriculture

- While hospitals are large water users, the water used will be from the urban supply and not from a water resource used for irrigation purposes.

- The average annual area that would be cropped to sweet potatoes at the site each year is estimated to be 3.75 ha. A sweet potato crop uses approximately four to five megalitres of water per hectare which is equivalent to 15 to 18.75 megalitres per annum. Which is the approximate volume of irrigation water that will not be used as a result of the Project.
- As outlined in the Agricultural Impact Assessment (refer **Appendix F**), it is not considered that the Project would have any impact on water use from agriculture.

Impacts to Regional Communities

- The main negative impact related to agriculture includes the loss of agricultural land; valued at $0.4 million gross value added per annum (SGS Economics and Planning 2018).
- The Project is expected to generate $425 million in total value added (direct and indirect) across five years up to 2023 for the region. During its operational phase, the new hospital is expected to generate up to $46 million gross value added.
- Overall, the SEIA (refer **Appendix Z**) has found that the impact to and loss of agricultural land would have a low negative impact and that the spatial distribution of this impact relates to Kingscliff (social) and the State (economic). Nonetheless, the new Tweed Valley Hospital in Kingscliff will, on balance, create an overall positive social and economic impact to the region

5.6.3 Options to Minimise and Mitigate Adverse Impacts on Agricultural Resources

Department of Premier and Cabinet is currently pursuing a collaborative opportunity with relevant agencies, outside of the Project, to support the agricultural industry in the region. Improved utilisation of agricultural land, including that which has not been farmed for some time. If successful, this initiative could more than offset the reduction of eight hectares of crops at any one time on the Project Site.

This initiative will target a broad range of objectives. Examples include:

- Partnerships with TAFE and other education providers to research and improve productivity
- Opportunities to get under-utilised land back into production.

Measures related to avoiding and minimising potential land use conflict with rural land are discussed in the following section.

5.6.4 Land Use Conflict Risk Assessment (LUCRA)

Tim Fitzroy & Associates (TFA) prepared a LUCRA which is attached at **Appendix J**.

The LUCRA was prepared based on:

- a review of the Concept Plan presented under the Tweed Valley Hospital Masterplan
- discussions with the Project Manager - TSA Management (including consultation with neighbouring residents)
- site inspection
- review of surrounding land uses.

In assessing the potential risk of land use conflict associated with the Tweed Valley Hospital and existing adjoining agricultural land uses, three key documents are relevant, namely: *Living and Working in Rural Areas – A handbook for managing land use conflict issues on the New South Wales North Coast,* produced by NSW Department of Primary Industries 2007; *Tweed Sustainable Agriculture Strategy*, Tweed Shire Council June 2006; and the draft *Rural Land Strategy,* Tweed Shire Council.

The *Living and Working in Rural Areas Handbook* (Department of Primary Industries *et.al* 2007) and Tweed Shire Council's draft *Kingscliff Locality Plan, Volume 2 – Precinct Plans* denote a number of recommended buffer distances to residential areas. Buffers may vary depending on the specifics of the proposed development and the nature of the adjoining agricultural land uses.

While the *Living and Working in Rural Areas Handbook* and draft KLP provide guidance on buffers for residential areas, these can be varied, and there is no reference to separation distances between agriculture and commercial (in this case health and education) land uses such as those proposed on the Project Site. In this case a project-specific LUCRA has been prepared to determine suitable buffers and strategies. The more conservative buffers for residential development from the *Living and Working in Rural Areas Handbook* have been used as a guide in this assessment. The actual width of a buffer should in practice be dependent on the most limiting factor involved (i.e. the factor that will require the widest buffer). In theory, this would lead to all other factors being adequately addressed.

The LUCRA considered a range of potential land use conflict sources, including:

- Agricultural chemical spray drift
- Odour
- Noise (including tractors and machinery operation)
- Dust
- Surface water and sediment runoff
- Traffic and access.

Any potential land use conflicts between the proposed hospital and existing agricultural land uses were considered against a risk assessment matrix to rank the potential land use conflicts in terms of significance. The matrix assesses the environmental/ public health and amenity impacts according to the:

- probability of occurrence
- severity of impact.

The procedure of environmental/public health and amenity hazard identification and risk control are performed in three stages:

- environmental/public health and amenity hazard identification
- risk assessment and ranking
- risk control development.

It is noted that the surrounding land use includes:

- fallow horticultural land and redundant Greenhouse/ Nursery (formerly Earth and Colour Nursery) to the west
- a market garden, inclusive of ground vegetable crops and road side stall to the south and south-west across Cudgen Road
- ground vegetable cropping to the south-west across Cudgen Road
- scattered dwellings and the Kingscliff TAFE to the south and south-east across Cudgen Road
- the main Kingscliff urban/ residential area to the east and vegetated rural land inclusive of wetlands and a watercourse to the north.

A site inspection coupled with a review of aerial photography has confirmed:

- The distance between the closest proposed hospital building and the existing vegetable cropping to south (Lot 1 DP1803772, Cudgen Road) is approximately 100 m
- The distance between the closest proposed hospital building and the unused former plant nursery to the west (Lot 6 DP 727425, Cudgen Road) is approximately 60 m
- The distance between the closest proposed hospital building and the sweet potato farm to the south-west (Lot 101 DP 866795, Cudgen Road) is approximately 280 m.

From 30 July to 10 August 2018 discussions were undertaken between TSA Management and neighbouring properties to help inform the assessment and determine:

- the extent of current farming activity
- any history of impact from existing farming activities.

It is important to note that the *Living and Working in Rural Areas Handbook* does not include reference to separation distances between agriculture and commercial (in this case health and education) activity such as those proposed on the Project Site. While a default buffer is recommended between State and Regionally Significant Farmland and residential development the DPI does not stipulate a setback from commercial/ industrial developments (including health and education) to State and Regionally Significant Farmland. A project-specific LUCRA and development of potential conflict minimisation strategies, including buffers, has been developed.

Based on the proximity of the existing vegetable cropping to the south of the Tweed Valley Hospital the LUCRA recommends a series of measures, including vegetated buffers to provide an effective safeguard to spray drift:

1. A **vegetated buffer** based on the following criteria is to be installed on the Project Site along the southern boundary:

    - Contain random plantings of a variety of tree and shrub species of differing growth habits, at spacings of four to five metres for a minimum width of 30 m
    - Include species with long, thin and rough foliage which facilitates the more efficient capture of spray droplets
    - Provide a permeable barrier which allows air to pass through the buffer. A porosity of 0.5 is acceptable (approximately 50 per cent of the [planting] screen should be air space)
    - Foliage is from the base to the crown [achieved by a variety of tree and shrub species]
    - Include species which are fast growing and hardy
    - Have a mature tree height at least three metres.

2. **Supplementary plantings** are to be installed between the existing row of mixed trees and shrubs on the western and south-western boundary of the Project Site based on the following criteria to form an improved vegetative screen:

    - contain random plantings of a variety of tree and shrub species of differing growth habits, at spacings of two to three metres for a minimum width of 10 m
    - include species with long, thin and rough foliage which facilitates the more efficient capture of spray droplets
    - provide a permeable barrier which allows air to pass through the buffer. A porosity of 0.5 is acceptable (approximately 50 per cent of the screen should be air space)
    - foliage is from the base to the crown [achieved by a variety of tree and shrub species]
    - include species which are fast growing and hardy

- have a mature tree height at least three metres
- Open spaces for patients should not be located along the southern frontage. By locating courtyards and balconies on the opposite side of the buildings to the southern farmland, the buildings themselves will provide physical screening of farm activities
- Hospital buildings will be air-conditioned. The air intake for air-conditioning should not be located on the southern side of the building/s
- Roof water shall not be utilised for potable use
- Any roof water utilised for secondary uses should be fitted with a first flush diverter and adequately filtered in accordance with the relevant Australian Standards for non-potable secondary use/s.

Note: The *Pesticides Act 1999* regulates the use of pesticides in NSW. Management practices must either eliminate spray drift or at least minimise it to a level where it will not cause adverse health impacts.

Recommendations for Noise Impacts

3. Hospital operations; machinery, air conditioning, aircraft (helicopter), vehicles (staff, patients, visitors, deliveries, waste collection), generators, night work, from the Tweed Valley Hospital are to be addressed in the Noise Impact Assessment to ensure that any noise impacts are sufficiently attenuated so as to comply with the Noise Policy for Industry (NSW EPA 2017) and the Interim Construction Noise Guidelines (DECC, 2009)

Recommendations for Stormwater Management

4. The preparation of a Soil and Water Management Plan for the construction phases of the development will be required to minimise the potential for erosion and sediment runoff to adjacent farm land, water courses and wetlands.

   A Stormwater Management Strategy for the operation phase of the development has been developed. Implementation of this strategy will adequately address the issues of sediment and nutrient runoff and pollution of adjacent farm land, water courses and wetlands.

Recommendations for Traffic and Access

5. Measures to reduce traffic impacts have been addressed in the Traffic Impact Assessment with regard to both construction and operations. The Tweed Valley Hospital main entrance has been located so it is not directly opposite the farms. Other appropriate controls relating to turning lanes and lane dividers are proposed to adequately address traffic concerns. Implementation of the recommendations in the Traffic Impact Assessment will adequately address traffic and access issues.

Overall the LUCRA has concluded that the Project Site is suitable for the proposed SSD application for the hospital subject to the recommendations provided.

It should be noted that the conclusions and recommendations presented within the LUCRA have been informed by the following factors:

- No aerial agricultural spraying is known to occur in the area. Given the use of ground cropping chemical application and small allotments within relatively close proximity of the Kingscliff TAFE and adjoining residential areas it is assumed that spray drift would be limited.

- Very fine or fine droplets pose the highest risk of spray drift; it is the single most important factor controlling drift potential. The higher droplets are released, the greater potential for drift. Given the adjacent land use consists of ground vegetable cropping and consequently the relatively low height at which spray is released the risk of spray drift is reduced.
- Given the nature and location of the Earth and Colour Hydroponic Nursery it is more than likely that any use of chemical sprays would be limited to the confines of the nursery operation.
- Fallow agriculture land (formerly sugar cane) and low intensity cattle (beef) grazing to the south-west, offer little potential risk of conflict.
- Noise associated with agricultural activity which may lead to land use conflict in the locality would be intermittent noise from tractors and other machinery. More detail is provided in the LUCRA.

5.7 SEAR 7 - Transport and Accessibility

A Traffic Impact Assessment (**Appendix L**) has been prepared by Bitzios Consulting. The report assesses traffic and transport requirements to support the Concept proposal for development of the Project Site. The assessment has been undertaken to address the SEARs. Although the SSD application is for a Concept Proposal and Stage 1 works, transport and traffic has also been assessed for both construction and operational phases of the development.

This assessment details the process for construction traffic management and assesses the operational transport and traffic impacts of the Project.

5.7.1 Scope

The scope of the study included the following:

- a review of the Project Site, including existing operations and accesses
- collection of traffic survey data for the surrounding road network
- a review of the proposed development and land zoning requirements
- a review and assessment of the existing road network and traffic conditions
- an assessment of traffic safety in the vicinity of the Project Site
- an assessment of public transport, pedestrian and cycling networks and connectivity surrounding the development site. This will include a summary of infrastructure to support the proposed rezoning and subsequent development (e.g. provision of footpaths, pedestrian crossings, bicycle paths)
- an assessment of the proposed development's traffic generation and the distribution onto the external road network, and any impacts and mitigation measures that are required to support the development (e.g. intersection/ road upgrades)
- an assessment of access locations and requirements
- an assessment of existing public transport provisions/ services and upgrades required to support the proposed development (e.g. provision of additional bus stops and bus services).

The study was also prepared in accordance with the following Policies and Guidelines:

- Guide to Traffic Generating Developments (Roads and Maritime Services)
- EIS Guidelines – Road and Related Facilities (DoPI)
- Cycling Aspects of Austroads Guides
- NSW Planning Guidelines for Walking and Cycling
- Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development
- Standards Australia AS2890.3 (Bicycle Parking Facilities).

5.7.2 Existing Conditions

One of the important attributes of the Project Site related to its selection was its strategic accessibility to existing transport links and road networks to service the catchment.

The Project Site has four existing access locations. Access is provided to the existing residential dwelling and to the detached shed. All accesses are to a rural standard of crossover.

Key existing roads in the locality, include:

- In the vicinity of the Project Site, the Pacific Highway is a divided road with 110 km/h and 100 km/h posted speed limits. It includes an interchange with Tweed Coast Road and incorporates a dual lane roundabout configuration
- Tweed Coast Road is a north-south rural arterial road connecting coastal towns including Pottsville, Hastings Point, Cabarita, Casuarina and Kingscliff
- Cudgen Road is an undivided two lane rural collector/ distributor road connecting Kingscliff to the east with Cudgen and Tweed Valley Way to the west
- Turnock Street is an undivided two lane rural arterial road connecting Kingscliff to the east with Cudgen Road to the west.

The road network immediately surrounding the Project Site consists predominantly of rural arterial or local access and collector streets. There are no formalised parking facilities on-street in the area. Surrounding residential streets have on-street parking.

No road upgrades are understood to be planned for the immediate future in the area other than maintenance works. Notwithstanding, future planned upgrades are identified within Tweed Shire Council's Tweed Road Development Strategy (TRDS) and Tweed Shire Council has identified that planning and funding investigations of the Tweed Coast Road duplication are underway.

An existing off-road shared path runs along the site frontage. The pathway connects to residential areas west of Tweed Coast Road and to Kingscliff in the east. Broader network connections are provided to the Banora Point/ Tweed Heads area to the north and to Casuarina/ Pottsville to the south. It is noted that future planning for Tweed Coast Road will include a combination of on and off-road cycle facilities extending from Casuarina to Chinderah.

Existing bus services are available along Cudgen Road, with two bus stops located along the frontage of the Project Site.

5.7.3 Future Planning and Transport Network Considerations

There are several future planning and transport network considerations for the subject area, specifically relating to future network capacity upgrades, new road connections and developments. These include (refer to **Appendix L** for more detail) developments proposed in the area such as Kings Forest and Gales-Kingscliff, as well as future growth of Kingscliff generally and as identified in the draft KLP.

The proposed Kings Forest development will rely significantly on Tweed Coast Road as the main traffic route between Kings Forest and the Pacific Highway.

The Gales-Kingscliff development area is located to the north of the Project Site. It is understood that the proposal is still in planning stages. The site proposes a mixture of land uses including residential, commercial, neighbourhood and community facilities.

Tweed Shire Council's transport network planning for the area has been developed in the form of the draft KLP, DCP and the TRDS.

The TRDS recently underwent a review in 2017 and considered:

- the existing road network (in terms of capacity, efficiency and safety)
- existing and forecast network capacity constraints
- growth in the Tweed Shire for a 25-30-year planning horizon.

The TRDS identifies a number of road capacity upgrades for the immediate area surrounding the Project Site, including:

- four-lane upgrade of Tweed Coast Road between the Pacific Highway and Casuarina
- a new east-west connection associated with the northern component of the Gales-Kingscliff development linking Tweed Coast Road to Kingscliff Street
- the north-south extension of Elrond Drive associated with the northern component of Gales-Kingscliff, allowing for a connection of Beach Street through to Ozone Street
- a new east-west connection associated with the southern component of the Gales-Kingscliff development extending Turnock Street to Tweed Coast Road linking Tweed Coast to Kingscliff Street
- reconfiguration of the Morton Street intersection from Tweed Coast Road and improvements for access for Chinderah Industrial Estate
- improvements to the Pacific Highway/ Tweed Coast interchange in consultation with RMS.

The various road network upgrades are based on the network capacity requirements and projected traffic growth within the area.

5.7.4 Existing (Background) Traffic

As detailed in the Traffic Impact Assessment, a range of traffic surveys were undertaken to inform the assessment, including turning movement surveys for intersections and tube counts. Refer to **Appendix L** for survey locations and identified peak periods.

Average Annual Daily Traffic (AADT) was derived from the tube count surveys undertaken for Cudgen Road and Tweed Coast Road. The 85th percentile speed was taken from all recorded speed data during the seven-day period (the highest daily 85th percentile speed was recorded). **Table 5.11** summarises the AADT and 85th percentile speed.

Table 5.11 AADT and Speed Data

Location	*Description*	*AADT*	*Recorded 85th Percentile Speed*	*Post Speed Limit*
Tweed Coast Road	To the north of Cudgen Road	17,757	82.3km/h	60km/h*
Cudgen Road	To the east of Tweed Coast Road and fronting the Project Site	11,774	67.5km/h	60km/h

Source: Bitzios - Note: the section of Tweed Coast Road from approximately 300m north of the Cudgen Road intersection to near Lot 130 Tweed Coast Road is 80km/h. The tube count was undertaken within the 60km/h zone.

It is noted that the 85th percentile speeds are significantly higher than the posted speed on Tweed Coast Road. This is expected to be due to the proximity to the 80km/h speed zone just to the north of count location. The vehicle speeds do however indicate that even with relatively high volumes for a

two-lane road, there does not appear to be any significant flow breakdown which would be associated with reduced Level of Service. Even during the isolated peak periods, the 85th percentile speeds were still in the order of 70km/h. The full set of tube count data including 85th percentile speeds is presented in the Traffic Impact Assessment.

Traffic generation rates for the existing development were established. Conservatively assessing the farming component to generate similar traffic to that of the existing residential dwelling, the Project Site's total traffic is calculated to be in the order of:

- two trips in the peak hour
- 15 daily trips.

Heavy vehicle percentages from the surveys undertaken relative to AADT are as follows:

- 8.8 per cent of AADT on Tweed Coast Road
- five per cent of AADT on Cudgen Road.

5.7.5 Background Traffic Modelling

The following process has been used to assess the background traffic (refer to Traffic Impact Assessment for full detail):

- identifying key intersections for assessment
- undertaking traffic surveys for the key intersections subject to this assessment in order to ascertain background traffic volumes for the AM and PM peak hours
- forecasting future year background traffic volumes at the anticipated year of opening and 10-year design horizon
- undertaking intersection modelling for key intersections. SIDRA Intersection 7 was used for the intersection modelling.

Based on the broad project delivery timeframes the proposed development is expected to be completed in Year 2022. Based on these time frames, Year 2023 has therefore been assessed as the conservative year of opening with Year 2033 as the 10-year design horizon.

The following factors were considered in determining the surrounding road network background growth:

- existing capacity and volumes
- future capacity upgrades
- future provision of alternate routes
- population growth in the region
- future developments in the area.

The Traffic Impact Assessment outlines that historical growth trends are not considered to be a realistic reflection of expected growth over the next 5-15 years. Whilst there have been periods of significant growth driven by the Tweed Coast Release Areas including Salt and Casuarina, in recent years there have been no developments of significant scale. It is however noted that the aforementioned developments of Kings Forest and Gales-Kingscliff will increase traffic volumes on Tweed Coast Road and the surrounds. Noting Kings Forest has approval to proceed, however has not yet done so and Gales-Kingscliff has not yet been approved, timing of these developments is not defined and any impacts to traffic growth is considered to occur in a staged manner over an extended period of time. In addition, these large-scale developments will also coincide with the construction of new linkages which will likely impact route choice.

As explained in the Traffic Impact Assessment, background traffic growth has been differentiated between the north-south corridor of Tweed Coast Road and the east-west corridor of Cudgen Road.

Traffic growth in the area was assessed by corridor, based on the traffic surveys (i.e. 2018 tube count volumes) and 2041 volumes from the Tweed Strategic Transport Model (2041 medium yield "base" scenario). This 2041 scenario does not include any infrastructure upgrades (e.g. such as the two east-west connections from Tweed Coast Road to Kingscliff) that will change route choice or potentially reduce traffic past the Project Site frontage. The strategic model considers future planning and development (e.g. such as Kings Forest and the Gales-Kingscliff developments). The 2018 tube count volumes and 2041 Tweed Strategic Transport Model volumes used for the calculation of growth rates are included in the Traffic Impact Assessment at **Appendix L**. This adequately accounts for consideration of cumulative impacts and growth in the Traffic Impact Assessment. Cumulative impacts are also further addressed in **Section 7.4**.

The following traffic growth volumes were established and used for calculating future background volumes:

- 1.73 per cent per annum compounding for the Cudgen Road/ Turnock Street corridor and turning movements at the Tweed Coast Road/ Cudgen Road intersection
- 0.80 per cent per annum compounding for the Tweed Coast Road Corridor.

Analysis of the following was undertaken using SIDRA Intersection 7 for the Year 2023 (year of opening) and Year 2033 (10-year design horizon) background traffic volumes:

- Pacific Highway/ Tweed Coast Road interchange
- Tweed Coast Road/ Cudgen Road signalised intersection
- Cudgen Road/ Kingscliff TAFE Access
- Cudgen Road/ Turnock Street roundabout
- Turnock Street/ Elrond Drive roundabout
- Turnock Street/ Pearl Street roundabout.

Crash data does not demonstrate a significantly high crash rate for the section of Cudgen Road or Turnock Street between Tweed Coast Road and Elrond Drive. There are no crash clusters or identified crash trends at any of the Project Site access locations.

5.7.6 Proposed Project

The master planning for the Project Site has identified that site may comprise of:

- For the purpose of the traffic analysis consistent with benchmarking against other NSW regional hospitals, traffic analysis has been based on a yield of 430 beds and 1050 staff
- associated allied health services
- emergency services facilities (ambulance)
- ancillary food and retail outlets (e.g. cafes, florist etc.).

It should be noted that the development yields have not been finalised at this stage of the project. The above is the latest available information and is a "worst case scenario" appropriate for the purpose of the SSD application for a Concept Proposal.

5.7.6.1 Travel Time Assessment

Travel times to the Project Site were calculated for the various population sectors across the Tweed LGA. The Project Site is well located with respect to current and forecast population centres, with a travel time of less than 30 minutes for nearly 70 per cent of the Tweed Shire population. Refer to the Traffic Impact Assessment for summarises of travel time by proportion of the Tweed Shire population and travel times and associated travel routes to key population centres.

5.7.6.2 Access and Internal Circulation

The development would be provided with a total of four access points:

- Access A: Left-in only from Cudgen Road at the eastern boundary
- Access B: Signalised all movements access to Cudgen Road
- Access C: Left-in only from Cudgen Road west of the Kingscliff TAFE access
- Access D: All movements access to Cudgen Road/ Turnock Street in the form of a fourth leg to the existing Turnock Street/ Cudgen Road intersection.

Sight distance requirements and compliance for each access are provided in the Traffic Impact Assessment and found to be acceptable.

Site access, internal circulation and egress movement paths have also been assessed and are acceptable.

No external queuing issues are expected with regard to access points.

5.7.6.3 Internal Road Geometry

The internal road geometry has been generally designed to comply with Australian Standards AS2890.1 (off-street parking) and AS2890.2 (off-street commercial vehicle facilities). It is however noted that plans for the Masterplan are high-level/ concept and while the design has considered the Australian Standards requirements, much of the detail is not shown. In this regard, further detailed analysis of the internal road geometry would be undertaken in future design stages.

For the purposes of the Concept Proposal the roads locations are considered to be indicative.

5.7.6.4 Car Parking Requirements and Provision

An important consideration when planning for the car parking provision is to achieve a balance between parking demand and providing an oversupply. It is widely acknowledged that provision of parking relates directly to car parking utilisation and traffic generation. Providing additional parking beyond the requirement will unnecessarily increase parking demand and private vehicle utilisation.

Table 5.12 details Tweed Shire Council's car parking requirements stipulated within Section A2 – Site Access and Parking Code.

Table 5.12 Development Car Parking Requirements

Land Use	*Yield*	*Required Parking Rate*	*Parking Requirement*
Hospital (visitor)	430 beds	0.8 spaces/ bed	344
Hospital (staff)		0.8 spaces/ bed	344

Source: Bitzios

The Project would incorporate in the order of 700 car parking spaces across four car parking areas. Car parking is separated into two dedicated staff car parks and two dedicated public car parks. Some additional short-term parking would be provided around ED and set down areas. However, further demand and feasibility studies, as well as staff and community consultation in relation to car parking, will be undertaken prior to lodgement of the Stage 2 SSD application. This would include a full demand study and business case developed to inform Stage 2, and a Car Park Project Working Group to be formed – this includes members for the Community Reference Panel. Hence parking numbers are not included for endorsement as part of this EIS.

For comparison, the peak parking accumulation (PPA) was calculated based on the rate stipulated within the RMS Guide to Traffic Generating Developments. The PPA rate is shown below:

- PPA = -19.56 + 0.85 B + 0.27 ASDS.

Based on this rate, the PPA is 630 car parking spaces. This is below Tweed Shire Council's requirement and below the development provision which indicates that the parking supply is sufficient to cater for demand.

The above considers the ultimate parking requirement in Year 2032, however the hospital is planned to commence operations in Year 2022/2023 with a lower yield. In this regard, the initial parking supply provided at time of opening would cater for the requirement as a minimum (i.e. 652 spaces).

Nonetheless, as aforementioned, a furthermore detailed assessment of car parking demand will be undertaken in Stage 2, in conjunction with an assessment of parking controls, tariffs and concession regimes for the campus.

While not proposed as part of this application, the site layout and future planning caters for additional parking provision in the form of overflow parking on the site if required.

Given the concept nature of the proposal, the internal car parking geometry has had general regard for the Australian Standards AS2890.1 (off-street parking) and AS2890.2 (off-street commercial vehicle facilities). However, further detailed analysis of the internal geometry would be undertaken in future designs stages (i.e. Stage 2).

A car parking management plan will be developed as part of Stage 2. Initial consultation for the development of the car parking management plan and management strategies has commenced and will continue through to Stage 2. The car parking management plan will detail any parking fees which will follow a typical tariff system as used across NSW. It is expected that management of car parking will be similar to the system used at the Lismore Base Hospital Uralba Street carpark (as outlined in the Traffic Impact Assessment), which includes:

- boom gate access
- structured fee for various time periods
- multiple payment methods
- operation 24 hours a day, seven days a week
- concession parking for eligible visitors.

Physical restrictions (i.e. boom gates) would only be placed on parking areas. Internal roads and patient drop-off areas will not be restricted.

5.7.6.5 Servicing and Refuse Requirements

It is understood that the largest vehicle required on the Project Site is a 19 m Articulated Vehicle (AV) for oxygen and gas deliveries and smaller service vehicles for a range of other deliveries and servicing requirements (e.g. linen, medical supplies, food, equipment). The service yard will cater for a range of standard service vehicles including:

- 19 m AV
- 12.5 m HRV
- 8.8 m MRV
- 6.4 m SRV.

The service vehicle parking requirement equates to 14 spaces. The Project Site is considered to provide sufficient service vehicle parking with 10 ambulance bays at the ED, a further four ambulance bays at the transit set-down area and provision for a range of service vehicles in the dedicated service yard. Servicing (other than by ambulances/ emergency vehicles) and refuse collection is expected to occur at various times across a typical day or typical week.

It is however noted that the application is for a Concept Proposal and plans for the Masterplan are high-level. In this regard, further detailed analysis and swept path assessment would be undertaken for Stage 2 which involves detailed design, construction (main works) and operation of the hospital.

The Traffic Impact Assessment recommends that the Site operate a Service Vehicle Management Plan (SVMP) that dictates standard servicing and refuse collection procedures for the Site and may incorporate timetables and schedules that specify when certain deliveries occur. At this stage service vehicle frequencies are not defined. The SVMP will be prepared as part of Stage 2.

5.7.6.6 Bicycle Parking Requirements and Provision

Based on Tweed Shire Council's bicycle parking requirements stipulated within Section A2 – Site Access and Parking Code, 14 visitor and 29 staff bicycle parking spaces are required for the Project.

The concept plans do not show bicycle parking, and this would be further considered at Stage 2, including appropriate bicycle parking, secure storage and end of trip facilities (showers, changing facilities and lockers).

5.7.7 Impact of Proposed Project

In conjunction with assessing the traffic impact of the proposed development, consultation was undertaken with a number of stakeholders, including:

- Tweed Shire Council
- RMS
- Surfside Buslines and TfNSW.

As discussed previously in **Section 5.7.3 and 5.7.4**, future transport and network planning, as well as background traffic growth has been considered in the Traffic Impact Assessment. This includes consideration of potential cumulative impacts and other developments when assessing the impacts of the Project. The assessment considers key future developments in the area, namely the Kings Forest and Gales-Kingscliff developments. Traffic growth rates and distributions utilised considered the Tweed Strategic Transport Model and consideration was given to future road upgrades and planning identified in the Tweed Road Development Strategy.

5.7.7.1 Development Traffic Generation

The RMS *Guide to Traffic Generating Developments* was used to calculate the development's peak hour traffic generation. The RMS guide specifies three peak period traffic generation rates for hospitals as follows:

- Vehicle Trip Generation in the Morning Commuter Peak Hour (MVT)
- Vehicle Trip Generation in the Evening Commuter Peak Hour (EVT)
- Peak Vehicle Trips (PVT).

The MVT, EVT and PVT development traffic volumes are presented in the following table:

Table 5.13 Development Traffic Generation (Peak Hour)

Land Use	*Yield*	*Peak*	*Peak Hour Trip Rate*	*Peak Hour Trips*
Hospital	430 beds and 1050 staff (ASDS)	MVT	MVT=-10.21+0.47B+0.06ASDS	255
		EVT	EVT=-2.84+0.25B+0.4ASDS	525
		PVT	PVT=-14.69+0.69B+0.31ASDS	608

Source: Bitzios

The RMS *Guide to Traffic Generating Developments* does not provide daily traffic generation rates. In lieu of this the Institute of Transportation Engineers (ITE) daily rate of 11.81 trips/ bed/ day was used to estimate daily traffic generation. These are presented in the following table.

Table 5.14 Development Traffic Generation (Daily)

Land Use	*Yield*	*Daily Trip Rate*	*Daily Trips*
Hospital	430 beds	11.81 trips/ bed/ day	5078

Source: Bitzios

The daily traffic generation aligns with typical traffic profiles where peak hour traffic is approximately 10 per cent of daily volumes.

An "IN:OUT" directionality split of "70%:30%" was adopted for the EVT peak and vice versa in the EVT peak. As a sensitivity test an "IN:OUT" split of "50%:50%" was used for the PVT which considers a staff changeover.

Traffic Impact Assessment reviewed 2016 Australian Bureau of Statistics data for methods of travelling to work and modal split. Travelling by private vehicle as the driver was the most common method (68.3 per cent), followed by private vehicle as a passenger (4.4 per cent). Active transport (walking and cycling) and public transport (bus) were the other main transport methods although utilisation was low (0.9-2.7 per cent).

Based on the mode splits and the estimated daily traffic generation the Tweed Valley Hospital is estimated to generate in the order of 150-300 daily pedestrian trips and in the order of 50 cyclist trips. Pedestrians and cyclists are expected to predominantly originate to the east (Kingscliff) and use the existing pedestrian pathway network. A small proportion may originate from the suburban area west of Tweed Coast Road. Considering the journey to work mode share and potential visitor/ patient trips the Tweed Valley Hospital is expected to generate in the order of 150 public transport trips (bus), with potential for additional trip generation with future service enhancements.

Traffic distribution on the surrounding network is also presented in the Traffic Impact Assessment.

5.7.7.2 Design Traffic Modelling

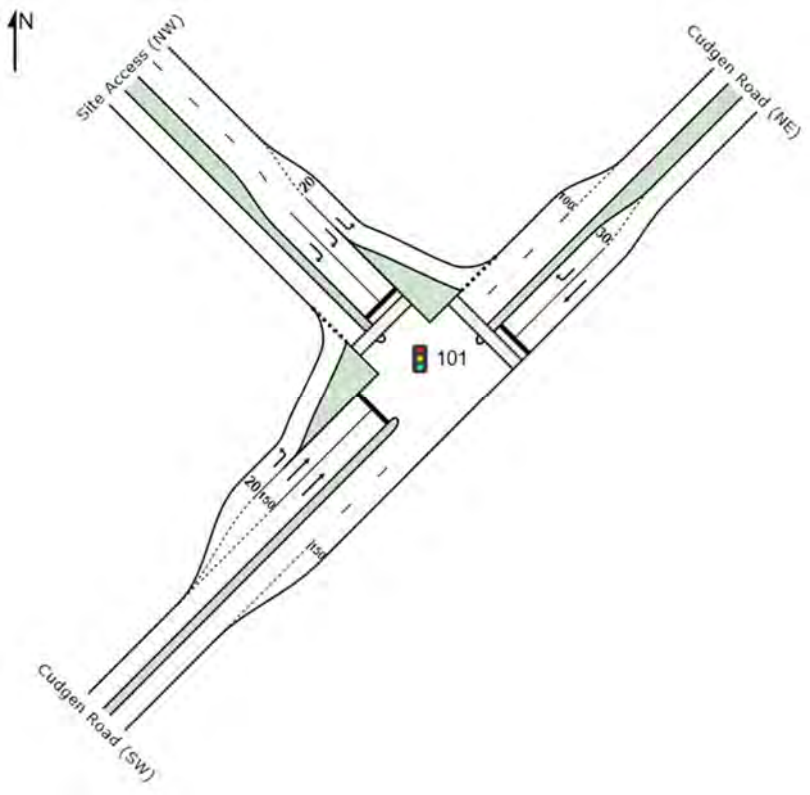
The Traffic Impact Assessment at **Appendix L** present a comprehensive design traffic assessment and extensive modelling. This was undertaken for the same intersections assessed under the background traffic scenarios. A new intersection is proposed for the site's primary access to Cudgen Road which is only modelled in the design scenarios. Another point of access is proposed via an additional leg to the existing Cudgen Road/ Turnock Street roundabout.

Design traffic consists of forecast background traffic and development traffic for Year 2023 (year of opening) and Year 2033 (10-year design horizon) for the MVT, EVT and PVT peak scenarios.

The following **Table 5.15** provides a summary of the outputs and findings of the modelling undertaken. For detail, including SIDRA results, refer to relevant referenced sections of the Traffic Impact Assessment at **Appendix L**.

Table 5.15 Summary of Modelling Findings

Modelled Component	***Summary of Results***
Pacific Highway/ Tweed Coast Road interchange	As demonstrated in Section 5.3.2 of the Traffic Impact Assessment at **Appendix L**, the intersection is shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95th percentile queue for a roundabout intersection in the Year 2023 and 2033 design traffic scenarios.
Tweed Coast Road/ Cudgen Road Signalised Intersection	As demonstrated in Section 5.3.3 of the Traffic Impact Assessment at **Appendix L**, background traffic modelling identified that the Tweed Coast Road intersection operates outside acceptable performance limits under background traffic volumes in Year 2023. A number of capacity upgrades were identified to bring the operations within performance thresholds. Using a devised Upgrade 2 option, the intersection is shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95th percentile queue for a signalised intersection in the Year 2023 design traffic scenarios. During the PM Peak with PVT volumes, some lanes are noted to operate at LOS D based on delay, however overall the intersection is considered to operate within acceptable limits. There are a number of factors that require consideration for the 10-year design horizon (and beyond) on this section of Tweed Coast Road (including upgrade of Tweed Coast Road to a four-lane cross section and future provision of new east-west links from Tweed Coast Road to Kingscliff). Due to these considerations, it is not appropriate to provide significant additional turning capacity at the intersection. As such, the intersection has been assessed with the Upgrade 3 option layout (i.e. four lane cross-section and minor turning capacity improvements). With Upgrade 3 the intersection is shown to operate at or just outside the accepted performance thresholds for a signalised intersection. A number of lanes are shown to operate at LOS D or E. Overall delay and LOS is within acceptable performance limits. The background traffic modelling for this intersection and the modelled development results do not consider the inclusion of the additional future planned east-west links between Tweed Coast Road and Kingscliff which will reduce turning volumes on Cudgen Road and improve intersection operations.

Modelled Component	Summary of Results
	The intersection modelling for the Tweed Coast Road/ Cudgen Road intersection indicates that a number of upgrades and improvements are required for the intersection to operate within acceptable performance limits for background traffic volumes in the year of opening (Year 2023). Recommended upgrades are presented in the Traffic Impact Assessment summarised in **Section 5.7.8** of this EIS.
Cudgen Road/ Site Access	The primary site access has been designed as a signalised intersection to cater for the design traffic volumes (i.e. background volumes and development volumes) and to provide suitable pedestrian amenity (i.e. signalised pedestrian crossings across the access and across Cudgen Road). The layout of the intersection used in SIDRA is shown in **Figure 5.5**.  **Figure 5.5 Cudgen Road/ Site Access SIDRA Intersection Layout** *Source: Bitzios* As demonstrated in Section 5.3.4 of the Traffic Impact Assessment at **Appendix L,** the intersection is shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95th percentile queue for a signalised intersection in the Year 2023 and 2033 design traffic scenarios. The 95th percentile queues on Cudgen Road extend approximately 150 m. Queues on Cudgen Road do not impact adjacent intersections (i.e. the TAFE access intersection to the north east and the Tweed Coast Road/ Cudgen Road intersection to the south-west). As previously noted, once the future planned east-west links between Kingscliff and Tweed Coast Road are provided, background through traffic volumes on Cudgen Road are expected to reduce to levels currently represented in 2018 count data, which will improve the access intersection performance.

Modelled Component	*Summary of Results*
Cudgen Road/ Kingscliff TAFE Access	As demonstrated in Section 5.3.5 of the Traffic Impact Assessment at **Appendix L** the intersection would operate within acceptable performance limits in terms of degree of saturation, average delay and 95th percentile queue for a roundabout intersection in the Year 2023 and 2033 design traffic scenarios.
Cudgen Road/ Turnock Street Roundabout	As demonstrated in Section 5.3.6 of the Traffic Impact Assessment at **Appendix L** the intersection (with the inclusion of an additional leg for site access) is shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95th percentile queue for a roundabout intersection in the Year 2023 and 2033 design traffic scenarios.
Turnock Street/ Elrond Drive roundabout	As demonstrated in Section 5.3.7 of the Traffic Impact Assessment at **Appendix L**, the intersection would operate within acceptable performance limits in terms of degree of saturation, average delay and 95th percentile queue for a roundabout intersection in the Year 2023 and 2033 design traffic scenarios. There is potential for future line marking changes at the intersection including priority and circulating lane changes (i.e. spiral) to reduce merging and weaving in proximity to the roundabout, particularly with the inclusion of new road links to the north which will reduce the function of Cudgen Road and Turnock Street as a through route.
Turnock Street/ Pearl Street roundabout	As demonstrated in Section 5.3.8 of the Traffic Impact Assessment at **Appendix L**, the intersection is shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95th percentile queue for a roundabout intersection in the Year 2023 and 2033 design traffic scenarios.

The external road network and intersections are expected to cater for the future background and design traffic scenarios, with the exception of the Tweed Coast Road/ Cudgen Road intersection. A range of capacity and performance upgrades have been identified as a result of the modelling and Traffic Impact Assessment. Recommended works are summarised at **Section 5.7.8**. On the basis of the modelling undertaken and recommended upgrades, intersections would operate within acceptable performance limits.

5.7.7.3 Safety

While higher traffic volumes inherently increase crash risk, the development manages the impact to traffic safety by:

- providing formalised access with suitable capacity to ensure safe and efficient operations and designed to meet the relevant standards
- improving pedestrian safety by providing a signalised crossing across Cudgen Road
- reducing existing deficiencies on the immediate road network (e.g. removal of the existing safety deficient eastbound bus stop which conflicts with the adjacent pedestrian refuge).

5.7.7.4 Public and Active Transport

The proposed hospital development will generate additional demand for public transport. During site observations, deficiencies were observed with the existing infrastructure.

With the inclusion of the proposed bus stop infrastructure and future route modifications (see recommendation in following section), the public transport network and infrastructure would be suitable to service the proposed development.

Access for community and aged care transport vehicles (B99 vehicles, mini-busses) has been catered for within the site geometry. Strategies for relocating existing community and aged car transport from the existing hospital to the new hospital as well as provision of new services will be investigated as part of Stage 2.

The Project Site is well serviced by the existing active (i.e. walking and cycling) transport network. Active transport access as well as pedestrian safety will be further improved by the Project.

A Green Travel Plan will be prepared as part of Stage 2 to support and maximise the use of alternate travel modes including walking, cycling, public transport and car sharing.

More specifically the Traffic Impact Assessment outlines that the Green Travel Plan would include:

- development of a Transport Access Guide (TAG) detailing:
    - bus stop locations
    - bus routes and service times
    - community transport services
    - pedestrian and cycle routes
    - bicycle parking and end of trip facility locations
    - PWD parking locations
- objectives and targets for alternate transport utilisation
- actions required to achieve the objectives
- governance support
- a monitoring and review process
- a process for incorporating and considering potential future transport modes or changes to existing modes (such as on-demand services, autonomous vehicles and electric vehicle facilities).

5.7.8 Recommended Works

The Project Site is a greenfield site. All accesses and internal circulation roads will be provided as new infrastructure. As such, no “improvements” to existing access and circulation infrastructure are proposed.

Upgrades to external intersections have been identified for the Tweed Coast Road/ Cudgen Road intersection to increase capacity as follows:

- upgrades required to cater for Background Traffic volumes in 2023
- upgrades required to cater for Design Traffic volumes (Development plus background) in 2023.

The initial upgrade would be part of the Preliminary Works identified in **Section 3.5** and is therefore not part of this SSD application.

The intersection will require further upgrades by 2033. It is expected that the four-lane upgrade of Tweed Coast Road will be completed by this time, by Tweed Shire Council.

Upgrades identified to cater for background traffic in 2023 are summarised as follows:

- Addition of a 100 m southbound left-turn lane on Tweed Coast Road
- Phase sequence change to allow the southbound left-turn to overlap with the westbound right-turn (i.e. possible with the provision of dedicated southbound left-turn lane)
- Lane discipline change for the two approach lanes on the south-eastern approach;
- Change of the left through lane to a through and right lane
- Change of the right through and right lane to a right only lane
- Extension of the south-eastern short departure lane from approximately 75 m to approximately 150 m
- Extension of the northbound departure lane from approximately 85 m to approximately 100 m
- Conversion of the north-western leg departure to a single lane (no physical changes. i.e. through provision of chevron line marking). With the lane discipline changes on the south-eastern approach, there is only one lane travelling through to the north-western departure lane.

Additional upgrades identified to cater for development traffic are summarised as follows:

- Extension of the northbound departure lane to approximately 200 m
- Extension of the southbound departure lane to approximately 150 m.

Further upgrades are expected to be undertaken as part of the four-lane upgrade of Tweed Coast Road. The specific capacity requirements and ultimate design of the intersection is expected to be refined as part of future planning and detailed design of the corridor upgrade.

It is understood that Tweed Shire Council has no planning for “interim” works at the intersection (i.e. prior to the four-lane upgrade of Tweed Coast Road). In this regard, upgrades undertaken in the interim should be commensurate with planning for the ultimate design scenario (i.e. with the four-lane upgrade).

Figure 5.6 shows the upgraded SIDRA layout (from the Traffic Impact Assessment) for Tweed Coast Road/ Cudgen Road intersection.

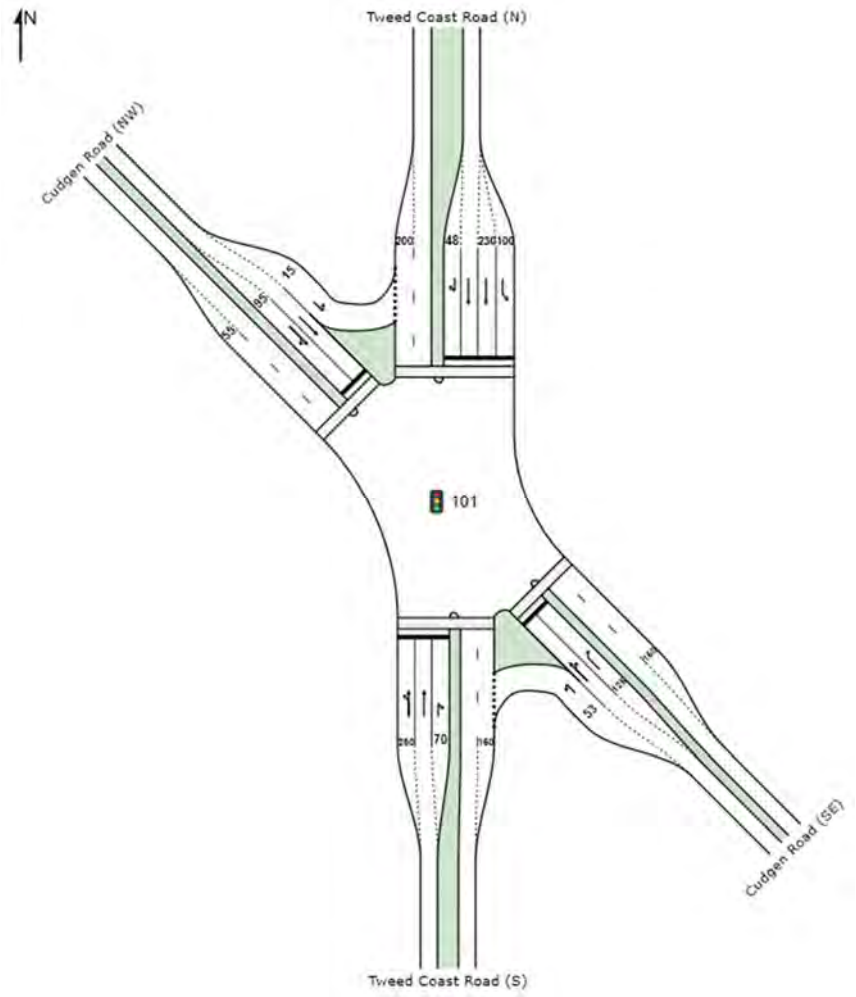


Figure 5.6 Tweed Coast Road/ Cudgen Road SIDRA Intersection Layout – Upgrade 2
Source: Bitzios

New signalised pedestrian crossing facilities would be provided as part of the signalised access intersection for the Project Site. A new pedestrian connection will be provided on the southern side of Cudgen Road near the existing TAFE access, connecting the existing footpath with the new westbound bus stop and the new signalised access intersection.

To cater for the public transport demand generated by the site, provide direct public transport access for the site and to resolve deficiencies with the existing bus stop infrastructure, two new bus stops will be provided on Cudgen Road. The bus stops would be indented, minimising impact to through traffic and will include shelters and seating.

Preliminary discussions with Surfside Buslines identified that they are open to modification/ extension of Route 601 which currently terminates within Kingscliff TAFE. Changes to the route may include:

- extension of the route to terminate within the hospital site (i.e. using the site's primary signalised access and turning around at the site's internal roundabout)
- continuation of the service west along Cudgen Road and north on Tweed Coast Road
- once provided, utilising the future planned east-west links between Tweed Coast Road and Kingscliff.

It is understood that TfNSW in coordination with Surfside Buslines are in the process of a service planning review. In addition, TfNSW are currently trialling On-Demand services across Greater Sydney including the Central Coast and Illawarra regions. Tweed Valley Hospital's inclusion within any updates to the service planning and the inclusion of On-Demand services will occur over the coming years in consultation with TfNSW, Surfside Buslines and other transport operators.

Following a review of the speed environment and traffic safety, as well as the proposed development, Local Area Traffic Management (LATM) measures are not considered warranted for the surrounding road network.

Relevant transport "enabling works" would be funded by Health Infrastructure. These include:

- the four site access intersections on Cudgen Road. Note that as per **Section 3.5** the east and west access points would be created separately as Preliminary Works. The main signalised site access intersection and other secondary access would form part of Stage 2
- provision of the new bus stops and associated infrastructure (Stage 2).

Health Infrastructure will work with Tweed Shire Council and RMS on the delivery of external traffic infrastructure commensurate with future planning for the surrounding road network. This includes upgrading the Tweed Coast Road/ Cudgen Road intersection separately as Preliminary Works to provide a better level of service.

As part of future planning a way finding signage scheme would be developed for the site to facilitate identification and legible access/ circulation.

Noise attenuation requirements relevant to the Project, including traffic, have been addressed by the acoustic consultant and summarised in **Section 5.11**.

5.7.9 Conclusion

A number of site access points and required upgrades have been identified and can be undertaken at applicable stages to adequately service and cater for the Project. Transport enabling works including the four access intersections will be funded by Health Infrastructure. Health Infrastructure will work with Tweed Shire Council and RMS on the delivery of external traffic infrastructure commensurate with future planning for the surrounding road network.

The overall conclusion from the investigations carried out by Bitzios Consulting and presented in the Traffic Impact Assessment is that traffic, parking, access and circulation arrangements for the Project would be satisfactory and there are no traffic or parking impediments to the Project.

5.8 SEAR 8 - Ecologically Sustainable Development

5.8.1 Overview of Sustainable Design Approach

An Environmentally Sustainable Design (ESD) report has been prepared by Steensen Varming and is attached at **Appendix M**. The report provides a summary of the relevant industry best practice guidelines and outlines how the design team will respond to the requirements through the implementation of specific ESD measures and initiatives for the Concept Proposal and Stage 1 Early and Enabling Works (addressed in **Section 6**). The development of the detailed design for Stage 2 (main works/ construction and operation) will further address ESD considerations and their implementation. The design (noting current stage is for a Concept Proposal; without detailed design)

should respond to the applicable ESD requirements contained within the following documents as considered in the ESD report:

- NSW Energy Efficiency Action Plan 2013
- NSW Government Resource Efficiency Policy (GREP)
- NSW Climate Change Policy Framework
- NSW Health Infrastructure Engineering Services Guidelines
- BCA Section J Requirements
- Sustainable Policy for NSW Government
- NSW and ACT Government Regional Climate Modelling climate change projections.

The relevant ESD requirements of the above guidelines are summarised in the ESD report at **Appendix M**.

ESD has been considered in the Concept Proposal and the initial design of the Project, with the aim to ensure the Project responds appropriately to the principles of sustainable design and ensure Health Infrastructure continues to deliver environmentally responsible projects. The requirements set out in the ESD report and policy can be categorised into several key areas as follows:

- Improving the health and wellbeing of building users
- Reducing energy consumption and associated CO2 emissions (e.g. implementing passive design measures to reduce energy demand; using efficient plant to meet reduced demand; considering installation of low or zero carbon (LZC) technologies to make further savings)
- Reducing potable water consumption
- Reducing the impacts of materials specification (e.g. use of sustainable and low carbon materials; use of locally sourced materials; improving material efficiency)
- Reducing the generation of waste associated with the development
- Reducing pollution associated with the development (e.g. surface water run-off, external lighting).
- The ESD report sets out a basic sustainable design framework covering these high-level objectives and summarises some of the specific measures and design principles which are currently proposed or are being considered by the respective design disciplines in the context of the Concept Proposal. The list below is a summary of measures and design principles from the ESD, which provides further detail.

This framework will be taken forward into the development of the detailed design for Stage 2 (main works/ construction and operation) which will further address ESD considerations and their implementation.

The following is a summary of the ESD initiatives for the Project (further elaboration is provided in the ESD report at **Appendix M**):

- Electrical Services:
    - Internal lighting design to improve occupant comfort
    - External lighting design to exceed minimum energy efficiency requirements and limit light pollution to surrounding areas
    - Specification of lighting controls
    - Specification of energy efficient equipment (all services)
    - Effective metering and monitoring (all services)

- Mechanical Services:
    - Passive conditioning techniques to reduce energy loads
    - Energy efficient heating, ventilation, and air conditioning (HVAC) system design and operation
    - Building management system to schedule and optimise plant efficiency
- Hydraulic Services:
    - Water and energy efficient fixtures and fittings
    - Submetering to reduce wastage
    - High efficiency plant
    - Materials specification in accordance with best practice
- Architectural:
    - Improving health and wellbeing
    - Reducing daylight glare to improve occupant comfort
    - Facilitating external views to improve occupant comfort
    - Maximising daylight to improve occupant wellbeing, and reduce energy consumption for artificial lighting
    - Using passive environmental design strategies to reduce energy demand
    - Reducing the impacts of materials specification
- Structural/ Civil Services:
    - High recycled content
    - Materials efficiency
    - Locally sourced materials
    - Reduction in energy use
    - Reducing construction waste
    - Reducing pollution associated with the construction and future operation of the development.

5.8.2 Water Management

ACOR Consultants have prepared an Integrated Water Management Plan (IWMP) in conjunction with an Infrastructure Management Plan (IMP) that addressed Hydraulic and Fire Services. The reports are attached in **Appendices T** and **U** and summarised in more detail at **Section 5.13** (Utilities).

ACOR Consultants, in the capacity of the Project hydraulic and fire services engineers has reviewed the condition, capacity, compliance, reliability and efficiency of the existing supply authorities and hospital infrastructure against the existing demands, the proposed demands and the Concept Proposal of the Tweed Valley Hospital. Existing (based on TTH) and proposed sewerage and water load calculations are provided in the IMP at **Appendix U**.

ACOR have found that the assessed infrastructure services (including water supply, waste water/ sewerage system) are suitable. As confirmed by the IMP and IWMP, the Concept Proposal can readily be serviced from existing infrastructure to service the proposed development loads.

The IWMP outlines that the hydraulic services systems documented will:

- Minimise site potable water consumption
- Ensure the safety of building occupants and patients
- Minimise water wastage

- Minimise initial capital cost and ongoing maintenance and energy costs.

Scope of services covered within the hydraulic services water management report, include:

- Sanitary and trade waste discharge
- Roof water plumbing and drainage systems connecting to existing civil trunk stormwater
- Domestic potable water supply systems and water supply security measures
- Alternative non-potable water supply systems and reclaimed rainwater
- Specialised Reverse Osmosis treated water
- Demonstration of water conservation measures.

These aspects of hydraulic services are addressed in further detail at **Section 5.13** and **Appendices T** and **U**, including measures and initiatives to minimise/reduce the demand on supplies and ensure efficiency.

Water and waste water systems to be implemented will meet the requirements of all statutory building codes, NSW Health requirements, NSW Health Infrastructure requirements and current industry best practice regarding water, waste and energy efficiency.

5.8.3 Principles of Ecologically Sustainable Development

The Project has been assessed against the ecologically sustainable development principles outlined in Schedule 2 of the EP&A Regulation 2000 which is summarised below.

5.8.3.1 The precautionary principle

Schedule 2 of the EP&A Regulation 2000 states *"the precautionary principle"*, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

"Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment. An assessment of the risk-weighted consequences of various options'".

The precautionary principle has been applied in the assessment of the Concept Proposal and generally for the future Stage 2 proposal. Stage 1 works are assessed separately below.

Potential environmental impacts of the Project would be relatively minor due to the current condition of the Project Site and nature of the works which are predominantly restricted to the existing highly disturbed areas. The Project is required to provide the Tweed-Byron region with an expanded and contemporary standard health facility and improved level of service. All works would be undertaken in accordance with the safeguards outlined in **Section 9** of this EIS.

Another precautionary measure is that hospitals are considered to be critical facilities and should be situated in a manner that reduces their susceptibility to risks or hazards. The Tweed region presents significant flood challenges, with a large extent of land affected by the 100 ARI and PMF flood levels. It is best practice and government planning policy to locate hospitals on land above the PMF to ensure that such critical facilities are not adversely impacted or strained during flood events. The Project Site and design response ensure the hospital would not be prone to flooding and is above the PMF level. Flooding is further addressed in **Section 5.17**.

5.8.3.2 Intergenerational equity

Schedule 2 of the EP&A Regulation 2000 defines inter-generational equity as "*the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations*".

The Project would not significantly affect the viability of local or threatened species, or any endangered ecological communities (EECs) or other environmental resources including water, soil and air. Therefore, local environmental values would not be substantially adversely affected by the Project and would be maintained for future generations. ESD initiatives incorporated into the Project would also help to deliver an environmentally responsible development. Without the works proceeding, the level and quality of hospital services provided to the Tweed-Byron region would decline. Overall, the socio-economic, safety and environmental benefits of the Project would occur with minimal potential environmental expense.

5.8.3.3 Conservation of biological diversity and ecological integrity

Schedule 2 of the EP&A Regulation 2000 requires the "*conservation of biological diversity and ecological integrity*", namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration.

The impacts to ecological integrity and conservation of biological diversity at the site have been thoroughly assessed as part of this EIS. No threatened species, endangered populations or threatened ecological communities (TECs) are likely to be adversely affected by the Project. No populations of native species are likely to be made locally rare or unviable as a result of the Project. Consequently, ecological integrity and biological diversity would be maintained at and surrounding the site. Biodiversity has been addressed at **Section 5.19**.

5.8.3.4 Improved valuation, pricing and incentive mechanisms

The following principles of valuation, pricing and incentive as per Schedule 2 of the EP&A Regulation 2000 are acknowledged as part of this review:

- Polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement.
- The users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.
- Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

This EIS has undertaken a thorough assessment of potential impacts and consequently has developed a set of mitigation measures and safeguards to ensure sound environmental practices and outcomes. The capital investment of the Project includes expenditure on ensuring that the works include adequate environmental measures and allows for effective construction management and measures to reduce environmental impact/ footprint.

5.9 SEAR 9 - Social and Economic Impacts

5.9.1 Overview

Given the significant nature of the Project to deliver a new hospital on a greenfield site, which also effectively relocates the existing hospital from Tweed Heads to Kingscliff and development of a greenfield (currently agricultural) site, a Social and Economic Impact Assessment (SEIA) has been prepared by SGS Economics and Planning (SGS). This report is attached at **Appendix Z**.

A SEIA for a hospital is primarily concerned with the nature of improvements to healthcare provision, experience and accessibility. In this case, with the geographical nature of the facility's relocation, there are also other social considerations around safety and rural/agricultural resources and lands.

The objective of the SEIA is to identify and evaluate the extent of economic and social impacts which will result from the development of the Tweed Valley Hospital. The evaluation is required to support the planning approvals process and SSD application.

The evaluation supports the SSD application through:

- Reviewing the identified and perceived impacts that may face the community
- Evaluating the socio-economic impacts (both positive and negative)
- Assessing the significance of the socio-economic impacts.

The focus of the SEIA analysis encompasses the Tweed and Byron Shire LGAs and is the official geographic catchment of the Tweed Valley Hospital as identified by the NNSW LHD.

SGS has employed a range of methods in its evaluation and assessment of social and economic impacts, including:

- Reviewing background materials to define the key issues
- Profiling the local catchment to understand the socio-economic context of the local region
- Linking that contextual understanding to the core purpose of the hospital redevelopment and relocation as articulated under the Tweed Valley Hospital Project Business Case document
- A Social Impact Assessment (SIA) which assesses the extent to which the proposed expansion and relocation of the hospital addresses a range of issues in this community, including health, amenity and access to services as defined under the catchment profile
- An Economic Impact Assessment (EIA) which presents direct employment and economic impacts, as well as calculating the wider economic effects on output, value added and employment through the use of an Input-Output (IO) Model
- Identification and assessment of positive and negative externalities which are likely to result from the relocation and expansion of the hospital facility.

The Social and Economic Impact Assessment is guided by the principles outlined in the *Social Impact Assessment Guideline (IAIA, 2015)*, as relevant to the specifics of the Tweed Valley Hospital Project. The SEIA outlines the issues pertaining to the function of the hospital in the Tweed Valley Catchment, considers and assesses the impacts that elements of the project or process will have and, where applicable, provides mitigation recommendations or links to other studies that provide mitigation procedures.

5.9.2 Contextual Analysis

The Project addresses a specific, identifiable need for increased provision of health services in the local community. Existing and future trends in the catchment of this hospital indicate there are a range of benefits which a greenfield hospital facility can deliver to the region. The extent and nature of these trends are explored in this chapter, along with analysis of how the new hospital will expand services in response to these evolving needs.

In undertaking the SEIA, a review of socio-economic, health and illness trends in the local catchment has been undertaken to gain a contextual understanding of the main issues in this catchment when it comes to the health and wellbeing of the local community.

The SEIA explores some of the challenges in addressing these issues and how the Tweed Valley Hospital is intended to assist.

The SEIA finds that based on population projections, particularly the projected increase in people aged 65 and over, combined with a sustained upwards trend of rates of hospitalisations, there is a clear indication of an increased future demand for health services in the local and Northern NSW catchment. Thus, the need for a larger facility with a wider range of services is justified.

5.9.3 Assessment and Findings

The following community impacts have been identified and defined as economic (direct and wider) or social as outlined in **Table 5.16.** Each impact is described in detail in the respective sections of the SEIA at **Appendix Z**. These are summarised below.

Note that in the SEIAs, the impacts being assessed are marginal to the base case of no hospital relocation or expansion. That is, the impacts described here (and in the SEIA) must be in addition to positive or negative impacts that would have otherwise occurred anyway (for example, interim maintenance works at the existing facility which are ongoing).

A Social Impact Assessment (SIA) for a hospital is primarily concerned with the nature of improvements to healthcare provision, experience and accessibility. In this case, with the geographical nature of the facility's relocation, there are also other social considerations around safety and rural/agricultural resources and lands.

An Economic Impact Assessment (EIA) primarily measures the degree to which the economic stimulus associated with a project accumulates in total economic activity levels of a defined region, i.e. after measuring the cumulative impact of all the buyer/supplier transactions that are induced in the region.

Table 5.16 Identification of Social and Economic Impacts

Social Impacts	*Economic Impacts*
■ Impact on surrounding areas during construction ■ Impact on availability of health services and facilities ■ Impact on capacity of health services and facilities ■ Impact on quality of health care provision ■ Impact on health care experience for patients, carers and families	**Direct Impacts** ■ Employment during construction ■ Employment and Employment Growth during operations ■ Gross Regional Product ■ Loss of agricultural land ■ Reduced economic function of centre ■ Impact on traffic and car parking

Social Impacts	*Economic Impacts*
■ Impact on physical accessibility of health services and facility ■ Impact on catchment self-sufficiency and cross-border patient flows ■ Impact on skills, education and research ■ Impact on health outcomes for Aboriginal and Torres Strait Islander people ■ Impact on community safety ■ Impact on patient, patient carers and families and staff safety ■ Impact on the amenity of the surrounding environment ■ Impact on rural lands ■ Impact on Tweed Heads Town Centre	■ Impact on agglomeration and clustering of health services **Wider Impacts** ■ Employment during construction ■ Employment and Employment Growth during operations ■ Gross Regional Product during construction ■ Gross Regional Product during operations

Source: SGS Economics and Planning

The overall impact has also been qualitatively distilled within a net community benefit framework within the SEIA and then in turn discussed in distributional terms as many of the impacts vary in terms of spatial intensity.

The social and economic impacts generated by the Project are described qualitatively in **Table 5.17** below (and in more detail in the SEIA).

Each impact is described as being high, medium or low, as well as an indication of whether the impact is a net positive or net negative impact. These qualitative descriptions are defined as follows:

- **High** – The impact is expected to have a significant effect and be felt throughout the whole catchment and even beyond, driven by the provision of services or infrastructure not currently within the catchment.
- **Medium** – The impact is expected to have a moderate impact throughout the catchment and be driven by a marginal change in infrastructure or services already provided.
- **Low** – The impact is likely to have negligible impact, be appropriately mitigated to remove its impact or have local or temporary impacts.

Those impacts that are considered Medium or High are most likely to influence the overall findings of a net community benefit assessment or Cost Benefit Analysis.

The majority of impacts identified in the social and economic assessments are likely to be positive, although the strength of these impacts varies significantly. These positive impacts are to some extent mitigated by some negative impacts, the most significant being the reduced economic function of the Tweed Town Centre as a result of the relocation, with others being fairly minor or ones which can be mitigated to a large extent with identified measures.

Impacts have been split by the two parts of Stage 1 – early enabling work and concept development of the hospital, to indicate when the impacts are likely to be generated. Mitigation measures are also identified, as appropriate, for negative impacts.

Table 5.17 Net Impact across Social and Economic Assessments, with Strength of Impact

Phase	*Positive*	*Negative*	*Mitigation Measures*
Early Enabling Works			
Social			
Impact on surrounding areas during construction		Medium	Construction is temporary and on-site traffic and construction measures will mitigate worst of the issues. Project Site is not immediately adjacent residential areas.
Impact on the amenity of the surrounding environment		Low	Considered during design process to minimise visual impact (Refer to Built Form and Urban Design Report)
Impact on rural lands		Low	Land Use Conflict Risk Assessment undertaken with risk management recommendations made
Economic			
Increased employment during construction phase (continuing into stage 2)	High		
Loss of agricultural land		Medium	Developed land unable to be relocated resulting in loss of land. Design measures seek to minimise impact on adjacent rural lands (see above). Project Site is small component of Far North Coast's State Significant Farmland (0.13%) agricultural land
Concept Development			
Social			
Improved availability of health services and facilities	High		
Increased capacity of health services and facilities	Medium		
Improved quality of health care	Medium		
Improved health care experience for patients, carers and families	Medium		
Enhanced catchment self-sufficiency in service provision	High		
Positive impact on skills, education and research capacity of NSW health care workers	High		
Positive impact on the health outcomes of Aboriginal and Torres Strait Islander community of Northern NSW	Medium		

Phase	Positive	Negative	Mitigation Measures
Reduces the risk of patients, visitors and staff members being adversely affected by infectious diseases, the behaviour and actions of drug and alcohol affected patients, and from flooding.	High		
Impact on surrounding areas during construction		Medium	Construction is temporary and on-site traffic and construction measures will mitigate worst of the issues. Project Site is not immediately adjacent residential areas.
Impact on physical accessibility of health services and facility		Low	Relocation of Hospital remains within local catchment, minimising wider impacts; potential to increase bus service and frequency between Tweed Heads and Project Site to facilitate patient and visitor accessibility. Long term population growth will benefit from more centralised health facilities; reduced cross-border patient flows will free up beds for NSW patients.
Impact on the amenity of the surrounding environment		Low	Considered during design process to minimise visual impact (Refer to Built Form and Urban Design Report).
Impact on rural lands		Low	Land Use Conflict Risk Assessment undertaken with risk management recommendations made.
Impact on Tweed Heads Town Centre		Medium	Relocation of Hospital remains within local catchment, minimising wider impacts; potential to increase bus service and frequency between Tweed Heads and Project Site to facilitate patient and visitor accessibility; Transition of current site to another use will mitigate issues around passive surveillance and centre activity. Development of Regional City Action Plan for Tweed.
Impact on community safety		Low	Application of CPTED principles in design process.

Source: SGS Economics and Planning

The SEIA also includes a distributional analysis to assess the extent to which the various impacts are concentrated in a local township or more evenly distributed across the broader region or the State of New South Wales (refer to SEIA for detail). Consultation was also undertaken by TSA and Health Infrastructure to understand the likely nature of impacts to key local stakeholders (particularly land users) and property owners/ occupiers in the vicinity of the Project Site. The likely impact findings along with potential mitigation measures are identified in the SEIA.

The distributional analysis demonstrates that most of the positive social outcomes associated with the Project benefit the broader Tweed-Byron region, whilst some negative impacts would appear to be more concentrated to either the Tweed Town Centre or Kingscliff.

Health Infrastructure notes that DPE and Tweed Shire Council are in the process of developing a Regional City Action Plan for Tweed, which will provide the opportunity to develop a future vision for TTH site, accounting for the opportunities canvassed in the SEIA.

The relocation of the hospital from the Tweed Town Centre would also be mitigated by retaining suitable community health and other out-of-hospital services in Tweed Heads.

Nonetheless, both Kingscliff and Tweed Town Centre also stand to benefit from other locally specific impacts associated with the hospital relocation and expansion as well.

5.9.4 Summary and Conclusion

The SEIA has applied a mix of quantitative and qualitative methods in the undertaking of its analysis. It considers both positive and negative impacts, however, it finds that development of a heath facility related land use (the Tweed Valley Hospital) in Kingscliff will, on balance, create an overall positive social and economic impact to the region.

In economic terms, the Project delivers:

- 2700 Full Time Equivalent (FTE) construction jobs over 3.5 years
- Operations phase - which refers to the stimulus generated by the operations of an expanded hospital at Kingscliff. This includes a base staffing of 1,053 FTE jobs currently, rising by an estimated 20 per cent to 2026/27, and then increasing by an estimated 1.1 per cent per annum to 2031/32. Further details of workforce planning would be developed. The operations phase will be realised in Stage 2 of the Project
- $425 million of Gross Value Added (GVA) to the NSW economy during the construction period
- A net annual increase of $46 million in GVA to the NSW economy once the hospital is fully operational.

The primary social benefits to the local community materialise in terms of improved availability, capacity and quality of healthcare. Specifically, the improvements will come from relieving constraints on perioperative services, inpatient beds, ED treatments/care, cancer services and elective surgery.

The Project will also result in the employment of more health practitioners, greater opportunities for practitioner upskilling as well as broader training and education for both staff and students across the campus and broader health and education precinct. This would include the hospital's programs around clinical placements for tertiary students, vocational education traineeships and digital library services for researchers.

The main negative impacts relate to the relocation aspect of the hospital services (from Tweed Heads), including the loss of agricultural land (valued at $0.4 million gross value added per annum), reduced economic function of the Tweed Town Centre in the short to medium term and increased traffic volumes at Kingscliff. There is also a marginal risk that the vacated location in Tweed Town Centre will have reduced physical accessibility to community health services. However, this can be potentially mitigated through the provision of a range of community health and other out-of-hospital services located in or close to the Tweed Heads Town Centre, as well as the improvement of public transport access between Tweed Town Centre and the new facility at Kingscliff. Delivery of the new Tweed Valley Hospital will have a positive impact on the availability of health services and facilities for both the local catchment and the Northern NSW catchment.

Other potential negative impacts identified in the SEIA can be mitigated with relevant measures identified in this EIS and those specifically referred to in the SEIA, including measures to manage community safety at the new facility through CPTED, incorporation of measures to assist in reducing or mitigating construction and amenity related impacts, and providing adequate on-site parking and measures to reduce potential traffic impacts.

5.10 SEAR 10 – Aboriginal Heritage

5.10.1 Background and Introduction

Niche Environment and Heritage Pty Ltd (Niche) was commissioned to prepare an Aboriginal Cultural Heritage Assessment (ACHA) for the Tweed Valley Hospital. The assessment is required to inform the EIS and is attached at **Appendix N**.

The assessment included background archaeological and historical investigation, consultation with the Registered Aboriginal Parties (RAPs) and an archaeological survey with the participation of the RAPs.

For this ACHA the Project Site is defined as all of the area proposed to be included in the proposed development footprint, inclusive of all internal roads, buildings, carparks, landscaping and ancillary sites required for the ongoing management of the proposed hospital.

5.10.2 Scope and Objectives

The objectives of the archaeological investigation are to identify whether Aboriginal sites, objects or places are present within the Project Site and, if present, determine whether these would be impacted by the proposed works and provide appropriate mitigation and management recommendations in accordance with the *National Parks and Wildlife Act 1974* (NSW). The assessment documents consultation with the local Aboriginal community, identifying any spiritual, traditional, historical or contemporary associations or attachments to Aboriginal sites or objects within the Project Site and/or to the Project Site itself. The results of the assessment are then used to outline recommended management measures in accordance with current best practice and informed by input from the Aboriginal community.

As outlined in the ACHA Report, the report has been prepared in accordance with (but not limited to) the following regulations and guidelines:

- Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (NSW Department of Environment and Conservation [DEC] 2005a)
- Aboriginal cultural heritage consultation requirements for proponents 2010 (ACHCRs) (NSW Department of Environment, Climate Change and Water [DECCW], 2010a)
- Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010b)
- Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECCW, 2010c)
- Guide to Investigating, assessing and reporting on Aboriginal cultural heritage in NSW (NSW Office of Environment and Heritage [OEH], 2011)
- The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance (Australia International Council on Monuments and Sites [ICOMOS], 2013)
- Engage Early (Commonwealth Government, 2016)
- NSW National Parks and Wildlife Regulation, 2009 (NPW Regulation)
- Tweed Aboriginal Cultural Heritage Management Plan 2018.

As per the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010), Niche followed the four stages of consultation which included the notification of project proposal and registration of interest, presentation of information about the Project, gathering information about cultural significance and a survey, and review of the draft report.

5.10.3 Register Searches, Site History and Disturbance

A search of the Australian Heritage Database, State Heritage Register (SHR) and Tweed Local Council LEP (2014) found no heritage listings/ sites relevant to the Project Site.

A search of the Landform Mapping and Predictive Modelling (LMPM) conducted on 26 July 2018, identified that most of the Project Site has been mapped as part of a larger area containing 'Predicted Aboriginal cultural heritage'.

A search of the AHIMS was conducted on 19 June 2018 (AHIMS Client ID 351986), revealed that no previously recorded sites have been identified within or in proximity to the current boundaries of the Project Site.

The ACHA outlines the landscape context of the Project Site. In summary, the extent of disturbance from previous and current farming activities, within much of the Project Site, mean it is unlikely that there will be undisturbed archaeological deposits related to Aboriginal occupation. This includes the elevated ridgeline and north-facing slopes within the Project Site. The lower-lying areas adjacent to the wetland may be less disturbed and there exists some potential for subsurface archaeological deposits in these areas. Additionally, landscape features such as those commonly identified as places of importance to Aboriginal people are noted within and adjacent to the Project Site. There is the potential for intangible cultural heritage values to exist.

5.10.4 Survey Methods

All 11 RAPs were invited to participate in the cultural significance assessment however only two individuals attended the surveys.

The methodology for the ACHA was developed by Niche and a copy is provided in that report at **Appendix N**.

The field surveys for the assessment concentrated on:

- Areas within the Project Site that would be disturbed by surface infrastructure including buildings, internal roadways, and carparks, as well as areas designated for hydrological and landscaping/ gardening works
- Areas which retain higher archaeological potential within the Project Site.

The following methods were used to identify archaeological resources, heritage values and significant cultural themes for the Project Site:

- Aboriginal community input – this was sought via the consultation process, participation in archaeological fieldwork and other correspondence
- Archaeological research, including landscape characterisation and field survey.

The above methods and activities have been ongoing throughout the assessment project, and continuously informed each other.

5.10.5 Assessment and Aboriginal Heritage Significance

Niche has carried out a detailed and staged investigation to assess the potential for any Aboriginal archaeological resource that might exist within the boundaries of the Project Site and undertaken consultation with RAPs to understand its cultural heritage significance.

The investigation included a review of previous archaeological work in the surrounding area and an archaeological surface survey of the Project Site.

The surface survey results have demonstrated the following:

- Visibility/ exposure was good to very good across the Project Site
- The Project Site has been significantly disturbed across almost its entirety, as evidenced by numerous crop fields, access tracks, bund walls, and irrigation infrastructure
- The soil and sediments are unlikely to contain any sub surface deposits of archaeological material due to the degree and duration of previous disturbance (cropping).

Based on the assessment, it has been concluded that the Project Site has low archaeological potential, for the following reasons:

- No sites of Aboriginal cultural heritage were identified on the surface of the ground during the survey
- The amount of and duration of cropping activities across the Project Site would have greatly disturbed any sites that may have existed here in the past
- The type of cropping (sweet potato) involves stripping back of the topsoil which over time would have greatly reduced the amount of soil and increased the impacts to underlying sediments.

The results of the archaeological investigation reflect the patterns of occupation and site distribution observed in the wider area, that permanent and ephemeral water sources were more utilised as camp sites and that areas away from water were used in a transitory nature. On the basis of the results of the investigation Niche has concluded the following:

- Any evidence of past Aboriginal land use has been detrimentally impacted by cropping activities
- The Project Site has extremely low potential to contain intact archaeological deposits.

Statements of significance for the Project Site are presented in the ACHAR. These statements of significance have been prepared in consideration of comments received from the RAPs during the consultation process, including those comments relating to the cultural significance of all sites and the interrelationships between the cultural and spiritual values with the natural landscape. Statements include:

- The Project Site is of social significance to the Aboriginal community as it is nearby to a significant site as told by one of the survey participants.
- The Project Site has aesthetic values due to its prominent position on an elevated landform with views in an almost 360-degree arc. The creek bank at the western margin of the Project Site was also acknowledged as having aesthetic values which will be increased by planned culling of pest vegetation.
- The Project Site contains no identified historic values relating to Aboriginal heritage.
- The Project Site has low archaeological values due to the degree and duration of cropping activities which has impacted on the surface and subsurface deposits across the majority of the area.

5.10.6 Conclusion and Recommendations

As identified during the site inspection for the proposed hospital infrastructure, there are no Aboriginal cultural heritage objects, places or features situated within the Project Site. The proposed development, which involves the construction of internal roads, hospital buildings, carparks and other

ancillary sites required for the hospital precinct will not impact on any Aboriginal cultural heritage values.

No further assessment is required.

Precautionary mitigation measures / recommendations are outlined in **Section 6.9** in relation to Stage 1 works.

5.11 SEAR 11 – Noise and Vibration

Acoustic Studio were engaged to prepare a Noise and Vibration Impact Assessment (**Appendix P**).

The existing noise environment has been established based on long-term and short-term monitoring data. Appropriate criteria for both noise and vibration have been discussed and set according to established guidelines and standards including:

- NSW Environmental Protection Authority (EPA) Noise Policy for Industry (NSW NPI) 2017
- NSW EPA Interim Construction Noise Guideline (ICNG) 2009
- NSW EPA Assessing Vibration: A Technical Guideline 2006.

While the assessment is primarily for a Concept Proposal, a preliminary operational noise assessment has also been included, to demonstrate that the Stage 2 operation (which will be assessed in detail in a separate application) of the Tweed Valley Hospital is capable of achieving applicable environmental noise criteria at nearby noise sensitive receivers.

5.11.1 Surrounding Land Uses and Existing Noise Environment

The Project Site is located within a suburban environment in Cudgen on the edge of Kingscliff, characterised by medium levels of activity throughout the day/ evening and low noise levels in the night.

The following land-uses surround the Project Site and have been grouped into catchments as identified in the Noise and Vibration Impact Assessment:

- Catchment Area A
  - Residential
  - Educational
    - Kingscliff High School to the southeast (closest and most affected educational receiver)
    - Kingscliff Library to the northeast
  - Passive Recreation Area - Jack Julius Park
  - Commercial including
    - Kingscliff Community Health Centre
    - Civic Swimming Pool
    - Life Bridge Australia
- Catchment Area B
  - Residential
  - Educational – North Coast TAFE Kingscliff Campus (TAFE)
  - Agricultural/ Commercial

- Catchment Area C
  - Residential
  - Agricultural.

Figure 5.7 shows the proposed Project Site in relation to noise-sensitive receivers. In addition to unattended long-term noise monitoring, attended short-term noise measurements were also carried out at Locations 1, 2 and 3.

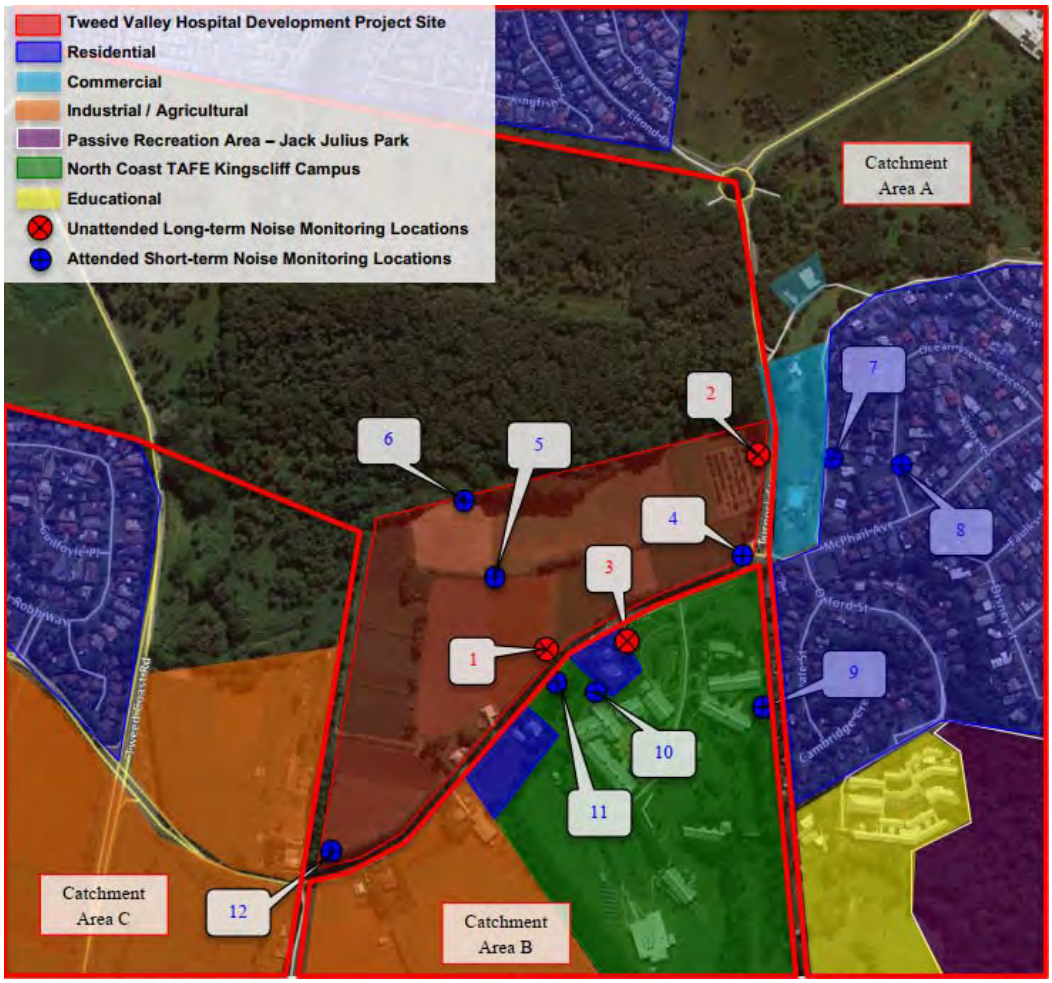


Figure 5.7 Noise-sensitive receivers and monitoring locations
Source: Acoustic Studio

A survey of the existing noise environment around the site perimeter bounded by Turnock Street, Cudgen Road and Tweed Coast Road was conducted through unattended noise monitoring to continuously record the noise levels on the site. Unattended long-term noise monitoring was carried out for the following periods:

- Thursday, 26 July to Friday, 3 August 2018 at the nearest residential noise sensitive receivers to establish the typical range of ambient and background noise levels at receiver locations
- Prior to unattended monitoring at the nearest residential noise sensitive receivers, unattended monitoring was carried out on the Project Site between Thursday, 14 June to Friday, 22 June 2018 on the Project Site to establish the typical range of ambient and background noise levels of the Project Site and surrounds plus traffic noise levels affecting the site.

The unattended long-term noise monitoring locations are shown in Figure 5.9. The noise loggers were located at the street-side boundaries of the Project Site and residential properties at the perimeter of the Site. These locations were chosen as they:

- were secure places to leave the noise loggers unattended
- were judged to provide representative of background and ambient noise levels at the nearest noise sensitive receivers plus traffic noise levels affecting the Project Site.

Operator attended, short-term monitoring was also carried out on Thursday, 14 and Friday, 22 June, Thursday, 26 July and Friday, 3 August 2018 in order to supplement the long-term outdoor data across the site and at key surrounding receivers, such as the TAFE campus and residences nearby, and to obtain spectral noise data for traffic noise at the Project Site.

Noise monitoring results are presented in the Noise and Vibration Assessment at **Appendix P**.

Based on the observations during the site inspections, both ambient and background noise levels around the Project Site are generally dominated by traffic noise and general urban hum around the site at all three locations.

Twelve (12) short-term noise monitoring locations were chosen as representative of the site and surrounds. These locations, including a summary of the measured values of the short-term background and ambient noise monitoring around the existing Site are also provided in the Noise and Vibration Assessment at **Appendix P**.

5.11.2 Concept Proposal

In response to the SEARs, the Noise and Vibration Report provides:

- An outline of key noise mitigation and management strategies that would inform the final design of the hospital to minimise potential noise impacts on the surrounding sensitive receivers
- An outline of key strategies to avoid or reduce impact of noise on the users of the site due to agricultural activities on the adjoining lands
- Commentary on the tentative locations of the proposed helipad, driveway/ road access, loading docks, service areas and other back of house areas to demonstrate that the noise impacts on sensitive receivers are avoided wherever possible.

Strategies that have been/ would be applied in the design include:

- Road layouts provide multiple entry points and reduce unnecessary use of the main entry. They also promote forward movement and unnecessary turning and reversing
- Service areas, loading docks and ambulance bays would be positioned away from the nearest noise sensitive receivers
- Selecting plant and equipment without any annoying characteristics such as low frequency or tonality (which can often be associated with pumps and chillers)
- Locating of plant strategically to ensure that the cumulative noise contribution at the receiver boundary is achieved. Where practical, plant will be located facing away from the nearest noise sensitive receivers or controls will be provided as required to reduce noise impact
- Noise mitigation/ control measures that are allowed for in the design (generally for plant and equipment) will include:

    - Noise enclosures or barriers/ screening as required
    - Acoustic louvres as required
    - In-duct attenuation

- Sound absorptive panels.

Potential noise impacts have been considered from agricultural activities on adjoining lands and road noise:

- The hospital building is located centrally to the proposed internal road network such that it is bounded by staff and public carpark on either side providing separation from Cudgen Road and neighbouring boundaries
- The hospital building is set back from Cudgen Road and the nearest agricultural land use, at a sufficient distance such that the determining factor for the building envelope construction will be driven by the control of Emergency Helicopter noise, which will be louder than noise associated with agricultural uses and road traffic noise.

The following comments with relation the design strategy and noise considerations are also provided:

- The Helipad will be located on the hospital building roof towards the west to provide for arrival and departure path requirements. This provides the maximum practical distance/ elevation from residences. Helicopter noise intrusion into the hospital has also been considered and identified that acoustic glazing and wall constructions will be required to some areas of the building (to be assessed further at Stage 2).
- Multiple road access points (a total of four) are provided, including a connecting rear road setback from Cudgen Road, which reduces hospital traffic at any one location and unnecessary trips on the main entry. This provides access for staff, service vehicles and ambulances as a left in only from the west most part of the site.
- Loading docks, service yards, plus ambulance bays would be setback from Cudgen Road at the most practical distance, away from the nearest noise sensitive receivers to limit noise impacts.
- The main access roadway to the hospital includes a new intersection with traffic lights with close proximity to residential receivers at 764 Cudgen Road, Cudgen. This location and the type of intersection has been dictated by a number of site specific factors and requirements, including:

    - This establishes an ordered entrance forecourt space and approach with centralised main public set-down, including public transport
    - The main entry is designed as a signalised intersection to cater for the design traffic volumes and to provide suitable pedestrian amenity and safety
    - Providing sufficient vegetation buffer from overspray on adjacent farmland/ agricultural sites
    - Providing maximum separation from other proposed hospital access points, as well as separation from existing driveways/ road access for other properties along Cudgen Way
    - Alignment with the TAFE frontage to allow for a potential future upgrade to a four-leg intersection as part of future expansion or development of the TAFE site.

5.11.3 Operational Noise Emissions Criteria

The NSW Noise Policy for Industry (NPI) provides guidance on methodology for determining limiting noise criteria for external noise emissions from plant associated with a development.

The criteria have two components:

- Intrusiveness Noise Level – controlling intrusive noise impacts in the short-term for residences
- Amenity Noise Level (ANL) – maintaining noise level amenity for particular land uses for residences and other land uses.

Based on the measured noise levels and in accordance with the methodology outlined in the NSW NPI the Noise and Vibration Assessment details the corresponding limits of allowable noise emission at the nearest receiver boundaries from the hospital. This includes criteria for (refer to **Appendix P** for detail):

- Plant and equipment
- Sleep disturbance and awakening
- Traffic
- Emergency Helicopter Operation.

5.11.4 Stage 2 Operation - Preliminary Assessment Summary

The Noise and Vibration Assessment has undertaken a preliminary assessment of the operational component for Stage 2 of the Tweed Valley Hospital. The preliminary operational assessment is based on the current concept development for information purposes to demonstrate that the proposed land use for a hospital is suitable and capable of achieving the relevant operational criteria at the existing noise sensitive receivers. The assessment has identified potential mitigation methods which may need to be considered to achieve compliance with applicable environmental noise goals. The outcome of the high-level assessment is summarised as follows:

- Operational Noise
  - Once the Project is completed, the premises will operate 24 hours a day, seven days per week.

- Mechanical Plant
  - Mechanical plant and equipment associated with the operation of the development is to be controlled to ensure external noise emissions are not intrusive and do not impact on the amenity of neighbouring receivers in accordance with the relevant criteria established in the Noise and Vibration Assessment
  - At this concept stage, final plant selections have not been made, therefore, a detailed assessment has not been carried out
  - Criteria has been established in the Noise and Vibration Assessment. During the detailed design the acoustic consultants will provide detailed design advice to the architect and services engineers to ensure that noise emissions from plant and equipment are effectively controlled to meet the relevant criteria at the nearest receiver boundaries.

- Traffic Noise Generation
  - General Traffic Noise - General traffic increase along Cudgen Road, Turnock Street and Tweed Coast Road, as a result of the hospital operation, is unlikely to have adverse noise impacts on receivers surrounding the Project Site
  - New Traffic Intersection - The Tweed Valley Hospital will include a new intersection with traffic lights with close proximity to residential receivers at 764 Cudgen Road, Cudgen. This will change the characteristics of existing traffic noise and will be localised to this particular receiver. At the detailed design stage, a detailed assessment will be carried out to quantify the impact and how this change in traffic noise compares to existing traffic conditions at the site and if additional noise control measures are required where feasible and reasonable
  - On-site Traffic Noise Generation - Locations are still being developed and further development of the traffic assessment will be carried out. At this stage, based on a high-level assessment there are no anticipated issues with on-site traffic noise impacting on surrounding receivers. A full assessment will be carried out at the detailed design stage and noise control measures incorporated as required (such as strategic positioning and screening).

- Emergency Helicopter Operations
  - Helicopter facilities used exclusively for emergency aeromedical evacuation, retrieval or rescue are not deemed 'Designated Development' under the NSW Environmental Planning and Assessment Regulation (2000) – Schedule 3. Such facilities are, therefore, exempt from the requirement for an EIS for Designated Development, which would include a detailed assessment of noise impacts in the surrounding community
  - A high-level assessment has been carried out, regardless, in order to understand likely noise levels expected from helicopter movements. Importantly, Tweed Valley Hospital is not proposed to be a major trauma facility with associated helicopter movements
  - Helicopter use would be predominantly for the transport of patients who are not able to be transported by road to and from other hospitals. The frequency and duration of helicopter movements is not expected to be high and the main flight paths (refer **Section 5.22**) avoid the main surrounding residential areas.

A survey of the existing noise environment both on the Project Site and around the site perimeter boundary has been conducted through unattended noise monitoring to continuously record existing ambient and background noise.

As advised in the LUCRA, there are four types of noise associated with agricultural activity - noise associated with intensive livestock facilities, aircraft activities, constant or long-term noise, (e.g. pumps or refrigeration plants), and intermittent noise from tractors and other machinery.

Tractor noise varies depends on a number of factors (listed below) however noise levels can range from 80 decibels (dB) to 92 dB at source.

Noise decay over distance can be predicted on the basis of noise attenuation rates of 6 dB(A) for each doubling of distance from the noise source. This attenuation rate assumes open ground conditions. The existence of natural barriers, broken topography or other features would increase attenuation and affect the resultant noise level at the receiver.

- Factors affecting noise from agricultural activities include:

  - type of engine (diesel or petrol; 2- or 4-stroke)
  - number of cylinders
  - cooling system (air or liquid)
  - load
  - timing, frequency and duration of operations
  - geographical conditions and barriers e.g. topography and inversions
  - weather conditions e.g. wind speed and direction
  - typical industry machinery and practices.

Based on site inspections, and ambient and background noise levels existing around the Project Site, the locating of the Tweed Valley Hospital on this site can achieve the criteria according to the existing ambient levels in relation to operation and identified potential mitigation methods. Given the presence of the existing farm activity on the site and associated noise, as well as local traffic noise and general urban hum identified in the noise assessment, it is expected that the hospital's operation at the site would not result in any significant adverse noise impact. The preliminary operational assessment presented in the Noise and Vibration Assessment based on the Concept Proposal is for the purposes of demonstrating at a high level that the proposed land use for a hospital is suitable and capable of achieving the relevant operational criteria at the existing noise sensitive receivers. Further detailed assessment and design measures would inform and be addressed in Stage 2.

5.12 SEAR 12 – Contamination

5.12.1 Contamination Assessment

An Environment Site Assessment has been prepared for the site. The following provides a summary of the assessment undertaken.

5.12.1.1 Stage 1 and Stage 2 Detailed Site Investigation

A combined Stage 1 and Stage 2 Environmental Site Assessment (Preliminary and Detailed Site Investigation) was undertaken by Occupational Hygiene & Environmental Consulting (OCTIEF) in July 2018 for the site (refer to **Appendix R**). The Preliminary Investigation assessed the historical land use, the potential for contamination resulting from past land use, a general appraisal of the type and location of any contamination on the site and an assessment of the need for further investigations.

Aerial photographs did not provide any indication of heavy industry or other significant potential contamination sources on or near the site since the period of review from 1944 to 2003. A review of desktop data determined the following:

- Broadacre intensive cropping across the elevated part of the site associated with agricultural activities may have been subject to agrichemical applications. Generally, broadacre application meets investigation criteria for residential land use
- Potential for three structures near Cudgen Road to have been used for storage/ mixing of chemicals and storage of fuel (hotspots requiring remediation).

An initial site inspection was undertaken on 14 June 2018 to validate results of the site history review and identify additional sources or evidence of potential contamination. At the time of the site inspection, cultivation of sweet potatoes was being undertaken at the site. Based on the initial site inspection, **Table 5.18** details the potentially contaminating activities and chemicals of concern that may be present.

Table 5.18 Chemicals of Concern

Potential for contamination	Chemical of Concern
Fuel leakage or spills	Hydrocarbons compounds (TRH. BTEX and PAH)
Pesticide use	Pesticides (organo-chlorines and organophosphorus pesticide)
Disposal of wastewaters/ bio-solids	Heavy metals
Degradation of building materials in on-site structures	Asbestos

The Stage 2 Detailed Site Investigation (DSI) was completed in August 2018, the DSI focused on further assessment of potential chemicals of potential concern (CoPC) identified in the Stage 1 Preliminary Assessment. The main objectives of the DSI were to investigate potential contamination sources and CoPC and whether risks posed by identified contamination (if present) to human health and the environment.

The scope of works for the DSI included a systematic composite sampling regime across the site which included hand augering of 50 locations. Targeted sampling was also completed in the vicinity of the identified potential sources on-site (main shed, AST (above ground diesel tank), farm dump, storage dam). Collection of a groundwater sample from the groundwater monitoring well installed as part of the geotechnical site investigation works, and collection of surface water samples from the on-site storage dam.

All samples submitted for laboratory testing were analysed for heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), BTEX (benzene, toluene, ethylbenzene and xylene), TRH (total recoverable hydrocarbons), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), organophosphorous (OP) and organochlorine (OC) pesticides and asbestos.

The findings of the DSI concluded that:

- No exceedances of relevant human health investigation levels for chemical contaminants were identified in the soil samples analysed. Exceedances of ecological assessment criteria are relatively minor and isolated, and the site is considered acceptable for use in the proposed development, from a chemical contamination perspective.
- No heavy metals were detected in any of the soil samples at concentrations exceeding the nominated health-based investigation levels.
- One sediment sample (SED01) reported copper and nickel concentrations exceeding the low sediment quality guidelines but below the high sediment quality guidelines. The copper and nickel concentrations detected were comparable to the surface soil concentrations across the cultivated area of the site and are not considered indicative of any significant contamination in the dam sediments.
- Asbestos containing material was identified in the area around the western side of the chemical storage/ equipment shed, soil results indicate asbestos fines in the soil and the asbestos containing material identified on the surface was moderately degraded presenting a risk to human health if disturbed.
- Zinc detected in the groundwater sample above the nominated investigation level is considered likely to be indicative of naturally occurring background concentrations in the groundwater.
- The surface soil sample collected adjacent to the main shed during the initial site inspection and sample HA4-0.15 collected during DSI reported zinc concentrations exceeding the ecological investigation levels for residential land use. These exceedances of the ecological assessment criteria are relatively minor and isolated, and not considered to affect suitability of the site for the proposed development.
- Anthropogenic wastes were noted in a small farm dump in the north western corner of the site. Visual assessment and soil analytical testing indicate the material in this area is inert waste, however some portions of the dump could not be assessed during the PSI/DSI due to vegetation overgrowth.

Based on the investigations carried out, OCTIEF considers that the works undertaken at the site have sufficiently characterised the site to enable assessment as suitable for the proposed purpose (hospital), subject to implementation of a Remediation Action Plan (RAP) for a small area of soil affected by Asbestos adjacent to the main shed. The remediation work is considered to be Category 2 remediation work (i.e. not needing consent) and a Remediation Action Plan would be implemented, and remediation work undertaken as part of separate Preliminary Works.

5.13 SEAR 13 – Utilities

A summary of services and utility requirements is provided in the following sections.

5.13.1 Hydraulic and Fire Services

ACOR Consultants were engaged to prepare an Integrated Water Management Plan (IWMP) in conjunction with an Infrastructure Management Plan (IMP) that addressed Hydraulic and Fire Services.

The reports are attached in **Appendices T and U** and summarised in the following sections:

5.13.1.1 General

ACOR Consultants, in the capacity of the Project hydraulic and fire services engineers has reviewed the condition, capacity, compliance, reliability and efficiency of the existing supply authorities and hospital infrastructure against the existing demands, the proposed demands and the overall vision and Concept Proposal of the Tweed Valley Hospital. These studies were done through desktop reviews of the Site Wide Investigation Reports (compiled by Wood & Grieve), on-site visual inspections and discussions with existing Tweed Hospital engineering staff.

ACOR has also initiated discussions with relevant utility service providers to check performance characteristics and capacity of their assets to service the proposed development.

Hydraulic and fire services include:

- Buildings sewage connecting to Tweed Shire Council Sewerage infrastructure
- Domestic water supply connecting to Tweed Shire Council Water Main infrastructure
- Fire protection water supply connecting to Tweed Shire Council Water Main infrastructure
- Liquified Petroleum Gas supplied by a service provider within site bulk storage tanks.

ACOR have found that the assessed infrastructure services (including water supply and sewerage system) are suitable for connection. As confirmed by the IMP and IWMP, the Concept Proposal can readily be serviced from the existing authority infrastructure, including Tweed Shire Council, gas supplier(s), and fire services utility supply capacity, to service the proposed development loads.

Water and waste water systems to be implemented will meet the requirements of all statutory building codes, NSW Health requirements, NSW Health Infrastructure requirements and current industry best practice regarding water, waste and energy efficiency.

It is noted that the proposal is for a Concept Proposal and Stage 1 works, with further development to occur at Stage 2.

5.13.1.2 Potable Water

Adequate and compliant potable water supply is available for connection to Tweed Shire Council water main system located in Turnock Street (300 mm water main). Potable water reticulation will be designed and constructed in accordance with AS3500.1 2015, AS3500.4 2015 and Australian Drinking Water Guidelines.

A new 130,000 litre potable water storage tank(s) with associated pumps and filter equipment (connected to essential electrical supplies) will provide approximately eight hours of managed supply to the hospital during a potential utility mains failure.

Potable water cross contamination prevention with hazardous areas (e.g. laboratories, dirty utility rooms, operating theatres and the like), as nominated in AS/NZS 3500.1 2003, will be achieved by the installation of approved backflow prevention valves.

5.13.1.3 Roof Water Plumbing and Drainage

Generally, rainwater collection systems will interconnect with the existing civil stormwater system and will be designed in accordance with AS3500.3 2015, State Office of Water, Tweed Shire Council requirements, and Australia Rainfall and Runoff guidelines.

Rain water collection and re-use for non-potable purposes is being considered for further life cycle cost/ benefit analysis (refer to alternative water supply section below).

Drainage from the helipad will discharge separately to the civil trunk stormwater drainage system via a "flame trap" device located under the helipad in a plantroom.

Water quality devices prior to discharge are considered as part of the Civil Engineering report (refer to **Section 5.16** and **Appendix X**)

5.13.1.4 Alternate Water Supply Systems

Alternative non-potable water supply could be supplied from roof water collection tank(s) and could provide supplementary irrigation water supply for drip irrigation only to formalised front entry landscaped areas only (subject to recommendations of the LUCRA at **Section 5.6.4**). Based on available historical rainfall data for this area, available roof collection area, extent of landscape irrigation and water balance calculations (presented in the IWMP), there would be no cost and no major environmental benefit if it is implemented.

Rainwater collection and re-use for other non-potable applications such as toilet flushing, has been discounted due to risks associated with possible air borne bacteria in a hospital environment.

5.13.1.5 Sanitary and Trade Waste Drainage

Sanitary waste generated by the site will be designed and constructed in accordance with AS3500.2 2015, Tweed Shire Council requirements and industry best practice and discharge to Tweed Shire Council sewerage rising main in Cudgen Road.

The IWMP also provides for waste minimisation measures.

Designated hydraulic trade waste (e.g. laboratories, commercial kitchens and the like) will be pre-treated in accordance with AS3500.2 2015, Tweed Shire Council requirements and industry best practice and will discharge directly to internal house sewer reticulation system.

Typically, pre-treatment systems would include the following:

- Grease arrestors will be required for the commercial kitchen and any food retail café etc
- Cancer treatment methods are to be determined, in particular treatment of thyroid cancer utilising Iodine 131

- Dilution pit(s) for pathology and other hospital laboratories
- Cooling pit(s) for high temperature discharge such as Centralised Sterile Services Department (CSSD), Reverse Osmosis (RO) plant disinfection equipment, steam boilers etc.

Final determination of liquid trade waste management systems will be based on final schedules of accommodation and models of care.

It is envisaged that the current trade waste agreement for TTH site will be transferred and modified for the Project Site upon completion of Stage 2 works.

5.13.1.6 Reverse Osmosis Water (RO)

Reverse Osmosis water supply will be required for:

- Centralised Sterile Services Department (CSSD)
- Renal treatment facilities
- CSSD plant will be located in the plantroom in close proximity to the CSSD area.

The RO plant will be designed in accordance with AS 4187 2014 version. Further detail is in the IWMP.

5.13.1.7 Fixtures and Fittings

Sanitary fixtures, fittings and tapware where nominated on future architectural plans and room data sheets would be in accordance with NSW Department of Health requirements. Final selections will be based on whole of life cost, water/energy efficiency, W.E.L.S registration (4-star minimum except showers to be minimum 3-star), availability, ease of maintenance, aesthetic appearance and durability.

5.13.1.8 Gas Services

There is currently no gas available in the vicinity of the Project Site, and no future planned works to provide natural gas to this area. The alternative is Liquified Petroleum Gas (LPG) stored on-site within gas tanks. Regular delivery of LPG by a service provider under current NSW Government contract is being negotiated. New LPG supply will be constructed to the requirements of AS5601:2004, AS1596, service provider and Health Infrastructure requirements. The new gas supply will extend from the new LPG tank compound. A gas subsidiary meter will be provided for the proposed building and reticulated within the building at seven kPa. Gas supply will feed to the mechanical services plant, domestic hot water heaters and to the kitchen. Further detail and assessment of this would occur at Stage 2.

5.13.1.9 Fire Service System

Fire hydrant and sprinkler supplies shall be extended from the Tweed Shire Council's water main with NSW Fire and Rescue booster valve assemblies to tank storages then pump boosted to serve the entire building (the water main can provide reasonable flow rates and pressures for domestic use; however, these rates are insufficient to meet the higher firefighting pressure and flow requirements, therefore pumps will be required for the fire and water services within the building).

The fire hose reels for the proposed building would be placed in positions compliant with the requirements of the Building Code of Australia/ National Construction Code (BCA/NCC) and AS2441:2005. Fire hose reels are to be placed generally within four metres of required exits to provide

full coverage to the proposed building and such that fire hose reels do not extend through fire and smoke doors. This would be further addressed as part of Stage 2 design.

5.13.1.10 Additional ESD initiatives

The following additional ESD measures are to be considered in future planning stages and subject to final cost/ benefit analysis:

- Solar contribution for water heating (minimum 50 per cent annual solar gain)
- Metering of water supplies including hot water metering
- Increased thickness of thermal insulation on all hot water supplies to improve efficiency
- Recyclable materials selection
- Low voltage power generation by the way of converting liquid flow (either water supply or sewage) at authority points of connection into energy
- Capture and reuse of fire services test water
- Capture of mechanical plant waste heat for input into domestic water heating plant.

5.13.2 Electrical and Communications

New electrical and communication infrastructure to allow connection to the local utility services will be required for the Project. ARUP has prepared an Infrastructure Management Plan for the Project relevant to electrical and communications (attached at **Appendix S** and a relevant plan at **Appendix B**).

Existing infrastructure will be carefully considered during detailed design of the Project (particularly for the south side of the site and site entrances and associated road works) and it is likely that existing infrastructure including power poles and Telstra, Optus, AARNET, and Essential Energy services will need to be relocated, including diversion of cables along Cudgen Road Stage 1.

5.13.2.1 Electrical

A temporary and permanent power supply and associated infrastructure to the Project Site will be established during Stage 1 Early and Enabling Works (refer **Section 3.2**). A preliminary maximum demand for the Project has been calculated to establish the electrical requirements for the Project and a preliminary application has been submitted to Essential Energy for an eight MVA supply to the Project Site that would be adequate to service the hospital and ancillary development. Essential Energy has confirmed availability of suitable capacity from the Cudgen zone station, located 2.1 km from the Project Site. It is noted that there is provision in the Masterplan for future expansion of the Tweed Valley Hospital and that this includes a new zone station to accommodate the expansion.

Temporary power supply for construction on the site can be provided from the existing 11kV aerial feeders running parallel to Cudgen Road.

Permanent supplies will be provided once the permanent substations serving Tweed Valley Hospital have been commissioned.

The hospital will have essential supplies that require a second supply from diesel generators on the site. These generators would require underground petroleum storage systems. The tanks will be compliant with AS 1692 and will be double walled with leak detection. Further detail would be relevant to Stage 2.

Refer to the Infrastructure Management Plan **Appendix S** and electrical engineering drawing at **Appendix B** for:

- Stage 1 works, including proposed infrastructure, cable routes, substations and switchboard locations
- Details of consultation with Essential Energy including a Connection Enquiry Preliminary Response for the Project.

5.13.2.2 Communications

Telstra services are available on the perimeter of the site with the main telecommunication service routes running parallel with the site along Cudgen Road. Communications lead-in infrastructure will be provided from a pit on the site boundary to the main incoming telecommunications room within the development area to allow incoming telecommunications services to be connected into the building once required.

Conduit pipes for incoming telecommunication services will be installed for the Project in Stage 1 Early and Enabling works and fibre will be installed in Stage 2 in the main works package.

Telstra has confirmed spare telecommunications capacity for the Project Site but cannot provide further information in terms of available connections until six months before Project completion due to a new policy relating to the 2020 NBN rollout which aims to connect the majority of NSW to NBN owned fibre. The Project Site is just outside of the NBN fixed cabling zone but by 2020, NBN may have procured the fibre in this area. Incoming telecommunications pits will be laid as part of the new development to a pit located on the boundary of the Project Site to allow the connection of the new telecoms services.

Details of infrastructure, cable routes and consultation with telecommunications providers is within the Infrastructure Management Plan for the Project attached at **Appendix S** and electrical engineering drawing at **Appendix B**.

5.14 SEAR 14 - Water and Soils

5.14.1 Geotechnical

Morrison Geotechnic has completed preliminary geotechnical investigations for the Project. The preliminary geotechnical investigation report is at **Appendix Q** and a summary is provided in the following sections as relevant. Further geotechnical investigations will be carried out as required. Below is a summary of the investigations carried out.

5.14.1.1 Investigations

The geotechnical assessment included fieldwork and laboratory testing in order to support assessment of the following:

- Description of subsurface materials in the depth range of the boreholes in accordance with Australian Standards including strength of encountered materials, weathering, defect spacing and defect descriptions of cored rock as well as photographs of the rock core, where encountered. A brief geological history of the site is also provided
- Groundwater conditions including levels

- Site classification in accordance with Australian Standards, including predicted ground movement and site reactivity at selected borehole locations
- Earthworks recommendations including excavation conditions (suitable excavation equipment), suitability for the reuse of excavated material as structural fill, compaction standards and site preparation as well as stripping depths
- Recommendations for filling
- Trafficability of subsoil material
- Safe temporary and permanent batter angles for earthworks and temporary retention options including characteristic geotechnical parameters for design
- Retaining wall design parameters including earth pressure coefficients
- Alternative footing systems, including allowable bearing pressures for high level footings and ultimate end-bearing pressures for deep footings as well as shaft adhesion for piles
- Geotechnical strength reduction factors
- Pavement design parameters and recommendations
- Earthquake site sub-soil classification in accordance with Australian Standards
- Site management and construction issues
- Recommended foundation systems
- Permeability of surficial soils within the proposed detention basin area
- Slope stability assessment.

Intrusive investigations included:

- The drilling of 25 boreholes across the Project Site (refer to **Appendix Q** for locations of boreholes):

    - Boreholes BH1 to BH7 and BH25 were deep boreholes drilled within the footprint of the proposed hospital building
    - Boreholes BH8 to BH22 were shallow boreholes drilled within the footprint of the associated access driveways, car parking areas, low-level administration/ retail/ education buildings
    - Boreholes BH23 and BH24 were also shallow boreholes drilled to depths of 0.5 m only for permeability testing within the proposed bioretention basin area.

Laboratory testing was conducted on samples recovered from geotechnical boreholes. Samples collected were sent to NATA registered contract laboratories for testing, including:

- Shrink/ swell tests for site reactivity
- Standard Compaction and Soaked Californian Bearing Ratio (CBR) tests for pavement design
- Particle Size Distribution(PSD) and Atterberg Limits tests to assess the reuse of excavated material as structural fill
- Point Load Strength Index tests of the recovered rock core was also carried out to more accurately assess the strength of the encountered bedrock.

Results are presented in the full report at **Appendix Q**.

5.14.1.2 Surface conditions

The topography of the site typically comprises slightly elevated, flat or gentle sloping terrain of less than five degrees within most of the proposed development area of the Project Site. This elevated flat and gentle sloping terrain grades into mild sloping terrain to the north which slopes downwards towards the north and north-west. This mild sloping terrain then grades into flat, low lying terrain of less than five degrees in slope angle forming a floodplain area along the northern boundary of the site.

Most of the proposed development is to be located within the slightly elevated, flat or gentle sloping terrain adjacent to Cudgen Road within only a small portion of the proposed development encroaching into the mild sloping terrain to the north and north-west.

No major drainage features are evident. The site has been cleared of native vegetation and at the time of the investigations it supported agricultural vegetation or fields which had been prepared for agriculture.

5.14.1.3 Subsurface conditions

The Tweed Heads 1:250,000 Geological map indicates that the underlying geology at the site is the Lamington Volcanics from the Tweed Range-Lamington Area. This is made up of basalt with members of rhyolite, trachyte, tuff, agglomerate, and conglomerate.

Based on the encountered conditions in the boreholes, it is typically expected that within the slightly elevated, flat or gentle sloping terrain adjacent to Cudgen Road, slightly weathered basalt rock of very high strength with some interbedded basalt layers is likely to be encountered from a depth of approximately one metre to 1.5 m, extending to a depth of approximately seven metres to 10 m.

Below this depth interbedded basalt rock (and possibly some clay layers) is likely to be encountered, extending to a depth of approximately 14 m to 15 m. Below this depth, slightly weathered basalt of very high strength is likely to be encountered, extending to depths in excess of 18 m to 20 m. Towards the mild sloping terrain at the location of borehole BH25, similar conditions are expected, however there is likely to be more interbedded layers of rock throughout with only minor slightly weathered basalt rock near the surface and the consistent level of basalt rock is expected to be encountered at a depth of approximately 20 m below the existing ground surface in this area.

Detailed descriptions of the subsurface conditions encountered are provided in the Engineering Logs within the full report at **Appendix Q**.

5.14.1.4 Acid Sulfate Soils

The site is mapped as having potential Acid Sulfate Soils (ASS) Classes 2, 3 and 5; however, the development area within the Project Site is within the Class 5 category. ASS are not typically found in Class 5 areas. Areas classified as Class 5 are located within 500 m on adjacent Class 1, 2, 3 or 4 lands. They usually occur below five metres AHD and beneath the water table. Works in a Class 5 area that occur below five metres AHD or are likely to lower the water table below one metre AHD on adjacent Class 1, 2, 3 or 4 lands will trigger the requirement for assessment and may require management according the TLEP 2014.

As per the geotechnical report at **Appendix P**, in accordance with the NSW ASS assessment guidelines and the TLEP 2014 clause 7.1, an ASS investigation is only required where works in a Class 5 area that occur below five metres AHD or are likely to lower the water table below one metre AHD on adjacent Class 1, 2, 3 or 4 land will trigger the requirement for an ASS assessment and may require management. Levels within the development area at the site indicate that the development and associated earthworks will occur well above RL5.0m AHD. A review of the ASS Risk map produced by the DLWC for NSW indicates that the development site is not located in an area which is assessed to contain ASS. On this basis and providing no earthworks are carried out below RL five metres AHD or works do not lower the water table below one metre AHD (which is not expected to occur at the site) an ASS investigation will not be required.

ASS risk mapping (OEH 1998) confirms this assessment, with the northern tip of the lot classified as high risk (one to two metres), and the remainder of the forested area on the site as high risk (two to four metres) (refer to BDAR at **Appendix I** for mapping). Additionally, the NSW EPI ASS mapping (Department of Planning and Environment [DPE], 1995) confirms that there is no ASS risk in the currently cleared portions of the Project Site where development is proposed. The northern tip of the site in the forested area is a class 2 area, with ASS soils likely to be found below the surface. However, this mapping excluded the remainder of the forested area which corresponds to the deferred matter zoning under Tweed LEP 2014.

Overall, an ASS investigation is not required, and ASS are not expected to be encountered, given the above factors. Standard construction management measures for any unexpected or potential encounters with ASS would be implemented as required.

5.14.1.5 Groundwater Bores

A search of groundwater bores registered with the NSW Department of Primary Industries, Office of Water identified eight bores within a 500 m radius of the site's boundaries. Bore reports for the bores identified mix use between domestic, farming and irrigation. Depth of standing water level ranged from three to five metres to 16-40 m.

During borehole drilling for the geotechnical investigation, groundwater was encountered in boreholes BH1, BH6, BH7 and BH25 only at depths ranging between 11.2 m and 14.4 m below the existing ground surface. No other boreholes encountered groundwater however, all other boreholes terminated before a depth of 11 m. On this basis, it is likely that if all boreholes extended to depths of greater than approximately 15 m below the existing ground surface, groundwater would most likely be encountered.

No significant groundwater issues are expected to be encountered in excavations under normal weather conditions in the slightly elevated cut areas of the site.

Standing groundwater and seepages are likely to be encountered in bored piles below a depth of approximately 11 m below the existing ground surface. Seepage would require the holes to be controlled by pumping or otherwise requiring the piles to be constructed under water or lined using appropriate materials and methods. The geotechnical report provides guidance and recommendations related to this.

5.14.1.6 Geotechnical Findings

The geotechnical investigation (refer to report at **Appendix P**) determined that the there are no significant geotechnical constraints for the Project. The report provides discussion and various recommendations in regard to:

- Description of subsurface materials
- Groundwater conditions including levels
- Site classification
- Earthworks
- Trafficability of subsoil material
- Retaining wall and batter design
- Footings and foundations
- Pavements
- Slope stability

- Soil permeability
- Re-use of material.

The geotechnical assessment indicates that the Project Site is considered satisfactory for development in relation to slope stability, and the Landslide Risk posed to the property can be maintained to a level of “Low” or better for the long-term (at least 70 years) if the recommendations outlined in the assessment are followed and implemented, which is a tolerable level of risk.

5.14.2 Soil Salinity

Based on laboratory analysis of five soil samples obtained from depths of between 0.15 m and one metre below the ground surfaces as part of contaminated land investigation undertaken on the site by OCTIEF, soil conductivity ranged between 14 and 61 µS/cm (0.014 and 0.061 dS/m). The BDAR report outlines that based on soil salinity criteria in the Soil Salinity Handbook, Second Edition, the soil salinity rating for soil on the Project Site taking into account the range of clay contents determined from geotechnical investigations (50-87 per cent) would fall into the “very low” category.

The soil salinities results from the contaminated land investigations infer that soil salinity risks to ecological receptors associated with the proposed development are likely to be low. With respect to potential impacts due to soil-derived saline run-off to the wetlands, the risks are expected to be further reduced through the use of appropriate erosion and sediment control measures during construction. Additionally, a proportion of run-off from the site currently enters the wetlands, further reducing the likelihood of increases in salinity in run-off from the site during construction and operational phases of the development.

5.14.3 Water Sources

Bonacci was commissioned to describe the water sources including the stormwater strategy associated with the Project and in support of the SSD application. The Water Sources report is at **Appendix Y**.

The Water Sources report (to also be read in conjunction with the Civil and Structural Report at **Appendix X**) describes the Concept Proposal, and Stage 1 works and how they interact with the water sources on-site and downstream. The report addresses:

- Flooding impacts and controls
- Groundwater
- Stormwater Runoff volumes and detention strategies (Stormwater Quantity)
- Stormwater Quality treatment measures (Stormwater Quality), and
- Erosion and Sedimentation Control measures.

As addressed in **Section 5.17**, the development area is above the PMF and no adverse flooding impacts/ interaction is expected.

The Geotechnical report (discussed previously) includes summaries of investigations and groundwater readings. The Water Sources report outlines that groundwater or water table has been identified at a depth of approximately 11 m. It is envisaged that the foundation system will utilise bore piers installed with a Continuous Flight Auger (CFA) or casing extending to the high strength basalt. It is not expected to encounter groundwater during construction of the building support piles. During the construction of the piles, if groundwater is encountered, the CFA or casing method of construction allows for local management of groundwater without taking water from the aquifer and discharging it off site. As a result, no construction impact is expected on the groundwater and the water table.

As outlined in the previous section, a stormwater drainage system would be constructed to convey stormwater runoff from the development. It will be designed to mimic natural flows to minimise future impact to the environmental area downstream.

The concept stormwater drainage systems have been designed to cater for design storms up to and including 100-year ARI (1% AEP) storm events. The hydrology and hydraulic analysis for the Project Site was established using a DRAINS (computer program for hydrological and hydraulic assessment) model. The hydrological parameters used in DRAINS are in accordance with Tweed Shire Council's Specifications.

The stormwater strategy includes a number of management measures and ultimately the bulk of the stormwater will end up in an extended detention basin where it will settle and discharge to the receiving waters in a controlled manner, achieving permissible site discharge rates. The proposed treatment measures, meet pollution reduction targets. It is important to note that the unimproved site discharges a very high quantity of total suspended solids and this is reduced by approximately one third by the change (without treatment) of land use alone. It is also important to note, that once all water quality measures are constructed and functioning, and development has been completed, the site would have a lower discharge of Gross Pollutants, Total Suspended Solids, Phosphorous and Nitrogen than if the site was left undeveloped. Stormwater management is further discussed at **Section 5.16** and the Civil and Structural Report at **Appendix X**.

Water courses and riparian areas have been mapped and shown in the BDAR at **Appendix I**. The proposed development does not encroach on such features or waterfront land. By definition, Waterfront Land is any land within 40 m of watercourse/ river banks. An intermittent watercourse occurs to the north of the Project Site, along with a coastal wetland area that marginally extends into the Project Site. The proposed works do not encroach on the coastal wetland or watercourse to the north. At its nearest, the closest proposed works are a minimum 200 m away from the intermittent watercourse. Since the discharge of water is controlled both in quantity and quality (stormwater management described previously), it is not proposed to provide water monitoring for the project, other than that required as part of soil and water management measures during construction.

The BDAR at **Appendix I** also provides an assessment of biodiversity related impacts, including any prescribed impact on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities.

Water impacts will be managed during both the construction and operation stages. On this basis, the residual prescribed impact of the Project was considered to be negligible. It is also expected that operation of the Project will result in a net improvement in the quality of stormwater that is discharged from the Project Site. Relevant recommendations for adaptive management have also identified in the BDAR.

As outlined in **Section 5.16**, soil and water management for the proposed development would be implemented during construction to prevent erosion and sedimentation impacts to receiving environments.

The Water Sources report describes that water sources, including the stormwater management strategy, on the site can be managed to not disturb groundwaters and provide beneficial water quality and quantity outcomes to the receiving waters.

By demonstrating the minimum to beneficial effects, it is reasonable to conclude that the site is suitable for the proposed development and demonstrates compliance with all relevant policy and requirements as outlined in **Section 5.16**.

5.15 SEAR 15 – Contributions

This issue has been addressed previously in **Section 5.1.5**.

5.16 SEAR 16 – Drainage

Bonacci were engaged to prepare a Civil and Structural Design Report which included an assessment of stormwater and drainage. This report is at **Appendix X**, with key drainage and stormwater aspects outlined below.

5.16.1 Catchment Delineation

The development area, and associated infrastructure is located generally in the southern portion of the Project Site, along the localised ridgeline. The Project Site is approximately 19.4 ha in area and sits at ridge level. The site currently drains via a number of constructed channels and a bund with openings to the west and north-west boundary that direct flows through and off the site to an existing culvert on Turnock Street. The location of the proposed development is above the PMF level within the Project Site.

5.16.2 Hydrology and Hydraulics

As outlined previously, separate Preliminary Works on the site would include soil and water management works, including sediment/ detention basins to mitigate runoff impacts from the existing conditions of the site in advance of the hospital.

As part of Stage 1 Early and Enabling works, a stormwater drainage system will be constructed to convey stormwater runoff from the newly constructed haul roads, level pads and associated infrastructure. It would integrate with the Preliminary soil and water management works and be designed to mimic natural flows to minimise future impact to downstream receiving environments. During Stage 1 works (and until Stage 2 works commence) the Project Site will remain close to 100 per cent pervious and the stormwater system will be designed to convey stormwater runoff to sedimentation basins and protect the newly constructed haul roads.

A stormwater drainage system would be constructed to convey stormwater runoff from the newly constructed buildings and associated, roads, carparks and landscape areas into a stormwater pit and pipe system. It will be designed to mimic natural flows to minimise impact to off-site receivers including the adjacent wetland to the north of the Project Site. The details of the discharge characteristics will be determined at detail design stage, guided by advice from a suitably qualified ecologist.

To ensure compliance with Tweed Shire Council permissible site discharge requirements, on-site detention will be included in the design. This on-site detention will take advantage of sedimentation basins constructed as part of the Preliminary Works (refer to **Section 3.5**).

Stormwater drainage systems for the Concept Proposal have been designed to cater for design storms up to and including 100-year ARI (1% AEP) storm events as per relevant Tweed Shire Council development design specifications.

The hydrology and hydraulic analysis for the Project Site was established using a DRAINS (computer program for hydrological and hydraulic assessment) model. The hydrological parameters used in DRAINS are in accordance with Tweed Shire Council's Specifications. The DRAINS model was

subsequently used to calculate the required on-site detention volumes. The Drains model flows were obtained for five-year, 20-year and 100-year ARI storm events. The effect of climate change was considered in hydraulic modelling, with effects of an increase in rainfall intensity checked. The increase is accounted for in the calculated detention volume.

5.16.3 Stormwater Analysis and Design

The proposed stormwater drainage network was designed using DRAINS software. It is proposed that all stormwater runoff from the new building, roads and carparks and landscape areas are captured and directed into the proposed new stormwater pit and pipe system. DRAINS will be used to model the proposed network and to correctly size the inlet pits and the network pipes.

The table below shows the pre-development stormwater discharge rates, the potential post development discharge rates and the permissible discharge rates as per Tweed Shire Council Development Design Specification D7.

Table 5.19 Discharge Rates

Pre-Development Discharge Rates		
20% AEP	10% AEP	1% AEP
3.89m^3/s	6.06m^3/s	8.06m^3/s
Post Development Discharge Rates		
20% AEP	10% AEP	1% AEP
5.39m^3/s	7.69m^3/s	10.0m^3/s
Permissible Discharge Rates		
20% AEP	10% AEP	1% AEP
4.65m^3/s	4.65m^3/s	4.65m^3/s

Source: Bonacci 2018

It is important to note, while the permissible discharge rates are conservative, there are opportunities to alter the discharge rate by conducting detailed investigation into the capacity of the receiving stormwater network (Stage 2 design will involve further assessment and refinement of stormwater measures). To comply with Tweed Shire Council's permissible site discharge requirements, approximately 6000 m^3 of on-site detention would be provided.

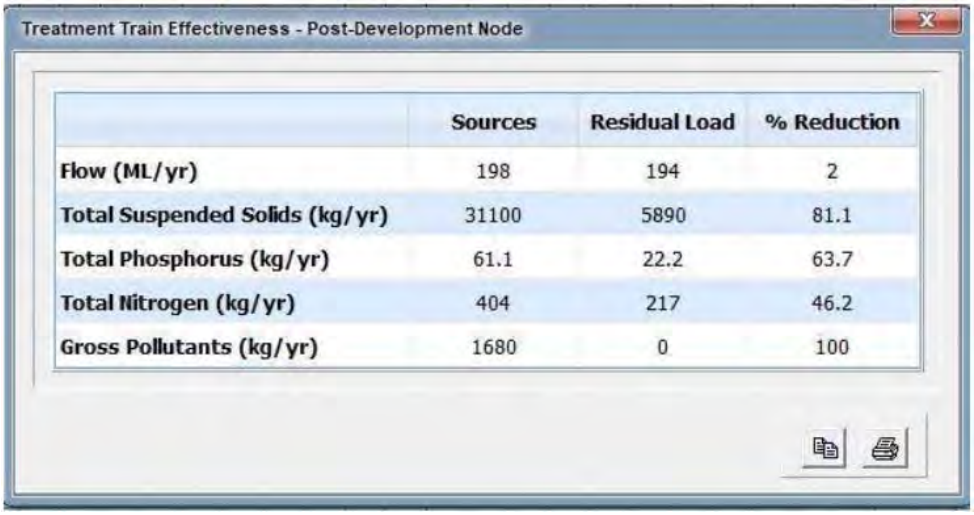
5.16.4 Water Quality

Stormwater quality treatment strategies have been developed for the site to reduce stormwater pollutant discharge resulting from of the proposed development. The Project Site has been distributed into sub-catchments based on the specific Water Sensitive Urban Design (WSUD) measures required for the site. A summary of the impervious area was based on the Concept Masterplan.

The water quality strategy for the site will incorporate swales, gross pollutant traps, bioretention basins and an extended detention basin in order to meet targets for the reductions of water borne pollution set out in Tweed Shire Council DCP and Development Design Specifications.

The concept water quality strategy for the Project Site was established using MUSIC [Version 6.2] model. The MUSIC model was established using Gold Coast Council's MUSIC link. The catchment summary along with WSUD measures for the site and MUSIC model details are outlined in the Civil and Structural Design Report.

The results of MUSIC modelling show that the pollutant removal rate achieves pollutant reduction targets. The results from the MUSIC model are shown below as a screen shot at **Figure 5.8**.



	Sources	Residual Load	% Reduction
Flow (ML/yr)	198	194	2
Total Suspended Solids (kg/yr)	31100	5890	81.1
Total Phosphorus (kg/yr)	61.1	22.2	63.7
Total Nitrogen (kg/yr)	404	217	46.2
Gross Pollutants (kg/yr)	1680	0	100

Figure 5.8 MUSIC Model Results (Bonacci 2018)

It is important to note that during the Preliminary Works undertaken separately to works covered in this SSD application (refer **Section 3.5**), soil and water management systems will be implemented to control stormwater runoff. Additional measures, as required would be implemented specific to the Stage 1 works (as discussed at **Section 6.11**). Erosion and sediment control for Stage 1 has been addressed at **Section 6.11**and as part of the Soil and Water Management Plan that forms part of the Civil and Structural Design Report at **Appendix X**. At the completion of the Preliminary Works, and any subsequent augmentation/ additional measures for Stage 1 works, the resulting pollution runoff will result in a decrease of agricultural pollutant runoff as the unimproved site/ existing use has not implemented stormwater runoff treatment measures.

The stormwater management strategy described in the Civil and Structural Design Report at **Appendix X** demonstrates the Concept Proposal and Stage 1 works are acceptable and can be effectively managed. The site is suitable for the proposed development by demonstrating that any impacts from the development can be mitigated by providing appropriate, adequate infrastructure within the site. The site can accommodate stormwater infrastructure such as on-site detention basins and bioretention basins to control the stormwater runoff.

The stormwater management strategy, demonstrates compliance with all the requirements of relevant plans and guidelines including the Tweed Shire Council DCP - including Tweed Urban Stormwater Quality Management Plan (2016), Landcom Managing Urban Stormwater: Soils and Construction, NSW Floodplain Development Manual (2005) and Guidelines for Development Adjoining Land and Water Managed by DECCW (OEH, 2013).

5.17 SEAR 17 – Flooding and Coastal Hazards

A key consideration in selecting the site for the Tweed Valley Hospital was that it was strategically located above the probable maximum flood (PMF) level.

A Flooding and Coastal Hazard Assessment was undertaken by BMT (**Appendix W**). It determined that the site presents a minimal flood risk, with the majority of the Project Site including the main development area and access being above the Regional Tweed River PMF level (as depicted in

Figure 5.9). As such the Project would occur without any loss of floodplain storage for any flood event. The Project Site is also not subject to nor in the vicinity of coastal hazards.

Figure 5.9 Peak PMF Flood Level (in orange) – BMT 2018

Additionally, on-site stormwater management infrastructure will be provided as part of the Project to manage peak flow impacts thereby addressing potential local catchment flooding impacts (refer to **Section 5.16** for further detail on stormwater management).

The Project will give rise to higher volumes of runoff associated with the conversion of the land use from predominately farming to that of a health services facility with considerably higher levels of imperviousness. However, it is expected that this incremental increase in runoff volume will not give rise to adverse flood impacts in the Chinderah/ Kingscliff area on the basis of previously completed future development scenarios assessed during the preparation of Tweed Shire Council's Floodplain Risk Management Study.

Alternative access routes will assist in maintaining access to the Project Site for populations south of the Tweed River during 5% AEP flood events, with population centres to the north able to access Robina Hospital within approximately 30 minutes. A broadly similar flood inundation pattern and predicted locations of road closure are expected during a 1% AEP flood event with the exception of potential impact to access via Clothiers Creek Road during this larger event. However, access via Casuarina Way/ Tweed Coast Road is predicted to be still flood free.

In respect of travel north from northern Tweed suburbs during the 1% AEP event, access on the M1 travelling north to either the Robina Hospital or Gold Coast University Hospital may be impacted at Oyster Creek (near Exit 87) and near Mudgeeraba Creek (near Exit 82). These two sites are subject to current upgrade projects which may improve their existing flood immunity.

Within the road network managed by the City of Gold Coast (which excludes the M1), potential flood free access is possible to the Robina Hospital via Laver Drive or alternatively via the Gold Coast Highway/ West Burleigh Road/ Bundall Road/ Cottesloe Drive/ Cheltenham Drive/ Robina Parkway and Laver Drive. Potential flood free access to Gold Coast University Hospital is possible via the Southport Nerang Road/ Olsen Avenue, or alternatively via Bermuda Street/ Bundall Road/ Smith Street/ Olsen Avenue.

Similarly, the RMS has advised for access from the Byron Central Hospital to the Tweed Valley Hospital site the flood immunity is generally at or above the 1% AEP flood level except between the Ewingsdale Road interchange and Gulgan Road, where the southbound carriageway is less than the 1% AEP level; on the Yelgun to Chinderah section which has a 5% AEP at the road centreline (for northbound and southbound carriages); and on the Chinderah bypass in the Tweed River floodplain which displays a 5% AEP (for northbound and southbound carriages).

The hospital's operational capacity (for emergency response facilities and critical infrastructure) is largely protected during extreme flood events and limited mainly by loss of access to the hospital from local and regional road network (as discussed in Section 2.4 of the flood report), noting that aerial access would still be possible.

BMT has previously assessed coastal hazards for the Tweed Shire coastline. In 2013 BMT prepared a Coastal Hazards Assessment for the combined Byron and Tweed Local Government Area coastal extents. The Coastal Hazard Assessment includes erosion hazard extents, wave inundation and storm tide inundation were considered. Mapping in the Kingscliff area identified that all of these hazards were contained relatively close to the coastline (in the vicinity of Marine Parade) and did not extend to being close to the site.

There are no assessed coastal hazards in the immediate vicinity of the site out to the 2100 planning horizon adopted by Tweed Shire Council.

Overall, there are no planning, legislative or practical reasons why the proposed development could not occur on the site from the perspective of achieving suitable extreme flood immunity and addressing the key objectives of Tweed Shire Council for flood planning, floodplain risk management and broader agency requirements for emergency management.

5.18 SEAR 18 – Bush Fire

A Bush Fire Constraint Assessment report has been prepared by Land & Fire Assessments Pty Ltd (LFA) in accordance with the relevant provisions of Planning for Bush Fire Protection (PBP) (RFS 2006) at Lot 102 DP870722, 771 Cudgen Road, Cudgen. The report is at **Appendix V**.

The assessment reviewed suitability of the site for the SSD application for the Concept Proposal and Stage 1 works. Detailed design and construction will be assessed at the Stage 2 SSD application. The Tweed Valley Hospital Concept Proposal is based on the current Tweed Valley Hospital Masterplan.

Hospitals are considered '*special fire protection purpose development'* pursuant to section 100B of the *Rural Fires Act 1997* and have greater restrictions under PBP as occupants in a hospital are particularly vulnerable to the impacts of a bush fire and might not be able to readily evacuate. As such the development has been assessed against 'special fire protection purpose development' controls under section 4.2.7 of PBP.

The assessment has considered the Tweed Valley Hospital Masterplan in context of potential bush fire risks associated with the site and whether the development is able to comply with the controls of PBP. The SSD application assessment considers key bush fire planning matters relevant to a Concept Proposal application including asset protection zones, internal roads, services and emergency evacuation planning. These matters would be addressed in more detail as part of a Stage 2 SSD application and also would require assessment of construction standards required for the development.

The site contains land designated as ‘Vegetation Categories 1 & 2’ and ‘Buffer’ on the Tweed Shire Council Bush Fire Prone Land Map and is therefore located on bush fire prone land as shown in **Figure 5.10.**

Figure 5.10 Bush fire mapping for the Project Site (Yellow Star)
Source: Tweed Shire Council Intramaps

The site consists of a broad flat portion, which slopes down to the north (around 13 degrees) before levelling out again to a flat slope. Elevations within the site range between approximately 20 m AHD on the central and southern portion of the site to 10 m AHD to the north.

The site consists of predominantly cleared/ cultivated land with Swamp Sclerophyll Forest to the north-east of the site and along the northern boundary. The Swamp Sclerophyll Forest is also found to the north of the site; this vegetation is the hazardous vegetation (along with the portion found on the site) and is classified as ‘Forested Wetland’. The location of hazardous vegetation associated with the site is presented at **Figure 5.11**.

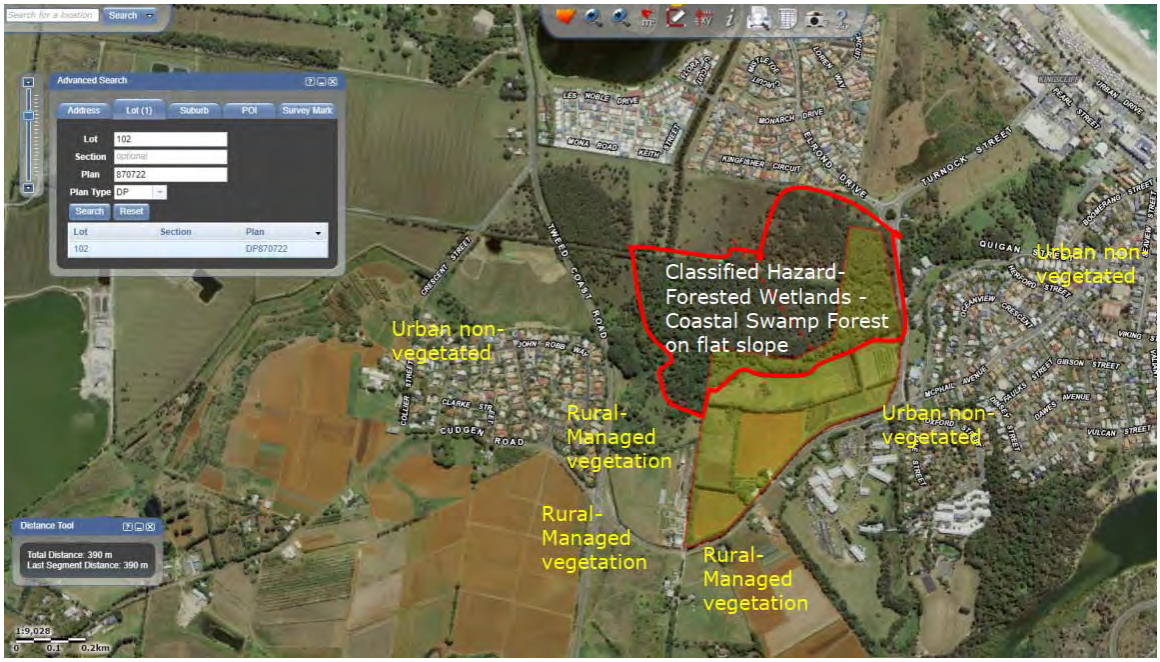


Figure 5.11 Bush fire hazard vegetation and land uses relevant to the site

Based on the slope and hazard vegetation applicable to the site an Asset Protection Zone (APZ) distance of 50 m is required from the Forested Wetland vegetation located within and adjoining the site. The assessment has concluded that the Concept Proposal and Masterplan design is capable of providing the minimum APZ requirements wholly within the boundaries of the site.

The current Concept Masterplan presents access arrangements within the site that presents multiple entry/ exit points, through roads with two-wheel drive, sealed, all-weather internal roads and is therefore capable of meeting internal access acceptable solution requirements under PBP. Access design would be assessed again during the Stage 2 SSD application in more detail including consideration against section 4.2.7 of PBP.

Reticulated water and power services are available to the site and the proposed hospital is therefore capable of providing water and power services in accordance with section 4.2.7 of PBP. Similarly, gas services are also capable of being provided in accordance with section 4.2.7 of PBP. Again, services (water, power and gas) design would be assessed further during the Stage 2 SSD application in more detail including consideration against controls presented in section 4.2.7 of PBP.

An emergency and evacuation plan will need to be prepared as part of the Stage 2 SSD application stage and in accordance with section 4.2.7 of PBP. The preparation of the emergency and evacuation plan is considered more appropriate at the detailed design stage where site arrangements are consolidated enabling accurate identification of internal access arrangements, evacuation areas and roles required within the plan under the Rural Fire Service (RFS) Guidelines for the Preparation of Emergency/ Evacuation Plan.

5.18.1 Pre-Release PBP 2018

Review of the Pre-Release PBP 2018, indicates that the key constraints for SFPP developments and bush fire protection measures identified in the bush fire assessment are generally similar to the current PBP provisions. However, there some key differences, in particular APZ distances are greater and there are other minor changes to the construction standards which has been planned for in the

Masterplan. Nonetheless the concept Masterplan has planned for a greater APZ as discussed in the bush fire assessment.

Although not specified as bush fire protection measure to be addressed under section 4.2.7 standards for SFPP in PBP 2006, construction standards do apply to Class 9a health care buildings if they are SFPP. This is now clarified in the pre-release PBP 2018 and therefore will need the hospital structure to be built to Bush Fire Attack Level (BAL) 12.5 as per AS3959-2009 construction standards.

Complying with the Pre-Release PBP 2018 requirements for SFFP developments will be addressed at the SSD Stage 2. Transitional provisions are in place until mid-2019, it is likely that the RFS will require compliance with pre-release edition of PBP 2018.

5.18.2 Conclusion

Overall the assessment found that the Tweed Valley Hospital:

- will not increase the risk to life from bush fire
- will not introduce controls that place inappropriate developments in areas exposed to unacceptable bush fire hazard
- can provide for appropriate bush fire protection measures to properties at risk of bush fire
- does not have adverse impacts on the surrounding environment
- does not place additional burden to current evacuation/ shelter options for the community.
- the proposed development is capable of complying with Planning for Bush Fire Protection 2006.

Based on consideration of the Concept Proposal and Masterplan and the bush fire constraints across the Site the proposed hospital is able to accommodate the necessary design considerations to comply with the 'special fire protection purposes' controls of PBP (section 4.2.7). Accordingly, the Site is suitable under the proposed SSD application (concept and early/ enabling works) as the hospital can be designed to meet the applicable bush fire protection measures for 'special fire protection purposes' development (including the revised provisions of the pre-release edition of the PBP 2018). Further detail is provided at **Appendix V**.

5.19 SEAR 19 – Biodiversity

Greencap Pty Ltd (Greencap) has prepared a Biodiversity Development Assessment Report (BDAR) in accordance with the *Biodiversity Assessment Method Order 2017* (Office of Environment and Heritage [OEH], 2017) (BAM), and to address more broadly the requirements in the *Biodiversity Conservation Act 2016* (NSW) (BC Act). The BDAR covers the existing property allotment at 771 Cudgen Road, Cudgen (Lot 102 DP 870722). As previously described, the Project Site comprises part of this Lot. The following provides a summary of the full BDAR attached at **Appendix I**.

A preliminary Arboricultural report that considers tree retention value and protection measures for trees to be retained is also provided at **Appendix DD**.

The majority of the Project Site is cleared and disturbed, meaning only minor vegetation removal is required. This includes up to three individual trees and grouped trees in windrows, comprising native and exotic species, as identified in the BDAR. The indicative location of vegetation to be removed/retained as assessed in the BDAR is shown at **Figure 5.13** and the tree removal plan at **Appendix D**.

The BAM identifies that the following biodiversity values are not assessed under the BAM:

- Marine mammals
- Wandering sea birds
- Biodiversity that is endemic to Lord Howe Island
- Biodiversity values associated with the assessment of the impacts of any clearing of native vegetation and loss of habitat on category 1-exempt land (within the meaning of Part 5A) of the Local Land Services (LLS) Act, other than the additional biodiversity impacts in accordance with clause 6.1 of the Biodiversity Conservation Regulation 2017 (NSW) (BC Reg).

These values are not present on the Lot or Project Site and therefore do not require additional assessment outside of the scope of the BDAR.

The BDAR provides an overview of the landscape context, including landscape features and soil hazard features such as contamination, ASS, slope stability and soil salinity (with reference to other technical reports prepared for the Project as relevant). The assessor has undertaken the required field surveys and identified vegetation formations and vegetation class on the Lot and area of the Project Site as outlined in the BDAR.

In accordance with the BAM, the Project has been located in order to avoid and minimise impacts upon biodiversity. The first phase in avoiding impacts on biodiversity was part of the site selection and due diligence process. One of the key criteria for this process was avoiding and minimising impacts on biodiversity.

The northern section of the Lot (approximately 6.8 ha), within which the Project Site is situated, is located on the Tweed River floodplain and is part of an important local wetland (mapped under the Coastal Management SEPP). The southern section of the Lot and Project Site is currently a working farm under cultivation (approximately 16 ha zoned/ mapped for agriculture). Apart from the windrows planted along the Lot boundary, most of the southern section of the Lot that encompass the Project Site, has been cleared of native vegetation. No Areas of Outstanding Biodiversity Value or areas of geological significance are located on the Lot, including the Project Site.

There are four Plant Community Types (PCTs) in eight vegetation zones located on the Lot. Two of these vegetation types (PCT 1064 Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion and PCT 1302 White Booyong – Fig subtropical rainforest of the NSW North Coast Bioregion) are composed of vegetation zones that can be classified as Endangered Ecological Communities (EEC). Vegetation communities identified are shown in **Figure 5.12.**

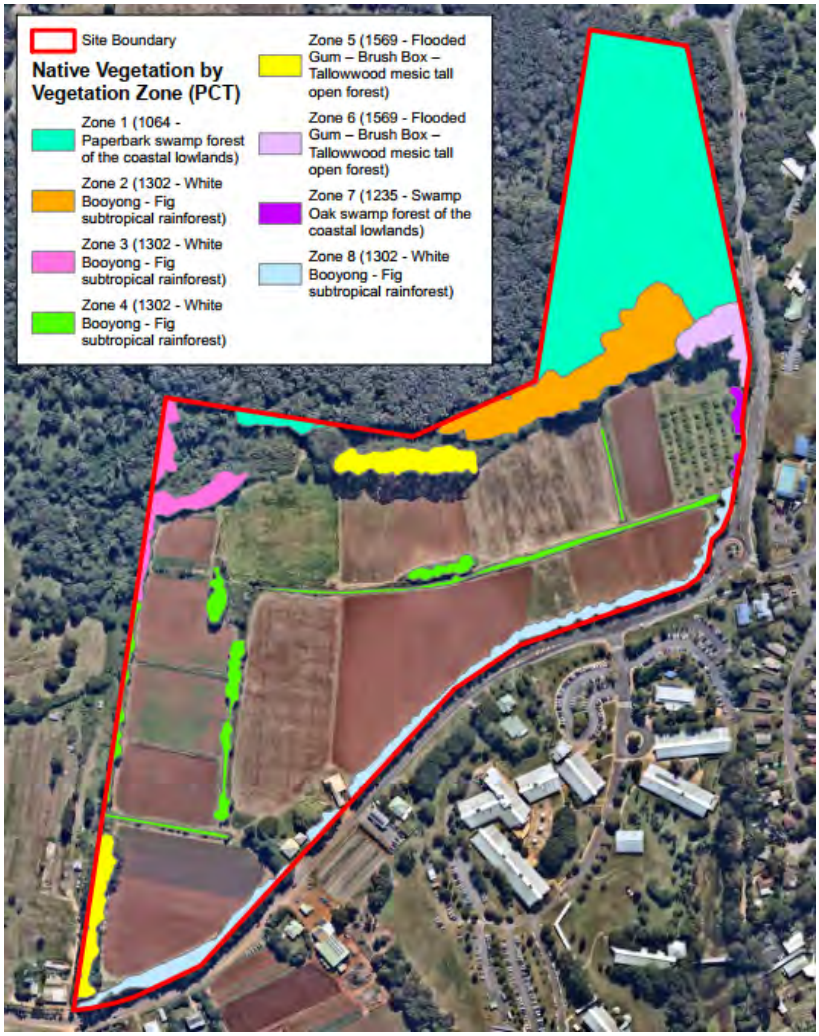


Figure 5.12 Native Vegetation Extent on Lot 102 DP 870722 (Greencap 2018)

The Proposal has been located on the Project Site to avoid direct impacts upon EECs. The development will directly impact one hectare of derived components of PCT 1302 in two vegetation zones located in windrows. These two zones do not conform to the Final Determination of the former NSW Scientific Committee for any EEC and the Vegetation Integrity (VI) score for these two zones is below the assessment threshold. Direct impacts on the other six vegetation zones have been avoided and minimised. Consequently, there is no requirement to offset the residual direct impact of the Project. The indicative location of vegetation to be removed/retained in shown in **Figure 5.13**.

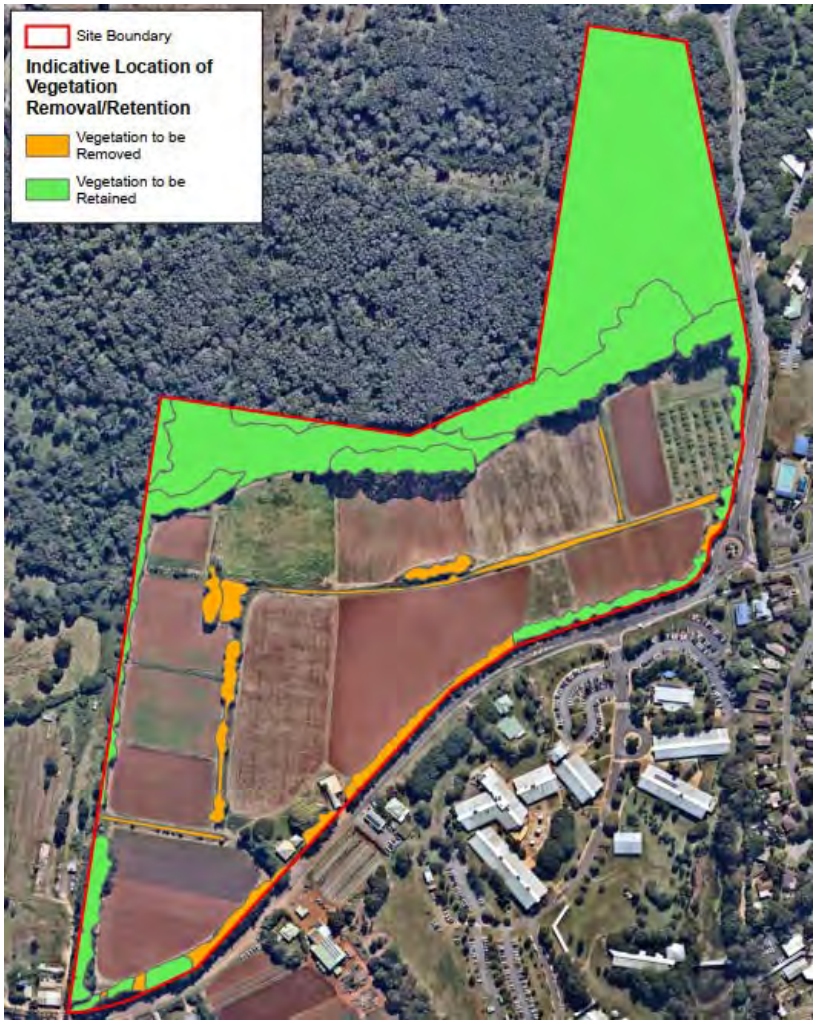


Figure 5.13 Direct Impacts on Vegetation (Greencap 2018)

An assessment of prescribed impacts was undertaken, with a particular focus on any prescribed impact on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities.

Water impacts will be managed during both the construction and operation stages. For example, construction activities will be conducted in accordance with an approved Construction Environmental Management Plan (CEMP). During operations, an integrated stormwater management system will convey stormwater runoff from buildings and associated infrastructure, roads, carparks and landscape areas. Additionally, the existing farm dam located at the north of the Project Site will be filled to return that part of the catchment to a more natural flow regime. On this basis, it is expected that operation of the Project will result in a net improvement in the quality of stormwater that is discharged from the Project Site and that the adverse impact of the development on water quality, water bodies and hydrological process that sustain threatened species and threatened ecological communities is, on balance, a positive impact. On this basis, the residual prescribed impact of the Project was considered to be negligible. Recommendations for adaptive management were also identified.

After avoiding and minimising the impact of the development on biodiversity (as outlined in section 3.1 and Table 6 of the BDAR at **Appendix I**) it was considered that the residual impact of direct, indirect and prescribed impacts that cannot be avoided and minimised is negligible. Consequently, there is no requirement to retire either ecosystem or species credits to offset the impact of the Project.

5.19.1 Summary of Recommendations

The proposed development will monitor and manage potential impacts which shall be outlined in a Biodiversity Management Plan and its sub plans:

- Vegetation Management Plan that incorporates associated components of the Landscape Plan
- Water Quality Management Plan
- Fauna Management Plan.

The Biodiversity Management Plan will include adaptive management for impacts on biodiversity that are uncertain in accordance with section 9.4.2 of the BAM and will include details of measures to monitor predicted impacts, guidelines and thresholds which will trigger adaptive management actions and other measures proposed to mitigate potential impacts.

As aforementioned and detailed in the BDAR, the successful application of the “avoid and minimise” strategy means that there are no residual impacts which will require offsetting, as no ecosystem or species credits are required for the Project.

5.20 SEAR 20 – Waste

A preliminary Waste Management Plan (WMP) has been prepared by TSA Management (refer **Appendix BB**).

It is not possible to precisely define waste streams associated with the operation of the hospital as the hospital is only at Concept Proposal stage, however the preliminary WMP provides an overview. More detail on the type, estimated quantities and management practices associated with these wastes would be addressed during Stage 2. Potential waste that could be generated during operation and would be considered further at Stage 2 has been outlined in the preliminary WMP and includes, but is not limited to:

- General domestic waste
- Waste water
- Biological waste (sewage)
- Clinical waste - Management of Clinical Waste Streams will be in compliance with NSW Health’s PD2017_026 Clinical and Related Waste Management for Health Services (refer to **Appendix BB**)
- Sharps
- Anatomical waste
- Disposable medical equipment
- Pharmaceutical waste
- Chemicals
- Plant maintenance (e.g. used oils, hydraulic and other plant fluids)
- Textiles
- E-waste
- Hazardous substances and dangerous goods.

The Tweed Byron Health Services Group (TBHSG) has a Waste Management Plan in place based on the following policies:

- NSW Health Department “Waste Management Guidelines for Health Care Facilities – August 1998
- Infection Control Policy (PD2007_036)
- Relevant legislation relating to Environmental protection and Occupational Health and Safety.

As design progresses for Stage 2, the existing TBHSG Waste Management Plan would be updated to ensure ongoing improvements and compliance with policy and legislation in all aspects of waste management, including generation, handling, storage and disposal of all forms of waste.

Relevant State and National Legislation and policy relevant to clinical and related waste would be followed in the development of the WMP. Waste minimisation and reduction strategies would also be considered within the Tweed Valley Hospital's WMP.

5.21 SEAR 21 – Community Engagement Strategy

Section 4.4 of this EIS details the ongoing Community Engagement Strategy. This will be further enhanced as the Project progresses towards detailed design.

5.22 SEAR 22 – Impact on Airspace

AviPro (a division of Resolution Response Pty Ltd) were engaged to assess the Project with regards to protected airspace and vertical obstructions (refer to **Appendix AA** for full report).

The proposed development is located marginally within the Coolangatta (Gold Coast) aerodrome Control Zone (CTR) and is therefore considered to be within 'prescribed airspace'. The CTR encompasses that airspace from ground level up to 1500 feet (457 m) above mean sea level out to a distance of seven nautical miles (13 km). Structures up to a height of 500 feet (153 m) are permitted in the vicinity of Kingscliff/ Cudgen as a matter of course without impacting flight safety.

The assessment determined that the positioning and proposed vertical development and design of the building will not incur any negative air traffic or protected airspace factors or considerations. It is not expected there would be any constraints imposed by prescribed airspace associated with airports or airport instrument approach and standard departure profiles. Protection of prescribed airspace will not be compromised either during the construction phase (crane erection) or in operation.

The report also refers to matters regarding helicopter landing sites (HLSs), with the Project incorporating such a feature on top of the proposed built form. Currently within Australia, there are no set rules or regulations applicable to the design, construction or placement of HLSs. There may however be local land use planning, location and movement approvals required. The report outlines various advisory material, guidelines and best practice standards that can be applied to HLS development, including the NSW Ministry of Health Guidelines for Hospital HLS in NSW. Refer to **Appendix AA** for details.

The Aviation assessment also considers the HLS and planned/ preferred flight paths for medical helicopters. These are shown at **Figure 5.14**. Primary considerations in selection of HLS approach and departure paths included:

- Direction of prevailing winds
- Location of vertical structures and obstacles/ hazards
- Airspace restrictions and limitations
- Avoidance of areas sensitive to noise and vibration
- Availability of emergency landing areas.

In summary, whilst the HLS is sited within the Gold Coast Airport Control Zone, it is a significant distance away from the aerodrome (more than 10 km) as to constitute no confliction, under normal circumstances, with arriving and departing aircraft. The new Tweed Valley Hospital HLS structure and

associated cranes used for construction will not infringe prescribed airspace surfaces limit. The siting of a rooftop HLS with its selected approach and departure paths that align north-north-east and south-west has resulted in an acceptable outcome. Approach and departure paths accord well with the surrounding community as the maximum extent overflight of built-up areas is avoided whilst conforming with the most likely wind directions expected in the area. The report also indicates that an elevated (rooftop) HLS will have a positive effect on noise and vibration to the surrounding environment as compared to an on-grade site.

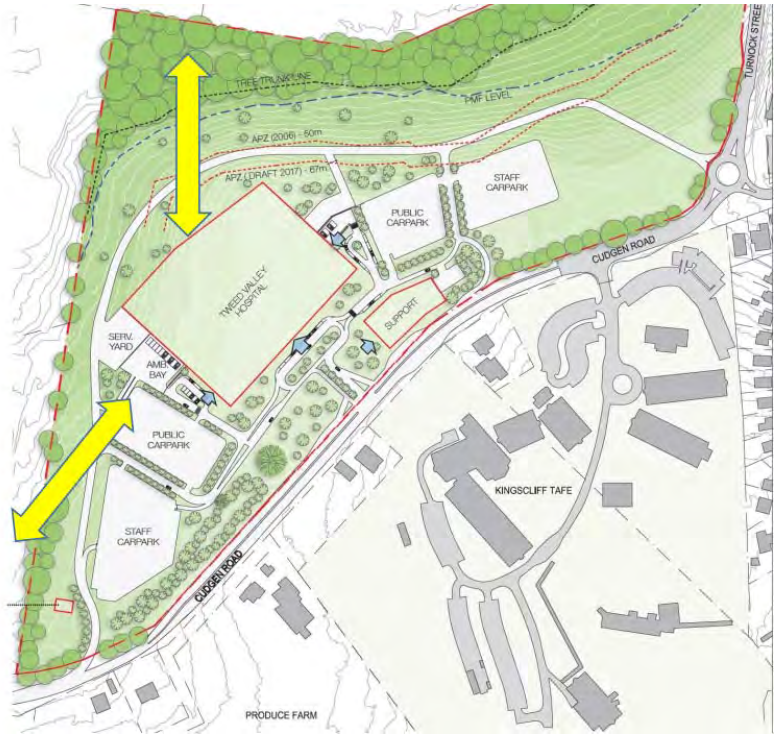


Figure 5.14 Indicative flight path illustration at Tweed Valley Hospital HLS (AviPro 2018)

5.23 SEAR 23 – Underground Petroleum Storage System

The hospital will have essential supplies that require a second supply from diesel generators on the site. These generators would require underground petroleum storage systems. The tanks will be compliant with AS 1692 and will be double walled with leak detection. Further detail would be relevant to Stage 2. Further detail on utilities and services has been provided previously.

5.24 Historical (Non-Aboriginal) Heritage

5.24.1 Historical Heritage Assessment

While there is no SEAR requirement for a Heritage Assessment, Niche was engaged to undertake a Historical Heritage Assessment for the Project (refer **Appendix O**) to assess potential impacts of the Project on historical heritage items, places and landscapes associated with the Project Site. This is relevant to the Concept Proposal and Stage 1 works.

The Project Site was inspected on 2 August 2018 by heritage consultants who noted that the site has been heavily modified by agricultural practices and continues to be used for agricultural activities. A

targeted site survey was undertaken to determine the nature and extent of historic heritage present. The survey focused on the previously identified walls (Niche 2018), the house on Cudgen Road, and associated plantings. During the course of investigations, it became clear that sections of dry stone wall were co-located with hedgerows (also known as windrows). Therefore, all hedgerows were inspected during the survey. Outside of these areas the Project Site is heavily disturbed by agricultural activities.

5.24.2 Existing Environment

The Project Site is situated on a prominent position in the landscape with views to the north and west and comprised of an elevated and roughly level terrace that runs along the southern boundary adjacent to Cudgen Road.

Searches were conducted of the Australian Heritage Database (which includes the World Heritage List, the National Heritage List, the Commonwealth Heritage list and the Register of the National Estate), the State Heritage Register, State Heritage Inventory and the TLEP 2014 heritage listings. The site is not listed within any of the registers. There are no listed items of State heritage significance located within close proximity to the site.

The following heritage items are within the vicinity of the site:

- A single listed item on the Commonwealth and National heritage registers:
    - Cudgen Burial Ground (ID 19489), Chinderah Road, Chinderah is a registered place on the Register of the National Estate and is located approximately 2.5 km north-west of the Project Site within Lot 492 DP720407. This item is a burial ground for South Sea Islanders who were brought over as indentured labourers from the mid to late 19th century to work in the timber and sugar cane industries in the Tweed River region.
- Items of local heritage significance that are listed on the Tweed LEP (2014) in the locality:
    - Chinderah Cemetery (LEP Listing No. 13), Tweed Coast Road, Chinderah is located approximately 2.5 km north-west of the Project Site within Lots 492 and 493 DP720407 and Lot 49 DP841783 and incorporates the Cudgen Burial Ground
    - Cudgen Sugar Mill Remains (LEP Listing No. A2), Tweed Coast Road, located within part Lot 3, DP 828298 resides to the immediate north-west of the Project Site. The remains of the mill are listed as having archaeological value due to its unique and significant status as the only fully developed plantation mill to be constructed using South Sea Islanders labour
    - Dry Stone Walls (LEP Listing No. 22), 463 and 501 Cudgen Road on Lots 7 and 8 DP812933 are situated approximately two kilometres south-west of the Project Site. Historical evidence indicates that the property on which the walls reside was known to have been worked by South Sea Islanders with anecdotal evidence suggesting that the walls were constructed by the Islanders. The significance of the walls is twofold, firstly in recognising the history and connection of South Sea Islanders to the Tweed district and their representative value as some of the few remaining dry stone walls in the area
    - War Memorial Cenotaph and Public School Rolls (LEP Listing No. 23) 11 Collier Street, Cudgen is located approximately 800 m west of the Project Site, on Lot 1 DP407094 and Lot 71 DP755701. The item is listed as a war memorial.

5.24.3 Assessment Results

The majority of the historic heritage aspects identified during the survey were built structures, however, some archaeological potential does exist in discrete locations. These are described below, and photos are provided in the report at **Appendix O**. The locality of these features on the site are shown at **Figure 5.15.**

Figure 5.15 Survey Results (Niche 2018)

5.24.3.1 Dry-stone walls

Five dry-stone walls were identified and recorded during the field survey.

Wall 1 – Cudgen Road

Wall 1 is a dry-stone wall approximately 64 m in length and is located adjacent to Cudgen Road, within the road reserve. The wall is constructed with large volcanic cobbles three to five courses high, with a rock rubble infill. The wall varies in width between one and three metres. From the western end for around 20 m the wall is low (single course) and partially collapsed. Between 20 m and 34 m the wall is in good condition and uniform in construction. Over the remaining 30 m of its extent the wall deteriorates and collapses in sections and is overtaken by ground cover. Vegetation and tree growth is intermingled with the wall along its extent. This relationship is both beneficial and deleterious, with tree roots holding together as well as tearing apart sections of the wall.

Wall 2 – Retaining wall

Wall 2 is an extensive wall which runs along much of the western and northern boundaries of Lot 102 DP870722. Wall 2 is a very well-constructed dry-stone wall of six to eight courses of large volcanic cobbles. The sections of wall examined were in excellent condition although the encroachment of vegetation was apparent, and at its eastern end its height reduces, and it forms more of a rubble batter than an upright wall. Thick vegetation prevented the full extent and condition of the wall from being assessed during the survey, and it is likely to be more extensive than shown in this report.

Sections of the wall have been impacted by later developments including track construction to the creek on the western side. Wall 2 appears to be a retaining wall designed to protect the ploughed fields upslope from the erosion and flooding from the creek in the west and wetlands to the north.

Wall 3

Wall 3 is a dry-stone wall of variable height located mid-slope on the western side of Lot 102 DP870722. The wall is oriented north-south within a row of trees and runs for approximately 46 m. The wall varies in height and condition; however, the majority of the wall is high (four to five courses of volcanic cobbles) and well formed. This wall is overgrown with vegetation which prevented its full extent from being defined and contributes to its deterioration. Included in this vegetation is a very old macadamia tree.

Wall 4

Wall 4 is a dry-stone wall of four to six courses of large volcanic cobbles. This wall is approximately 60 m long and contained within a hedgerow mid-slope. This wall appears to act as a terrace, supporting the upslope fields, although it could also be the remains of a culvert or retaining wall associated with the tramway that was roughly in this location. This wall is heavily concealed by the trees and vegetation of the hedgerow. It was only viewed and photographed from above as it was too difficult to access it from its base. This wall appears to be in good condition and remains in situ.

Wall 5

Wall 5 is a dry-stone retaining wall of approximately 63 m, running roughly north-south on the eastern boundary of the Project Site, adjacent to Turnock Street and retaining part of the road alignment. It is heavily overgrown by trees and other vegetation. It is unclear if Wall 5 is contemporaneous with the other dry-stone walls or a more modern structure, therefore requires further historical research to confirm its origins. Although it follows the alignment of Turnock Street, it possibly pre-dates the building of this road (which was post-1974), and may represent an earlier track, tramway or field that was subsequently utilised as a convenient new boundary line for when the Project Site was subdivided in 1974. For the purposes of this report, however, it has been nominally classified as one of the significant stone wall features until further information is available.

5.24.3.2 House and associated structures

The historic sugar plantation on the site would have contained a manager's or owner's residence as well as a variety of accommodation for workers and livestock, as well as the mill and associated buildings. The historical evidence indicates that the mill was not within the Project Site but to the south towards Cudgen Creek. However, given its elevated position, the southern side of the Project Site could have been considered a favourable spot to site a residence. The site inspection, however, revealed no evidence of an early (c. 1870s) building, indicating that the plantation-era domestic structures were located elsewhere or have disappeared from the Project Site.

Stylistically the existing house is a circa 1890-1900 weatherboard cottage on low stumps with iron roof. Originally it had a front, bullnose verandah facing Cudgen Road. In the nature of many farmhouses, the building has been extensively modified in response to changing family needs. Almost all original features have been removed or obscured except for an internal wall with a fretwork arch, one door and some VJ walls and ceiling. Major alterations that have been undertaken on the house greatly diminish the house's heritage values.

On the eastern side of the house is a non-significant modern garage and a farm shed from the 1950s-70s.

5.24.3.3 Trees

Within the immediate house grounds there are three mature trees – two figs and one poinciana. One fig is on the north-east side of the house, and has a large, spreading form. The other fig and the poinciana are in the north-west side of the house. The second fig has a taller, more contained habitat, and may be growing out of another tree. Owing to the high growth rate of trees in this area, supported by rich soil and high rainfall, these trees may not be very old (possibly 40-60 years).

Along the southern (Cudgen Road) boundary is a line of mature exotic pines (probably Pinus radiata) mixed with regrowth rainforest species such as tuckeroo (*Cupaniopsis anacardioides*) and macaranga (*Macaranga tanarius*). The pine trees probably date from the 1930s onwards when the McPhail family established the current farm boundaries.

5.24.3.4 Hedgerows

The property is divided into individual paddocks by six major hedgerows formed by the collection and piling of boulders from the surrounding fields. These are becoming overgrown by grass, weeds and trees, but do not exhibit the same maturity of regrowth or level of weathering or lichen colonisation as the stone walls, suggesting they are of more recent origin.

5.24.3.5 Rubbish deposits

Across the site three rubbish deposits were identified. A small scatter of fragmented ceramics was identified amongst the volcanic cobbles of Wall 3. These ceramics were utilitarian 19th century or early 20th century domestic-ware. Two other, larger rubbished deposits were identified in the north-west corner of the site. These two rubbish deposits contained a range of material including evidence of the old tramway in the form of rail track, as well as other cast-iron, a Schultz Engineering and Manufacturing Co. ferrous metal container (post-1961) and demolition debris. Initial inspection indicated some of the material may be 19th or early 20th century, while other material is more recent.

5.24.4 Significance Assessment

The Historical Heritage Assessment provides an assessment of the significance for the Project Site and the identified elements. Overall, the Project Site is part of one of the first land grants in the area and is associated with the initial development of the sugarcane and dairy industry in the area during the 19th and early 20th century and has been used for agricultures continuously since. It has moderate local historical significance on this basis, for while its use for general agriculture remains, specific links to the sugar and dairy industries, and the original more extensive plantation/ farm landscape that it was once part of, have mostly disappeared through subdivision and boundary changes, a loss of physical evidence, change to agricultural activities and encroaching urban development.

The dry-stone walls (1-5) are physical evidence of early activities, and likely date to that early phase of development when the Project Site was a large sugar plantation and then dairy farm and were probably built with the use of South Sea Islander labour. They therefore have local historical significance and potential (pending community consultation) associative significance with the Australian South Sea Islander community and the life of the former plantation owner, Henry Robert Cazala, and the Cornwell family, who were prominent historical figures in the district.

The dry-stone walls and mature trees on the Project Site have individual aesthetic value and also contribute to the Project Site's overall aesthetic qualities. Wall 1, which is visible from Cudgen Road, provides aesthetic interest to that road and the frontage of the Project Site, while the mature trees

have local landmark value and contribute to local vistas. The rubbish deposits identified as well as the existing house area have potential to reveal archaeological relics relating to the early land use and occupancy, including the early tramway, and therefore have local significance.

5.24.5 Potential Impacts and Recommendations

The Historical Heritage Assessment (**Appendix O**) identifies the following potential impacts associated with the Project:

- Wall 1 – the current Masterplan positions the western end of Wall 1 hard on the eastern side of the emergency vehicle entry from Cudgen Road. Although in principle there should be no impact, final detailed design and construction requirements for the driveway entry may necessitate the need for encroachment.
- Wall 2 and 5 – these walls are outside of the current footprint. They constitute approximately 618.8 m of the total 791.8 m of the dry-stone walls on the Site. They are located in an area which may be subject to vegetation management/ clearance. The impact of these activities on heritage needs to be considered as part of the vegetation management plan.
- Walls 3 and 4 comprise approximately 113.2 m of the 791.8 m of the dry-stone walls and are likely to be impacted by the development; with wall 4 being completely impacted by the carpark footprint of the Masterplan.
- Trees – a proportion of trees will be removed, retained and incorporated in the new design. Notably, the main fig will be retained and incorporated in the new design.
- Rubbish deposits – these deposits are outside of the current footprint, however may need to be removed during general site improvement
- Hedgerows – most of the hedgerows will be impacted by the proposed development.

Note: removal of the house is subject to separate Preliminary Works.

The Historical Heritage Assessment (**Appendix O**) concluded that:

- The Project Site once formed part of a historically significant sugar plantation, established 1875, and then major local dairy farm that was subdivided into smaller farms from 1916. Much of the physical evidence of that early development has vanished or been heavily altered, including the early farmhouse which has been extensively modified where its heritage values are now minimal. However ongoing use of the land for agriculture continues an important historical association. That association, however, is considered diminished by the previous subdivisions, changes to agricultural practice, and recent surrounding development that have occurred, reducing the Subject Site to a remnant of that original wider rural landscape.
- The most significant items on the site are the five dry-stone walls which are very early features and probably built by South Sea Islanders.
- The land has been used for agricultural purposes for over 140 years. The Project will result in a change of use from rural to infrastructure with subsequent large-scale development, altering the historical use of the land.
- The Project is considered to be sympathetic overall to the heritage values of the Project Site as it does not adversely impact the curtilage and has minor or no impacts to four of the five dry-stone walls.
- Three of the stone walls will or may be impacted to some degree by the proposed works. These walls are not classified as ‘relics’ under the under the *Heritage Act 1977*, but ‘works’, and therefore do no invoke any requirements for management of relics as per that Act.

- The historic rubbish dumps located in this assessment are not within the immediate impact area for the hospital works. There remains some potential for these dumps to retain early and possibly locally significant relics associated with the use of the land for sugar and early dairying activities.

A range of measures are recommended to mitigate any impacts to the identified heritage values of the Project Site. Recommended mitigation measures relate to minimising or removing impacts to the stone walls through the design where possible and archivally recording all features to be removed; stabilising and rebuilding one of the walls (Wall 1 under Preliminary Works) and representing any demolished sections of wall in new roadway surfaces; managing the archaeological deposits in accordance with best practice, and interpreting the history of the Project Site in the new development.

The detailed list of recommendations is provided in the Historical Heritage Assessment at **Appendix O** and summarised in **Section 9**.

6. Assessment of Stage 1 Works

Stage 1 works have been described in **Section 3** previously and generally involve the following work:

- Construction compound for Stage 1 works
- Augmentation and connection of permanent services for the new facility (water, sewer, electricity, telecommunications)
- General clearance of site vegetation within the footprint of construction works, including tree stumps
- Chipping of cleared vegetation (excluding weed species) to use on-site for ground stabilisation/ erosion control, or off-site disposal (as required)
- Bulk earthworks and recycling of materials to establish the required site levels and create a stable landform in preparation for hospital construction
- Piling and associated works
- Stormwater and drainage infrastructure for the new facility
- Rehabilitation and revegetation of part of the wetland area
- Construction of temporary internal road ways for use during construction and in preparation for final road formations in Stage 2
- Retaining walls.

6.1 SEAR 1 – Bulk Earthworks

Details of the bulk earthworks for Stage 1 works of the Project and associated infrastructure are provided in **Appendix X** which includes a cut and fill plan (General Earthworks Plan) and a Foundation/ Piling Plans (refer to Drawing No. C0005, C0006, C0007, C00011 and C00013). A consolidated set of plans are also provided in **Appendix B**.

Approximate volumes of cut and fill are 118,653 m^3 and 139,812 m^3 cubic metres respectively, resulting in excess cut volume of 21,159 m^3. Excavated rock is to be recycled and reused on site as road base where suitable and general fill where appropriate.

The Traffic Impact Assessment also provides consideration of construction related impacts for Stage 1 works (discussed at **Section 6.3**). It notes that haulage routes have not been confirmed at this stage, however the main access/ haulage routes are expected to be via Cudgen Road, Tweed Coast Road and the Pacific Highway. Given expected construction volumes, impacts are expected to be minimal.

Haulage of material would be managed through the scheduling of deliveries and availability of fleet to minimise the number of haulage and delivery vehicles during peak periods.

6.2 SEAR 2 – Site Office Details

Portable Site Offices will be used on the site as the existing dwelling will be demolished as part of the Preliminary Works and remediation process. A site compound for Stage 1 works is included on the plans at **Appendix B**.

6.3 SEAR 3 – Transport and Accessibility

The Traffic Impact Assessment at **Appendix L** includes consideration of construction related impacts applicable to Stage 1 works. Assessment of construction parking and traffic should be considered with the context and current stage of the proposal. Detailed construction methodologies and documentation are prepared by the construction contractor(s) prior to commencement of works. Key considerations are detailed as follows:

- construction does not typically require a Transport Impact Assessment, as the nature of construction is temporary
- in order to commence construction, the construction contractor is required to have in place all relevant approvals and applications with Tweed Shire Council (e.g. Construction Certificate, approval for Temporary or Partial Road Closure Including Road Related Areas)
- if oversize and/or over mass vehicles and loads are required, approval is required from RMS.

The site is expected to have sufficient area for construction parking on-site in the form of temporary hardstand parking. Access to these parking areas will be provided via a temporary site access or accesses.

All construction traffic and any impacts to the external road network due to works or in providing construction access to the Project Site will be managed under a Construction Traffic Management Plan (CTMP) and traffic control plan (TCP). These should be prepared in accordance with the Roads and Maritime Services (formerly RTA) Traffic Control at Work Sites manual. The construction contractor will be required to develop and seek approval for the implementation of a CTMP prior to commencement of construction to ensure safe and efficient management of traffic. For the purpose of this assessment a preliminary CTMP has been included at Appendix E of the Traffic Impact Assessment. The preliminary CTMP is for information only and is not for implementation. A detailed and formalised CTMP prepared by the contractor is needed prior to the start of construction.

Key construction traffic management considerations are summarised below and in Section 6 of the Traffic Impact Assessment.

Traffic generated as a result of construction works for Stage 1 are expected to include:

- Heavy vehicle movements for the delivery and removal of construction equipment and machinery, spoil and waste management
- Small and medium sized vehicles for material delivery
- Light vehicles for movement of construction personnel, including contractors, labour force and supervisor/ management staff.

Construction traffic volumes have been estimated based on expected construction traffic volumes for the new Maitland Hospital EIS, given the similar scale (new Maitland Hospital has a gross floor area of approximately 60,000 m^2 which is within the range proposed for Tweed Valley Hospital). Estimated construction traffic movements are summarised in **Table 6.1.**

Table 6.1 Estimated Daily Construction Traffic (Bitzios 2018)

Vehicle Type	*Estimated Average Vehicles Accessing Site (average per day)*	*Estimate of Average Daily Trips (i.e. two-way movements)*
Heavy Vehicles	35	70
Light Vehicles	55	110
Total	90	180

While construction traffic is expected to be spread throughout a typical day, as a worst-case assessment it is estimated that 20 per cent of heavy vehicles and 100 per cent of light vehicles could arrive/ depart in a peak hour. This equates to in the order of 125 peak hour trips.

Construction works for Stage 1 of the Tweed Valley Hospital is expected to result in additional traffic that may result in some delays on the external road network as a result of construction vehicles travelling on the network and accessing the site and additional traffic movements associated with construction (e.g. construction staff). All construction traffic and any impacts to the external road network will be managed under the aforementioned CTMP. The construction contractor will be required to prepare and seek approval for the implementation of a CTMP prior to commencement of works.

The estimated construction related additional traffic movements may result in some additional delays at key intersections on the haulage route and key travel routes. It is recommended that heavy vehicle movements take place outside the commuter and school peak periods. It is likely that much of the labour force will arrive prior to the typical AM peak period.

Where required, vehicle movements (e.g. along the site frontage and at site access locations) will be managed under the aforementioned CTMP.

Public and active transport (walking and cycling) trips generated by construction activities are expected to be low. Regardless, the Project Site is well serviced by alternate transport. The existing infrastructure will adequately cater for any additional demand generated by construction activities. The existing infrastructure will adequately cater for any additional demand generated by construction activities.

Minimal impacts to public transport during construction works associated with Stage 1 are expected.

Some minor travel time delays may occur to bus services as a result of additional construction vehicles and particularly heavy vehicles on the surrounding road network.

Minimal impact to pedestrians and cyclists is expected in the area during construction. The CTMP will manage pedestrian and cyclist infrastructure and deal with any impacts and required interim routes.

Haulage routes have not been confirmed at this stage, however the main access/ haulage routes are expected to be via Cudgen Road, Tweed Coast Road and the Pacific Highway. Given expected construction volumes, impacts are expected to be minimal.

Haulage of material should be managed through the scheduling of deliveries and availability of fleet to minimise the number of haulage and delivery vehicles during peak periods. This again can be addressed in the detailed CTMP prior to commencement.

6.3.1 Conclusion

Stage 1 construction related traffic is not expected to result in any significant impacts and would be of a temporary nature and managed accordingly. All construction traffic and any impacts to the external road network will be managed under a CTMP, prepared by the contractor prior to commencement.

The overall conclusion from the investigations carried out by Bitzios Consulting and presented in the Traffic Impact Assessment is that traffic, parking, access and circulation arrangements for the Project, including Stage 1 works, would be satisfactory and there are no traffic or parking impediments.

6.4 SEAR 4 – Noise and Vibration

The Noise and Vibration Impact Assessment focuses on the construction noise and vibration impacts associated with Stage 1 Early and Enabling Works. Details of the noise monitoring, locations and methodology has been outlined previously in **Section 5.11** and full background and details are at **Appendix P.**

6.4.1 Construction Noise Criteria

The relevant guideline applied for the assessment of construction noise is the Interim Construction Noise Guideline (ICNG). This guideline provides construction noise criteria for residential, commercial and industrial noise receivers. This proposes that if construction noise exceeds the RBL (Rating Background Level) by up to +10 dB (or +5 dB outside of recommended standard hours) then the area can be considered as being 'noise affected'. Noise levels above 75 dB(A) are considered 'highly noise affected'.

The project-specific construction noise criteria based on the measured background noise levels at the site are detailed in the Noise and Vibration Assessment (**Appendix P**). Criteria presented in the assessment includes:

- Project specific residential construction noise criteria for airborne noise
- Residential construction noise criteria for ground-borne noise
- Industrial, commercial, educational and hospital construction noise criteria for airborne noise
- RNP (NSW EPA Road Noise Policy) assessment criteria for additional traffic on local roads generated by land use development including construction vehicles/ traffic.

The assessment results summarised at **Section 6.4.3.2** include reference to the established criteria and predicted noise levels.

6.4.2 Construction Vibration Criteria

Construction vibration is to be assessed in terms of:

- Human comfort
- Disruption to sensitive equipment
- Structural damage.

Relevant criteria for each of these are discussed in the Noise and Vibration Assessment (**Appendix P**). Vibration and its associated effects are usually classified as continuous, impulsive or intermittent as defined in the Noise and Vibration Assessment.

6.4.3 Construction Noise Assessment - Stage 1 Early and Enabling Works

Proposed construction hours for the Stage 1 of the Project are proposed to be as follows:

- Monday to Friday - 7:00 am to 6:00 pm
- Saturday - 8:00 am to 4:00 pm (extended hours)
- Sunday and Public Holidays – No works.

As outlined in **Section 1.7**, the timing and delivery of the Project is critical. Extended construction hours (i.e. Saturday 1.00 pm to 4.00 pm) are needed in order to meet the critical project delivery timeframe which is driven by:

- The significant forecast population growth in the Tweed-Byron region
- The constraints of current infrastructure at TTH, which is at capacity - a program of interim upgrade works has commenced to assist in meeting the needs of the community until the new hospital opens, and services are transferred
- The physical limitations of TTH site, which has inadequate space to develop new buildings and access is impacted by flooding.

These drivers strongly support the requirement for extended construction hours.

The Noise and Vibration Assessment has included extended hours in the assessment.

The Noise and Vibration Assessment has developed a list of main tasks and associated typical plant/ equipment for the Stage 1 works based on indicative construction works program that outlines the key activities.

6.4.3.1 Construction Noise Assessment Methodology

A preliminary assessment of the likely noise impacts of the proposed works on the most-affected receivers surrounding the site has been carried out.

The assessment has considered the following:

- Typical activities
- Project specific Noise Management Levels (NMLs) at each sensitive receiver location
- Noise level predictions are calculated using the established noise data
- Noise level predictions consider:
    - Distance attenuation
    - Ground and building reflections
    - Meteorological conditions
- The noise level predictions are based on assumptions that represent the worst-case scenario
- L_{Aeq} noise levels are predicted for the operations of the nearest works area on the site to each of the nearest sensitive receiver locations
- The predictions consider individual tasks and associated equipment with a range from the nearest construction site boundary and the centre of construction site
- The predictions assume continuous operation of equipment/ plant over the 15-minute assessment period to provide a worst-case assessment, unless otherwise stated
- The assessment predicts noise levels with equipment located centrally to the site and at the nearest position of the site boundary to the nearest noise sensitive receiver to provide a worst-case assessment.

6.4.3.2 Assessment Results

Table 6.2 presents the results for the construction noise assessment at surrounding receivers based on typical plant and equipment (detailed in **Appendix P**) operating within the boundary of the construction works site. Levels predicted to exceed the “Recommended Standard Hours”/ commercial, industrial, educational criteria and “Outside Recommended Standard Hours” criteria are in red and

blue respectively. Where recommended standard hours criteria are exceeded, outside recommended standard hours criteria are also exceeded.

Table 6.2 Predicted equipment/ plant noise levels at the nearest surrounding community receiver locations

Location and Construction Activity	Predicted equipment noise levels at surrounding community receivers, in $dBL_{Aeq,15min}$						
	Residential		Commercial	Agricultural	Passive Recreation Area	Educational	
						TAFE	KHS
	Catchment						
	A	B	A	B	A	B	A
	Noise Management Level, dB(A)						
	50[1] / 55[2]	52[1] / 57[2]	70	75	60	55	55
Trucks[3]	52-61	63-77	51-59	58-77	47-49	59-66	50-52
Concrete Mixer Truck	50-59	61-75	48-56	56-75	45-47	57-64	48-50
Compactor	51-60	64-76	49-57	57-76	46-48	58-65	49-51
Grader/ Roller	48-57	61-73	46-54	54-73	43-45	57-64	46-48
Excavator with Hammer/ Saw	60-69	71-85	59-67	66-85	55-57	67-74	58-60
Excavator with bucket/ Backhoe/ Front loader	54-64	68-80	52-60	60-79	49-51	61-68	52-53
Bobcat	51-60	64-76	49-57	57-76	46-48	58-65	49-51
Concrete Pump	51-60	64-76	49-57	57-76	46-48	58-65	49-51
Mobile Crane	52-61	63-77	51-59	58-77	47-49	59-66	50-52
Jackhammer	51-60	64-76	49-57	57-76	46-48	58-65	49-51
Piling Rig	54-63	67-78	52-60	59-78	49-51	60-67	52-54
Rock Crushing	60-69	71-85	59-67	66-85	55-57	67-74	58-60
Grinder	42-51	53-67	41-49	48-67	37-39	49-56	40-42
Hand Tools/ Drills	45-54	56-70	44-52	51-70	40-42	52-59	43-45
Wood Chipper	60-69	71-85	59-67	66-85	55-57	67-74	58-60
Chain/ Circular Saw	55-64	66-80	54-62	61-80	54-52	62-69	53-55

Location and Construction Activity	Predicted equipment noise levels at surrounding community receivers, in dBL$_{Aeq,15min}$						
	Residential		Commercial	Agricultural	Passive Recreation Area	Educational	
						TAFE	KHS
	Catchment						
	A	B	A	B	A	B	A
	Noise Management Level, dB(A)						
	50[1] / 55[2]	52[1] / 57[2]	70	75	60	55	55
Forklift	45-54	56-70	44-52	51-70	40-42	52-59	43-45

Notes:
1 Outside Recommended Standard Hours
2 Standard Recommended Hours
3 Worst case truck noise
Source: Acoustic Studio

As described in the Noise and Vibration Assessment and as per the RNP, an increase in the traffic noise level of up to + 2dB in relation to the existing traffic noise level is considered to be a minor impact and barely perceptible to the average person.

Based on existing traffic volume data for the roads surrounding the site (refer to Traffic Impact Assessment by Bitzios), the limit of increase in traffic volume can be predicted such that the resulting increase in traffic noise level over the existing is limited to +2 dB. Further, considering the preliminary traffic volume data provided by Bitzios, **Table 6.3** shows the indicative limits of increases in traffic volumes due to construction traffic to maintain an increase in traffic noise levels of less than 2 dB at each receiver.

Table 6.3 Indicative limit of increase in traffic volume due to addition of construction traffic, in order to maintain an increase in traffic noise level of less than 2 dB(A)

Traffic Source	Existing Traffic Volume (2018)		Limit of Increase in Traffic Volume (Weekday Average)	
	am	pm	am	pm
Cudgen Road	1414	1223	791	685
Turnock Street	574	611	321	342
Turnock Road	1648	1738	923	974

As long as construction traffic accessing the site results in increases of traffic volumes which are within the outlined limits, the increase of existing traffic noise levels would be less than 2 dB. Therefore, the RNP criteria will be met at all residential receivers for all time periods.

Based on the results from the high-level assessment based on the indicative Stage 1 works, Acoustic Studio make the following concluding comments:

- Construction works noise impacts will be greatest at Residential Catchment B and the educational receiver (TAFE) is the next most sensitive/ noise impacted receiver. Noise from various plant and equipment operating individually are generally predicted to be above the NMLs and the Highly Noise Affected levels at both receivers, due to the proximity to the nearest affected receivers. The worst-case noise impacts are for excavators with hammers, wood chipping and rock crushing with noise levels predicted to be above the NMLs by up to 24 dB when used during recommended standard hours and up to 28 dB(A) when used outside recommended standard hours on a Saturday. Mitigation measures to be considered and incorporated where reasonable and feasible would include:

    - Applying Standard Hours
    - Including Respite Periods where activities are found to exceed the 75 dB(A) Highly Affected Noise Level at receivers, such as three hours on one hour off.

- For all other receivers, the noise generated from the construction works noise from individual equipment operating is below the Highly Noise Affected Levels and generally able to meet the NMLs achieving the relevant criteria when further away from the perimeter boundary.
- The individual and cumulative noise levels from operations of various plant and equipment are predicted to be up to 19 dB lower when location of activities within the site boundary are further away from a particular receiver, and in some cases, within the NMLs depending on the distance to the receiver.
- For construction works carried out outside standard recommended hours (i.e. Saturday – 1.00 pm to 4.00 pm), some plant/ activities are predicted to be above the outside standard hours' NMLs that would otherwise be within NMLs for the standard work hours' criteria for Residential Receivers Catchment A. In these cases, noisy activities are to be scheduled to less sensitive times so as to minimise potential noise impacts.
- The predictions above for noise levels above NMLs is not unusual given the heavy plant and equipment that must be used, such as excavators and rock crushing plant, and the proximity of sensitive receivers.
- Construction traffic along the roads surrounding the Site will have no adverse noise impacts on nearby receivers during the day-time period.

It is important to recognise that the actual noise levels generated during the construction works are likely to vary considerably depending on many factors including:

- Number of items of plant and equipment operating simultaneously
- Location of equipment on the site – relative to the noise-sensitive receivers
- Shielding of noise provided by structures and hoardings on and around the site
- Reflections provided by existing structures on and around the site
- Meteorological conditions.

When construction and excavation works are likely to exceed stated criteria at nearest sensitive receivers, particularly when works occur in the areas closer to the nominated receiver, all feasible and reasonable noise control measures are to be considered. An overview of control measures is at **Section 6.4.5**.

6.4.4 Construction Vibration - Stage 1 Early and Enabling Works

A detailed vibration assessment has not been carried out at this stage, as actual vibration levels experienced will be dependent upon:

- Site and strata characteristics
- Specific construction equipment used
- Vibration requirements of sensitive equipment.

Based on the scope of works and typical equipment required, some human perception vibration impacts may occur – particularly from the use of excavators with hammers during excavation when near site boundaries along Cudgen Road. The Noise and Vibration Assessment therefore recommends that details of the vibration management controls required for the works would be determined when the Early and Enabling Works Construction Noise and Vibration Management Plan (CNVMP) is prepared by the contractor.

It is recommended that, prior to the commencement of the Stage 1 Early and Enabling Works, vibration surveys will be carried out of each key vibration-generating-activity/ equipment.

The contractor will be required to carry out a vibration assessment at the commencement of operations for each vibration generating activity to determine whether the existence of significant vibration levels justifies a more detailed investigation.

If the assessment indicates that vibration levels might exceed the relevant criteria, then vibration mitigation measures will need to be put in place to ensure vibration impacts are minimised using all reasonable and feasible measures.

Catchment B residences present the most stringent vibration criteria, particularly given their proximity to the Project Site. Controlling vibration at these receivers will also ensure that vibration criteria at all other receivers will also be satisfied.

It is recommended that a CNVMP is prepared at the detailed design stage when a contractor is engaged. The contractor would be required to prepare a final CNVMP based on their proposed plant, equipment and construction methodology.

6.4.5 Control and Mitigation Measures

As a general rule, prevention is to be applied as universal work practice at any time of day, but especially for the occasional construction works to be undertaken at critical times outside normal daytime/ weekday periods.

It is noted that the reduction of noise at the source and the control of the transmission path between the construction site and the receiver(s) are the preferred options for noise mitigation/ minimisation. Providing treatments at the affected residences or other sensitive land uses is to be only considered as a last resort. Construction noise shall be managed by implementing a range of strategies as outlined in the Noise and Vibration Assessment (**Appendix P**) and summarised below:

- Plant and equipment selection and management
- On-site noise management
- Consultation, notification and complaints handling
- Work scheduling
- Undertake vibration assessment and surveys as required

- If, during construction, an item of equipment exceeds either the noise criteria at any location or the equipment noise level limits, the noise control measures outlined in the Noise and Vibration Assessment, together with construction best practices, shall be considered to minimise the noise impacts on the neighbourhood
- Noise and vibration monitoring.

Implementation of all reasonable and feasible mitigation measures for all construction works would ensure that any adverse noise impacts to surrounding residential, commercial and recreational receivers are minimised when noise goals cannot be met due to safety or space constraints.

A preliminary CNVMP is attached to the Noise and Variation Assessment carried out by Acoustic Studio and focuses on the construction noise and vibration impacts associated with Stage 1 Early and Enabling Works. The Preliminary CNVMP is based on assumed works, methods and equipment, and outlines likely requirements for managing construction noise and vibration impacts from works to nearby sensitive receivers. Construction noise and vibration management requirements are described in as much detail as is possible in the preliminary CNVMP at this early stage in the design process.

The main contractor shall be responsible for developing a comprehensive CNVMP prior to commencement of works and to ensure that noise and vibration from activities carried out on site is minimised as far as practical.

6.5 SEAR 5 – Sediment, Erosion and Dust Control

6.5.1 Erosion and Sediment Control – Stage 1 Works

As outlined previously, Health Infrastructure would undertake some Preliminary Works separately, including initial erosion and sediment controls to responsibly manage the land. The following measures would be additional and specific to the SSD application as applicable.

Erosion associated with the proposed Stage 1 work activities, both within the site and the surrounding area may pose a risk to the receiving environment if appropriate measures are not implemented. It is unlikely that the construction works will impact on the hydrology or flooding characteristics of the area given the lack of waterways on-site and that the main development/ works area is not flood prone.

Soil and erosion control procedures and devices will be required to be provided during construction. Controls are to be in line with relevant authorities and best practice standards. This will include the Tweed Shire Council requirements, the EPA. OEH and Managing Urban Stormwater Soils and Construction (“the Blue Book”). A soil and water management plan has been prepared for the Project (as part of the Civil and Structural Design report which is attached as **Appendix X**).

Works will only commence once all erosion and sediment controls have been established. The controls will be maintained in place until the works are complete and all exposed erodible materials are stable.

Erosion and sedimentation controls will be checked and maintained (including clearing of sediment from behind barriers) on a regular basis (including after any precipitation events) and records kept and provided on request.

All sediment control measures will be checked and repaired or re-installed (if required) if heavy rainfall was forecast.

With effective implementation and management of such measures, erosion and sedimentation risks can be minimised and do not pose a significant threat to the environment.

6.5.2 Air Quality

The following section addresses air quality and dust related impacts applicable to Stage 1 - Early and Enabling Works.

6.5.2.1 Environmental Aspects and Impacts

Particulate matter will be the main source of air pollution during Stage 1 construction works, and so air quality management measures for the proposed works will focus primarily on particulate matter generated during construction. Emissions to the atmosphere during construction are typically divided into two categories:

- Dust and particulates (general earthworks)
- Gaseous (vehicle and plant emissions).

Vegetation clearing, and excavation activities have the potential to affect air quality if not properly managed. Dust has the potential to be generated from earthworks associated with construction activity for Stage 1. The total amount of dust generated depends on the silt and moisture content of the soil and the type of activities being carried out.

Some emissions, such as those generated by vehicle exhausts are not considered to present a significant risk to the environment and community. However, all vehicles, plant and equipment will be maintained to comply with the manufacturer's specifications, along with relevant standards and legislative requirements (refer to **Section 6.5.2** for appropriate mitigation measures).

6.5.2.2 Factors likely to affect dust generation and impacts onto sensitive receivers

In addition to the inherent risks of specific construction activities creating the potential to generate dust, a number of other environment factors also affect the likelihood of dust emissions. These include:

- Wind direction - determines whether dust and suspended particles are transported in the direction of the sensitive receivers
- Wind speed - governs the potential suspension and drift resistance of particles
- Soil type - more erodible soil types have an increased soil or dust erosion potential
- Soil moisture - increased soil moisture reduces soil or dust erosion potential.

6.5.2.3 Impacts on air quality

The potential for impacts on air quality will depend on a number of factors. Primarily impacts will be dependent on the nature, extent and magnitude of construction activities and their interaction with the natural environment. Potential impacts attributable to construction might include:

- Potential adverse health effects including eye, nose and throat irritation from excessive inhalation of fine particles
- Deposition of dust on surfaces where it may cause damage and/or lead to a need for increased cleaning or repai.

- Aesthetic effects that arise from visible airborne dust plumes and from deposits of dust on surfaces
- Need for increased maintenance of air filtering systems (e.g. air conditioners etc)
- Impacts on water quality and/or vegetation health from dust deposition
- Impacts on residential sensitive receivers, including impacts on living areas, swimming pools and general amenities
- Complaints from the public relating to dust or odour
- Dust deposition impacts on threatened flora species or habitat for threatened fauna species
- Dust deposition impacts on sensitive agricultural receivers, including sugar cane and horticulture farms
- Dust contamination of water tanks.

6.5.2.4 Mitigation Measures

Works will be undertaken in a manner that minimises dust emissions from the site, including wind-blown and traffic-generated dust and tracking of material onto public roads. All activities on the site shall be undertaken with the objective of preventing visible emissions of dust from the site. Should such visible dust emissions occur at any time, the contractor shall identify and implement all feasible and reasonable dust mitigation measures, including cessation of relevant works, as appropriate, such that emissions of visible dust cease.

Prior to construction activities, training will be provided to all project personnel, including relevant sub-contractors on sound air quality control practices and the requirements from this plan through inductions, toolboxes and targeted training.

Dust management will form part of the CEMP prepared by the contactor. The following mitigation measures would be implemented during construction activities as relevant:

General

- Construction activities will be modified, reduced or controlled during high or unfavourable wind conditions if they have a potential to increase dust generation
- Control measures including water carts, sprinklers, sprays, dust screens or the application of geo-binding agents will be utilised where applicable to control dust emissions. The frequency of use will be modified to accommodate prevailing conditions. Dust control equipment will be maintained to ensure its operability
- Erosion control structures will be checked regularly for build-up of silt and other materials to ensure deposits do not become a dust source
- Waste will be segregated and collected on a regular basis to ensure odours associated with waste do not become an issue
- No waste will be burnt on-site
- Stormwater, recycled water or other water sources shall be used, where feasible and reasonable, in preference to potable water for construction activities, including concrete mixing and dust control.

Vehicle Movement and Material Storage

- Areas of disturbed material and access roads will be stabilised where possible using appropriate methods
- Measures implemented to minimise dust, soil or mud from being deposited from vehicles on public roads. This will be achieved by implementing mitigation measures such as rumble grids and large

aggregate at entry/ exit points. Manual cleaning will also be carried out where appropriate. In the event of any spillage or tracking, the spilt material will be removed within 24 hours
- Hardstand areas and surrounding public roads will be cleaned, as required, using methods including brooms, bobcat attachments or street sweepers
- All loaded haulage trucks will be covered where there is a risk of release of dust or other materials and at all times on public roads.

Plant and Equipment

- Engines of plant parked near to residents will be switched off when not in operation
- Exhaust systems of construction plant, vehicles and machinery will be maintained in accordance with manufacturer's specifications to ensure that emissions do not exceed EPA regulations. Periodic visual checks will be undertaken to ensure ongoing compliance, typically weekly
- Any plant, equipment or machinery will be immediately switched off should there be visible signs of smoke emissions emitting from equipment/ machinery
- Dust suppression systems will be installed and used on crushing and screening plants to minimise generation of dust from these activities.

Given the nature of the Stage 1 works, there is the potential for dust generation and dispersion. With the implementation of effective management measures and safeguards, dust generation can be effectively controlled, and the risk minimised. Air quality management would form part of the CEMP for the works and will encompass the above standard mitigation measures.

6.6 SEAR 6 – Contamination

Contamination of the site has been addressed in detail in **Section 5.12** and mitigation measures are proposed in the form of a Remediation Action Plan for works that will be undertaken as Preliminary Works outside of the scope of this SSD.

A hazardous materials survey has not been able to be conducted as the dwelling on site is currently occupied. However, as the demolition of the dwelling is not within the scope of this SSD application, a hazardous materials survey is more appropriately addressed as part of those demolition works.

6.7 SEAR 7 – Ecologically Sustainable Development

6.7.1 Overview of Stage 1 Sustainable Design Approach

An Environmentally Sustainable Design (ESD) report has been prepared by Steensen Varming and is attached at **Appendix M**. The report provides a summary of the relevant industry best practice guidelines and outlines how the design team will respond to the requirements through the implementation of specific ESD measures and initiatives for Stage 1 Early and Enabling Works.

Due to the nature of the Stage 1 works, the proposed measures and initiatives outlined in this section are largely associated with ground works. The applicable ESD requirements contained within the following documents have been considered in the ESD report:

- NSW Energy Efficiency Action Plan 2013
- NSW Government Resource Efficiency Policy (GREP)
- NSW Climate Change Policy Framework
- NSW Health Infrastructure Engineering Services Guidelines

- BCA Section J Requirements
- Sustainable Policy for NSW Government
- NSW and ACT Government Regional Climate Modelling climate change projections.

The relevant ESD requirements of the above guidelines are summarised in the ESD report at **Appendix M**.

ESD has been (as addressed previously) considered for the Concept Proposal, with the aim to ensure the Project responds appropriately to the principles of sustainable design and ensure Health Infrastructure continues to deliver environmentally responsible projects. The measures set out in the ESD report and policy for the Stage 1 works can be categorised into several key areas as follows:

- Reducing energy consumption and associated CO2 emissions (e.g. implementing passive design measures to reduce energy demand; using efficient plant to meet reduced demand; considering installation of low or zero carbon (LZC) technologies to make further savings)
- Reducing potable water consumption
- Reducing the impacts of materials specification (e.g. use of sustainable and low carbon materials; use of locally sourced materials; improving material efficiency)
- Reducing the generation of waste associated with the development
- Reducing pollution associated with the development (e.g. surface water run-off, external lighting).

The ESD report sets out a basic sustainable design framework covering the above objectives and summarises some of the specific measures and design principles which are currently proposed or are being considered by the respective design disciplines for the Stage 1 works.

The following is a summary of the ESD initiatives specific to the Stage 1 works of the Project (further elaboration is provided in the ESD report at **Appendix M**):

- Hydraulic Services:
    - Materials specification in accordance with best practice. This includes locally sourced materials where possible
- Architectural:
    - Improving ecological value
    - Reducing the impacts of materials specification
- Structural/ Civil Services:
    - High recycled content
    - Materials efficiency
    - Locally sourced materials
    - Reduction in energy use
    - Reducing construction waste
    - Reducing pollution associated with the construction and future operation of the development.

6.7.2 Principles of Ecologically Sustainable Development

The Project has been previously assessed against the ecologically sustainable development principles relevant to the Concept Proposal, in the context of Schedule 2 of the EP&A Regulation 2000. Consideration of these principles for Stage 1 works is provided below.

6.7.2.1 The precautionary principle

Potential environmental impacts of the Stage 1 works would be relatively minor due to the current condition of the Project Site and nature of the works which are predominantly restricted to the existing highly disturbed areas. As previously discussed with regard to the Concept Proposal, the Project is required to provide the Tweed-Byron region with an expanded and contemporary standard health facility and improved level of service. All works would be undertaken in accordance with the safeguards outlined in **Section 9** of this EIS and a CEMP.

6.7.2.2 Intergenerational equity

The Stage 1 works would not significantly affect the viability of local or threatened species, or any EECs or other environmental resources including water, soil and air. Therefore, local environmental values would not be substantially adversely affected and would be maintained for future generations. ESD initiatives and safeguards applicable to Stage 1 works will ensure environmentally responsible development.

6.7.2.3 Conservation of biological diversity and ecological integrity

The impacts to ecological integrity and conservation of biological diversity at the site have been thoroughly assessed as part of this EIS. No threatened species, endangered populations or TECs are likely to be adversely affected during Stage 1 works. No populations of native species are likely to be made locally rare or unviable as a result. Consequently, ecological integrity and biological diversity would be maintained at and surrounding the site. Biodiversity has been addressed in more detail elsewhere in this EIS and the appended BDAR.

6.7.2.4 Improved valuation, pricing and incentive mechanisms

This EIS has undertaken a thorough assessment of potential impacts and consequently has developed a set of mitigation measures and safeguards to ensure sound environmental practices and outcomes are achieved during Stage 1 works. The capital investment of the Project includes expenditure on ensuring that the works include adequate environmental measures and allows for effective construction management and measures to avoid, minimise and mitigate the environmental impact.

6.8 SEAR 8 – Biodiversity Assessment

The key overall impacts on biodiversity have been addressed in **Section 5.19** and the BDAR at **Appendix I**. In terms of Stage 1 works the most likely impacts stem from water and soil movement on the site and minor vegetation removal. Water and soil impacts will be managed during the construction stage in accordance with an approved Construction Environmental Management Plan (CEMP) and as per the Soil and Water Management Plan described previously.

The majority of the Project Site is cleared and disturbed, meaning only minor vegetation removal is required. This includes up to three individual trees and grouped trees in windrows, comprising native and exotic species as identified in the BDAR. The indicative location of vegetation to be removed/retained as assessed in the BDAR was shown previously at **Figure 5.13** and the tree removal plan at **Appendix D**.

A total of one hectare of native vegetation on the Site will be directly impacted by the Project during the Stage 1 works (as depicted in **Section 5.19**). Direct impacts on native vegetation are outlined in the BDAR and include the Plant Community Type - White Booyong - Fig subtropical rainforest, including native and exotic species. There will be no direct impact on TECs.

A total of approximately 6.2 ha of native vegetation may be indirectly impacted by the Project, including approximately 5.1 ha of Endangered Ecological Communities. Vegetation condition is moderate, low and derived and vegetation integrity will not decrease (refer to BDAR). Indirect impacts are addressed in the BDAR and generally relate to:

- Noise and vibration
- Light spill and visual amenity
- Dust
- Bush fire and changing fire regimes
- Damage or removal of retained native vegetation
- Weeds.

As a result of the indirect risk assessment, it was identified that the residual risk following the application of mitigation measures was very low. The applicable measures are summarised at **Section 5.19** and **9.2**.

As identified in the BDAR and the relevant Civil reports, Stage 1 works will not significantly impact on the biodiversity values of the site or surrounds, including threatened species or habitat, subject to the mitigation measures identified. The successful application of the avoid and minimise strategy means that there are no residual impacts which will require offsetting, as no ecosystem or species credits are required for the Project.

6.9 SEAR 9 – Aboriginal Heritage

The Aboriginal Cultural Heritage Report (discussed in **Section 5.10**) did not identify any sources of Aboriginal heritage on the Project Site. However, in respect to the Stage 1 works the following recommendations have been made and are supported.

Recommendation 1: Cultural Heritage Induction

- A cultural heritage induction should be provided to all contractors and staff who will be involved in works that involve ground surface disturbance/ earthworks.

Recommendation 2: Aboriginal Objects – Stop work provision

- In the event that suspected Aboriginal objects are encountered during construction, all work in the area that may cause further impact must cease and the Office of Environment and Heritage (OEH) should be contacted.

Recommendation 3: Human remains – Stop work provision

- In the event that suspected human remains are encountered during construction, all work in the area that may cause further impact, must cease immediately.
- The location, including a 20 m curtilage, should be secured using barrier fencing to avoid further harm.
- The NSW Police must be contacted immediately.

- No further action is to be undertaken until the NSW Police provide written notification to Health Infrastructure.
- If the skeletal remains are identified as Aboriginal, Health Infrastructure or their agent must contact:

    - the OEH's Enviroline on 131 555
    - representatives of the Registered Aboriginal Parties.

- No works are to continue until the OEH provides written notification to NSW Health Infrastructure or their Agent.

Recommendation 4: Further Aboriginal cultural heritage works

- In the event that works causing ground disturbance are planned within the vegetated section of the Project Site (i.e. the section along the water and in the north), consultation with the RAPs and a further cultural heritage survey with representatives of the RAPs will be required.

6.10 SEAR 10 – Acid Sulfate Soil

As identified in the Geotechnical Report and discussed previously in **Section 5.14.1.4**, the area where Stage 1 works are proposed is identified as being Class 5, a buffer to other ASS classes. On the basis that the geotechnical assessment did not identify any risk of ASS on the site, and the works will not be intercepting groundwater, an Acid Sulfate Soil Management Plan is not considered necessary.

6.11 SEAR 11 - Drainage

Drainage, stormwater and water sources have been comprehensively addressed for the Project in terms of the Concept Proposal at **Sections 5.14** and **5.16**, demonstrating the ability to ensure acceptable water quantity and quality targets.

The stormwater management strategy, including Soil and Water Management Plan, in the Civil and Structural Design Report at **Appendix X** demonstrates the Stage 1 works are acceptable and can be effectively managed. The site is suitable for the proposed development by demonstrating that any impacts from the development can be mitigated by providing appropriate, adequate infrastructure and sediment and erosion control measures within the site. The site can accommodate stormwater infrastructure such as on-site detention basins and bioretention basins to control the stormwater runoff. Soil and water management will be implemented during construction. The design of these measures is in accordance with the Landcom "Blue Book". Refer to the Civil and Structural Design Report and drawings C0005, C0006 and C0007 for the Soil and Water Management plan, Typical Detailing and sediment basin volume calculation sheets.

For soil and water management of the site, the following summarised measures are provided to minimise the risk of sediments being washed into neighbouring properties, receiving environmental areas and erosion of the site.

- Utilise the basins constructed as part of the separate Preliminary Works as sedimentation basins for Stage 1 works by providing a minimum of 7126 cubic metres to the overall disturbed site assuming that any upstream catchment is excluded by providing diversion stormwater drainage lines (which bypasses the site during the construction stage) to control stormwater quality overall as per Soil and Construction Volume 1, March 2004 by Landcom

- Catch drains and similar infrastructure to manage the runoff within the site and direct it to the appropriate basin
- A sediment fence/catch drain (or diversion bund) around the site
- Temporary access to site with shaker pad(s)
- Indicative stockpile areas with sediment fence around it during construction. The stockpile must be located out of water flow paths (and be protected by earth banks/drains as required).

At the completion of the separate Preliminary Works, and any subsequent augmentation/ additional measures for Stage 1 works, the resulting pollution runoff from the Project Site will result in a decrease of agricultural pollutant runoff as the unimproved site/ existing use has not implemented stormwater runoff treatment measures.

The Stage 1 component of development works, including the stormwater management strategy and drainage measures, demonstrates compliance with all the requirements of relevant plans and guidelines including the Tweed Shire Council DCP - including Tweed Urban Stormwater Quality Management Plan (2016), Landcom Managing Urban Stormwater: Soils and Construction, NSW Floodplain Development Manual (2005) and Guidelines for Development Adjoining Land and Water Managed by DECCW (OEH, 2013).

Groundwater or water table has been identified at a depth of approximately 11 m. It is envisaged that the foundation system will utilise bore piers installed with a Continuous Flight Auger (CFA) or casing extending to the high strength basalt. It is not expected to encounter groundwater during construction of the building support piles. During the construction of the piles, if groundwater is encountered, CFA or the casing method of construction allows for local management of groundwater without taking water from the aquifer and discharging it off site. This is done by keeping groundwater out of the casing by not permitting contact between the auger the groundwater table. As a result, no construction impact is expected on the groundwater and the water table.

As groundwater is unlikely to be intercepted and not impacted, a Dewatering Management Plan is not considered necessary for the scope of work in Stage 1. This will be further assessed at Stage 2 as required.

6.12 SEAR 12 - Waste

The Preliminary WMP relates to the Concept Proposal and Stage 1 works of the new Tweed Valley Hospital development. A separate WMP will be prepared for the Stage 2 construction works and the hospital operations, which will form part of the Stage 2 SSD application.

The Stage 1 works will be undertaken by a principal contractor. All statements and proposals documented in the preliminary WMP are intended as a guide. Upon appointment, the contractor(s) will formulate their own WMP for the works and ensure alignment with the legislation, health services requirements and project requirements. Hence the preliminary WMP will be replaced by the contractor's WMP once appointed.

The nature of the proposed Stage 1 construction works would result in the following likely waste types:

- Excess or unsuitable sediment spoils from earthworks (approximately 21,519 m^3)
- Green (vegetation/ organic) waste
- Demolition waste
- Biological waste (sewage)
- Construction and building waste
- Packaging and general waste.

The works will be undertaken in accordance with legislative requirements relevant to the management of waste in NSW. In accordance with NSW Health requirements for healthcare facilities, a detailed WMP will be prepared for the site providing detailed information regarding the nature and volume of waste generated by the development and the means of storage and disposal of waste from the site. Waste management practices will adopt the principles of reduce, reuse, recycle, treat and dispose.

The preliminary WMP provides an overview of waste management practices, with the major components of the waste management system including:

- Waste avoidance
- Waste recycling and reuse
- Waste segregation
- Waste streaming
- Waste handling and storage
- Waste treatment
- Waste disposal and transport.

The WMP (also to be detailed in the contractors WMP) outlines roles, responsibilities and training/ induction measures. This helps to ensure adherence to the WMP and sound waste management practices are implemented and carried out.

As stated previously, the Stage 1 works will be undertaken by a principal contractor who will prepare their own detailed WMP once appointed. The plan would be generally consistent with the approach, principles and management methods outlined in the preliminary WMP at **Appendix BB**. It would provide further details of the management requirements for expected waste types as required.

6.13 SEAR 13 Construction Hours

To deliver this important Project, construction hours proposed for the Stage 1 works are:

- Monday to Friday – 7.00 am to 6.00 pm
- Saturday – 8.00 am to 4.00 pm (extended)
- Sunday and public holidays – no work.

As outlined in **Section 1.7**, the timing and delivery of the Project is critical. Extended construction hours (i.e. Saturday 1.00 pm to 4.00 pm) are needed in order to meet the critical project delivery timeframe which is driven by:

- The significant forecast population growth in the Tweed-Byron region
- The constraints of current infrastructure at TTH, which is at capacity - a program of interim upgrade works has commenced to assist in meeting the needs of the community until the new hospital opens, and services are transferred
- The physical limitations of TTH site, which has inadequate space to develop new buildings and access is impacted by flooding.

These drivers strongly support the requirement for extended construction hours.

The proposed construction hours have been assessed and are supported by the Noise and Vibration Assessment by Acoustic Studio.

7. Other Matters for Consideration

7.1 Structural Design

Bonacci were engaged to prepare a Civil and Structural Design Report which is attached as **Appendix X**; applicable to the Stage 1 works, including piling.

Structural design is generally to be based on a standard 8.4 m x 8.4 m grid in accordance with Health Infrastructure guidelines. This may be varied in non-clinical spaces. Structural design associated with the Project will be conducted in accordance with the current revision of all relevant Australian Standards and applicable substructure and super-structure considerations, as outlined in the Civil and Structural Report.

7.2 Accessibility

Blackett Maguire and Goldsmith prepared an Access Capability Statement (**Appendix CC**) which contains a high-level assessment of the Concept Proposal SSD application against the requirements of the Building Code of Australia (BCA) and Access to Premises Standards (DDA).

The high-level assessment predominately relates to Stage 1 early and enabling works. Arising from the assessment, Blackett Maguire and Goldsmith are satisfied that the Concept Proposal and Stage 1 works is capable of satisfying the performance requirements of the BCA and Access Standards in relation to accessibility for people with disabilities.

Further detailed assessment of the Project will occur based on the developed design (Stage 2) to ensure compliance.

7.3 Mosquitos and Biting Insects

The northern region of NSW, including Tweed Shire, is known to be affected by mosquitos, sandflies and midges. Furthermore, the Project Site is on land within proximity to coastal wetlands and floodplain areas, and the Concept Proposal includes both stormwater and wastewater detention areas on-site. These areas present potential habitats for supporting biting insect breeding.

Given the high-level Concept Proposal, specific detail or measures around mosquitos and biting insects have not be detailed at this stage. Where required, detailed design and measures to ameliorate the potential impact of these species on staff, patients and visitors can be developed at Stage 2. If required, measures can also be developed to ensure the development minimises the potential for creating new midge and mosquito breeding areas.

The architectural and detailed design, including operational management of the Project at Stage 2 should have regard to the following, as required:

- Measures for the exclusion of mosquitoes entering hospital buildings
- Minimising mosquito breeding risk in constructed stormwater management retention or detention systems
- Hospital management awareness of any mosquito risks.

7.4 Cumulative Impacts

As outlined previously the greenfield site was selected following a comprehensive site selection process, including extensive due diligence investigations, community consultation and consideration of alternatives. While acknowledged as SSF (refer to **Section 5.6**) development of the Project Site for the Tweed Valley Hospital will result in improvements to runoff and water quality outcomes for downslope and downstream receiving environments through the implementation of WSUD solutions.

Whilst the development would introduce a new use and built form to this greenfield site on the urban/ rural interface and general locality, it makes use of a strategically located site and favourable land conditions to support delivery of the Tweed Valley Hospital. It would not result in significant or unreasonable social or economic impacts. The site can be effectively serviced by utilities and infrastructure and has good transport connectively and access attributes to service the local catchment.

It is expected that the Project would add to a number of common cumulative impacts, including resource consumption (e.g. construction material) and generation of greenhouse gas emissions (e.g. through operation of vehicles and equipment and use of electricity). However, the environmental management measures identified within **Section 9** and the choice of methodology for completion of the Project aim to minimise the extent to which the Project contributes to cumulative adverse environmental impacts.

The following sub-sections provide consideration of other approved, pending or potential future development in the locality in the context of potential cumulative impact. Overall, the site is well suited to the Project and would deliver socio-economic benefits for the community and can be undertaken with effective management and mitigation of environmental impacts, including any potential cumulative effects.

7.4.1 Recent Approved or Pending Development Applications

A high-level review of DPE's major projects register and Tweed Shire Council's Development Application tracker found no recently lodged or approved significant developments within proximity to the Project Site that would result in significant implications in regard to traffic, infrastructure services, amenity and/or environmental impacts when considered in-light of the Tweed Valley Hospital.

The following noteworthy approved developments (that also have current approved or applied for modifications) were found within the surrounding area:

- The Cudgen Lakes Sand project was found on DPE major projects register as having been approved in 2009 and is currently subject to a pending modification. The original project includes the extraction of up to 650,000 m^3 of sand a year for a period of 15-20 years (current modification seeks to extend this period, amongst other things) and transporting the sand off-site by road and pipeline, as well as rehabilitation of the site. The extraction area is located north-west of Cudgen Village with pipes to extend to Kingscliff (Turnock Street vicinity). The extraction area is not proximal to the Project Site (more than 800 m away). Construction activity and extraction, including transportation, could add to noise, dust and traffic in the locality. However, this is not expected to significantly influence cumulative impacts given the nature of the activity and physical separation distance from the Project Site. Noise and dust management has been addressed in this EIS and would be applied in the CEMP, along with construction traffic management. The traffic assessment has determined, for both the Concept Proposal and Stage 1 works, that traffic and access can be adequately managed and addressed.

- A 40-lot subdivision, construction of an internal road and associated infrastructure was approved in 2013 with deferred commencement at 15-17 Collier Street, Cudgen. Modifications have also been recently approved. The timeframe for this development is unknown. It is located on the western side of Cudgen Village and therefore removed (more than 800 m away) from the Project Site. Cumulative impacts could include amenity related construction impacts; however, this is not expected to be significant given the distance and would be temporary.

7.4.2 Kings Forest Development

Kings Forest is a State Significant Precinct with a concept approval in place for a number of years for a large master-planned community, including residential (up to 4500 dwellings), commercial, and community uses. The site sits between the M1 to the west and Tweed Coast Road to the east. Current access to the site is from Tweed Coast Road via Depot Road. The site is approximately 15 km south of Tweed Heads and two kilometres south of the Project Site at 771 Cudgen Road, Cudgen (via Tweed Coast Road).

The concept plan for Kings Forest provides a framework for future development but does not authorise any specific development; this requires further applications for development to occur. The first of which was granted a number of years ago but currently the Kings Forest development has not commenced. The timeline for the development of the Kings Forest site is unknown and construction may or may not commence during the period of construction for the Tweed Valley Hospital. Nonetheless, given the distance between the Project Site and Kings Forest no discernible construction or amenity related cumulative impacts are expected. Whilst both developments would result in traffic generation, Tweed Coast Road is already designated for an upgrade – the need for which would be triggered in the later stages of the Kings Forest development. The Traffic Impact Assessment prepared for the Project has considered traffic impacts and subject to relevant upgrades applicable to the Project, no unreasonable cumulative traffic impacts are expected.

7.4.3 Gales Holdings and General Growth of Kingscliff

Areas around Kingscliff, including parts of west and north Kingscliff have the potential to support future development and growth. This is presented in parts of the draft KLP recently exhibited by Tweed Shire Council. In addition to the Locality Plan, of note is the Gales Holdings (private land owner/ developer) proposed vision for a range of civic, commercial, retail, residential, recreational and environmental projects based on their envisaged structure plan for the locality. This is not an approved plan or proposal and some areas of the land are not currently zoned to support urban development.

Areas immediately north of the Project Site and around Turnock Street (to the north-east) are currently zoned R1 General Residential. The exhibited draft KLP indicates these as potential future precincts and growth areas, for a range of mixed use, business, community, low and medium density residential development. The draft KLP envisages this over a medium to long-term planning horizon (10-30 years). These areas are expected to contribute to growth and increased density in suitable areas over time as indicated in the draft KLP. However substantial land use change or development of these areas is not expected in the immediate to short-term and are therefore unlikely to contribute to potential cumulative impacts during the construction timeframe of the Tweed Valley Hospital that is anticipated to be completed by 2022/2023.

Future release and growth of these areas would result in traffic generation. Relevant road upgrades may be required over time to accommodate this; however, these would need to be considered as future planning occurs. Under the current circumstances, the Traffic Impact Assessment for the Tweed

Valley Hospital has addressed traffic generation attributable to its development, including relevant traffic background increases, and recommended relevant upgrades as required.

As aforementioned, the SEIA concluded that development of the Tweed Valley Hospital in Kingscliff will, on balance, create an overall positive social and economic impact to the region. On the basis of the assessment undertaken, and that potential future growth and developments would also be subject to additional planning and merit assessment, the Project is not expected to adversely impact surrounding development. Rather it would integrate with the projected growth and support vitality in the locality and region.

7.4.4 Cumulative Impact on State Significant Farmland

Impact to SSF would be addressed in the Planning Report to rezone the land via a site-specific SEPP, as well as **Sections 5.2.3** and **5.6** of this EIS.

In terms of potential cumulative impact to SSF, this is considered unlikely. The site was selected as the most suitable based on a rigorous site selection process, and alternatives discounted for differing reasons as outlined previously. Whilst there would be a very small loss of SSF on the urban fringe, the main SSF area of the Cudgen Plateau would not be affected (as addressed at **Section 5.6**). The land area affected represents only approximately 0.13 per cent of SSF mapped for the Far North Coast of NSW or 0.013 per cent of mapped BSAL land for the same region. The *Northern Rivers Farmland Protection Project 2005* and Local Planning Directions include provisions to protect SSF from residential and urban development, with the only exception being for public infrastructure that has been supported by a thorough review of alternative sites.

As the Project is for a public purpose/ infrastructure and given that the site was deemed the most suitable and the feasible option on the basis of an extensive review of potential sites, arguments that suggest the proposed hospital would set a precedent and could allow further urban development to occur on SSF are unfounded. The draft SEPP and rezoning process by DPE would also ensure that rezoning of the Project Site to SP2 Infrastructure does not have any unintended consequences beyond the Project Site. On this basis there would be no further incremental or cumulative impact to SSF attributed.

7.4.5 Conclusion and Mitigation Measures

The SEIA conducted a comprehensive assessment of social and economic impacts, including rating potential benefits and impacts as well as a distributional analysis. The SEIA finds that development of a heath facility related land use (the Tweed Valley Hospital) in Kingscliff will, on balance, create an overall positive social and economic impact to the region. On this basis, and the overall assessment undertaken, including consideration of growth and other major approved or potential future developments, the Project is not expected to result in any significant adverse impacts that could affect other major approvals. The Project would integrate with the expected growth in and around Kingscliff and support vitality in the locality and region.

The potential cumulative impacts associated with the Project and any other potential major developments would be further considered as required for the Stage 2 SSD application. Where applicable, the project team would coordinate activities and undertake them in a manner to help minimise any potential cumulative impact where such risk may be present.

In the event that other major developments do occur concurrently with the Project, the potential for any such cumulative impacts would need to be considered and managed by the construction contractor

once the timing of other developments becomes known. The CEMP would need to include a process to review and update mitigation measures as new work begins or if complaints are received.

Bitzios Traffic Consultants and RMS have investigated potential traffic solutions for the supporting road works that would address the hospital requirements and ensure capacity/ efficiency of the local road network. Required local road upgrades would be undertaken to appropriately manage traffic generation and access. Relevant mitigation measures are outlined throughout relevant parts of **Section 5** and **6** and summarised in **Section 9**.

7.5 Site Suitability

As outlined throughout this EIS, the site was selected as part of a comprehensive site selection and evaluation process, including due diligence investigations, consultation and consideration of alternatives.

The assessments undertaken for the Project and in formulating this EIS, including that presented in **Section 5** and **6** and supported by various specialist assessments, demonstrate that the site is suitable for the Project.

The Project Site is strategically located, capable of supporting the Tweed Valley Hospital, and justifiable taking into account the anticipated benefits, potential environmental impacts and subsequent mitigation measures and safeguards that can effectively ensure sound development and environmental outcomes. Based on the assessment undertaken it has been demonstrated that the Project for a new major referral hospital on the Project Site is appropriate and suitable.

7.6 Public Interest

The TTH and services will not meet the healthcare needs of the Tweed-Byron community into the future. The existing hospital is at capacity and the site has inadequate space to develop a new building and other limiting constraints. There is a clear need for a new hospital and expansion.

The Project to develop a new hospital for the Tweed-Byron region on the greenfield site is a significant and important social and healthcare investment for the region and would deliver positive socio-economic benefits. There is clear rationale to support a greenfield development on the Project Site. The Project would deliver a much-needed renewal, expansion and modernisation of existing hospital services and healthcare, delivering long-term benefits to patients, staff, stakeholders and the wider community.

The Project's investment in social infrastructure would have positive economic multiplier effects and support long-term healthcare planning.

The potential environmental impacts posed by the Project have been thoroughly examined. The Project is sited on an already disturbed land parcel, is situated in a strategic location, and would have limited environmental impact (that can be managed) and on balance, net positive social and economic impacts.

The Project is in the public interest.

8. Environmental Risk Assessment

The SEARs state that the EIS must include an environmental risk assessment to identify the potential environmental impacts associated with the development. Where relevant, the assessment of key issues below, and any other significant issues identified in the risk assessment, is to include:

- Adequate baseline data
- Consideration of the potential cumulative impacts due to other developments in the vicinity (completed, underway or proposed)
- Measures to avoid, minimise, and if necessary, offset predicted impacts, including contingency plans for managing any significant risks to the environment.

8.1 Assessing Environmental Risk

An environmental risk assessment has been prepared for the Project. This environmental risk assessment identifies, assesses and evaluates the potential risk of the various activities associated with the Project. The risk assessment process involved the following:

- Selection and development of an appropriate risk assessment process
- Identification of all potential environmental risks
- Analysis of all potential environmental risks
- Evaluation of environmental risks.

8.2 Methodology

8.2.1 Project Team Discussions

Individuals from the project team (including consultants) held discussions to identify, analyse and value potential environmental risks for the Project.

8.2.2 Determination and Assigning the Environmental Risk Rating

Risk assessment is the process by which environmental hazards and associated impacts are systematically identified, assessed and ranked according to perceived risk. This environmental risk assessment has been carried out to ensure that all potential risks are identified so that they can be addressed by means of appropriate and effective controls through the development assessment process.

In this environmental risk assessment, the significance of an impact (relevant to the risk) has been characterised by considering the likelihood of the event occurring and the potential consequence of the event to specify the level of significance related to the environmental risk associated with each potential impact. The manageability of potential impacts has also been considered to determine a final risk rating.

8.2.3 Environmental Risk Rating

The Risk Assessment Matrix (as shown below in **Table 8.1**) illustrates how the residual environmental impacts of a proposal are assigned by reviewing the significance of potential impacts and the ability to manage those impacts. The risk assessment has been adapted from Australian Standard AS4369.1999 Risk Management and Environmental Risk Tools. The sum of the values assigned provides an indicative ranking of potential residual impacts after the mitigation measures are implemented as follows:

- The significance of impact is assigned a value between 1 and 5 based on:
  - the receiving environment
  - the level of understanding of the type and extent of impacts
  - the likelihood of occurrence
  - the severity/ consequence of the impact
  - the likely community response to the environmental consequence of the Project
- The manageability of environmental impact is assigned a value between 1 and 5 based on:
  - the complexity of mitigation measures
  - the known level of performance of the safeguards or mitigation measures proposed
  - the opportunity for adaptive management.

It should be noted that the assessment is not intended to be exhaustive, rather it focuses on key risks.

Risk scores for likely and potential impacts were derived using the following risk matrix (**Table 8.1**).

Table 8.1 Risk Matrix

Significance of Impact	***Manageability of Impact***				
	5 Complex	4 Substantial	3 Elementary	2 Standard	1 Simple
1 – Low	6 (Medium)	5 (Low/Medium)	4 (Low/Medium)	3 (Low)	2 (Low)
2 – Minor	7 (High/Medium)	6 (Medium)	5 (Low/Medium)	4 (Low/Medium)	3 (Low)
3 – Moderate	8 (High/Medium)	7 (High/Medium)	6 (Medium)	5 (Low/Medium)	4 (Low/Medium)
4 – High	9 (High)	8 (High/Medium)	7 (High/Medium)	6 (Medium)	5 (Low/Medium)
5 – Extreme	10 (High)	9 (High)	8 (High/Medium	7 (High/Medium)	6 (Medium)

Table 8.2 provides the outcomes of the Environmental Risk Assessment undertaken for the Project and assigns anticipated risk ratings relevant to key potential impact parameters.

Table 8.2 Environmental Risk Assessment

Parameter	*Potential Impact*	*Summary of Proposed Mitigation*	*Significance of Impact*	*Manageability Impact*	*Residual impact*
Biodiversity	■ Loss of native vegetation within the development site. ■ Potential impacts to flora and fauna. ■ Indirect impacts to receiving environments.	■ Vegetation clearing would be limited to the amount required to undertake the works. ■ Disturbances beyond the limit of works would be avoided. ■ If non-mobile fauna or habitat features are identified (e.g. birds nest) before or during construction, a suitably licensed and experienced ecologist is to be contacted and appropriate measures would be discussed and implemented prior to commencement/ re-commencement of works. ■ Implement recommendations of the BDAR prepared by Greencap.	2	2	4 (Low/Medium)
Environmental Amenity	■ Effect on residential amenity.	■ Adequate setbacks from residential areas are provided to avoid or minimise amenity related impacts. ■ Stage 2 design to develop built form and design response, including appropriate selection of materials and finishes. ■ Implementation of measures related to noise and visual amenity (commented on elsewhere).	2	2	4 (Low/Medium)
Landscape character and visual impact	■ Modification of site/ introduction of new elements into landscape and associated visual impact.	■ The Concept Proposal and identified planning envelope has been sited/ arranged to balance the impact of height and bulk with the clinical and functional requirements of a hospital. There are substantial setbacks from surrounding receivers and the concept zonal densities reduce at upper levels. ■ Pristine coastal views would not be impacted.	4	3	7 (High/Medium)

Parameter	Potential Impact	Summary of Proposed Mitigation	Significance of Impact	Manageability Impact	Residual impact
		■ Stage 2 design will develop a design response appropriate to the site context and operational needs. ■ Implement recommendations of the Visual Impact Assessment based on Concept Proposal. To be assessed further at Stage 2.			
Traffic, Access and Parking	■ Increased traffic on local roads. ■ Parking demand. ■ Intersection performance.	■ Provision of adequate access and performing intersections, including upgrades. ■ Provision of adequate car parking. ■ Implement recommendations of Traffic Impact Assessment prepared by Bitzios.	3	2	5 (Low/ Medium)
ESD	■ Demand on water, energy and resources.	■ ESD measures to be developed and incorporated into the design of the built form and construction methodologies at Stage 1.	3	1	4 (Low/ Medium)
Aboriginal	■ Potential impact to Aboriginal sites or artefacts.	■ The Project would be in accordance with the recommendations of the Aboriginal Cultural Heritage and Archaeological Report prepared by Niche. ■ An unexpected finds procedure be adopted in the event of the discovery of any Aboriginal objects during construction.	1	1	2 (Low)
Non-Aboriginal Heritage	■ Potential impact to historic heritage sites.	■ The Project would be in accordance with the recommendations of the Historical Heritage Report prepared by Niche. ■ If any unexcepted item of European heritage is discovered during works, work shall cease immediately, and the project heritage consultant or Office of Environment and Heritage be notified.	3	1	4 (Low/ Medium)

Parameter	Potential Impact	Summary of Proposed Mitigation	Significance of Impact	Manageability Impact	Residual impact
Noise and vibration	■ Noise and vibration from construction activities. ■ Noise from operation and function of the facility (to be addressed further at Stage 2).	■ The Project would be undertaken in accordance with the recommendations of the Noise and Vibration Assessment prepared by Acoustic Studio. ■ Noise and Vibration further considered in Stage 2 for main works and operations.	4	2	6 (Medium)
Soils and geotechnical	■ Potential exposure of contamination or hazardous materials during works, including management and remediation. ■ Soil erosion and sedimentation as a result of the works. ■ Negligible risk of potential acid sulfate soils.	■ The Project would be in accordance with the recommendations of the Geotechnical Report prepared by Morrison Geotechnics. ■ The Project will be undertaken in accordance with the stormwater assessment and Soil and Water Management Plan prepared by Bonnaci. ■ The Project will be undertaken in accordance with the Contamination Assessment and Remediation Action Plan prepared by OCTIEF.	3	2	5 (Low/ Medium)
Utilities	■ Impacts to adjacent utilities. ■ Need for augmentation and increased demand on services.	■ The development will comply with the requirements of the relevant public authorities in regard to the connection to, relocation and/or adjustment of services affected by the construction. ■ The site can and would be provisioned by adequate services and capacity. ■ The Project will be undertaken in accordance with the relevant infrastructure management plans prepared by ACOR and ARUP.	2	2	4 (Low/ Medium)

Parameter	Potential Impact	Summary of Proposed Mitigation	Significance of Impact	Manageability Impact	Residual impact
Waste	■ Waste generation from construction. ■ Poor waste management, handling and disposal practices.	■ Waste will be in accordance with the recommendations of the preliminary Construction Waste Management Plan prepared by TSA Management and a detailed Construction Waste Management Plan will be prepared prior to the commencement of works. ■ Resource management hierarchy principles would be followed. ■ Working areas would be maintained, kept free of rubbish and cleaned up at the end of each working day.	2	2	4 (Low/ Medium)
Stormwater and water resources	■ Runoff. ■ Reduced water quality. ■ Impacts to surface and ground waters, including low-lying wetlands.	■ The Project will be undertaken in accordance with the stormwater assessment and Soil and Water Management Plan prepared by Bonnaci as part of the Civil and Structural Design Report and Water Sources Assessment.	4	2	6 (Medium)
Bush fire	■ Bush fire hazard and risk to development in event of bush fire.	■ An adequate APZ can be provided and relevant bush fire protection measures are to be adopted and implemented as per the Bush Fire Assessment prepared by Land and Fire Assessments. Further detail to occur at Stage 2.	3	2	5 (Low/ Medium)
Socio-economic	■ Relocation of health services. ■ Impacts to businesses and Tweed CBD. ■ Impact to agriculture. ■ On balance net positive impact.	■ Implementation of relevant measures in this EIS and the SEIA prepared by SGS Economics and Planning. ■ The findings of the SEIA confirm a net benefit to the community.	3	2	5 (Low/ Medium)

Parameter	Potential Impact	Summary of Proposed Mitigation	Significance of Impact	Manageability Impact	Residual impact
Flooding	■ Flood risk (PMF).	■ The development area and critical hospital buildings are above the PMF flood level.	1	1	2 (Low)
Agriculture and potential rural land use conflict	■ Impact to/from agricultural land and activity.	■ Implementation of the recommendations of the Rural Land Use Conflict Risk Assessment prepared by Tim Fitzroy and Associates.	3	2	5 (Low/ Medium)
Air quality	■ Dust and emissions generated during construction.	■ Appropriate dust management measures would be implemented by the construction contractor as part of a CEMP. ■ Ensure plant and vehicles are fitted with appropriate exhaust systems.	2	2	4 (Low/ Medium)
Aviation	■ Potential airspace conflict.	■ No conflict identified. Project to be in accordance with findings and recommendations of the Aviation Report by Avipro.	2	2	4 (Low/ Medium)
Hazards (preliminary only)	■ Inappropriate storage, handling or disposal of hazardous material (to be further considered at Stage 2 - relevant to detailed design and operation).	■ Effective management of hazardous material in accordance with relevant standards (detailed assessment to occur at Stage 2). ■ SEPP 33 assessment to be prepared for Stage 2 application (detailed design, main construction and operation).	Stage 2 Assessment	Stage 2 Assessment	Stage 2 Assessment

9. Environmental Management

9.1 Environmental Management Plan

Stage 1 works/ activities would be delivered in accordance with a Construction Environmental Management Plan (CEMP) which incorporates environmental site inductions, toolbox sessions and awareness. A preliminary CEMP has been prepared as discussed below. A detailed CEMP would be developed, reviewed and approved prior to any works/ activities commencing, and would include all relevant sub plans, such as:

- Biodiversity Management Plan
- Soil and Water Management Plan
- Construction Waste Management Plan
- Traffic Control Plan
- Construction Noise and Vibration Management Plan
- Dust/ Air Quality Management Plan
- Access and Movement Plan (for construction staff).

The CEMP would incorporate all relevant safeguards and management measures detailed in this EIS and the requirements of the development consent. These would be implemented and complied with throughout all stages of the Project. The CEMP would be submitted to the DPE for review and approval.

All construction staff and site personnel would be made aware of their environmental responsibilities and safeguard measures within the CEMP to avoid and minimise environmental impacts.

An on-site meeting would be held with each relevant contractor, construction staff, site personnel, Project Manager and Health Infrastructure project staff before the commencement of works/ activities, including site establishment. The purpose of the meeting is to discuss the environmental safeguards that are required to be implemented for the relevant phase of works. The meeting would also include relevant environmental awareness and toolbox talks.

Relevant environmental aspects to be considered for environmental awareness/ toolbox training include the limit of works, environmentally sensitive areas (e.g. native flora, water courses, wetland areas), pollution prevention, vegetation trimming and removal (e.g. noxious weed management, protection of native flora/ fauna), construction methodology (e.g. excavation) and hazards (e.g. mass movement). The training would also address who is responsible for the various components (e.g. inspection and maintenance of sedimentation and erosion controls, etc). Environmental awareness/ toolbox talks would commence early in the program and continue as new personnel/ contractors are engaged.

For the purposes of this application, TSA Management have prepared a Preliminary CEMP for the Stage 1 works which is attached as **Appendix G** and an overview is provided as follows. The objective of the Preliminary CEMP is to outline parameters for site management practices during construction and is intended to provide sufficient information to support the SSD application. As indicated above, the Preliminary CEMP is intended to be developed into a detailed CEMP by the contractor when appointed to deliver the Stage 1 works. The preliminary CEMP details management practices relating, but not necessarily limited, to:

- Site Operations, including:
    - Legislative requirements
    - Hours of construction works
    - Security and safety
    - Public and property protection
    - Complaints and neighbour management
- Construction methodology for Stage 1 early works, including:
    - Site establishment
    - Remediation/validation
    - Staging
    - Environmental and amenity
    - Noise and vibration
    - Dust
    - Odour control
    - Protection of trees
    - Vegetation removal
    - Stormwater run-off
- Traffic, access and parking, including:
    - Parking of worker and construction vehicles
    - Construction site entry and exit
    - Pedestrian protection
- Waste Management, including:
    - Waste management and recycling principles
    - Storage or dangerous goods.

The preliminary CEMP also includes mitigation measures that have been recommended and identified as part of the EIS assessment process to manage the Stage 1 Early and Enabling Works construction impacts. These are also included in the following section for reference.

Following appointment, the principal contractor will be obliged to develop and provide for use detailed CEMP/s that will incorporate WHS, Environmental and Quality management. This plan will be developed specifically for the subject site and contract works. The plans will take into consideration site-specific risks that have been identified and document the implementation of control measures to effectively mitigate those risks. The plans would be accordance with the Development Consent and be approved and implemented prior to commencement of works.

9.2 Mitigation Measures and Safeguards

This EIS has identified a number of management and mitigation measures that are designed to minimise adverse environmental, social and economic impacts that could potentially arise from the Project. Mitigation measures have been identified to minimise and manage the Stage 1 Early and Enabling Works construction impacts. These are provided in **Table 9.1** and the preliminary CEMP.

The measures provided would manage construction risks associated with Stage 1 Early and Enabling Works of this SSD application. Successful implementation would reduce the risks of impact. The identified measures would be incorporated into a detailed CEMP prior to commencement.

In addition, various preliminary recommendations have been identified in the EIS (**Section 5**) and the specialist reports that are not directly applicable to and/or cannot be addressed during Stage 1. These typically relate to the Concept Proposal, demonstrating that it is appropriate, and would be considered further and implemented accordingly and as applicable in Stage 2 (detailed design, main works and operation) of the Tweed Valley Hospital. **Table 9.2** provides reference to the relevant assessments that provide recommendations and measures relevant to the Concept Proposal and overall Project that would further inform and be addressed/implemented at Stage 2.

The environmental management measures for Stage 1 Works have been derived from the assessment undertaken and those (as relevant) detailed in appended consultants' reports.

Table 9.1 Stage 1 Early and Enabling Works - Mitigation Measures and Safeguards Summary

Matter	*Action/Measure*
General	■ A detailed CEMP would be prepared by the contractor prior to any works/ activities commencing, and would include all relevant sub plans, such as: - Biodiversity Management Plan - Soil and Water Management Plan - Construction Waste Management Plan - Traffic Control Plan - Construction Noise and Vibration Management Plan - Dust/ Air Quality Management Plan - Access and Movement Plan (for construction staff). ■ All employees, contractors and subcontractors to receive a project induction. The environmental component may be covered in toolbox talks and should include: - Environmental mitigation measures - Vegetation clearing operations and controls to prevent unauthorised clearing - Unexpected Finds Protocols and responsibilities (historic heritage, Aboriginal heritage, contamination and waste) - Waste management strategies and measures. ■ Implement community consultation measures to keep the community informed of the construction program and potential impacts, including relevant contact details. ■ A complaint handling procedure and register will be implemented to assist in recording and managing complaints during construction.
Biodiversity	■ Implement recommendations and measures of the BDAR prepared by Greencap, including: - The proposed development will monitor and manage potential impacts which shall be outlined in a Biodiversity Management Plan and its sub plans: - Vegetation Management Plan; Water Quality Management Plan; and Fauna Management Plan. The Biodiversity Management Plan will include adaptive management for impacts on biodiversity and will include details of measures to monitor predicted impacts, guidelines and thresholds which will trigger adaptive management actions and other measures proposed to mitigate potential impacts. ■ All works to be undertaken in accordance with a Soil and Water Management Plan (including sediment and erosion control).

Matter	Action/Measure
	■ Alternative commercially available flocculants (for sediment basins) that work effectively as a gypsum replacement that do not create the large increases in pH should be used. ■ All works to be undertaken in accordance with a CEMP, including Traffic Control Plan, Access and Movement Plan, Noise and Vibration Management Plan. ■ Should wildlife enter the construction footprint, a suitable qualified fauna handler should be notified, and actions taken in accordance with the CEMP. ■ To ensure the safety of any native fauna occupying trees and vegetation proposed for removal, during vegetation clearing works, a suitably qualified and experienced person shall be present as a fauna spotter-catcher to supervise the tree removal. ■ On the day of clearing and prior to any clearing taking place, all trees within 30 m of those trees to be cleared are to be inspected for the presence of native fauna by an experienced fauna spotter-catcher. ■ During tree removal and major earth works a fauna spotter-catcher needs to be used at a minimum of one operator per machine. ■ The fauna spotter-catcher must not be involved in the vegetation clearing works whilst responsible for identifying fauna present on the site and will remain on site during any vegetation clearing works to ensure that any tree occupied by a fauna is not accidentally cleared or interfered with. ■ Any uninjured native fauna detected during the tree removal shall be rescued and relocated into an area of appropriate habitat that is nearby, but outside of the development footprint. ■ Any injured native fauna detected shall be rescued and transferred to a local veterinarian for treatment and/or WIRES for rehabilitation. ■ Should koalas be found on the Site during vegetation clearing works and/or earthworks, tree clearing works and/or earthworks must be temporarily suspended within a range of 30 m from any tree which is occupied by a koala. ■ Works are to be avoided in any area between the koala and the nearest areas of habitat to allow the animal to move to adjacent undisturbed areas. ■ Works must not resume until the koala has moved from the tree of its own volition. ■ In order to minimise direct impacts on ground dwelling and arboreal fauna, any earthworks conducted to clear rocks and trees along the windrows (zone 4) shall have a suitably qualified fauna spotter-catcher as outlined above. ■ Removal and management of weeds. ■ Avoid light spill to remnant vegetation, through restricting work to project footprint and daily timing of construction activities such as avoiding night works as much as possible and directing lights away from remnant vegetation. ■ Dust managed in accordance with a CEMP, including: - Daily monitoring of dust generated by construction activities. - Dust suppression measures (setting maximum speed limits and application of dust suppressants) - Commence revegetation as soon as practicable. ■ Existing trees and areas of native vegetation not identified for removal shall be protected from damage during works, including: - Establishing a Tree Protection Zone in accordance with AS 4970-2009 around native trees and vegetation adjacent to the construction footprint that are to be retained - Erect temporary 1800 mm high protective fencing, securely installed beneath the outer canopy of any tree to be retained

Matter	Action/Measure
	- Trees and vegetation may be fenced off in clusters where it is not practical to fence off individual trees - There shall be no stockpiling, storing materials, parking machinery, washing machinery or changes to existing soil levels within the fenced areas - Retention of the main fig tree onsite (*Ficus benjamima)* (refer tree removal/preservation plans).
Transport and Accessibility	■ Implement recommendations of Traffic Impact Assessment prepared by Bitzios, including a Construction Traffic Management Plan (CTMP) to be developed by the contractor and incorporated into the CEMP.
Aboriginal Heritage	The works would be in accordance with the recommendations of the Aboriginal Cultural Heritage and Archaeological Report prepared by Niche, including: ■ A cultural heritage induction should be provided to all contractors and staff who will be involved in works that involve ground surface disturbance/ earthworks. ■ In the event that suspected Aboriginal objects are encountered during construction, all work in the area that may cause further impact must cease and the OEH should be contacted. ■ In the event that suspected human remains are encountered during construction, all work in the area that may cause further impact, must cease immediately. - The location, including a 20 m curtilage, should be secured using barrier fencing to avoid further harm. - The NSW Police must be contacted immediately. - No further action is to be undertaken until the NSW Police provide written notification to the NSW Health Infrastructure. If the skeletal remains are identified as Aboriginal, NSW Health Infrastructure or their agent must contact: - the OEH's Enviroline on 131 555 - representatives of the Registered Aboriginal Parties. No works are to continue until the OEH provides written notification to NSW Health Infrastructure or their Agent. ■ In the event that works causing ground disturbance are planned within the vegetated section of the Project Site (i.e. the section along the water and in the north), consultation with the RAPs and a further cultural heritage survey with representatives of the RAPs will be required.
Historical (Non-Aboriginal) Heritage	If any unexcepted item of historical heritage is discovered during works, work in the vicinity shall cease immediately, and the project heritage consultant or Office of Environment and Heritage be notified. Works would not recommence until clearance provided. The works would be in accordance with the recommendations of the Historical Heritage Report prepared by Niche (where applicable to the Stage 1 works), including: ■ Wall 2 and 5. Although these features sit outside the impact zone, future vegetation management might have a detrimental impact. Therefore, it is recommended that heritage considerations be incorporated into a vegetation management plan. Avoid removing trees and vegetation which may be supporting the walls. ■ Wall 3. If possible, impact should be avoided through a redesign of the road that shifts it further north to avoid the wall. The wall should be temporarily barricaded during construction works and considered in future management policies. If impacts are unavoidable, the features should have an archival record prepared prior to commencement of works, and consideration be

Matter	Action/Measure
	given to representing the demolished section within the new surfacing of the road (as part of any future development of the site). ■ Wall 4. This feature currently sits within a proposed car park (including for construction purposes) and therefore is likely to be demolished. Consideration should be given to retaining it and incorporating it into the design of the car park to avoid impacts. If this is not possible, an archival recording of the feature should be prepared before demolition (include photographs, scale drawings, and surveying). ■ Archaeological deposits. These are principally the rubbish areas and house area where there is potential for materials relating to the early occupation and use of the Project Site. Such relics may be of local heritage significance. The house area will be directly impacted by the development while the rubbish deposits, although outside of the current footprint, may need to be removed during general site improvement works. Given the project's status as a SSD, permits to excavate or remove such relics would not be required under Section 139[1] of the Heritage Act 1977 as such approvals are exempted under SSD. However, it is recommended that should such relics be located during ground disturbance works, that they be managed appropriately and in accordance with best practice. A process for managing the discovery of any relics should be included in any environmental or other plans for the Project works. ■ Hedgerows. These are not of heritage significance but remain items of interest reflecting the later development of the Project Site. An archival recording of the hedgerows should be prepared prior to impacting works. ■ Interpretation. The presence of stone walls likely associated with the sugar industry and South Sea Islander labourers in that industry presents an opportunity for these aspects of the region's history to be interpreted. Those walls that will be retained in the development area should be included in an interpretation plan and/or strategy for the hospital precinct, as part of any future development of the site.
Noise and Vibration	The works would be accordance with the recommendations of the Noise and Vibration Assessment prepared by Acoustic Studio, including preparation of a Construction Noise and Vibration Management Plan (CNVMP) for Stage 1 Works and consideration of the following measures and those outlined in the preliminary CNVMP. If, during construction works, an item of equipment exceeds either the noise criteria at any location or the equipment noise level limits, the following noise control measures, together with construction best practices shall be considered to minimise the noise impacts on the neighbourhood: ■ Schedule noisy activities to occur outside of the most sensitive times of the day for each nominated receiver. For example, avoiding works during "outside standard hours" at nearby residential receivers. ■ Consider implementing equipment-specific temporary screening for noisy equipment, or other noise control measures recommended in Appendix E of AS2436. This is most likely to apply to noisier items such as jackhammers. ■ For large work areas, solid screening or hoarding as part of the worksite perimeters would be beneficial. ■ Locate specific activities such as carpentry areas (use of circular saws etc) to internal spaces or where shielding is provided by existing structures or temporary screening. ■ Limit the number of trucks and heavy vehicles on site at any given time (through scheduling deliveries at different times). ■ Unnecessary idling of vehicles and equipment is to be avoided. ■ Traffic routes are to be prepared to minimise the noise impact on the community.

Matter	Action/Measure
	■ When loading and unloading trucks, adopt best practice noise management strategies to avoid materials being dropped from a height. ■ Adopt quieter methodologies. For example, where possible, use concrete sawing and removal of sections as opposed to jackhammering. ■ Ensure that any miscellaneous equipment (extraction fans, hand tools, etc), not specifically identified in this assessment, incorporates silencing/shielding equipment as required to meet the noise criteria. Best practice construction noise management strategies would include: ■ Plant and equipment: - Use quieter methods - Use quieter equipment - Operate plant in a quiet and effective manner - Where appropriate, limit the operating noise of equipment - Maintain equipment regularly - Where appropriate, obtain acoustic test certificates for equipment. ■ On-site noise management: - Strategically locate equipment and plant - Avoid the use of reversing alarms or provide for alternative systems - Maximise shielding in the form of existing structures or temporary barriers - Schedule the construction of barriers and structures so they can be used as early as possible - Brief Project staff and workers on the noise sensitivity of the neighbours to the site, particularly the residents nearby. The staff and workers need to be mindful of the noise from their discussions and colour of the language, particularly in sensitive periods, for example, during the pre-start times or “toolbox talk” as they gather to commence for work in the morning. ■ Consultation, notification and complaints handling: - Provide information to neighbours before and during construction - Maintain good communication between the community and Project staff - Have a documented complaints process and keep register of any complaints - Give complaints a fair hearing and provide for a quick response - Implement all feasible and reasonable measures to address the source of complaint. ■ Work scheduling: - Schedule activities to minimise noise impacts - Ensure periods of respite are provided in the case of unavoidable maximum noise levels events - Keep truck drivers informed of designated routes, parking locations and delivery hours. ■ The contractor is to consider implementing environmental noise monitoring as recommended by the Noise and Vibration Assessment. The details of the vibration management controls required for the Stage 1 Works would be determined when the applicable CNVMP is prepared by the contractor, including the following considerations: ■ The contractor shall carry out a vibration assessment at the commencement of operations for each vibration-generating-activity/ equipment to determine whether the existence of significant vibration levels justifies a more detailed investigation.

Matter	Action/Measure
	■ A more detailed investigation will involve methods of constraining activities generating high vibration levels. A method of monitoring vibration levels will then need to be put in place. An additional review of vibration mitigation measures and vibration criteria may then be necessary. ■ All practical means are to be used to minimise impacts on the affected buildings and occupants from activities generating significant levels of vibration on-site. ■ The following considerations shall be taken into account: - Modifications to excavation and construction equipment used - Modifications to methods of excavation and construction - Rescheduling of activities to less sensitive times. ■ If the measures given above cannot be implemented or have no effect on vibration levels or impact generated, a review of the vibration criteria is to be undertaken and the vibration management strategy amended. ■ Undertake vibration surveys and monitoring as required and recommended by the Noise and Vibration Assessment.
Soils and Geotechnical	■ The works would be in accordance with the recommendations of the Geotechnical Report prepared by Morrison Geotechnics and any required further geotechnical investigations. ■ The remediation works identified in the Contamination Assessment prepared by OCTIEF would be undertaken separately and in advance of Stage 1 Works, as Preliminary Works. ■ The CEMP will detail contingency measures to address unexpected finds of contaminated material.
Services and Utilities	■ The Project will be adequately serviced, and relevant service and utility works would be undertaken in accordance with the relevant infrastructure management plans prepared by ACOR and ARUP. ■ The development will comply with the requirements of the relevant public authorities in regard to the connection to, relocation and/or adjustment of services affected by the construction.
Drainage, Stormwater and Water Resources	■ The works would be undertaken in accordance with the stormwater assessment and Soil and Water Management Plan prepared by Bonnaci as part of the Civil and Structural Design Report and Water Sources Assessment. ■ The CEMP prepared by the contractor would include: - Fuel and chemical storage requirements - Safety Data Sheet (SDS) register and requirements - Refuelling protocols - Spill management and response procedures. ■ All fuels, chemicals, and liquids will be stored at least 50 m away from any drainage line or waterways as far as is practicable and will be stored in an impervious bunded and covered area within the compound site. ■ Visual monitoring of local water quality (i.e. turbidity, sheen, oil and grease) will be undertaken regularly to identify any potential water quality issues.
Air Quality and Dust	Dust management of Stage 1 works will form part of the CEMP prepared by the contactor. The following mitigation measures would be considered for the construction activities as relevant: ■ Construction activities will be modified, reduced or controlled during high or unfavourable wind conditions if they have a potential to increase dust generation. ■ Control measures including water carts, sprinklers, sprays, dust screens or the application of geo-binding agents will be utilised where applicable to control dust emissions. The frequency of use will be modified to

Matter	Action/Measure
	accommodate prevailing conditions. Dust control equipment will be maintained to ensure its operability. ■ Erosion control structures will be checked regularly for build-up of silt and other materials to ensure deposits do not become a dust source. ■ Waste will be segregated and collected on a regular basis to ensure odours associated with waste do not become an issue. ■ No waste will be burnt on-site. ■ Stormwater, recycled water or other water sources shall be used, where feasible and reasonable, in preference to potable water for construction activities, including concrete mixing and dust control. ■ Areas of disturbed material and access roads will be stabilised where possible using appropriate methods. ■ Measures implemented to minimise dust, soil or mud from being deposited from vehicles on public roads, such as rumble grids and large aggregate at entry/ exit points. Manual cleaning will also be carried out where appropriate. In the event of any spillage or tracking, the material will be removed within 24 hours. ■ Hardstand areas and surrounding public roads will be cleaned, as required. ■ All loaded haulage trucks will be covered where there is a risk of release of dust or other materials and at all times on public roads. ■ Engines of plant parked near to residents will be switched off when not in operation. ■ Exhaust systems of construction plant, vehicles and machinery will be maintained in accordance with manufacturer's specifications to ensure that emissions do not exceed EPA regulations. Periodic visual checks will be undertaken to ensure ongoing compliance. ■ Any plant, equipment or machinery will be immediately switched off should there be visible signs of smoke emissions emitting from equipment/ machinery. ■ Dust suppression systems will be installed and used on crushing and screening plants to minimise generation of dust.
Social and economic	■ Implementation of other relevant measures to avoid, minimise or mitigate construction related impacts.
Waste	■ Waste will be in accordance with the recommendations of the preliminary Construction Waste Management Plan prepared by TSA Management and a detailed Construction Waste Management Plan will be prepared prior to the commencement of works. The Waste Management Plan will be prepared in accordance with the EPA's "Waste Classification Guidelines (2008)" and the *Protection of the Environment Operations Act 1997*. ■ Resource management hierarchy principles would be followed. ■ Working areas would be maintained, kept free of rubbish and cleaned up at the end of each working day.
Cumulative Construction Impacts	■ The CEMP would incorporate measures to manage potential cumulative construction impacts. The CEMP and relevant sub-plans would be reviewed and updated as required (such as when new work begins or if complaints are received) to incorporate potential cumulative impacts from surrounding development activities as they become known.

Table 9.2 Concept Proposal Preliminary Recommendations/Measures for further Consideration and Implementation at Stage 2

Matter	*Action/Measure*
Biodiversity	■ Implement recommendations of the BDAR prepared by Greencap.
Rural land use conflict	■ Implementation of the recommendations of the Rural Land Use Conflict Risk Assessment prepared by Tim Fitzroy and Associates.
Environmental Amenity	■ Adequate setbacks from residential areas are provided to avoid or minimise amenity related impacts. ■ Stage 2 design to consider appropriate design response and selection of materials and finishes. ■ Implementation of measures related to noise and visual amenity (commented on elsewhere).
Landscape character and visual amenity	■ The Concept Proposal and identified planning envelope has been sited/ arranged to balance the impact of height and bulk with the clinical and functional requirements of a hospital. There are substantial setbacks from surrounding receivers. ■ Stage 2 design will develop a design response appropriate to the site context and operational needs. ■ Implement recommendations of the Visual Impact Assessment based on the Concept Proposal. To be assessed further at Stage 2.
Transport and Accessibility	■ Implement recommendations of Traffic Impact Assessment prepared by Bitzios, including: - Provision of adequate access and performing intersections, including upgrades. - Provision of adequate car parking on the Project Site.
Ecologically Sustainable Development (ESD)	■ ESD measures to be developed and incorporated into the design of the built form and construction methodologies, using principles identified in the ESD report prepared by Steensen Varming.
Aboriginal Heritage	■ The Project would be in accordance with the recommendations of the Aboriginal Cultural Heritage and Archaeological Report prepared by Niche.
Historical (Non-Aboriginal) Heritage	■ Implement recommendations of the Historical Heritage Report prepared by Niche.
Noise and Vibration	■ The Project would be accordance with the recommendations of the Noise and Vibration Assessment prepared by Acoustic Studio and further consideration is to occur in Stage 2 for main works and operation.
Soils and Geotechnical	■ The Project would be in accordance with the recommendations of the Geotechnical Report prepared by Morrison Geotechnics and any further investigations. ■ The Project would be undertaken in accordance with the stormwater assessment and Civil Report prepared by Bonnaci.
Services and Utilities	■ The Project would be undertaken in accordance with the relevant infrastructure management plans prepared by ACOR and ARUP.
Bush fire	■ An adequate APZ provided and relevant bush fire protection measures are to be adopted and implemented as per the Bush Fire Assessment prepared by Land and Fire Assessments. Further assessment to occur at Stage 2.

Matter	*Action/Measure*
Drainage, Stormwater and Water Resources	■ The Project would be undertaken in accordance the assessment prepared by Bonnaci as part of the Civil and Structural Design Report and Water Sources reports.
Social and economic	■ Implementation of relevant measures in this EIS and the SEIA prepared by SGS Economics and Planning.
Aviation	■ The Project to be in accordance with the advice from AviPro regarding aviation considerations.

10. Justification and Conclusion

The Project to develop a new state-of-the-art hospital for the Tweed Valley on a greenfield site is a significant and important investment in healthcare and wellbeing services for the region's community and would deliver positive socio-economic benefits. There is clear rationale to support a greenfield development on the Project Site. The Project would deliver a much-needed renewal, expansion and modernisation of existing hospital services and healthcare, delivering long-term benefits to patients, staff, stakeholders and the wider community.

At this stage, it is important to consider the Project in the context of being a Concept Proposal, noting that certain impacts of the development cannot be fully measured or mitigated at this stage as it is subject to further developing the design of the hospital and its future operational practices. Key issues, such as built form, visual, and environmental amenity, amongst others, would be considered further in the future application for Stage 2. However, based on the assessment undertaken for the Concept Proposal and Stage 1 works, it has been demonstrated that the Project for a new major referral hospital on the Project Site is appropriate. The Environmental Impact Statement for Stage 2 would present and assess the design of the hospital buildings, main works, and operation of the Tweed Valley Hospital to ensure relevant environmental, social, and economic considerations are addressed.

The Project will introduce a new land use and large hospital campus, with associated built form, into the local setting. The Masterplan and Concept Proposal, demonstrate the suitability of the Project Site and forward planning considerations for both the realisation of the Tweed Valley Hospital and future long-term healthcare service provision. The Project will be a significant facility for the region. Environmental, social and economic impacts have been considered and can be effectively addressed and managed, including the delivery of necessary upgrades to local roads and intersections. The Project will support a vibrant health hub that services the community and delivers considerable benefits.

Based on the assessment of the Concept Proposal and planning envelopes, whilst an obvious change to the Project Site and local context will occur, measures are available to help reduce or mitigate the impact and detailed design is yet to occur. Stage 2 design will develop the built form response for the Project, with a design outcome that would aim for a visually appropriate and balanced built form that adequately considers hospital and civic identity, clinical functionality, the context of the site and amenity. The Project is not expected to unreasonably detract from the overall amenity or environmental qualities of its setting and an appreciation of these important local qualities would be maintained.

Overall, the potential environmental impacts posed by the Project have been thoroughly examined throughout this Environmental Impact Statement, supported by the detailed specialist studies. The Project is sited on an already disturbed land parcel that presents the most suitable option to provide a purpose-built contemporary hospital campus, in a strategic location with proximal highway and local road access, whilst having limited environmental impact and on balance, net positive social and economic impacts.

It is considered the Project warrants approval for the following reasons:

- The Environmental Impact Statement addresses the Secretary's Environmental Assessment Requirements and the Project will result in a much-needed renewal, expansion and significant improvement to health services/ facilities for the residents and visitors of the Tweed-Byron region. The current Tweed Hospital and services will not meet the healthcare needs of the Tweed-Byron community into the future. The existing hospital is at capacity and the site has inadequate space

to develop a new building and access is impacted by flooding. There is a clear need for renewal and expansion.

- The site was selected as a result of a comprehensive site selection process, including extensive due diligence investigations, community consultation and consideration of alternatives.
- The Project will benefit patients, staff, stakeholders and the wider community, delivering improved, greater capacity, and high-quality healthcare in a pleasant setting and contemporary and functional built form.
- The Project is considered justifiable taking into account the anticipated benefits, potential environmental impacts and subsequent mitigation measures and safeguards that can effectively ensure sound development and environmental outcomes. The assessment has demonstrated that the development would not generate environmental impacts that cannot be appropriately managed.
- The Project is generally consistent with and achieves State policy. It delivers critical healthcare infrastructure and services for the Tweed-Byron region.
- The Project is a significant investment in social infrastructure and would have positive economic multiplier effects and support long-term healthcare planning and expansion/ supplementary supporting health related development opportunities.
- The area and shape of the site allows for the provision of new health facilities that meet the design requirements for current and future needs.
- There are no traffic or parking impediments to the Project and appropriate infrastructure would support the development.
- The Tweed Valley Hospital would effectively integrate into the future growth and strategic direction of the Kingscliff township and locality, and the Tweed-Byron region more broadly.
- The Project is consistent with the principles of ecological sustainable development as defined by Schedule 2(7)(4) of the Environmental Planning and Assessment Regulation 2000.
- The Project is consistent with the objectives of the *Environmental Planning and Assessment Act 1979.*

Given the planning merits described above, and significant public benefits, the Project deserves favourable consideration by the Minister for Planning or delegate.

References

Acoustic Studio, (2018). *Tweed Valley Hospital Noise and Vibration Impact Assessment for State Significant Development*. September 2018 for TSA Management and GeoLINK.

Bitzios Consulting, (2018). *Tweed Valley Hospital Project Traffic Impact Assessment*. September 2018 for TSA Management and GeoLINK.

Department of Infrastructure, Planning and Natural Resources, (2004). Planning guidelines for walking and cycling, [Online]. Available http://www.pcal.nsw.gov.au/__data/assets/pdf_file/0006/164742/planning-guidelines-for-walking-and-cycling.pdf.

Government Architect NSW, (2017). Government Architect NSW Better Placed home page, [Online]. Available: https://www.governmentarchitect.nsw.gov.au/policies/better-placed.

Niche (Rebecca Yit), (2018) - Re: Tweed Valley Hospital – Historical Heritage Stone Wall Assessment, 27 July 2018 – Letter Report to TSA

NSW Health, (2009). Healthy Urban Development Checklist, [Online]. Available: https://www.health.nsw.gov.au/urbanhealth/Publications/healthy-urban-dev-check.pdf.

NSW Planning & Environment, (2017). *North Coast Regional Plan 2036*, [Online]. Available: https://www.planning.nsw.gov.au/~/media/Files/DPE/Plans-and-policies/north-coast-2036-regional-plan-2017.ashx.

Parliamentary Counsels Office, (2018) Government of New South Wales Legislation home page, [Online]. Available: NSW Government Legislation Home Page. [Accessed July-September 2018]

SGS Economics & Planning, (2018). *Tweed Hospital Social and Economic Impact Assessment*. September 2001 for NSW Health Infrastructure.

Transport for NSW, (2018). Future Transport Strategy 2056, [Online]. Available: https://future.transport.nsw.gov.au/sites/default/files/media/documents/2018/Future_Transport_2056_Strategy.pdf.

Tweed Shire Council, (2009). *Tweed Urban and Employment Land Release Strategy 2009*, [Online]. Available: https://www.tweed.nsw.gov.au/Documents/Planning/TSC01649_Urban_Land_Release_Strategy_Introduction.pdf.

Tweed Shire Council, (2018). Tweed Shire Council - Kingscliff Locality Plan, [Online]. Available: https://www.yoursaytweed.com.au/kingsclifflocalityplan.

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Appendix A

Secretary's Environmental Assessment Requirements

Appendix B

Plans and Drawings

Appendix C

Built Form and Urban Design Report

Appendix D

Tree Removal, Preservation and Landscape Plans

Appendix E

Survey

Appendix F

Agricultural Report

Appendix G

Preliminary Construction Environmental Management Plan

Appendix H

Consultation Report

Appendix I

Biodiversity Development Assessment Report

Appendix J

Land Use Conflict Risk Assessment

Appendix K

Visual Impact Assessment

Appendix L

Traffic Impact Assessment

Appendix M

ESD Report

Appendix N

Aboriginal Cultural Heritage Assessment

Appendix O

Historical Heritage Assessment

Appendix P

Noise and Vibration Assessment

Appendix Q

Geotechnical Assessment

Appendix R

Contamination Assessment

Appendix S

Electrical and Communications Site Infrastructure Management Plan

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Integrated Water Management Plan

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Appendix V

Bush Fire Assessment

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Flood Assessment

Appendix X

Civil and Structural Design Report

Appendix Y

Water Sources

Appendix Z

Social and Economic Impact Assessment

Appendix AA

Aviation

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Preliminary Waste Management Plan

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Access Capability Statement

Appendix DD

Arboricultural Report