Land Use Conflict Risk Assessment

Mixed Agricultural Use on Proposed Tweed Valley Hospital
Lot 102 DP 870722
Cudgen Road, Cudgen

HEALTH SCIENCE ENVIROMENTAL EDUCATION
ENVIRONMENTAL AUDITOR

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Acronyms

BOM	Bureau of Meteorology
DCP	Development Control Plan
DM	Deferred Matter
DPE	Department of Planning and Environment
DPI	Department of Primary Industries
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning & Assessment Act
EPA	Environment Protection Authority
GCUH	Gold Coast University Hospital
LUCRA	Land Use Conflict Risk Assessment
PMF	Probable Maximum Flood
POEO Act	Protection of the Environment Operations Act
SEPP	State Environmental Planning Policy
SSD	State Significant Development
SSF	State Significant Farmland
SWMP	Soil and Water Management Plan
TFA	Tim Fitzroy & Associates
TLEP	Tweed Local Environmental Plan

Executive Summary

Tim Fitzroy & Associates (TFA) has been engaged by Health Infrastructure to undertake a Land Use Conflict Risk Assessment (LUCRA) for land described in real property terms as Lot 102 DP 870722 Cudgen Road, Cudgen for the proposed Tweed Valley Hospital. This report has been prepared to: assess suitability of the Project Site from a potential land use conflict risk perspective; and to accompany an Environmental Impact Statement (EIS) prepared by GeoLINK for the staged development of the Tweed Valley Hospital.

The EIS has been prepared to accompany a State Significant Development (SSD) Application for a new hospital which will be assessed under the Environmental Planning & Assessment (EP&A) Act. The Project has been established based on the following supporting documentation:

- Tweed Valley Hospital Business Case;
- Tweed Valley Hospital Masterplan; and
- Tweed Valley Hospital Concept Proposal and design.

This LUCRA has concluded that the Project Site is suitable for the proposed State Significant Development Application for the hospital subject to the recommendations provided further below.

This LUCRA is based on:

- a review of Concept Proposal;
- discussions with TSA Management;
- site inspection; and
- review of surrounding landuses.

In assessing the potential risk of land use conflict associated with the proposed Tweed Valley Hospital and existing adjoining agricultural landuses, 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.

LUCRA's were initially conceived in the *Living and Working in Rural Areas Handbook* (Department of Primary Industries *et.al* 2007) by the Centre for Coastal Agricultural Landscapes in partnership with the Northern Rivers Catchment Management Authority as a tool to better manage potential land use conflicts between residential development and rural activities and environmental attributes/assets on the NSW North Coast. Heath Infrastructure has chosen to adopt the LUCRA tool to better identify potential land use conflicts risks associated with the proposed development and existing agricultural landuses and where necessary propose mitigation options to address any unacceptable risks.

The *Living and Working in Rural Areas Handbook* (Department of Primary Industries *et.al* 2007) denotes a number of recommended buffer distances to residential areas as described below:

- 300 metres from State and regionally significant farmland;
- 100 metres to wetlands;
- 50 metres to native vegetation/habitat;
- 50 metres to minor waterways;
- 300 metres to sugar cane, cropping and horticulture;
- 200 metres to greenhouse and controlled environment horticulture.

Tweed Shire Council's Draft *Kingscliff Locality Plan, Volume 2 – Precinct Plans* nominates typical buffers of 80 metres to agricultural land for residential development around the locality of the Project Site. It notes these buffers may increase depending on the specifics of the proposed development and the nature of the adjoining agricultural land uses.

The more conservative buffers from the *Living and Working in Rural Areas Handbook* have been used in this assessment.

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 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:

1. The distance between the closest proposed hospital building and the existing vegetable cropping to south (Lot 1 DP1803772, Cudgen Road) is approximately 100 metres.
2. 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 metres.
3. 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 metres.

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 activity such as those proposed on the Project Site.

While a default buffer area of 300m width is recommended between *State and Regionally Significant Farmland* and *residential development* the DPI does not stipulate a setback from commercial/industrial developments to *State and Regionally Significant Farmland*.

Recommendations for Vegetated Buffers

Based on the proximity of the existing vegetable cropping to the south of the proposed Tweed Valley Hospital we recommend a series of 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 4–5 m 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% of the screen should be air space);
    - foliage is from the base to the crown;
    - include species which are fast growing and hardy; and
    - have a mature tree height at least 3m;

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 2–3 m 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% of the screen should be air space);
    - foliage is from the base to the crown;
    - include species which are fast growing and hardy; and
    - have a mature tree height at least 3m;

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.

- 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.

Recommendations for Noise Impacts

Hospital operations; machinery, air conditioning, aircraft (helicopter), vehicles (staff, patients, visitors, deliveries, waste collection), generators, night work, from the proposed 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

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

Measures to reduce traffic impacts have been addressed in the Traffic Impact Assessment with regard to both construction and operations. The Tweed Valley Hospital 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.

Other Considerations that have Informed this Assessment

A number of factors have led to this conclusion including:

- 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.

1. Introduction

Tim Fitzroy & Associates (TFA) has been engaged by Health Infrastructure to undertake a Land Use Conflict Risk Assessment (LUCRA) for land described in real property terms as Lot 102 DP 870722 Cudgen Road, Cudgen for the proposed Tweed Valley Hospital (see Site Locality Plan **Illustration 1**). This report has been prepared to: assess suitability of the Project Site from a potential land use conflict risk perspective; and to accompany an Environmental Impact Statement (EIS) prepared by GeoLINK for the staged development of the TWEED VALLEY HOSPITAL.

The EIS has been prepared to accompany a State Significant Development (SSD) Application for a new hospital which will be assessed under Part 4 of the Environmental Planning & Assessment (EP&A) Act. The Project has been established based on the following supporting documentation:

- Tweed Valley Hospital Business Case;
- Tweed Valley Hospital Masterplan; and
- Tweed Valley Hospital Concept Proposal and design.

Illustration 1 Site Locality Plan

1.1 Scope of this Assessment

This assessment has been undertaken to determine the potential land use conflicts between the proposed Tweed Valley Hospital (as detailed in the previous section) and the neighbouring agricultural enterprises.

This assessment considers relevant requirements in the Planning Secretary's Environmental Assessment Requirements as follows. It is noted that some of the following requirements are assessed fully in other reports.

Environmental Amenity:
Include a preliminary assessment of the impact of existing adjoining and adjacent agricultural activities upon the proposal including:

- *tractor/machinery operation within the vicinity of the subject area which may cause conflict*
- *potential sources of odour/air pollution from surrounding agricultural pursuits from the use of chemical sprays, inorganic fertilisers, organic fertilisers, and compost, burning of crops, dust, and chemical spray drift any proposed biological buffers between the future buildings and adjacent agricultural land.*

Include a preliminary assessment of the likely future impact/s of the proposal on the existing agricultural activities on adjacent and adjoining land and what mitigation strategies are proposed.

Agricultural Impact:
Provide details of the impact of the proposal on mapped State Significant Farmland SSF) in terms of:

- *agricultural resources and industries*
- *agricultural supplies in the North Coast region due to loss of SSF*
- *fragmentation of existing SSF in the area*
- *impact on other farmland including SSF in the region*

The impact assessment should consider agricultural productivity, land values, agricultural investment, impacts to key support infrastructure/services including transport routes, adjoining land users (including a detailed Land Use Conflict Risk Assessment), impacts to water use from agriculture, regional communities and the environment.
Identify options to minimise and mitigate adverse impacts on agricultural resources, including agricultural lands, enterprises and infrastructure at the local and regional level.

Social and Economic Impacts
Include an assessment of all the likely social and economic consequences of the hospital relative location, including the benefits the hospital would provide to the local region. The assessment should include (but not limited to) the following:

- *identification of all potential and perceived impacts of the proposed development on the agricultural communities, resources and enterprises surrounding the site*

- *consideration of all potential and perceived impacts of the proposal on agricultural productivity and land capability on the site and in relation to adjoining and near by sites*
- *identification of the affected individual and groups who will be impacted by the future operation, including the users/occupiers of the surrounding properties*
- *proposed mitigation measures to reduce the identified risks in the social and economic assessment. impact of the proposed activities on the local community including consideration of local planning and consultation findings.*

Outline all potential and perceived social and economic impacts on the development on the wider area, including particular impacts on the Tweed Heads City Centre and the adjacent farmland enterprises as a result of the relocation of the existing hospital services.

Noise and Vibration:
Outline key strategies to avoid or reduce impact of noise on the users of the site due to agricultural activities on the adjoining lands (tractor operations / road noise).

The tasks involved in undertaking this LUCRA were to:

Step 1: Gather information

- Determine the nature of the land use change and development proposed;
- Assess the nature of the precinct where the land use change and development are proposed;
- Appraise the topography, climate and natural features of the Project Site and broader locality.
- Conduct a site inspection;
- Describe and record the main activities of the surrounding agricultural land use and their regularity, including periodic and seasonal activities that have the potential to be a source of complaint or conflict.

Step 2: Evaluate the risk level of each activity

- Record each activity on the risk assessment matrix, and identify the level of risk of a land use conflict arising from the activity.

Step 3: Identify the management strategies and responses that could help lower the risk of the issue resulting in a dispute and conflict

- Identify management strategies for each activity;
- Prioritise Strategies;
- Provide Performance targets for each activity.

Step 4: Record the results of the LUCRA

- Summarise the key issues, their risk level, and the recommended management strategies.

1.2 Overview of Hospital Project

The Tweed Valley Hospital Project consists of:

- Delivery of 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;
- Masterplanning for additional health, education, training and research facilities to support these 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 new hospital, including green space and other amenities, campus roads and car parking, external road upgrades and connections, utilities connections, and other supporting infrastructure.

Health Infrastructure proposes to undertake the development of the Tweed Valley Hospital via a Staged SSD Application for the following components:

- Concept Proposal and Stage 1 Early and Enabling Works (see **Appendix A**);
- Stage 2: Hospital Delivery - Main Works and Operation;
- Subsequent Stages: Potential Future Expansion.

1.3 Planning Context

The Project Site has a mix of zones. It is zoned under the Tweed Local Environmental Plan (TLEP) 2014 as:

- *RU1 Primary Production (majority of site)*
- *R1 General Residential*
- *DM (Deferred Matter)*

Deferred Matters from the TLEP 2014 default to the provisions of the TLEP 2000. These areas on the Project Site are zoned as:

- *1(b1) Agricultural Protection*
- *2(c) Urban Expansion*
- *7(l) Environmental Protection (Habitat)*

The Project Site is identified as *State Significant Farmland (SSF).*

In assessing the potential risk of land use conflict associated with the proposed Tweed Valley Hospitaland existing adjoining agricultural landuses, the following documents were considered:

- *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;
- *Draft Rural Land Strategy*, Tweed Shire Council; and the
- *Draft Kingscliff Locality Plan, Volume 2 – Precinct Plans*, Tweed Shire Council.

The key provisions of these documents are addressed as follows:

1 Living and Working in Rural Areas

This publication presents a consolidation of best practices and strategies arising from managing land use conflict on the North Coast. The publication addresses land use conflicts and interface issues arising between agricultural practices and neighbouring residents.

LUCRA's were initially conceived in the *Living and Working in Rural Areas Handbook* (Department of Primary Industries *et.al* 2007) by the Centre for Coastal Agricultural Landscapes in partnership with the Northern Rivers Catchment Management Authority as a tool to better manage potential land use conflicts between residential development and rural activities and environmental attributes/assets on the NSW North Coast. Heath Infrastructure has chosen to adopt the LUCRA tool to better identify potential land use conflicts risks associated with the proposed development and existing agricultural landuses and where necessary propose mitigation options to address any unacceptable risks.

The *Living and Working in Rural Areas Handbook* (Department of Primary Industries *et.al* 2007) denotes a number of recommended buffer distances to residential areas as described below:

- 300 metres from State and regionally significant farmland;
- 100 metres to wetlands;
- 50 metres to native vegetation/habitat;
- 50 metres to minor waterways;
- 300 metres to sugar cane, cropping and horticulture;
- 200 metres to greenhouse and controlled environment horticulture.

We note 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 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 (see Site Plan and Surrounding Land Uses in **Appendix B**) has confirmed:

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

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 activity such as those proposed on the Project Site.

While a default buffer area of 300m width is recommended between *State and Regionally Significant Farmland* and *residential development* the DPI does not stipulate a setback from commercial/industrial developments to *State and Regionally Significant Farmland*.

This LUCRA will:

- use the default buffers to residential development as a guide for the proposed development;
- maintain the existing reference to residential development as per DPI *et. al* 2007

The actual width of the 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.

Any potential land use conflicts between the proposed hospital and existing agricultural land uses will be 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; and
- Severity of impact.

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

1. Environmental/public health & amenity hazard identification;
2. Risk assessment and ranking; and
3. Risk control development.

The Tweed Valley Hospital should be designed to minimise instances of incompatibility such that normal farming practice are not inhibited. Where such instances do arise, measures to ameliorate potential conflicts should be revised wherever possible.

Conflict between residential development and agricultural land uses is likely to occur where residential land uses directly abut, or are sufficiently close to, farmland such that they are likely to be affected by agricultural activities. Conflict between the proposed commercial development (Tweed Valley Hospital) and existing agricultural activities could occur but are less likely given the reduced likelihood of exposure to workers or patients compared to residential receptors due to the probability of occurrence.

Such conflict can arise from the use of agricultural chemicals, noise, dust and odour generating activities. Adverse impacts of the proposed development on farmland may include noise (vehicles and helicopter), sediment and stormwater run-off.

When considering potential land use conflict between residential and agricultural activities it is important to recognise that all agricultural activities:

- should incorporate reasonable and practicable measures to protect the environment in accord with the Protection of the Environment Operations Act (POEO Act) and associated industry specific guidelines; and
- are legally conducted as required by other legislation covering workplace health and safety, and the use and handling of agricultural chemicals.

Nevertheless, certain activities practised by even the most careful and responsible farmer may result in a nuisance to adjacent residential areas through, for example, unavoidable odour drift and noise impacts. Typical conflicts between agricultural enterprises and residential development as provided in **Table 1.1** below.

Table 1.1 Typical Conflicts between agriculture and adjoining residential areas

Noise	• Dogs, livestock. • Farming equipment, pumps, spray machines, transport. • Ancillary equipment associated with on-farm processing.
Odour	• Agricultural fertilisers and chemicals. • Intensive animal industries. • Application of effluent to pasture
Health concerns	• Chemicals. • Spray drift. • Smoke.
Water	• Access. • Pumping. • Quantity.
Smoke and ash	• Burning of pasture, stubble or 'rubbish'.
Visual intrusion	• Hail netting. • Polyhouses.
Nuisance	• Stray dogs. • Vandalism. • Trespass. • Noxious and environmental weeds.

The Living and Working in Rural Areas Handbook (NSW DPI *et. al* 2007), in particular Chapter 6 Development Control, provides guidance in the assessment and mitigation

of potential land use conflict matters and has been used as a resource for this Land Use Conflict Risk Assessment (LUCRA).

2 Tweed Sustainable Agriculture Strategy

Objective 1.2 – Minimise land use conflicts between agriculture and other land uses

Rural land is increasingly being purchased for lifestyle purposes which reduces opportunities for agriculture and has potential to generate land use conflicts between farmers and people new to rural areas. Similarly, new rural landholders are seeking opportunities to utilise their often-small parcels of land for productive purposes, which 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. Council must give due consideration to the impacts of development on agriculture when assessing development applications and has a responsibility to ensure land use conflict is minimised.

Actions:

- Implement actions identified in the draft Rural Land Strategy to address potential conflicts, including preparing a specific chapter in the DCP about land use conflict, buffers and setbacks to farmland.
- Increase the awareness, capacity and skill of lifestyle land owners to manage their land sustainably so that it does not degrade the environment or impact on adjacent farmers.
- Raise awareness and appreciation of rural activities, including agricultural practices, among new and existing landholders living close to agricultural production.
- Help industry adopt more sustainable agricultural practices.

3 Draft Rural Land Strategy

Land use conflict occurs when a land use or activity is incompatible with the views, expectations and values of the people living and working in an area. Conflict within communities impacts on community wellbeing; that combination of social, economic, environmental, cultural and political conditions identified by individuals and their communities as essential for them to flourish and fulfil their potential.

In recent decades, as rural communities have become less dependent on production from the land as the dominant income and employment source, a change in the function and composition of villages has occurred, creating an increased potential for land use conflicts.

Lack of knowledge or interest by some newcomers in utilising the agricultural potential of their land changed how rural land is used in some areas. This in turn places pressure on adjoining agricultural land owners to conform to a new set of expectations and limitations, potentially creating conflict between neighbours.

One of the functions of the Rural Land Strategy is to minimise potential land use conflicts, both through planning policy and decisions that reflect past accumulation of

knowledge, and though education programs for new and existing land owners on how to live together in a contemporary or changing rural environment.

What did the community say?
There is concern that routine farming operations and their impacts (such as spraying, slashing, noise and smells) might be restricted due to close proximity to new residential properties. Purchasers of land adjoining rural zoned land should accept the existing right of farmers to retain their farming practices and not push farmers out.

Developers should include buffers on their land, not on the rural property. It should be an option to share a buffer with neighbours.

This LUCRA has been prepared to assist the Department of Planning and Environment (DPE) in assessing potential land use conflicts between the proposed development at the Project Site and the neighbouring agricultural developments.

4 Kingscliff Locality Plan, Volume 2 – Precinct Plans

The draft Kingscliff Locality Plan and Development Control Plan is a framework to guide future growth and a range of other planning objectives. The Kingscliff Locality Plan provides background and strategic justification for LEP amendments and also directly inform the Kingscliff Development Control Plan.

The intent of the Kingscliff Locality Plan Volume 02: Precinct Plans is to provide more focussed contextual information and strategies as they relate to specific precincts.

The Tweed Valley Hospital site is located within the Green Edge Precinct. Strategy 5 of section 12.4 of Vol 2 nominates typical buffers of 80 metres to agricultural land for residential development around the locality of the Project Site. It notes these buffers may increase depending on the specifics of the proposed development and the nature of the adjoining agricultural land uses.

It is noted that the more conservative buffers from the *Living and Working in Rural Areas Handbook* have been used in this assessment.

2. Gather Information

2.1 Nature of the land use change and development proposed

The Project Site is described in real property terms as Lot 102 DP870722 Cudgen Road Cudgen. The Project Site comprises a single lot and has an area of approximately 23 hectares. The Project Site fronts Cudgen Road and is located immediately west of the Kingscliff urban area. The Project Site has 800 metres frontage to Cudgen Road; and 490 metres frontage to Turnock Street. It has proximal access to the Tweed Coast Road, which connects to the M1 in the north. The Project Site is approximately 13.5 km south of Tweed Heads. The Project Site is currently predominantly zoned as rural land, situated on the urban periphery of Kingscliff.

The Project Site topography is undulating. The Project Site is substantially clear of vegetation, with some scatters and strands of trees, and vegetation along its northern extent. Approximately 50% of the Project Site is used for agricultural purposes. The Department of Environment's eSPADE website indicates the Project Site is largely made up of Residual (Cudgen) soil landscapes.

The Project Site contains a number of environmental and development constraints which include:

- About half of the Project Site (northern) is mapped as bush fire prone land (category 1 vegetation and buffer);
- Council's mapping indicates that the northern portion is affected by the Flood Planning Area and the Probable Maximum Flood (PMF), however the majority of the Project Site (south) is not mapped as flood prone;
- Majority of the Project Site mapped as Class 5 Acid Sulfate Soils, with the northern portion Classes 2 and 3;
- Vegetation in the northern portions of the Project Site are mapped by Council as preferred Koala habitat (2009 veg mapping – indicative only);
- The Project Site includes area mapped as Coastal Wetland and Proximity Area for Coastal Wetlands under the State Environmental Planning Policy (Coastal Management) 2018 (Coastal SEPP); and
- The Project Site is mapped as being Biophysical Strategic Agricultural Land.

This report has been prepared to support an EIS prepared to accompany a State Significant Development Application for the Tweed Valley Hospital which will be assessed under Part 4 of the Environmental Planning and Assessment Act.

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

- Delivery of 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;
- Masterplanning for additional health, education, training and research facilities to support these 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 new hospital, including green space and other amenities, campus roads and car parking, external road upgrades and connections, utilities connections, and other supporting infrastructure.

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

- A Concept Proposal of the Tweed Valley Hospital and Stage 1 early and enabling works; and
- A second development application for Stage 2 works which will include detailed design, construction and operation of the Tweed Valley Hospital (Project Application).

A detailed description of the proposed staging of the development is provided in the following sections.

(a) Concept Proposal and Stage 1 Early and Enabling Works

This component (and EIS) seeks approval for a Concept Proposal of the Tweed Valley Hospital and Stage 1 early and enabling works.

The Concept Proposal is informed by service planning to 2031/32 and has an expected gross floor area in the range 55,000m^2 to 65,000m^2. The hospital is expected to include (with more detail to be confirmed/provided at Stage 2) the following components/ services:

- A main entry and retail area
- Administration Services
- Ambulatory Services
- Acute and Sub-Acute in-patient units
- Paediatrics
- Intensive Care Unit
- Close Observation Unit
- Mental Health Services
- Maternity Unit
- Renal Dialysis
- Pathology
- Pharmacy
- Cancer Services including Day Oncology and Radiation Oncology
- Emergency Department
- Integrated Interventional Services
- Interventional Cardiology
- Medical Imaging
- Mortuary
- Back of house Services
- Car parking
- Future expansion areas.

Stage 1 includes:

Early and enabling works (for site clearance and preparation), generally comprising:

- 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 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 internal road ways for use during construction and in preparation for final road formations in Stage 2
- Retaining walls.

(b) Stage 2: Hospital Delivery - Main Works and Operation

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

(c) Subsequent Stages: Potential Future Expansion

Any subsequent stages would be subject to a separate application(s) as required and would 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.

2.2 Nature of the precinct where the land use change and development are proposed

The Project Site is zoned under the TLEP 2014 as:

- *RU1 Primary Production (majority of site)*
- *R1 Genearl Residential*
- *DM (Deferred Matter)*

Deferred Matters from the TLEP 2014 default to the provisions of the TLEP 2000. These areas on the Project Site are zoned as:

- *1(b1) Agricultural Protection*
- *2(c) Urban Expansion*
- *7(l) Environmental Protection (Habitat)*

The land is identified as *State Significant Farmland (SSF).* The subject development falls within the following buffers (note: the following buffers are default values that apply to residential development - they have been applied to the health facility for the purpose of this assessment):

- 300 metres from State and regionally significant farmland
- 300 metres to cropping and horticulture
- 200 metres to greenhouse and controlled environment horticulture.

Approximately 50% of the Project Site is currently used for vegetable cropping predominately sweet potato. An agricultural assessment was conducted by the Agricultural Risk Consulting Group (18 July 2018) summarised activities as follows:

- There is approximately 11.21 ha of cultivated area.
- There is an additional 0.58ha of Custard apple trees, these trees appeared to have been abandoned. There were several dead trees and there was no indication that the trees had been tended to, most probably for several years. In their current condition, they could not produce a commercial crop and it is unlikely that they could be salvaged sufficiently enough to produce a commercial crop in the future.
- There is an additional 0.19ha paddock located immediately to the north of the Custard Apples, there was no indication that this area was in use for any farming activity.
- Of the 11.24 ha of cultivation;
    - There are 5 paddocks on the western border that total 3.37 ha and 4 paddocks with a total of 3.65 ha that are bordered by the timbered are to the immediate north of all cultivation paddocks. The total area of all 9 paddocks is 7.02ha. The slope on these paddocks range from 6% to 17%.
    - There are 4 paddocks that are on the southern boundary (Cudgen Rd side) that total 4.22 ha, these paddocks are relatively flat.
    - In relation to all cultivation, there was existing or old drip irrigation tube present. This indicates that the paddocks had been irrigated using drip irrigation. The type of drip irrigation that appears to have been used is thin walled product that is typically used for a single season after which it is removed and disposed of.
    - For paddocks with a slope of greater than 5% it is difficult to get even irrigation distribution, this is irrespective of whether drip irrigation or overhead irrigation is used.
    - For paddocks with a slope of greater than 10%, the management of the paddocks including operations such as tractor work and harvesting is significantly more difficult than on flat ground. Production from paddocks with significant slopes such as the 9 paddocks with a total of 7.02ha, can be expected to be lower than on paddocks with little or no slope.

We note 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 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.

See Masterplan in **Appendix A**.

2.3 Topography, Climate and Natural Features

The RL of the Project Site ranges from 25 to 7.0m. The land to the north and south of the bank is both relatively flat with slopes less than 10%. The lower flat area of the Project Site to the north is known to be flood affected. There is an existing bank running through the Project Site, this bank has a slope around the 12% (see Site Survey **Appendix C**).

The land at the top of the bank available to be developed has an area of 9Ha. The bank can be built up without impacting on flood but may have riparian restrictions. The lower areas of the Project Site are heavily flood affected with flood depths of 6-8m.

The Tweed Head 1:250,000 Geological Sheet 1972 indicates the ground conditions to be Quaternary alluvial deposits (River, gravels sand, clay), overlying the tertiary lamington volcanics comprising basalt, rhyolite, tuff, trachyte, agglomerate and conglomerate.

Reference to eSpade indicates the Cudgen soil landscape to be present across the Project Site which comprises the lamington volcanics. Northern spur adjacent Turnock Street to be Pottsville soil landscape comprising Aeolian sand dune deposits.

Reference to the NSW Groundwater Bore Archive indicates ~10m of clay underlain by interbedded, basalt and clay beds to a depth of 47m. Records indicate - North spur adjacent to Turnock Street has high probability for the occurrence of Acid Sulphate Soils The geology comprises two categories:

- Elevated Areas: Tertiary volcanic rocks: basalt, rhyolite, trachyte, gabbro, syenite (Tv);
- Lower Areas: Holocene tidal-delta flat: marine sand, silt, clay, shell, gravel (Qhef). Holocene coastal lagoon: organic mud, marine sand, clay, silt, shell (Qhek).

The soils within the Project Site are within the Cudgen (cu) soil landscape which are generally red basaltic – landscape variant. They are generally deep well drained alluvial kraznozems.

The Project Site is situated within the sub-tropical climatic zone and the climate can be described as humid sub-tropical, characterised by hot, humid summers and mild winters. Rainfall is seasonally distributed, being concentrated mainly in the summer months.

Climate averages from the Coolangatta Weather Station are provided **Table 2.1**. Whilst not replicating the exact onsite weather conditions the Coolangatta Weather station results provide a good indication of the general weather experienced in the locality.

Wind from the south-easterly quadrant predominates in summer and autumn. South-westerlies are the main winds in winter, whereas in the spring months, wind directions are equally divided between the north and south-east.

Although the strong winds are generally from the south-east and north, strong north-westerly winds, occur approximately one day per month during summer.

At 9am the dominant wind is from the south (37%), while at 3pm the dominant wind direction is mixed between south east (34%) and northerly (31%).

Table 2.1 Local Climatic Conditions

Monthly climate statistics

All years of record

Site information

Site name: COOLANGATTA
Site number: 040717
Latitude: 28.17 °S **Longitude:** 153.51 °E
Elevation: 4 m
Commenced: 1982 **Status:** Open
Latest available data: 09 Aug 2018

Additional information

Additional site information

Nearest alternative sites

1. 058013 CONDONG SUGAR MILL (17.9km)
2. 058158 MURWILLUMBAH (BRAY PARK) (22.5km)
3. 040190 SOUTHPORT RIDGEWAY AVE (22.7km)

View: Main statistics All available | Period: 30 year period not available | Text size: Normal Large

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years	
Temperature															
Mean maximum temperature (°C)	28.4	28.3	27.3	25.5	23.2	21.0	20.6	21.5	23.4	24.6	25.9	27.3	24.8	30	1982 2018
Mean minimum temperature (°C)	21.0	20.9	19.8	17.0	13.9	11.4	10.2	10.5	13.3	15.9	18.1	19.7	16.0	31	1982 2018
Rainfall															
Mean rainfall (mm)	161.1	172.2	184.6	162.0	134.5	138.9	69.8	59.0	39.8	88.0	123.4	149.1	1513.4	33	1982 2018
Decile 5 (median) rainfall (mm)	142.8	145.9	160.2	117.6	98.5	98.3	53.6	38.5	21.2	68.5	110.3	133.3	1566.4	34	1982 2018
Mean number of days of rain ≥ 1 mm	10.5	12.0	12.9	11.2	9.9	8.2	5.7	5.1	4.7	7.2	9.2	10.1	106.7	34	1982 2018
Other daily elements															
Mean daily sunshine (hours)															
Mean number of clear days														3	2005 2010
Mean number of cloudy days														3	2005 2010
9 am conditions															
Mean 9am temperature (°C)	25.7	25.4	24.3	22.1	19.5	17.0	16.4	17.8	20.2	22.0	23.3	24.7	21.5	19	1991 2010
Mean 9am relative humidity (%)	70	72	72	71	70	71	67	61	62	65	68	68	68	18	1993 2010
Mean 9am wind speed (km/h)	18.1	17.1	17.4	16.1	14.9	13.4	13.5	15.2	17.8	19.0	19.4	18.6	16.7	18	1991 2010
3 pm conditions															
Mean 3pm temperature (°C)	26.6	26.5	25.4	23.7	21.6	19.7	19.4	20.0	21.4	22.5	23.8	25.3	23.0	19	1991 2010
Mean 3pm relative humidity (%)	69	69	67	64	62	60	56	56	61	66	68	68	64	18	1993 2010
Mean 3pm wind speed (km/h)	22.9	21.8	22.3	20.0	18.3	16.8	18.3	20.4	22.2	23.1	22.5	22.7	20.9	18	1991 2010

red = highest value blue = lowest value

Product IDCJCM0027 Prepared at Thu 09 Aug 2018 01:38:17 AM EST

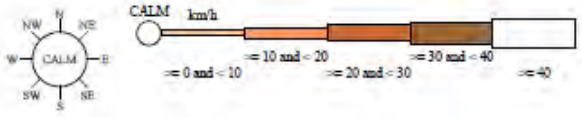
Rose of Wind direction versus Wind speed in km/h (01 Oct 1987 to 10 Aug 2018)

Custom times selected, refer to attached note for details

COOLANGATTA

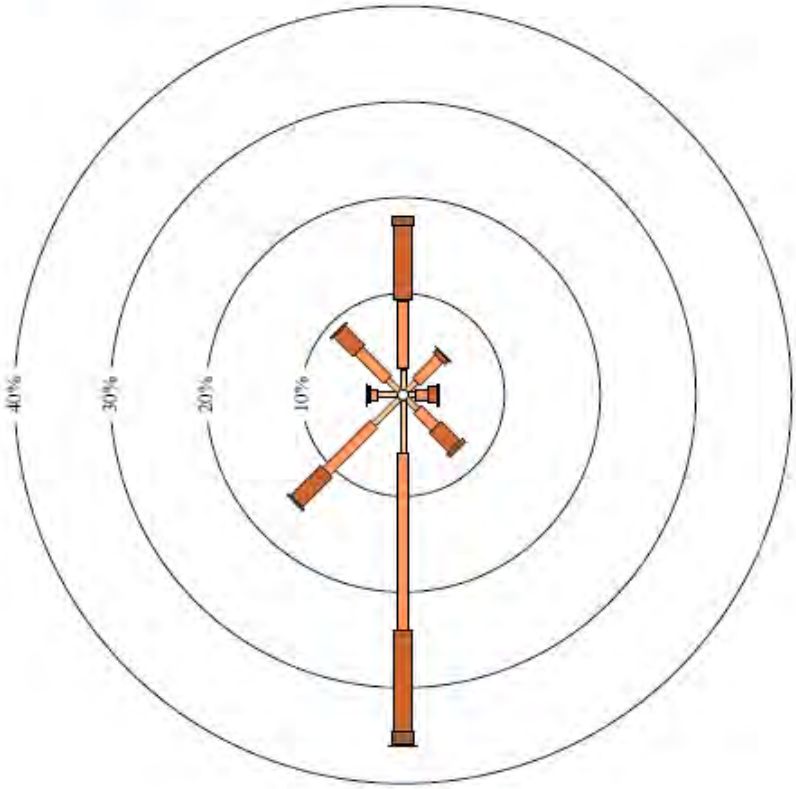
Site No: 040717 • Opened Jan 1982 • Still Open • Latitude: -28.1681° • Longitude: 153.5053° • Elevation 4m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



9 am
11034 Total Observations

Calm 3%



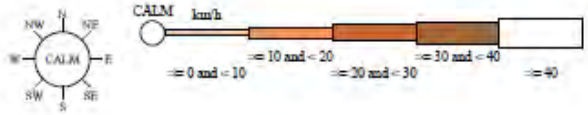
Rose of Wind direction versus Wind speed in km/h (01 Oct 1987 to 10 Aug 2018)

Custom times selected, refer to attached note for details

COOLANGATTA

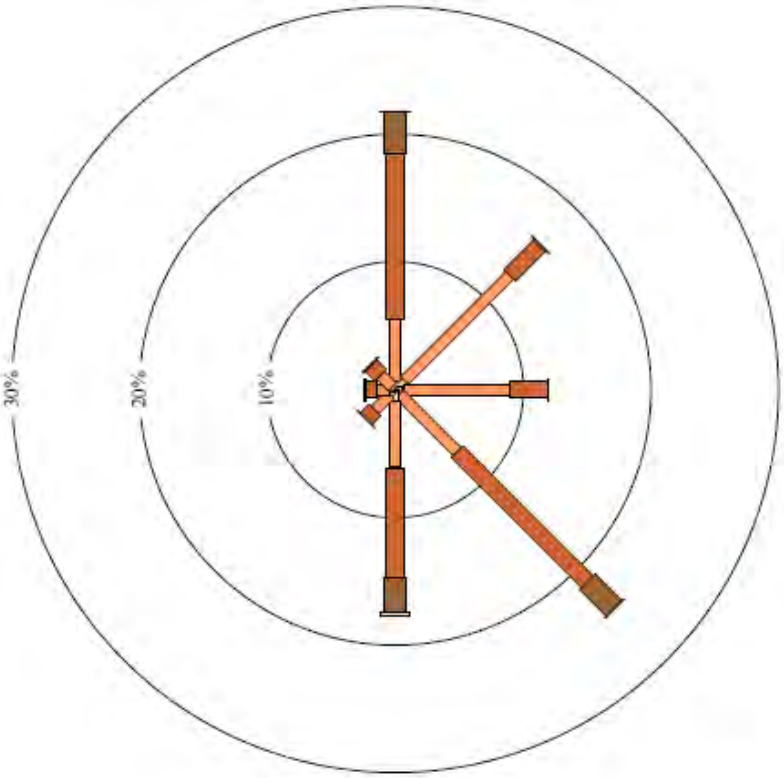
Site No: 040717 • Opened Jan 1982 • Still Open • Latitude: -28.1681° • Longitude: 153.5053° • Elevation 4m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



3 pm
11060 Total Observations

Calm *



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2.4 Site Inspection

A site inspection of the Project Site was undertaken on Friday 20 July 2018. The Project Site can be divided into two distinct sections:

- Section A (south) consists of mildly sloped cleared paddocks used to grow vegetables (sweet potatoes and custard apples); and
- Section B (north) consists of a low lying, flood prone land with vegetation comprising Broad-leaved Paperbark Closed Forest to Woodland and Early Regrowth Rainforest.

The southern and western boundaries of the Project Site have a mixture of native and exotic vegetation of varying height and depth. There is one dwelling and a shed located on the southern boundary.

Photographs of the Project Site subject and surrounds were taken (see **Appendix D**).

Wind conditions at the time of inspection were south east approximately 5-10 km/hr. Observations recorded during our site inspection noted the tractor-based application of chemicals on Lot 2 DP616751. The inspection did not reveal any distinguishable impacts (noise, odour, dust) from any adjoining operations on the Project Site.

The principal human-based impact observed was road traffic noise along the Tweed Coast Way and Cudgen Road.

2.5 Consultation with Neighbouring Residents

From 30 July to 10 August 2018 discussions were undertaken between Wendy Salkeld and Sue Folliott (TSA Management) and neighbouring residents to determine:

- The extent of current farming activity; and
- Any history of impact from existing farming activities.

Consultation was undertaken with the following:

- Son of Resident, 792 Cudgen Rd;
- Occupier *Hardy's Electrical and Solar*, 764 Cudgen Rd;
- Sam Prichard, Lessee, 738-740 Cudgen Rd;
- Mrs Allen, Owner, 738-740 Cudgen Rd;
- Left calling card, no response received; 744 Cudgen Road;
- Left calling card, no response received 748 Cudgen Road;
- Mathew Prichard Mate & Matts Farm, 752 Cudgen Rd;
- Dan Cutler, Tweed Learning Infrastructure Manager, Kingscliff TAFE;
- Left Phone message, no response received, Kingscliff High school;
- Glenn Nott (business owner) Kingscliff Aquatic Centre;
- Bill Sexton, Kingscliff Community Health Centre; and

- Darran Jones Commercial Sales & Leasing Specialist, Commercial GC South Network on behalf of the owners of Lot 6 DP727425 (former Earth and Colour Hydroponic Nursery).

A summary of the comments relevant to potential land use conflicts provided are contained in **Table 2.2**. A copy of File note on consultation is provided in **Appendix E**.

Table 2.2 Consultation with Neighbouring Residents

Neighbouring Location	Comments
Son of Resident 792 Cudgen Road	No farming activity conducted on their land and there had been none for many years
Occupier (Dave) friend of the Resident Hardy's Electrical and Solar 764 Cudgen Rd	Calling card left for owner; no response received
Sam Prichard (lessee) 738-740 Cudgen Rd	One piece of land being taken now, but what are the plans for TAFE expansion and has heard that there will be a new state high school built in this area ▪ Further encroachment: farmland looks to never be rezoned unless the Government wants to use it and then the Government will only pay rural land use value ▪ Perception of the risk of fertilizer spray on the farm by users of the hospital ▪ Design of roads: concerned about traffic impacts, access to/from property. ▪ Will there be a 4-lane road? ▪ Would another road be built on the other side of the property? ▪ What traffic considerations/ assessment/planning is being undertaken now?
Mrs Allen 738-740 Cudgen Rd	Mrs Allen confirmed: ▪ that there is no farming activity on the property or adjacent property (Don Becks); ▪ they had previously had an agricultural assessment of their land which confirmed there was insufficient good soil to enable farming activity – plateau good then becomes sandy and rock heading south. Disagreed with the community view that the area was good farmland ▪ that red dust was an issue from the neighbouring property's trucks and that they were unable to open any windows on the Eastern side of the property ▪ there was a shallow rock shelf through Cudgen Plateau ▪ her concerns about increased traffic but more related to the noise from the upgrade of Tweed Coast Road and intersection ▪ her concerns about increased drug users associated with the hospital ▪ her support of the hospital as "we need it" but concerned with being so close to it
Mate & Matts Farm Mathew Prichard 752 Cudgen Rd	Matthew Prichard confirmed that: ▪ the Property consists of a farmhouse, retail outlet and packing facility. ▪ Farming activities occur during daylight hours only with 19 employees currently on payroll.

	Matthew Prichard identified the following potential sources of conflict: **Traffic:** ▪ currently has 10 truck movements per week between 11.00-1600 – some semi-trailers which reverse into the property, blocking the road during that time. Can be during school pick up time adding to congestion ▪ Currently has permit for bob cats and excavators to travel between Cudgen Rd farm (main farm and packing facilities) and others on Plantation Rd – very slow and obstruct traffic. Tractors also – but not as slow. ▪ Queried whether a road was planned through his property? Stated he had seen a map of a planned road running through his property to Southern Kingscliff on TSC letterhead **Access:** ▪ Will his shopfront / business access be blocked or on an intersection? Restricted access will impact his business activity **Car parking:** ▪ Concerned that construction workers will park on his property or on street blocking access ▪ Reassurance given that all construction parking will be confined to the Project Site ▪ Concerned about spill over of parking once operational – cited Gold Coast University Hospital (GCUH) as example where people park in surrounding streets ▪ Reassurance given that all operational parking will be provided on the Project Site **Crime:** ▪ Concerned about antisocial behaviour associated with hospital, increase in crime, property damage and theft **Impact to business:** ▪ Can we operate our business as usual? ▪ No concerns about pesticides spray drift and dust as he has to manage that anyway ▪ More concerned about restrictions to access and lost production from shadowing. ▪ Loss of production has occurred on the North East side of the property due to shadowing from TAFE **Encroachment onto adjacent farmland:** ▪ Concerned about rumours that an aged care facility and private hospital is already in planning on nearby sites Matthew stated that maintenance of the buffer by TAFE has only been undertaken recently and prior to that overgrowth had attracted and harboured rats
Dan Cutler, Tweed Learning Infrastructure Manager, Kingscliff TAFE	Mr Cutler: ▪ confirmed that they have no direct neighbour issues (Mate & Matts farm) – don't even know they are there ▪ advised that they do have issues at both Kingscliff and Murwillumbah campus with ash from sugar cane burn off and that this should be considered during planning
Glenn Nott (business owner) Kingscliff Aquatic Centre	Dan advised that when the pool was first built when it was open farmland there was an ongoing problem with red dirt in the pool however since the residential development had occurred there was no longer an issue

Bill Sexton Kingscliff Community Health Centre	Bill advised they had no impact from the farming activities but should consider run off of red dirt into library entrance during planning
Darran Jones (DJ) Commercial Sales & Leasing Specialist | Commercial GC South Network on behalf of tenants of Lot 6 DP727425 former Earth and Colour Hydroponic Nursery	*Describe and record the main activities of the land use and their regularity, including periodic and seasonal activities that have the potential to be a source of complaint or conflict.* DJ's Response: ▪ A cottage that is leased for residential use and a farm shed that is used as an office *Confirm numbers of employees;* DJ's Response: ▪ No fulltime employees *Describe the Typical and Atypical Hours and days of operation.* DJ's Response: ▪ Cottage is used 24/7 and the shed / office used occasionally *Are there any dwellings on the site?* DJ's Response: ▪ Yes, a 2-bedroom cottage plus a small shed with office and storage *Confirm processes that occur within the existing structures?* DJ's Response: ▪ Cottage is currently leased and the shed houses the owner's office *What, if any fertilisers and chemicals (pesticides, herbicides, insecticides) are used on the site and in what locations are they applied (provide on plan of site)* DJ's Response: ▪ Nil *What method/s are used to apply fertilisers and chemicals (pesticides, herbicides, insecticides)?* DJ's Response: ▪ Nil *Are water pumps used and if so where are they located?* DJ's Response: ▪ There is a fresh water spring located on the northern boundary of the property *What noise generating equipment and machinery is used on the farm?* DJ's Response: ▪ NIL *Describe the annual planting, fertilising, harvesting schedule for the farm?* DJ's Response: ▪ NIL *Is there currently stormwater runoff from 771 Cudgen Road, to the neighbour's site and what if any impact is it having?* DJ's Response: ▪ There is a council easement and drain between the 2 sites *Is there any onsite processing of harvested product? and if so where does it occur onsite?* DJ's Response: ▪ No

2.6 Potential Land Use Conflicts

The following key items have been identified as potential land use conflicts between the surrounding agricultural/horticultural operations and the proposed development.

2.6.1 Agricultural Chemical Spray Drift

The off-target movement of agricultural chemicals can be a cause for concern to residents in proximity to farming areas. These concerns are largely based on fears of exposure to agricultural chemicals but also due to detection of odours associated with the chemical.

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 selection of applicators and nozzles that give the correct droplet size range is important.

The higher droplets are released, the greater potential for drift. Given the adjacent land use consists of ground vegetable cropping and the relatively low height at which spray released the risk of spray drift is reduced.

Given the nature and location of the former 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 should it reopen.

From a planning perspective, it is not considered practical to base buffer area dimensions on individual chemicals or formulations. Based on the available research on chemical spray drift, the planning guidelines for setback to residential development have adopted a minimum width of 300 m where open ground conditions apply; and a minimum width of 40 m where a vegetated buffer element can be satisfactorily implemented and maintained.

It should be noted that the recommended vegetated buffer (which includes multiple rows of trees) will not capture 100% of the chemical spray drift, but may reduce spray drift to less than 1% at a sensitive receptor when managed in terms of porosity, litter build up and noxious weed control to ensure effectiveness.

2.6.2 Odour

Odour from cropping and horticulture can arise from use of chemical sprays, fertilisers (inorganic and organic), effluent disposal and composting. Such detrimental odours can impact on residential amenity and have the potential to affect public health.

Odour is often a major factor in many complaints about off-site chemical spray drift where there is sometimes no objective evidence of toxic exposure. Some agricultural chemicals contain ‘markers’ (strong odours) to allow easy identification and these markers or mixing agents are sometimes detected at a distance from the target area

and cause concern even though in some circumstances extremely low levels of the active ingredients may be present.

Residents' association of the odour with the chemical is sufficient to raise fears of exposure. In addition, perceptions of an odour's acceptability and individual capacity to detect particular odours can vary greatly.

Factors affecting complaints from odour are influenced by the frequency, intensity, duration and offensiveness of the odour. An objectionable odour may be tolerated if it occurs infrequently at a high intensity, however a similar odour may not be tolerated at lower levels if it persists for a longer duration.

2.6.3 Noise

There are four types of noise associated with agricultural activity which may lead to land use conflict. These are the noises 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.

The most likely types of noise associated with agricultural activity which may lead to land use conflict in the locality would be 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 92dB 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; and
- typical industry machinery and practices.

Given the nature of adjoining land use it is unlikely that noisy activities will occur at night. Noisy activities associated with agriculture are intermittent and may only affect a particular adjacent residence for a few hours several times a year. For example, small cropping on a two crop per year basis for potatoes generally requires approximately 25 hours of machinery activity per hectare per year.

2.6.4 Dust

The main sources of dust from vegetable cropping include cultivation prior to planting, tractor and transport movements. Contemporary farming practices incorporate measures to minimise loss of soil, but at times it is necessary to leave land unplanted for extended periods, which can lead to the movement of dust. Local conditions,

including wind strength and direction, rainfall, humidity and ambient temperatures, soil type, vegetative cover and type of on-site activity determine the extent of the nuisance.

The vegetated buffer designed to capture chemical spray drift will also be effective in reducing conflict resulting from dust.

2.6.5 Surface Water and Sediment Runoff

The proposed development will alter land surface characteristics and the hydrological balance on the Project Site and has the potential to impact adjoining farmland. The increase of impermeable surfaces and changes to drainage patterns can accelerate soil erosion, siltation and sedimentation; and increase the risk of flooding.

Techniques to alleviate conflict due to downstream effects of the proposed development include suitable erosion, sediment and stormwater control during the construction and operational stages of the development.

The land generally slopes in a northerly direction from a mid-point away from adjoining farmland and towards the melaleuca and swamp she-oak forest. There is also a side slope to the north west towards the former Earth and Colour Hydroponic Nursery. An earthen bund runs along the western boundary which includes a series of breaks whereupon drainage traverses in a northerly direction along a council stormwater easement and drain between the 2 sites (D Jones, 30 July 2018).

A Soil and Water Management Plan for the construction and operation phases of the development and management of stormwater run-off should be prepared. The SWMP should incorporate buffer areas to the northern wetland and be designed to divert and spread stormwater to reduce conflicts from stormwater run-off between the proposed development and adjacent farmland.

2.6.6 Traffic and Access

According to discussions with Matthew Prichard, Mate and Matts Farm, there are currently has 10 truck movements per week between 11.00 -1600 – some semi-trailers which reverse into the property, blocking the road during that time which can include school pick up time adding to congestion.

Currently Matthew Prichard has a permit for bob cats and excavators to travel between Cudgen Rd farm (main farm and packing facilities) and others on Plantation Rd, this process is very slow and has the potential to obstruct traffic. He also has a permit to access the Road with his Tractors.

3. Land Use Conflict Risk Assessment

3.1 Introduction

In this report, a risk assessment matrix is used 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; and
- Severity of impact.

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

1. Environmental/public health & amenity hazard identification;
2. Risk assessment and ranking;
3. Risk control development.

Procedure:

1. Prepare LUCRA Hazard Identification and Risk Control form.
2. List all hazards associated with each activity.
3. Assess and rank the risk arising from each hazard before “controls” are applied on the LUCRA form.
4. Develop controls that minimise the probability and consequence of each risk using the five level methods. Record these controls on the form.
5. Re-rank each risk with the control in place to ensure that the risk has been reduced to an acceptable level. If the risk ranking is not deemed to be acceptable consideration should be given to whether the proposed activity should be allowed to proceed.

3.2 Risk Assessment and Risk Ranking

It is necessary to differentiate between an 'environmental hazard' and an 'environmental risk'. 'Hazard' indicates the potential for harm, while 'risk' refers to the probability of that harm occurring. For example, the presence of chemicals stored in a building is a hazard, but while the chemicals are stored appropriately, the risk is negligible. **Table 3.1** defines the hazard risks used in this report.

The Risk Ratings (severity of the risks) have been established by assessing the consequences of the risks and the likelihood of the risks occurring.

Table 3.1 Measure of Consequence

Level	Descriptor	Description	Examples/Implications
1	Severe	▪ Severe and/or permanent damage to the environment ▪ Irreversible with management	▪ Damage or death to animals, fish, birds or plants ▪ Long term damage to soil or water ▪ Odours so offensive some people are evacuated or leave voluntarily ▪ Many public complaints and serious damage to Council's reputation ▪ Contravenes Protection of the Environment & Operations Act and the conditions of Council's licences and permits. Almost certain prosecution under the POEO Act
2	Major	▪ Serious and/or long-term impact to the environment ▪ Long-term management implications	▪ Water, soil or air impacted badly, possibly in the long term. ▪ Limited damage to animals, fish or birds or plants ▪ Some public complaints Impacts pass quickly ▪ Contravenes the conditions of Council's licences, permits and the POEO Act ▪ Likely prosecution
3	Moderate	▪ Moderate and/or medium-term impact to the environment ▪ Some ongoing management implications	▪ Water, soil or air known to be affected, probably in the short term ▪ No damage to plants or animals ▪ Public unaware and no complaints to Council ▪ May contravene the conditions of Council's Licences and the POEO Act ▪ Unlikely to result in prosecution
4	Minor	▪ Minor and/or short-term impact to the environment ▪ Can be effectively managed as part of normal operations	▪ Theoretically could affect the environment or people but no impacts noticed ▪ No complaints to Council ▪ Does not affect the legal compliance status of Council

Level	Descriptor	Description	Examples/Implications
5	Negligible	▪ Very minor impact to the environment ▪ Can be effectively managed as part of normal operations	▪ No measurable or identifiable impact on the environment

This report utilises an enhanced measure of likelihood of risk approach which provides for 5 levels of probability (A-E). The 5 levels of probability are set out below in **Table 3.2.**

Table 3.2 Probability Table

Level	Descriptor	Description
A	Almost certain	Common or repeating occurrence
B	Likely	Known to occur, or 'it has happened'
C	Possible	Could occur, or 'I've heard of it happening'
D	Unlikely	Could occur in some circumstances, but not likely to occur
E	Rare	Practically impossible

3.3 Risk Ranking Method

For each event, the appropriate 'probability' (i.e. a letter A to E) and 'consequence' (i.e. a number 1 to 5) is selected.

The consequences (environmental impacts) are combined with a 'probability' (of those outcomes) in the Risk Ranking Table (Table 3.3) to identify the risk rank of each environmental impact (e.g. a 'consequence' 3 with 'probability 'D yields a risk rank 9).

The table yields a risk rank from 25 to 1 for each set of 'probabilities' and 'consequences'. A rank of 25 is the highest magnitude of risk that is a highly likely, very serious event.

A rank of 1 represents the lowest magnitude or risk, an almost impossible, very low consequence event.

Table 3.3 Risk Ranking Table

PROBABILITY	A	B	C	D	E
Consequence					
1	25	24	22	19	15
2	23	21	18	14	10
3	20	17	13	9	6
4	16	12	8	5	3
5	11	7	4	2	1

NOTE

A risk ranking of 25-11 is deemed as an unacceptable risk.

A risk ranking of 10-1 is deemed as an acceptable risk.

Thus, the objective is to endeavour to identify and define controls to lower risk to a ranking of 10 or below.

3.4 Risk Reduction Controls

The process of risk reduction is one of looking at controls that have an effect on probability such as the implementation of certain procedures; new technology or scientific controls that might lower the risk probability values.

It is also appropriate to look at controls which affect consequences e.g. staff supply with a mechanism to change impacts or better communications established. Such matters can sometimes lead to the lowering of the consequences.

Table 3.4 LUCRA Site Assessment

Site Feature	Condition/Comments	Potential Conflict
Residential Development/ Buffer Distances	The closest point of the proposed hospital building is approximately ▪ 100m to vegetable cropping on Lot 1 DP803772 to the south; ▪ 60m to the former Earth and Colour Hydroponic Nursery to the west (Lot 6 DP727425); ▪ 120m to Mate & Matts Roadside Stall to the south-so-west (Lot 101 DP866795); ▪ 280m to sweet potato farm to the south west (Lot 101 DP 866795). Default Buffer distances to Residential development: ▪ 300 metres from State and regionally significant farmland ▪ 300 metres to cropping and horticulture ▪ 200 metres to greenhouse and controlled environment horticulture.	Moderate
Site Location: Vehicular Access	The subject development has direct access to Cudgen Road. Based on the advice of Mathew Prichard there are potential conflicts between heavy and slow vehicles	Moderate

	accessing Matt and Mates Farm and vehicles entering the Tweed Valley Hospital opposite. Measures to reduce any potential traffic impacts are to be addressed in the Traffic Impact Assessment and subsequent Traffic Management Plan for both construction and operations.	
Aspect	North	Low
Exposure	At 9am the dominant wind is from the south (37%), while at 3pm the dominant wind direction is mixed between south east (34%) and northerly (31%) (BOM 2018)	Low-Moderate
Run-on and Upslope Seepage Site Drainage and Water pollution	Run-on or seepage on adjoining farmland will be minimal. The land generally slopes in a northerly direction away from adjoining farmland and towards the melaleuca and swamp she-oak forest. Cross fall to the north west connects to an existing council easement which runs along the western boundary. The soils within the Project Site are generally red basaltic – landscape variant. They are generally deep well drained alluvial kraznozem.	Low
Agricultural Chemical Spray Drift	The off-target movement of agricultural chemicals can be a cause for concern to residents in proximity to farming areas. These concerns are largely based on fears of exposure to agricultural chemicals but also due to detection of odours associated with the chemical.	Moderate
Odour	Odour from cropping and horticulture can arise from use of chemical sprays, fertilisers (inorganic and organic), effluent disposal and composting. Such detrimental odours can impact on residential amenity and have the potential to affect public health.	Moderate
Noise	Given the proposed setbacks, daytime operations intermittent use of tractors and delivery vehicles coupled with the installation of air conditioning in the proposed Tweed Valley Hospital the likelihood of noise impacts from the existing agricultural activities are deemed to be negligible. Noise from traffic and mechanical equipment from the construction and operation of the proposed Tweed Valley Hospital are to be addressed in the Nosie Impact Assessment.	Low to negligible
Dust	The main sources of dust from a vegetable cropping include cultivation prior to planting, tractor and transport movements. Wind speed in excess of 30 km/hr from the south have the potential to generate airborne particulate matter (dust) from the adjoining farms to the south of the Project Site	Moderate

The areas of moderate potential conflict outlined in **Table 3.4** will be addressed through the following **Risk Reduction Controls** outlined in **Table 3.5**.

Table 3.5 Hazard Identification and Risk Control Sheet

Work undertaking

Activity	Identified Hazard	Risk Ranking	Method of Control	Controlled Ranking
Use of Agricultural/ Horticultural Sprays	**Health and Safety** Spray drift from an application of agricultural chemicals has the potential to adversely affect the health and safety of persons in non-targeted areas.	**C3 = 13 Unacceptable**	Based on the proximity of the existing vegetable cropping to the south of the proposed Tweed Valley Hospital we recommend a series of vegetated buffers to provide an effective safeguard to spray drift. 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 4–5 m 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% of the screen should be air space); ▪ foliage is from the base to the crown; ▪ include species which are fast growing and hardy; and ▪ have a mature tree height at least 3m; **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:	**C4 = 8 Acceptable**

			▪ contain random plantings of a variety of tree and shrub species of differing growth habits, at spacings of 2–3 m 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% of the screen should be air space); ▪ foliage is from the base to the crown; ▪ include species which are fast growing and hardy; and ▪ have a mature tree height at least 3m; Update as access has moved east away from farmland **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. ▪ 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 building 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.	

Odour	Chemical sprays, fertilisers (inorganic and organic), effluent disposal and composting	B4 = 12 Unacceptable	The nominated vegetated buffer designed to capture chemical spray drift will also be effective in reducing conflict resulting from odour	D4 = 5 Acceptable
Noise	Hospital operations; machinery, air conditioning, aircraft (helicopter), vehicles (staff, patients, visitors, deliveries, waste collection), generators night work,	B4 = 12 Unacceptable	The most likely types of noise associated with agricultural activity which may lead to land use conflict in the locality would be intermittent noise from tractors and other machinery. Given the proposed setbacks, daytime operations intermittent use of tractors and delivery vehicles coupled with the installation of air conditioning in the proposed Tweed Valley Hospital the likelihood of noise impacts from the existing agricultural activities are deemed to be negligible. Hospital operations; machinery, air conditioning, aircraft (helicopter), vehicles (staff, patients, visitors, deliveries, waste collection), generators, night work, from the proposed 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).	D4 = 5 Acceptable
Dust	Cultivation prior to planting, tractor and transport movements	B3 = 17 Unacceptable	The nominated vegetated buffer designed to capture chemical spray drift will also be effective in reducing conflict resulting from dust.	D4 = 5 Acceptable

Residential Development/ Buffer Distances	The closest point of the proposed hospital building is approximately ▪ 100m to vegetable cropping on Lot 1 DP803772 to the south; ▪ 60m to the former Earth and Colour Hydroponic Nursery to the west (Lot 6 DP727425); ▪ 120m to Mate & Matts Roadside Stall to the south-so-west (Lot 101 DP866795); ▪ 280m to sweet potato farm to the south west (Lot 101 DP 866795).	B3 = 17 Unacceptable	The nominated vegetated buffer designed to capture chemical spray drift will also be effective in reducing conflict resulting from activities associated with surrounding landuses.	D4 = 5 Acceptable
Run-on and Upslope Seepage Site Drainage and Water pollution	Increase of impermeable surfaces and changes to drainage patterns can accelerate soil	C3 = 13 Unacceptable	A Soil and Water Management Plan for the construction and operation phases of the development and management of stormwater run-off should be prepared. The SWMP should incorporate appropriate water quality treatment measures and flow detention measures to reduce conflicts from stormwater run-off between the proposed development and adjacent farmland.	D4 = Acceptable

	erosion, siltation and sedimentation;			
Traffic and Access	Potential conflicts between vehicular access to Mate and Matts Farm and the main entrance to the Tweed Valley Hospital.	B3 = 17 Unacceptable	The Tweed Valley Hospital entrance has been located so it is not directly opposite the farms. And other appropriate controls relating to turning lanes and lane dividers are proposed to adequately address traffic concerns.	D3 = 9 Acceptable

4. Discussion

While a default buffer area of 300m width is recommended between cropping and residential development the actual width of the 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 identified that the most limiting factor is agricultural spray drift and odour. In addition, the LUCRA identified that the greatest potential source of conflict relates to vehicular traffic and access. Careful consideration needs to be given to the Traffic Impact Assessment to ensure that adjoining farm operations to the south are not compromised by changes to local traffic flows as a consequence of the proposed Tweed Valley hospital.

The proposed development should be designed to minimise instances of incompatibility such that normal farming practice are not inhibited. Where such instances do arise, measures to ameliorate potential conflicts should be devised wherever possible.

When considering potential land use conflict between residential and agricultural activities it is important to recognise that all agricultural activities:

- should incorporate reasonable and practicable measures to protect the environment in accord with the Protection of the Environment Operations Act (POEO) and associated industry specific guidelines; and
- are legally conducted as required by other legislation covering workplace health and safety, and the use and handling of agricultural chemicals.

Nevertheless, certain activities practised by even the most careful and responsible farmer may result in a nuisance to adjacent residential areas through, for example, unavoidable odour drift and noise impacts.

4.1 Vegetated Buffers

The use of vegetated buffers to separate incompatible land uses is gaining increasing interest as a means of reducing the need for physical separation and hence increasing development opportunities. Biological buffers can also contribute to increased biodiversity, shade, visual improvements, soil stability, water quality and amenity. The role of appropriately designed vegetative buffers in intercepting chemical drift and providing visual barriers is well recognised. Such benefits, however, are only derived from established and well-maintained buffers, which may take many years to realise and can prove difficult to enforce.

Biological buffers can also affect the local microclimate (either positively or negatively) through shading, taking up of water and nutrients, and altered airflow patterns. They can also impede the views and amenity of nearby residents and, if inappropriately managed, can harbour exotic weeds or pests.

Vegetated buffers have other advantages in that they:

- create habitat and corridors for wildlife;
- increase the biological diversity of an area, thus assisting in pest control;
- favourably influence the microclimate;
- are aesthetically pleasing;
- provide opportunities for recreational uses;
- contribute to the reduction of noise and dust impacts.

In order to maximise beneficial effects and effectively reduce conflict, biological buffers need to be well planned and managed. This includes effective provision for ongoing management and maintenance of the values of the vegetated barrier so that it performs its function as a buffer.

It is recommended that a landscape plan be prepared indicating the extent of the buffer, the location and spacing of proposed and existing trees and shrubs and a list of tree and shrub species to be planted. The application should also contain details concerning proposed ownership of the vegetated buffer and the means by which the buffer is to be maintained.

All plantings are to be mulched, fertilised and watered for the first twelve months after planting.

The landscape plan must indicate:

a) proposed location for planted shrubs and trees;
b) botanical name of shrubs and trees to be planted;
c) mature height of trees to be planted;
d) location of trees identified for retention in the development application plans.

As a general rule, buffer areas should be properly designed to avoid special maintenance requirements whilst achieving their maximum desired effect of separating conflicting land uses. However, it will be necessary to ensure ongoing maintenance of buffer areas, including replanting, thinning, management for fire protection, herbicide damage, noxious weeds, feral animals, litter build-up etc. so that the buffer areas continue to be effective in reducing conflict. Vegetated buffers may require ongoing attention to maintain a porosity of 0.5 with suitable lower and upper storey vegetation to ensure their effectiveness in capturing spray drift.

Vegetated buffers may serve as components of wildlife corridors and improve opportunities for conserving wildlife habitat.

To achieve effective management, clear responsibilities for maintenance should be determined before the buffer areas are implemented. Responsibilities for maintenance will be largely determined by ownership. In general, maintenance of buffer areas in private ownership will be the responsibility of the proprietor, as controlled by development conditions. The recommended mechanism is through planning conditions imposed on a development approval. These conditions attach to the land and are binding on successors in title.

The necessary controls to ensure this maintenance is carried out must be in place at the time the buffer area is created.

4.2 Building Orientation and Design

Measures to reduce land use conflict include:

- 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 building 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.

4.3 Noise Impacts

Hospital; operations; machinery, air conditioning, aircraft (helicopter), Vehicles (staff, patients, visitors, deliveries, waste collection), generators, night work, from the proposed 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)

There are four types of noise associated with agricultural activity which may lead to land use conflict. These are the noises 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.

The most likely types of noise associated with agricultural activity which may lead to land use conflict in the locality would be 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 92dB 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; and
- typical industry machinery and practices.

Given the nature of adjoining land use it is unlikely that noisy activities will occur at night. Noisy activities associated with agriculture are intermittent and may only affect a particular adjacent residence for a few hours several times a year. For example, small cropping on a two crop per year basis for potatoes generally requires approximately 25 hours of machinery activity per hectare per year.

4.4 Stormwater Management

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.

The nominated buffer areas can also be designed to utilise techniques such as water spreading and water diversion to reduce conflicts from stormwater run-off between the proposed development and adjacent farmland. Ongoing maintenance and enforcement must be identified and incorporated into conditions of approval.

4.5 Traffic and Access

Measures to reduce any potential traffic impacts are addressed in the Traffic Impact Assessment and subsequent Traffic Management Plan for both construction and operations.

The Tweed Valley Hospital 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.

5 Conclusions and Recommendations

This Land Use Conflict Risk Assessment is based on:

- a review of Concept Proposal;
- discussions with TSA Management;
- site inspection; and
- review of surrounding landuses.

This LUCRA has concluded that the Project Site is suitable for the proposed State Significant Development Application for the hospital subject to the recommendations provided further below.

Recommendations for Vegetated Buffers

Based on the proximity of the existing vegetable cropping to the south of the proposed Tweed Valley Hospital we recommend a series of 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 4–5 m 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% of the screen should be air space);
    - foliage is from the base to the crown;
    - include species which are fast growing and hardy; and
    - have a mature tree height at least 3m;

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 2–3 m 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% of the screen should be air space);

- foliage is from the base to the crown;
- include species which are fast growing and hardy; and
- have a mature tree height at least 3m;

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.

- 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 building 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.

Recommendations for Noise Impacts

Hospital operations; machinery, air conditioning, aircraft (helicopter), vehicles (staff, patients, visitors, deliveries, waste collection), generators, night work, from the proposed 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

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

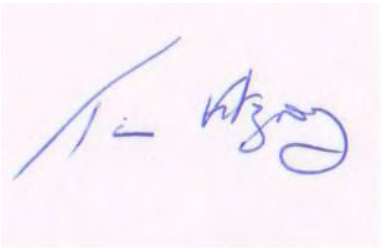
Measures to reduce traffic impacts have been addressed in the Traffic Impact Assessment with regard to both construction and operations. The Tweed Valley Hospital entrance has been located so it is not directly opposite the farms. Other appropriate controls relating to turning lanes and lane dividers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

Other Considerations that have Informed this Assessment

A number of factors have led to this conclusion including:

- 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.

This report has been prepared by Tim Fitzroy of *Tim Fitzroy & Associates.*



Tim Fitzroy
Environmental Health Scientist
Environmental Auditor

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Tweed Shire Council, Draft Rural Land Strategy, Murwillumbah, NSW

Copyright and Usage

A Masterplan

NOTES

LANDSCAPE INDICATIVE ONLY - REFER LANDSCAPE ZONAL PLAN L-MP-12

LEGEND

- SITE BOUNDARY
- MAXIMUM PLANNING ENVELOPE
- TREE TRUNK LINE
- APZ OFFSETS
- PROBABLE MAXIMUM FLOOD LEVEL
- INDICATIVE BUILDING ENTRIES

N

DIMENSIONS

USE FIGURED DIMENSIONS. DO NOT SCALE. CONTRACTORS MUST VERIFY ALL DIMENSIONS ON THE SITE BEFORE COMMENCING ANY WORK OR MAKING ANY SHOP DRAWING WHICH MUST BE SUBMITTED AND REVIEWED BEFORE MANUFACTURE.

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TSA MANAGEMENT

CLIENT

NSW GOVERNMENT Health Infrastructure | Health Northern NSW Local Health District

PROJECT

TWEED VALLEY HOSPITAL
771 Cudgen Road, Cudgen

DRAWING TITLE

MASTERPLAN
CONCEPT PLAN

SCALE	DATE	DRAWN BY	CHECKED
1:2500 @ A3	19/09/2018	CE	MH

PROJECT No	DRAWING No	REVISION
10363	AR-SKE-10-006	04

B Site Plan & Surrounding Landuses

TJF 1810 001 - TVH - SURROUNDING LAND USES.dwg

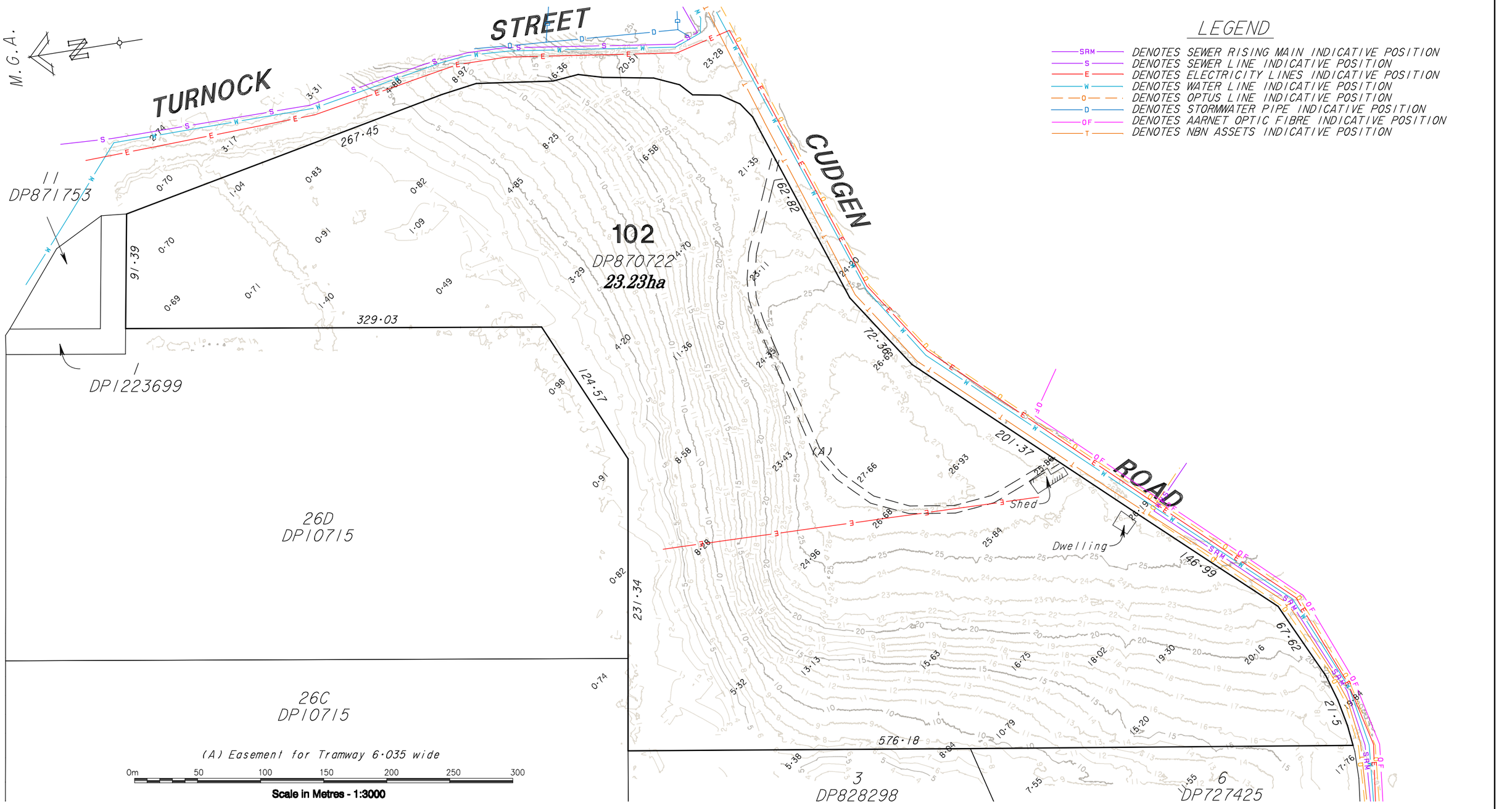
Appendix B

Subject Site and Surrounding Land Uses for the Tweed Valley Hospital Project

Lot 102 on DP870722 | Cudgen Road, Cudgen

PREPARED BY:
tim fitzroy & associates

C Site Survey



LEGEND

- SRM — DENOTES SEWER RISING MAIN INDICATIVE POSITION
- S — DENOTES SEWER LINE INDICATIVE POSITION
- E — DENOTES ELECTRICITY LINES INDICATIVE POSITION
- W — DENOTES WATER LINE INDICATIVE POSITION
- O — DENOTES OPTUS LINE INDICATIVE POSITION
- D — DENOTES STORMWATER PIPE INDICATIVE POSITION
- OF — DENOTES AARNET OPTIC FIBRE INDICATIVE POSITION
- T — DENOTES NBN ASSETS INDICATIVE POSITION

Revision | Chk

Client:

NSW Health Infrastructure

IMPORTANT NOTES :

CONTOUR INTERVAL - 1.0 m
CONTOURS HAVE BEEN CREATED BY B&P SURVEYS FROM LIDAR DATA PROVIDED BY LPI (CAPTURED MARCH 2014). THEIR ACCURACY SHOULD BE CONSIDERED APPROXIMATE ONLY.
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PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON THE SITE, THE RELEVANT AUTHORITIES SHOULD BE CONTACTED FOR POSSIBLE LOCATION OF FURTHER UNDERGROUND SERVICES AND DETAILED LOCATION OF ALL SERVICES.
TITLE BOUNDARIES SHOWN HEREON HAVE BEEN SOURCED FROM LPINSW DCDB ON 7/11/2017 AND ARE INDICATIVE ONLY. BOUNDARY DISTANCES SHOWN ARE TAKEN FROM DP870722.

SURVEY INFORMATION PLAN
SITE 8

LOT 102 DP870722
CUDGEN ROAD
CUDGEN

Parish of CUDGEN County of ROUS

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SCALE AT A3	Level DATUM	F.Bk	L.Bk	Drawn	REF. No.	DATE	DRAWING No./Size	Sheet	Of	Rev.
1 : 3000	A.H.D.	-	-	RLL Chk'd PAW	T16452	7/11/2017	22290 D	1	2	-

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A QUALITY ASSURED COMPANY

D Site Photos

Photo 1 **Project Site looking South**

Photo 2 **Farm to the South**

Photo 3 **Former Earth & Colour Nursery to the west**

Photo 4 **Mate & Matts Road side Stall**

E Consultation

FILE NOTE | TWEED VALLEY HOSPITAL REDEVELOPMENT

SUBJECT	Agricultural impact – Consultation with neighbouring properties
DATE	Monday 6 August – Thursday 9 August

Purpose of engagement with surrounding neighbours to determine:

- Extent of current farming activity
- Any history of impact from existing farming activities

Door knock undertaken Monday 6 August from 0900-1045 by Wendy Salkeld and Sue Folliott. Calling cards with contact details via the Tweed Valley Hospital Project Website left at properties which were unoccupied at the time.

Follow up phone calls were undertaken by Sue Folliott

Property Address	Date	Time	Response	Outcome
792 Cudgen Rd **PROPERTY DESCRIPTION** House directly fronting Cudgen Rd adjacent to TAFE	Monday 6 August 2018	09.10	• No response to door knock. Calling card left with contact details	Son (Tim) will contact if any further information required
	Monday 6 August 2018		• Message received via website to call	Confirmed no farming activity onsite
	Wednesday 8 August 2018	14.30	• Phone conversation (Sue) with son of resident wishing to advise that due to his father's age there should be no contact with him directly at the premises.	

			• Tim stated that his father is 86 years old and would feel intimidated by the hospital contacting him directly at home • Sue reassured Tim that the Project team would not contact his father directly • Sue reinforced Community and Consumer Reference Group opportunity but if that was not an option was happy to answer any queries or concerns his father may have and that he could contact me directly • Tim confirmed there was no farming activity conducted on their land and there had been none for many years	
764 Cudgen Rd **PROPERTY DESCRIPTION** House directly fronting Cudgen Rd with adjacent business – Hardy's Electrical and Solar	Monday 6 August 2018	09.15	• Wendy & Sue spoke to "Dave" who was a friend of the resident. Calling card left with contact details • Phone number on van for sale (if needed) 0452 349 454) • Number of cars parked on site at business premises but no response • Calling card left at door of business premises with contact details	
Property: on left-hand dirt driveway of 738-740 Cudgen Rd (leased from uncle Kerry?) Spoke with lessee Sam Prichard Phone: 0457 753 966 Email: samprichard@hotmail.com **PROPERTY DESCRIPTION** Lives in house at end of driveway. Property boundaries are from Cudgen Road down to rear beyond the shed (it gets wider at the rear)/Mr and Mrs Allen house 738-	Monday 6 August 2018		• Sue and Wendy introduced themselves as part of the project team and here to provide information on the project and gather input. Sam raised the following: • One piece of land being taken now, but what are the plans for TAFE expansion and has heard that there will be a new state high school built in this area • Further encroachment: farmland looks to never be rezoned unless the Government wants to use it and then the Government will only pay rural land use value • Perception of the risk of fertilizer spray on the farm by users of the hospital	Responses to be developed re concerns and provided via email Discuss agencies community responses at cross agency meeting eg TAFE and education Consultants to consider in reports: • Traffic

740 Cudgen to sugarcane windbreak. 43 acres of farming land (two sites) Cousin Tracey lives in white house that fronts Cudgen Road, Uncle Kerry Prichard owns the brown brick house next door. Matthew and Henry are brothers at the fruit barn property.			• Design of roads: concerned about traffic impacts, access to/from property. • Will there be a 4-lane road? • Would another road be built on the other side of the property? • What traffic considerations/ assessment/planning is being undertaken now? • Concerned about the impact on the Kingscliff village and its character • Concerned to join a community reference group due to number of reasons • Family and historical considerations • Keen to be in contact, express views and input and to hear more regularly from the project	• Agricultural impact • Socioeconomic
738-740 Cudgen Rd Owners WR & NJ Allen Spoke with owner Mrs Allen **PROPERTY DESCRIPTION** House set back from Cudgen Rd. Land extends through to Alan McIntosh site at back and bordered by driveway of adjacent farmland to the east and Don Becks property to the west	Monday 6 August 2018	09.30	• Sue and Wendy introduced themselves as part of the project team and here to provide information on the project and gather input. • Mrs Allen confirmed that there is no farming activity on the property or adjacent property (Don Becks) • Stated they had previously had an agricultural assessment of their land which confirmed there was insufficient good soil to enable farming activity – plateau good then becomes sandy and rock heading south. Disagreed with the community view that the area was good farmland • Stated that red dust was an issue from the neighbouring property's trucks and that they were unable to open any windows on the Eastern side of the property	Consultants to consider in reports: • Traffic • Agricultural Impact • Town Planning

			• Stated there was a shallow rock shelf through Cudgen Plateau • Concerned about increased traffic but more related to the noise from the upgrade of Tweed Coast Road and intersection • Concerned about increased drug users associated with the hospital • In support of the hospital as "we need it" but concerned with being so close to it	
744 Cudgen Rd White house fronting Cudgen Rd	Monday 6 August 2018	10.35	No response to door knock. Calling card left with contact details	
748 Cudgen Rd Brick house fronting Cudgen Rd	Monday 6 August 2018	10.35	No response to door knock. Calling card left with contact details	
Mate & Matts Farm **752 Cudgen Rd** Spoke to part owner Matthew pH 0408 026 642 matthewprichard@hotmail.com **PROPERTY DESCRIPTION** Property consists of a farmhouse, retail outlet and packing facility. Farming activities occur during daylight hours only with 19 employees currently on payroll.	Monday 6 August 2018 Wednesday 8 August Wednesday 8 August	10.40 14.00 15.45	• Sue and Wendy introduced themselves as part of the project team and here to provide information on the project and gather input. • Recognising Matthew was busy at the time, an offer to call or visit at a more appropriate was provided. Matthew stated he was only available for a phone call this week as in America the following week • Arranged to call one afternoon later in the week • Phone call to Matthew (Sue). Time not convenient. Arranged for 16.00 • Text message received from Matthew that something had come up. Call rescheduled to 13.00 Thursday	Responses to be developed re concerns and provided via email Information re Community Reference group to be provided by email Consultants to consider in reports: • Traffic • Agricultural Impact • Town Planning • Socio-economic

Water pumps are located at the rear of the property and provide a reliable source of water for farming activities There is no noise generating equipment over and above tractors etc onsite Planting occurs all year round	Thursday 9 August	13.00	• Sue confirmed that the reason for contact was as part of the planning process to consult with the local community, listen to concerns, provide information and gather information about current farming activities • Sue confirmed that planning and design was still developing and input from the local community was important to this process • Matthew raised the following concerns during the phone call: • Traffic: o currently has 10 truck movements per week between 11.00-1600 – some semi-trailers which reverse into the property, blocking the road during that time. Can be during school pick up time adding to congestion o Currently has permit for bob cats and excavators to travel between Cudgen Rd farm (main farm and packing facilities) and others on Plantation Rd – very slow and obstruct traffic. Tractors also – but not as slow. o Queried whether a road was planned through his property? Stated he had seen a map of a planned road running through his property to Southern Kingscliff on TSC letterhead • Access: o Will his shopfront / business access be blocked or on an intersection? Restricted access will impact his business activity	

			• Carparking:
			  o Concerned that construction workers will park on his property or on street blocking access
			  o Reassurance given that all construction parking will be confined to the site
			  o Concerned about spill over of parking once operational – cited GCUH as example where people park in surrounding streets
			  o Reassurance given that all operational parking will be provided on the site
			• Crime:
			  o Concerned about antisocial behaviour associated with hospital, increase in crime, property damage and theft
			  o Confirmed that assessment is undertaken as part of the planning process however Matthews response was that once the theft happens its too late
			• Impact to business:
			  o Can we operate our business as usual?
			  o Explained that part of the agricultural impact assessment looks at hospital design and how the hospital operates so that it doesn't impact the surrounding farming activities
			  o Matthew stated he is not worried about pesticides and dust as he has to manage that anyway more restrictions to access and lost production from shadowing.	

			○ Loss of production has occurred on the NE side of the property due to shadowing from TAFE ○ Sue advised that as part of the planning process shadowing is considered • Encroachment onto adjacent farmland: ○ Has heard that an aged care facility and private hospital are already in planning on nearby sites ○ Reinforced that one of the reasons the site was chosen was the ability for complementary health services to be provided within the site and that an aged care facility was not being considered as part of that. • Sue queried whether there was any impact from TAFE in addition to the shadowing concern raised. Matthew stated that maintenance of the buffer by TAFE has only been undertaken recently and prior to that overgrowth had attracted and harboured rats • Encouraged Matthew to consider being part of the Community Reference Group. Matthew asked for further information as to expected commitment to the process in order to consider.	

Phone contact with neighbouring businesses (Sue Folliott)				
Property Address	**Date**	**Time**	**Response**	**Outcome**
TAFE	Thursday 9 August 2018	14.30	• Sue explained purpose of the call was to assist with the Planning process for the hospital by determining any	Traffic consultant to consider in report

Spoke with Dan Cutler, Tweed Learning Infrastructure Manager pH 0439 882 078 email: daniel.cutler5@tafensw.edu.au			baseline information regarding current or historical agricultural impact • Dan advised excited about the potential opportunities for TAFE and HI with the hospital located across the road • Dan confirmed that they have no direct neighbour issues (Mate & Matts farm) – don't even know they are there • Advised that they do have issues at both Kingscliff and Murwillumbah campus with ash from sugar cane burn off and that this should be considered during planning • Raised concern re parking impacts and people utilising TAFE parking during construction and when operational – especially if paid parking implemented at the hospital. • Dan advised parking is already at capacity at TAFE and there is currently an internal application into their Capital Works for additional parking but unlikely to occur quickly as would be seen as a low priority with other works in the state • Dan advised the TAFE entrance intersection is hazardous due to speeding vehicles on Cudgen Rd when students/ staff attempting to exit / enter. • Sue reiterated a traffic impact assessment was underway as part of the planning process which includes looking at road alignments, road safety etc • Sue advised Dan about the Community Representative group if anyone from TAFE was interested in being a part of the planning process	
Kingscliff High School	Thursday 9 August 2018	11.30	• Spoke to Reception re purpose of the call. They were going to call back with the most appropriate contact details	Follow up phone call to media unit if required

	Thursday 9 August 2018	15.00	• Voice message received to contact their media unit.	
Kingscliff Aquatic Centre Spoke with Glenn Nott (business owner)	Thursday 9 August 2018	11.15	• Sue explained purpose of the call was to assist with the Planning process for the hospital by determining any baseline information regarding current or historical agricultural impact • Dan advised that when the pool was first built when it was open farmland there was an ongoing problem with red dirt in the pool however since the residential development had occurred there was no longer an issue • Thinks it the most suitable site for the hospital and makes sense	No current impact identified
Kingscliff Community Health Centre Spoke with Bill Sexton, NNSW LHD	Thursday 9 August 2018	12.30	• Sue explained purpose of the call was to assist with the Planning process for the hospital by determining any baseline information regarding current or historical agricultural impact • Bill advised they had no impact from the farming activities but should consider run off of red dirt into library entrance during planning	Follow up with Kingscliff library if required