



# Orchard Hills North Rezoning Services Infrastructure Assessment

Orchard Hills

January 2023

Client:  
Legacy Property



Quality  
Safety  
Environment

**J. WYNDHAM PRINCE**  
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS  
& PROJECT MANAGERS



# Orchard Hills North Rezoning Services Infrastructure Assessment

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PO Box 4366, PENRITH WESTFIELD, NSW 2750  
580 High Street, PENRITH, NSW 2750  
P 02 4720 3300  
W [www.jwprince.com.au](http://www.jwprince.com.au)  
E [jwp@jwprince.com.au](mailto:jwp@jwprince.com.au)

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Legacy Property has submitted a planning proposal for the rezoning of the Orchard Hills North site. The site subject to this proposed rezoning is approx. 152 hectares of existing rural lots currently under fragmented ownership. The planning proposal is to rezone the existing agricultural land to mixed land uses including approximately 1,729 residential lots, neighbourhood centre and open space areas.

J. Wyndham Prince were engaged to prepare a Services Infrastructure Assessment report to inform the planning of Orchard Hills North. This assessment has reviewed the current existing infrastructure for potable water, waste water, electricity, telecommunication and natural gas. Contact was made with service providers to understand the possible new infrastructure that may be required to provide adequate service to the proposed development.

Revision E of this report was updated to reflect current project details as of January 2023. However, the findings of the report reflect the investigations undertaken in March 2018. The findings of the report remain current as of March 2018. Since these investigations were reported, it is understood that the services agencies have undertaken further planning works to account for the Orchard Hills North development.

Sydney Water are the main supplier of potable and waste water infrastructure and services in the Orchard Hills North Area. Sydney Water currently has significant trunk potable water infrastructure through and adjoining the site. It is assumed that this infrastructure has sufficient capacity for the proposed development as the local reservoir (WS0038) is located within the overall structure plan area.

Waste water infrastructure currently does not extend into the proposed rezoning area however the existing infrastructure downstream of the proposed development have sufficient capacity to provide service to the proposed development. The developer will be required to extend the existing infrastructure into the development site to ensure that the staged wastewater requirements of the site are met.

Endeavour Energy have confirmed that electrical service can currently be provided to the site via feeders that will need to be installed from the nearby Claremont Meadows Zone Substation. Endeavor Energy originally indicated that, due to ongoing development in the area, an additional Zone substation may be required within the overall Orchard Hills North Structure plan area. At this stage, no additional Zone Substation is required.

NBN Co. has confirmed the proposed development can be serviced by the NBN network under their current servicing arrangement and policies. The development would be serviced via an extension from the lead-in works that services the other developments in the area. NBN Co. would deliver the lead-in infrastructure to service the precinct with partial funding from the developer.

Jemena has provided confirmation that natural gas can be provided to the site. Under Jemena's current policies any required lead in works will be provided and funded by Jemena directly. The developer, if gas is required to development, will need to provide trenching for the staged delivery of the gas reticulation network.

Through this assessment, it was found that the Orchard Hills North development can be adequately serviced with all of the above infrastructure and that provision of services is not expected to be an impediment to development. Correspondence with authorities and specific services reports from separate consultants can be reviewed in the appendices of this report.

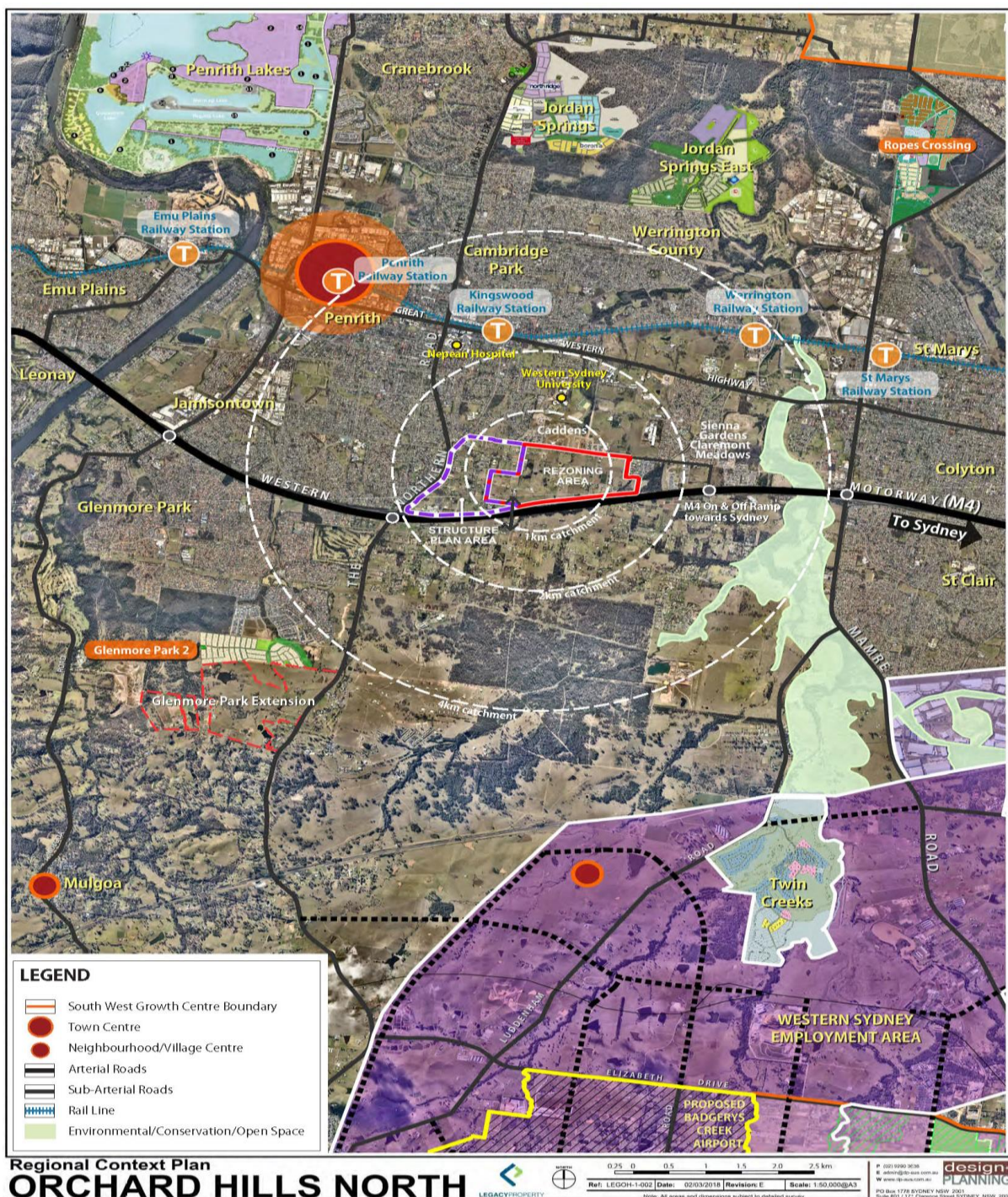


## 2 INTRODUCTION

Legacy Property is proposing to rezone a site in Orchard Hills North, located within the Penrith Local Government Area (LGA). The proposed rezoning area is approximately 151.92 hectares (ha) with frontages to Caddens Road to the north, Kingswood Road to the west, the Western Motorway to the south and Claremont Meadows residential lots to the east.

Orchard Hills North is well located being north of the Western Sydney Motorway, in close proximity to the University of Western Sydney (to the north), Nepean Hospital (to the north) and to the Penrith City Centre. South of the Motorway is currently mostly Orchard Hills rural lands, Defence Lands and to the south west is Glenmore Park. Further south, will be the Badgers Creek Airport.

FIGURE 1 REGIONAL CONTEXT



Source: Design and Planning 2018

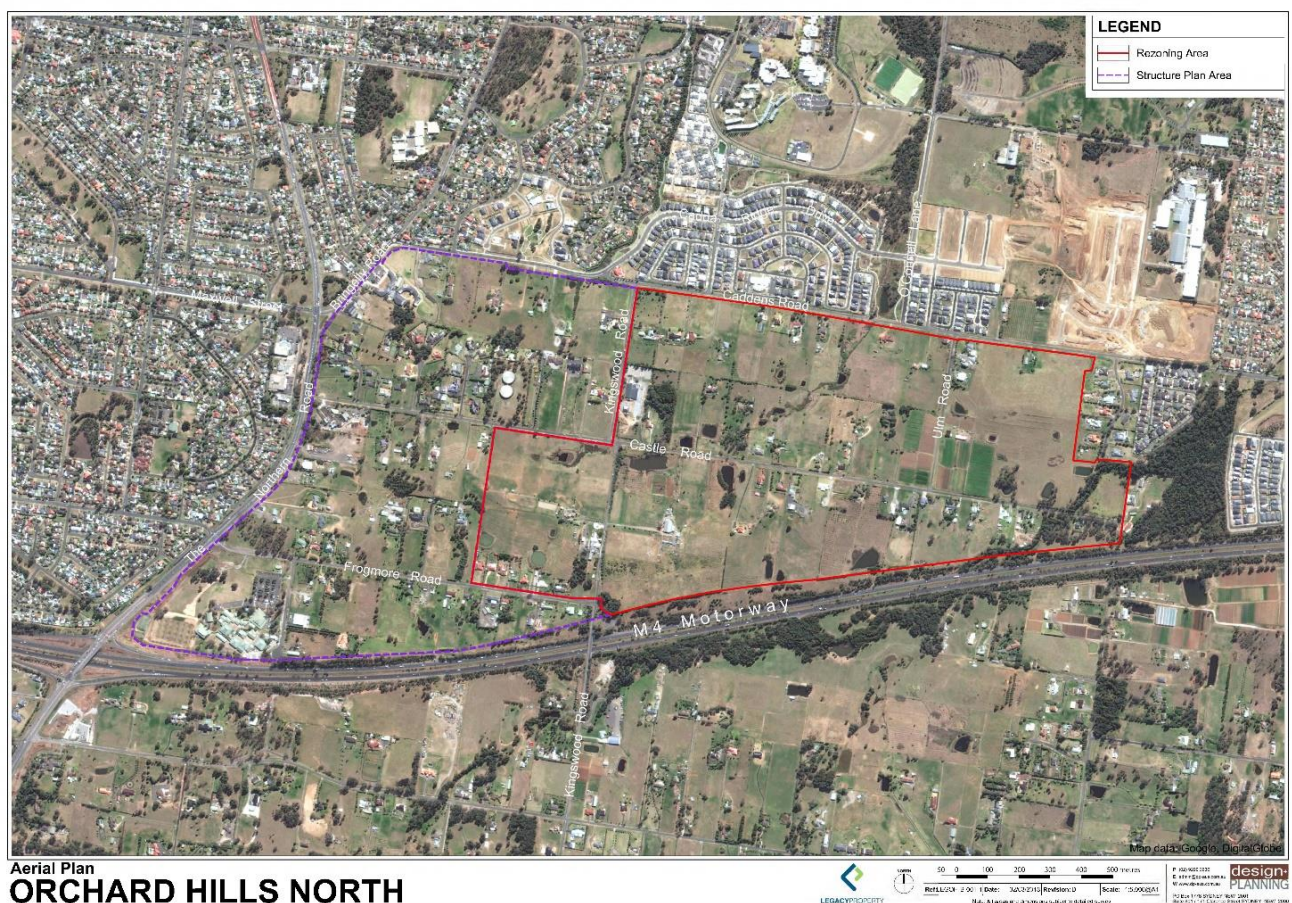


The rezoning site comprises 54 existing lots (including the school and uniting church) within the proposed rezoning area, located at the following addresses:

- 80-154 Caddens Road, Orchard Hills
- 26-48 Kingswood Road, Orchard Hills
- 117-149 Castle Road, Orchard Hills
- 53-105 Castle Road, Orchard Hills
- 182-226 Caddens Road, Orchard Hills
- 2-164 Castle Road, Orchard Hills
- 1-5 Castle Road, Claremont Meadows
- 7 Castle Road, Claremont Meadows
- 5, 9,13,19,23,29,33 and 35 Frogmore Road, Orchard Hills

The proposed rezoning area is identified in Figure 1 below

**FIGURE 2 PROPOSED REZONING AREA**



Source: Nearmap/ Design and Planning 2018

The existing fragmented ownership of the site has historically been a barrier to coordinated planning or development of the area, however, Legacy Property has now secured agreements covering significant portions of the rezoning area.

Legacy Property nominated the Orchard Hills North site under Penrith City Council's Accelerated Housing Delivery Program (AHDP) in October 2017. In November 2017 the site was endorsed by Penrith City Council as a short-term rezoning opportunity to provide for housing delivery over the next 3-5 years.

Penrith Council has, in December 2022, provided their final endorsement of the Planning Proposal.

## **2.1 Structure Plan And Rezoning Area**

The Planning Proposal (PP) for Orchard Hills North aims to rezone the 151.92ha site from agricultural land to mixed land uses, forming around 1,729 residential lots, a neighbourhood centre and numerous areas of green space.

Discussions with the Department of Planning and Environment (DP&E) and Council have highlighted the need to consider the logical extension of the rezoning area west (namely the Structure Plan area) to The Northern Road, to ensure that future land uses and connections for the entire Orchard Hills North precinct are planned in a holistic manner.

In order to ensure that the future development is fully integrated, a high level Structure Plan has been prepared for the entire precinct, covering an area of approximately 268.09ha. The Structure Plan considers how the rezoning area (151.92ha) integrates with the balance of the precinct (116.14 ha) and identifies potential future land uses as well as key road connections. It is expected that the Structure Plan will provide a framework for the future rezoning of the remaining area, either through a Council Local Environmental Plan (LEP) amendment or a developer/owner led PP.

Council has endorsed proceeding with the rezoning area at present to meet the objectives of its AHDP. A significant factor in this approach is that Legacy Property has secured agreements covering a majority of the rezoning area and is therefore in a position to progress with the PP and provide greater certainty for coordinated future development. Council is also proposing to undertake a strategic corridor study for The Northern Road and any proposal to rezone that land may pre-empt the outcome of this study.

As a result, the same level of technical investigations undertaken for the rezoning area have not yet been undertaken for the wider Structure Plan area. The balance of the Structure Plan area has been considered as part of investigations for this PP, however not at a detailed level to support rezoning.

## **2.2 Background**

The cultural landscape of the Orchard Hills North site has developed as a rural landscape over the past 100 years with constantly evolving pastoral practices and declining Cumberland Plain Woodland. Within the last 50 years Orchard Hills North has typically been associated with orchard food production, grazing farming practices with some specialisation in agricultural farming and rural residential communities.

Although genuine food production practices have steadily declined over recent years, and only two lots within the site are currently used for any form of agricultural production, the site remains zoned as RU4 Primary Production Small lots. Today, the majority of the site is utilised for residential purposes and has been substantially cleared.

## 2.3 Our Vision

Orchard Hills North will be a residential community set amongst rolling hills in the rich natural landscape of Western Sydney, offering panoramic views to the Blue Mountains and surrounding areas. The development will incorporate a diverse mix of housing types across 1,729 residential lots, focused around a new neighbourhood centre that forms the focal point of the future community and offers a high level of convenience for residents.

The overarching vision of Orchard Hills North is to support a safe and connected community. This will be achieved through the provision of a wide variety of green spaces and links, connecting each of the future neighbourhood precincts with one another as well as the wider regional community, thereby placing a focus on active transport such as walking and cycling.

## 2.4 Design Principles

A site analysis, supported by extensive technical studies, has informed the following design principles for the Structure Plan and rezoning area:

- Retain key creek lines and capitalise on the opportunity to create a central green link
- Retain existing significant vegetation as natural bushland.
- Manage and retain views into and out of the site.
- Provide opportunities for a diverse mix of housing types, with medium density housing located around the neighbourhood centre and major open space
- Create a new neighbourhood centre combined with a relocated primary school to establish a community focal point
- Respect heritage buildings and the character of the area
- Integrate with the community to the north, west and east.
- Link O'Connell Lane, Caddens Road, Frogmore Road and The Northern Road into a meaningful urban road network.
- Improve water quality and water flow.
- Utilise landscaping and topography on the southern boundary to manage noise.
- Promote pedestrian and cycle linkages.
- Generate employment opportunities along the Northern Road.

## 2.5 Master Plan And Rezoning Description

It is proposed to rezone the site from RU4 Primary Production Small Lots, under Penrith Local Environmental Plan (PLEP) 2010, to part R1 General Residential, B2 Local Centre, RE1 Public Recreation, E2 Environmental conservation and E3 Environmental Management in the south eastern corner of the site, as well as provide for appropriate controls relating to minimum lot size, height, heritage items, and visual landscape.

The rezoning of Orchard Hills North will provide approximately 1,729 residential lots. It is expected that the site will ultimately provide a broad mix of housing types ranging from larger environmental living lots (2,000m<sup>2</sup>) to traditional detached residential lots (primarily 300-600m<sup>2</sup>) and smaller compact and attached housing lots (minimum of 220m<sup>2</sup>). The proposed neighbourhood centre will provide around 6,000-8,000m<sup>2</sup> of retail space supported by cycle and pedestrian links with approximately 15.77ha of open space, bushland and riparian corridors.

A new/relocated primary school is proposed adjacent to the neighbourhood centre, supported by open space to facilitate share usage. The location of parks and open space areas have



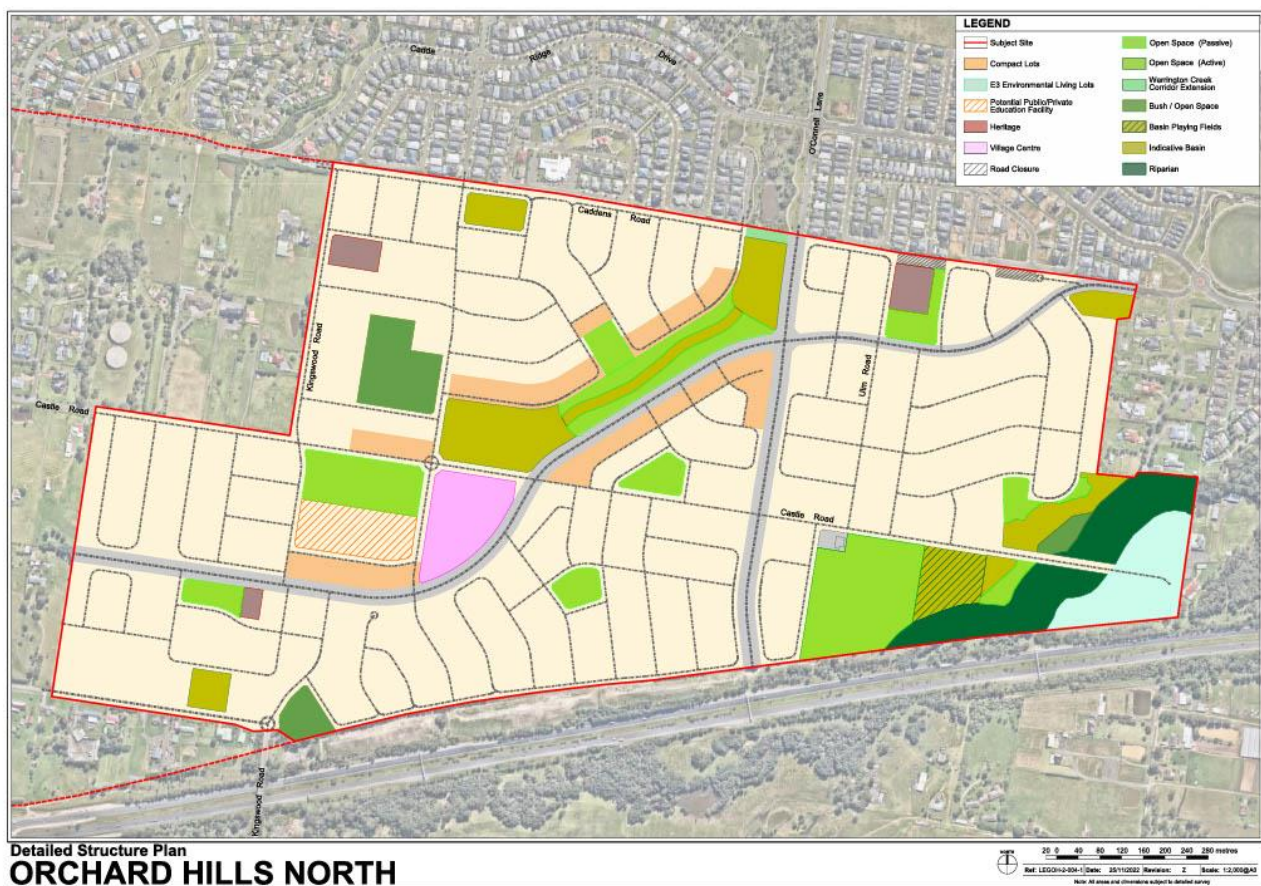
been carefully selected to enhance the existing value of the natural landscape, such as hill tops and creek lines, and to retain the significant bushland areas, in order to provide the highest level of amenity for future residents.

The site is physically and strategically suited for urban development, noting that:

- It is a discrete area formed by the boundary of an existing urban area and major road infrastructure.
- it adjoins an existing residential subdivision, and is in close proximity to the hospital, Western Sydney University and the Penrith CBD.
- there are limited environmental or physical constraints that would prevent redevelopment
- it is outside the Western Sydney Priority Growth Area and is therefore better placed to be rezoned through a developer led PP
- upgrades are currently being undertaken to the Northern Road, which the Orchard Hills site is located east thereof, and gains access thereto. Thus, the rezoning of the land will support the Government's cost of infrastructure and will result in better utilisation of the land
- it is able to capitalise on the availability of new and existing infrastructure, such as the recently completed Werrington Arterial Road and new M4 on and off-ramps, the signalisation of the Frogmore Road/Northern Road intersection as part of The Northern Road upgrade, and four train stations within 4.5km of the site (Penrith, Kingswood, Werrington, St Marys).

The indicative Concept Master Plan for the site is identified in Figure 3 below.

**FIGURE 3 DETAILED STRUCTURE PLAN FOR ORCHARD HILLS NORTH**



### 3 POTABLE WATER

The primary potable water supplier in the region of the proposed development is Sydney Water.

Qalchek Pty Ltd have been engaged to review current Sydney Water infrastructure in the area of the development and consult with Sydney Water on the proposed development. Their report has been based on information from Hydra as well as a previous feasibility letter issued by Sydney Water.

#### 3.1 Services Infrastructure Implementation Plan

Within and surrounding the proposed development there is a significant amount of major potable water infrastructure. Adjoining the site there is an existing Sydney Water Reservoir (WS0083) and accompanying trunk infrastructure. The following existing water infrastructure is present in and around the site;

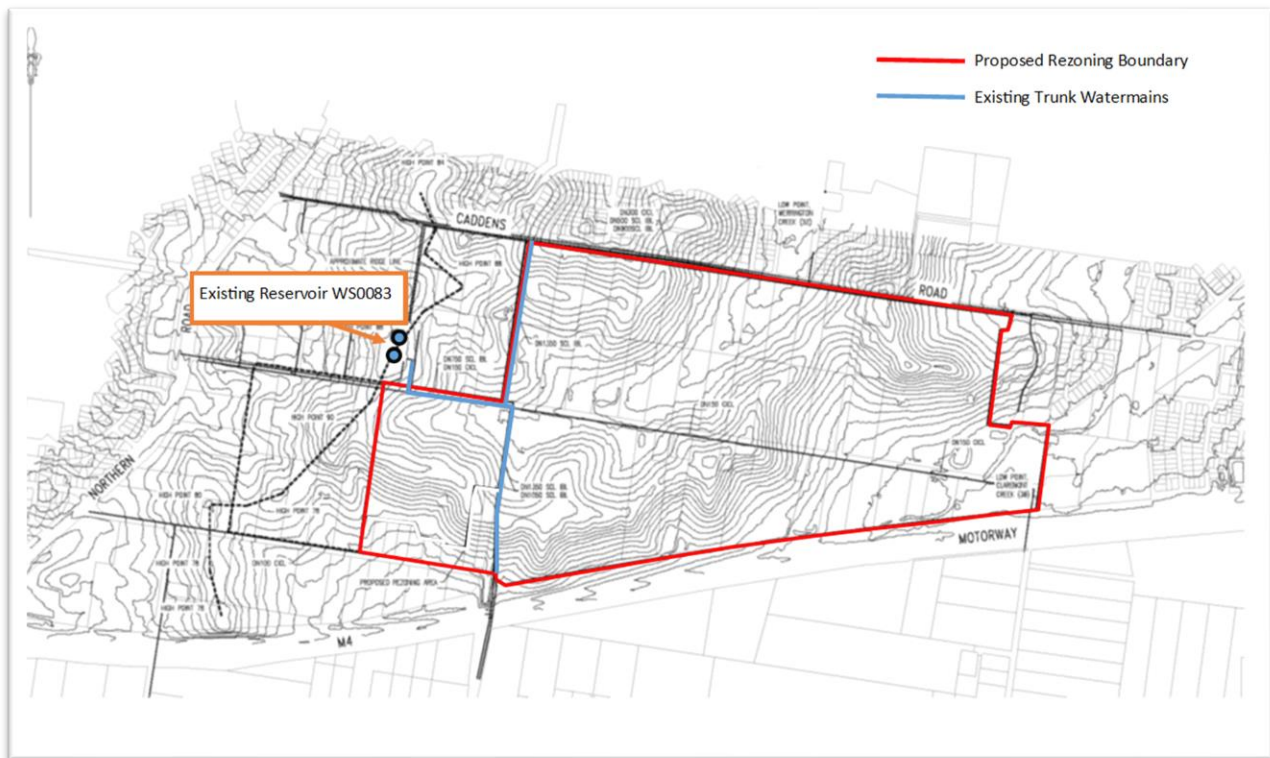
- Within Kingswood Road there are both a 1350mm and a 1050 diameter water main;
- Within Caddens Road there are three mains, a 900mm, a 500 and a 300mm diameter trunk water mains.
- Within the site, there is also a 150mm diameter main that services the current rural properties.

Qalchek has reviewed the existing water supply and, pending comments from Sydney Water, it is understood that this infrastructure has sufficient capacity to service the proposed development. Detailed modelling will need to be undertaken to determine if any amplifications works are required to ensure dynamic equilibrium with the surrounding area and proposed development.

Qalchek has prepared a servicing implementation strategy, attached in Appendix B. This strategy shows the existing infrastructure running through the site. As part of this strategy, it is recommended that the existing trunk mains are maintained in their existing location. The existing 150mm main servicing rural properties would be reconstructed as part of the proposed development.



**FIGURE 4 POTABLE WATER SERVICING IMPLEMENTATION STRATEGY**



### 3.2 Service Demand Estimates

The development proposes to create approximately 1,729 lots as part of the initial rezoning. Using Sydney Water's empirical guide for pipe sizing in the Water Standards Australia Code, a standard 100mm dia main can service 40 standard residential lots. However, this capacity can be increased if the reticulation system is looped.

Using these empirical guidelines, it is expected that the existing trunk mains in and around the site will have sufficient capacity to service the proposed 1,729 lots and proposed retail space.

Qalchek has advised that as part of the detailed design and planning process detailed modelling is required to confirm specific demand estimates.

### 3.3 Service Infrastructure Implementation Program

Potable water will be delivered as part of each stage of subdivision works. Additional modelling will need to be completed to determine if any amplification works will be required to the existing infrastructure.

This future modelling will determine relevant lot thresholds for the implementation of the amplification works and required timing.

### 3.4 Funding Of Infrastructure

The developer of the proposed site will be responsible for the installation and funding of potable water infrastructure for the site.

It should not be expected that Sydney Water will provide any funding for subdivision reticulation works if the proposed development is completed by only one developer. If the site is developed by multiple developers, Sydney Water may provide some reimbursement for upsized pipes. Sydney Water would normally fund any off site amplification works (if required).

### **3.5 Onsite Infrastructure Requirements**

Potable water reticulation throughout the site will be provided within the road verge of the public road reserves.

For each stage of the proposed development, the developer will need to consult with Sydney Water during the development application and detailed design phases. For each development release the developer will need to engage an accredited Water Service Coordinator in accordance with Sydney Water's Section 73 process.

The required reticulation to service the development, will need to be installed in accordance with Sydney Water requirements and standards.

### **3.6 Endorsement Of Infrastructure**

Due to time constraints, while preparing this infrastructure strategy report, it was not possible to engage with Sydney Water to secure their endorsement of the proposed strategy.

Qalchek is currently seeking a meeting with Sydney Water to discuss the proposed development and to confirm the strategy that has been prepared.

## 4 WASTEWATER

Sydney Water is the current supplier of Wastewater within the Orchard Hills North release area. Qalchek has assessed the existing infrastructure and reviewed previous discussions with Sydney Water on the proposed development site.

Qalchek have prepared a wastewater infrastructure strategy for the proposed development, which is attached in Appendix B.

### 4.1 Services Infrastructure Implementation Plan

The Sydney Water Growth Servicing Plan July 2014 - June 2019 does not propose any new works within the Orchard Hills North site. The Strategy does confirm that the adjoining Claremont Meadows Stage 2 can be serviced by connection to existing infrastructure, and it is known that the Caddens Road Precinct to the north has been serviced by developer lead in works.

There are two existing trunk sewer services surrounding the site that is expected to be utilised to ensure that the entire site can be serviced.

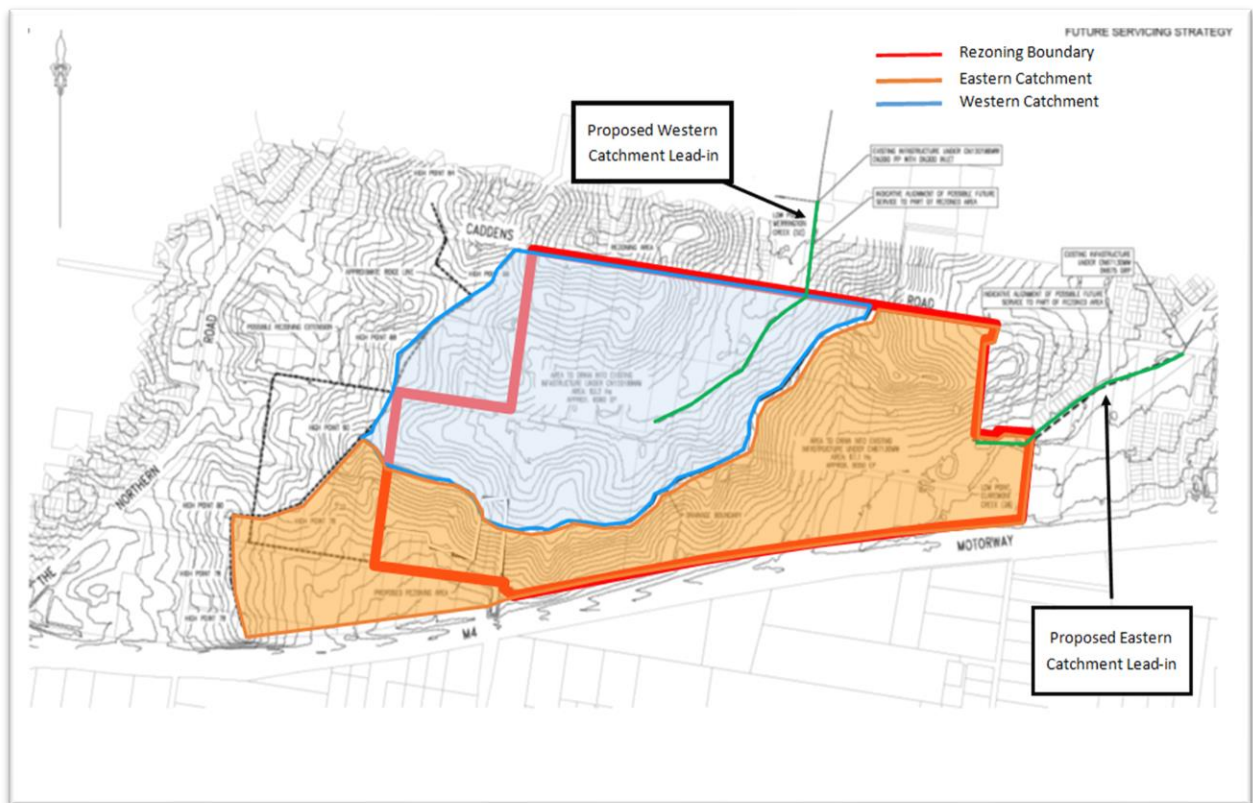
The main services that the site will utilise are as follows:

- Case Number 120189WW; An existing 300mm PVC main that is located at the corner of Caddens Road and O'Connell Lane.
- Case Number 67130WW; an existing 675mm diameter main that currently follows the alignment of Claremont Creek. This will need to be extended along the creek line into the development.

Both of these mains feed into the St Marys trunk system that Sydney Water suggest that has capacity constraints. Previous advice from Sydney Water suggests that amplification works may be required to be undertaken further downstream. These amplification works will be completed by Sydney Water. However, Qalchek's assessment, based on the size of the existing mains, that the existing mains should have sufficient capacity to service the development.

Similar to the potable water, detailed modelling through the design and planning process will need to be undertaken to determine the specific capacity of the existing infrastructure. Sydney Water, in early March 2018, is conducting a review of the operation of wastewater systems of St Marys and Penrith. This review will determine the required upsizing/ amplification works that will be required.

**FIGURE 5 WASTEWATER SERVICING IMPLEMENTATION STRATEGY**



## 4.2 Service Demand Estimates

Qalchek has reviewed the proposed development site and has determined two main catchments feeding to the two existing trunk mains. The eastern portion of the site, serviced by CN 67130WW is approximately 67.1ha it is expected that this will produce approximately 5050 EP (Equivalent Population).

The catchment to be serviced by CN120189WW is approximately 83.2ha. This catchment will produce approximately 6060 EP to wastewater infrastructure.

## 4.3 Service Infrastructure Implementation Program

It is expected that development will progress from the eastern end of the site to the west. At the commencement of the project / prior to the release of the first lots, the existing sewer main will need to be extended along its current alignment, along with Claremont Creek into the site. This will ensure sufficient capacity for the eastern catchment to be developed.

Prior to the development of the western catchment of the proposed rezoning areas the existing sewer at the corner of Caddens Road and O'Connell Lane will need to be extended sufficiently into the site to capture the relevant staged development.

**TABLE 1 - WASTEWATER LEAD-IN PROGRAM**

<b>Catchment</b>	<b>Program</b>
<b>Eastern Catchment</b>	Prior to the first lot in catchment
<b>Western Catchment</b>	Prior to the first lot in catchment

#### **4.4 Funding Of Infrastructure**

The respective developer/s will be responsible for the installation and funding for the staged delivery of wastewater servicing for the Orchard Hills North development. It is not expected that Sydney Water will contribute any funds to the internal staged reticulation.

It is expected, however, that the proposed lead in waste water mains will be funded through the Sydney Water procurement process which will allow the developer to be reimbursed by Sydney Water for the cost of the lead in infrastructure. However, this is based upon the current Sydney Water Procurement policy which is subject to change, which may impact the funding for infrastructure received. In addition, it is expected that Sydney Water would fund any other off site amplifications works which may be required.

#### **4.5 Onsite Infrastructure Requirements**

Wastewater reticulation throughout the site will be provided within the proposed residential lots. For each stage of the proposed development, the developer will need to consult with Sydney Water during the development application and construction certificates phases of each development release through an accredited Water Service Coordinator in accordance with Sydney Water's Section 73 process.

The required reticulation, to service the development, will need to be installed in accordance with Sydney Water requirements and Standards.

#### **4.6 Endorsement Of Infrastructure**

Due to time constraints, while preparing this infrastructure strategy report, it was not possible to engage with Sydney Water to secure their endorsement of the proposed strategy. Qalchek is currently seeking a meeting with Sydney Water to discuss the proposed development and the strategy that has been prepared. However, Sydney Water is going to review the existing St Marys and Penrith wastewater operation. As part of this, they will provide confirmation as to the capacity of the existing wastewater infrastructure.

Endeavour Energy is the predominant supplier of electricity in the Penrith municipal area in which the proposed Orchard Hills North rezoning resides.

Powerline Design Pty was engaged by Legacy Property Group to engage with Endeavour Energy and provide an assessment of existing infrastructure and the capacity of infrastructure to cater for the proposed development. Endeavour Energy provided a technical review response for Orchard Hills North. Powerline Design's report can be found in Appendix C and Endeavour Energy's technical review is found in Appendix C.

### 5.1 Services Infrastructure Implementation Plan

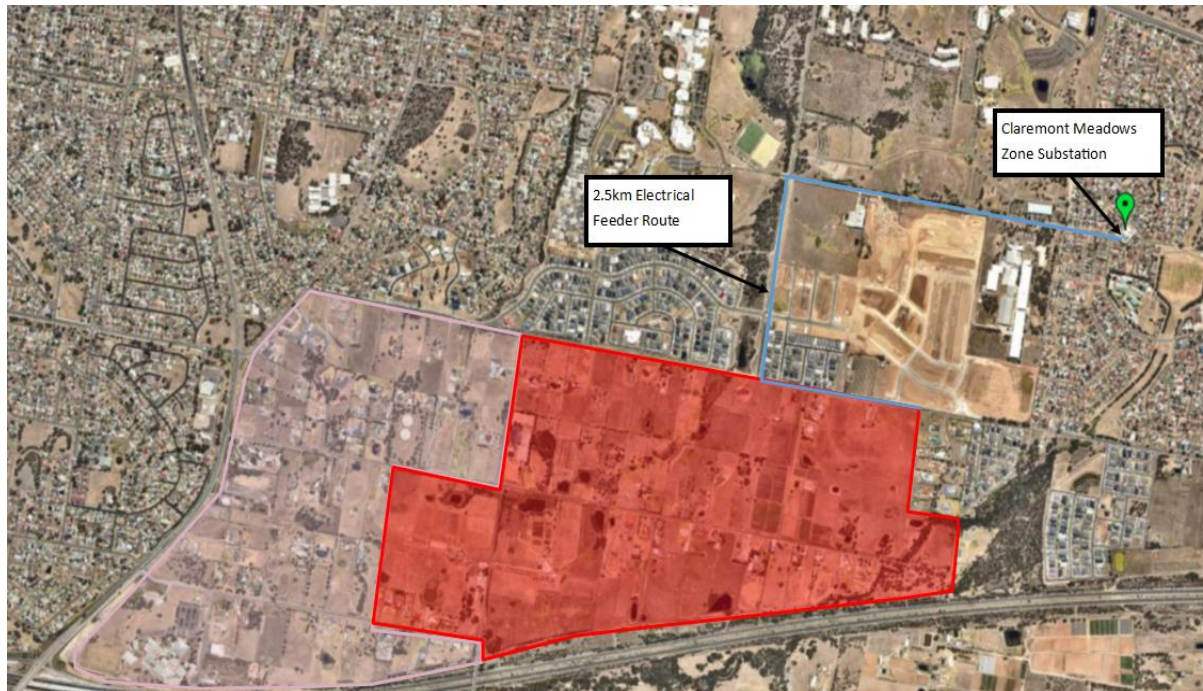
The site currently has two sources of high voltage, 11kV. These sources feed to the site from the two surrounding Zone substations. The Claremont Meadows zone substation currently feeds the majority of the proposed Orchard Hills North development site. The 11kV feeder, CS1247 "Ulm Rd", currently provides service to 4 pole/pad mounted substations within the proposed rezoning area. The remainder of the rezoning and structure plan area is serviced via an 11kV feeder from the Kingswood Zone substation. This 11kV feeder currently provides service to 5 pole-mounted substations which provide electrical service to the existing residential dwellings and commercial areas.

The Claremont Meadows Zone Substation is the closer of the two substations and currently has 6 spare circuit breakers which would allow an additional 6 feeders to be connected to the substation. The advice received from Endeavour Energy, regarding the Kingswood Zone Substation, is that it is currently at full capacity and cannot support any additional high voltage feeders.

The proposed development of the site within the initial rezoning area will require a new 11kV feeder from the Claremont Meadows Zone Substation, as the existing feeder entering the proposed site is currently at capacity. This feeder will have an approximate length of 2.5km following the existing roads from the Zone substation to the North-Eastern corner of the site.



**FIGURE 6 ELECTRICAL FEEDER LEAD IN ROUTE**



The ongoing development in the area, surrounding the Claremont Meadows Zone substation, will require additional feeders to be connected to the zone substation. This may result in the remaining 6 free circuit breakers to be used up prior to the proposed development being undertaken. If this is the case there may be an opportunity for some of the circuit breakers to be double cabled in order to accommodate the development.

Depending on other surrounding developments, Endeavour Energy may determine that the Claremont Meadows Zone Substation does not have sufficient capacity for the proposed loads for the later stages of Orchard Hills North. If this is the case Endeavour Energy has advised that they may seek acquisition of land within the overall Orchard Hills North development for the purposes of a new Zone substation. If this zone substation was required it would be a 132;11kV substation requiring approximately 10,000m<sup>2</sup> of land. Network capacity cannot be reserved for the proposed development until such time as the application being submitted and the associated electrical designs being certified.

## **5.2 Service Demand Estimates**

The proposed Orchard Hills North Development currently proposes 1,729 residential lots and 7,000m<sup>2</sup> of retail/ commercial land. On a 11kV network the average residential lot requires approximately 4kVA per lot and an average square meter of retail / commercial land requires 100VA per m<sup>2</sup>. The expected load demands for the proposed development are documented in TABLE 2.

**TABLE 2 – ELECTRICAL EXPECTED DEMAND LOADS**

<b>Development Type</b>	<b>Quantity</b>	<b>Load per lot or m2</b>	<b>Estimated Total Load on a 11kV Network</b>
<b>Residential Load</b>	1,729 lots	4kVA per Lot	6.9 MVA
<b>Retail/ Commercial</b>	7,000 m2	100VA per m2	0.7 MVA

Based on the expected lot release proposed for the development of 150 to 250 lots per year the net additional load required from the zone substation on the 11kV network is approximately 6.9MVA over a period of 7 to 12 years.

The internal estate electrical reticulation will require a minimum of 32 pad mounted substations, rated at 500kVA. These pad mounted substations will need to be evenly spread throughout the development. It is assumed that each of these substations will take a load of approximately 400kVA. Additional pad mounted substations may be required depending on the staging and distribution of the overall development if the full load of each substation cannot be fully utilised.

### **5.3 Service Infrastructure Implementation Program**

In order to supply the development two additional high voltage feeders, 11kV, will be required to be brought in from the existing Claremont Meadows Zone Substation. Via road, this substation is approximately 2.5km from the north-eastern corner of the proposed development. With the proposed route for these feeders, via O'Connell Street and O'Connell lane, there are existing spare high voltage conduits which will limit the amount of additional excavation outside the extent of the development.

The below table, TABLE 3, outlines the expected timing for the delivery of each of the feeders to ensure that there is sufficient supply of electricity at any given time in the development.

**TABLE 3 - ELECTRICAL FEEDER TIMING REQUIREMENTS**

<b>11kV Feeder</b>	<b>Anticipated Lot Threshold</b>
<b>Feeder 1</b>	Prior to the first lot being released
<b>Feeder 2</b>	Prior to the 700 <sup>th</sup> lot being released



## **5.4 Funding Of Infrastructure**

The developer will be required to initially fund the delivery of all lead in and staged reticulation infrastructure, however, part of this cost is currently expected to be reimbursed by Endeavour Energy. For the lead in feeder portion of the costs, Endeavour Energy's current reimbursement policy would however refund/ contribute a significant portion of the expected costs. Endeavour Energy's policy is currently to reimburse the cost of the 11kV cables, part of the costs of the installation of the cables, and any spare ducts that would be required to be installed.

Under the current reimbursement policy Endeavour Energy would contribute part of the expected costs of subdivision reticulation. Under this current policy, the majority of High voltage costs are expected to be reimbursed, this included the cost of pad mounted substations. It should be noted that this reimbursement policy is subject the change at the discretion of Endeavour Energy.

## **5.5 Onsite Infrastructure Requirements**

As part of the staged delivery of the development high and low voltage reticulation will be delivered within the verge of the public road reserves. This internal reticulation will require all existing overhead cables to be relocated underground in accordance with Endeavour Energy's standards and guidelines. The internal reticulation will require the installation of the required pad mounted substations, distribution pillars and light columns above ground, along with the relevant conduits and cables, underground.

It is the developer's responsibility to consult with Endeavour Energy through a level 3 Accredited Service Provider during the detailed design phase for each stage of the development to ensure that all Endeavour Energy's on site requirements are met.

## **5.6 Endorsement Of Infrastructure**

Endeavour Energy were consulted during the preparation of this services infrastructure assessment, however, the advice received from Endeavour Energy does not provide a formal agreement to reserve supply for this development. Endeavour Energy has only provided advice as to the current infrastructure and loading on the existing network. As noted previously to ensure the relevant supply is reserved for the development stage applications need to be submitted and subsequent detailed designs certified.

## 6 TELECOMMUNICATIONS

NBN Co. is the main provider of telecommunications within the Orchard Hills North Precinct. NBN Co. was contacted as part of this assessment and report as they will be the responsible for the rollout of NBN in the Orchard Hills precinct.

### 6.1 Services Infrastructure Implementation Plan

Underground telecommunications cables are present within Caddens Road to the North of the site. Currently, there are NBN Co. assets fronting the site in this section of Caddens Road. NBN Co. also has infrastructure in Castle Road, Frogmore Road and Kingswood Road.

Connection to telephone and optic fibre services is not expected to present a limitation to development. NBN Co. presently undertakes the provision of telecommunication services to new residential developments as part of the National Broadband Network rollout. The current arrangement is that the developer funds the installation of pit and pit infrastructure as well as a \$600 per allotment contribution towards the supply and installation of the fibre optic cable. NBN Co. will partially fund and install the backhaul to the network exchange point as well as any upgrades to the local exchange as required.

Consultation with NBN Co. confirms that the proposed development can be serviced by telecommunications. NBN Co. has advised that a short lead-in will be required to service the development.

It should also be noted that existing Telstra, Aarnet, Nexgen and PipeNetwork Cables are present within the site and surrounding streets. Any adjustments to these cables will need to be considered and negotiated with the asset owner prior to undertaking work.

### 6.2 Service Infrastructure Implementation Program

NBN Co. will be providing a lead in of 1.3 kilometres. It is expected that the delivery of this lead in infrastructure will need to commence at least 12 months prior to the registration of the first lot. The developer will be responsible to deliver the subdivision reticulation as part of each stage of the development.

### 6.3 Funding And Onsite Requirements Of Infrastructure

The NBN Co. has confirmed that NBN Co. will partially fund the backhaul of lead in cables. They have advised that the developer will be required to partially fund the backhaul as it is over the standard distance. NBN Co. has confirmed that the developer will be required to contribute approximately \$9,000 to the backhaul.

The developer will be will be responsible to fully fund and install fibre-ready pit and pipe infrastructure within the precinct. NBN Co. will then take possession of the infrastructure and install the fibre cables. The Developer will need to ensure that all pit and pipe infrastructure is installed in accordance with NBN Co's specifications and policies. Any defects and conforming work will not be accepted by NBN Co. until the network is deemed Fibre-ready.

**FIGURE 7 NBN CO. FIBRE TO THE PREMISES NETWORK**

## 4 FTTP Network Overview

The NBN Co New Development Fibre to the Premises (FTTP) network is designed to provide fibre connectivity to premises, including New Development projects.

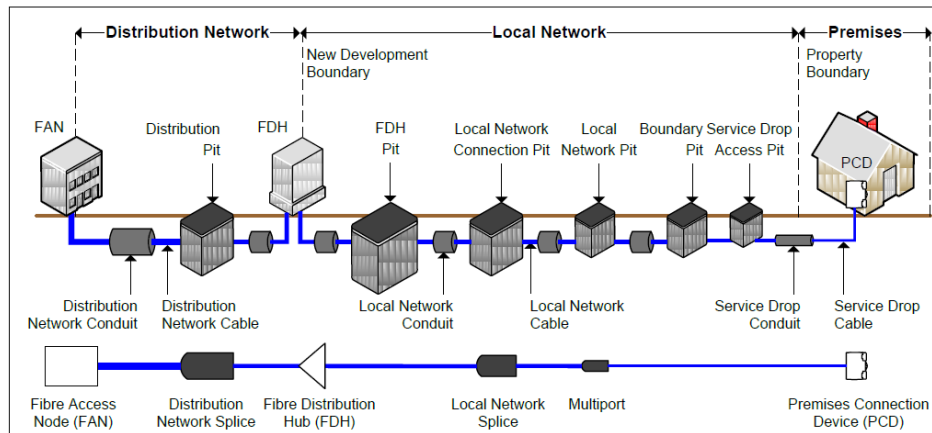


Figure 1 – Fibre to the Premises Network

The FTTP network is divided into hierarchical components which assist in the planning, design, and implementation of the FTTP network.

Network components shown in Figure 1 (above) that are relevant to New Development project deployment of fibre ready facilities are set out below.

## 6.4 Endorsement Of Infrastructure

NBN Co. has provided confirmation that service will be available for the proposed development. Further discussions will need to be had with NBN Co. to confirm the timing of the proposed development.

## **7 NATURAL GAS**

Jemena is the primary natural Gas provider for the Orchard Hills North Precinct. Jemena was consulted during the preparation of this report to understand the extent of existing infrastructure and the proposed supply demands of the proposed precinct development. Jemena has confirmed that there is sufficient capacity and infrastructure to service the proposed development.

### **7.1 Service Demand Estimates**

The average annual domestic usage demand for natural gas is 19GJ/dwelling/year. Jemena has confirmed that the existing network has sufficient capacity to service the entire of the of the proposed development of Orchard Hills North. This confirmation provided by Jemena included both the proposed rezoning area and the Structure Area.

### **7.2 Funding And Onsite Requirements Of Infrastructure**

The developer of the proposed site will be required to provide all trenching at no cost to Jemena, to provide reticulation throughout the site. It is expected that Jemena will require any contributions based on their current Access Arrangement guidelines. However, this is subject to more detailed economic viability assessments which Jemena is yet to undertake.

### **7.3 Endorsement Of Infrastructure**

Jemena has provided confirmation that adequate capacity is available in the surrounding networks to provide natural Gas service to the proposed development. Further discussions will be required to be held with Jemena to ensure that works will be delivered in line with the development program.

## 8 CONCLUSION

J. Wyndham Prince Pty have undertaken a review of the existing infrastructure in and surrounding the proposed rezoning area of Orchard Hills North. All service reviews undertaken in this report indicate the proposed development can be serviced: In summary:

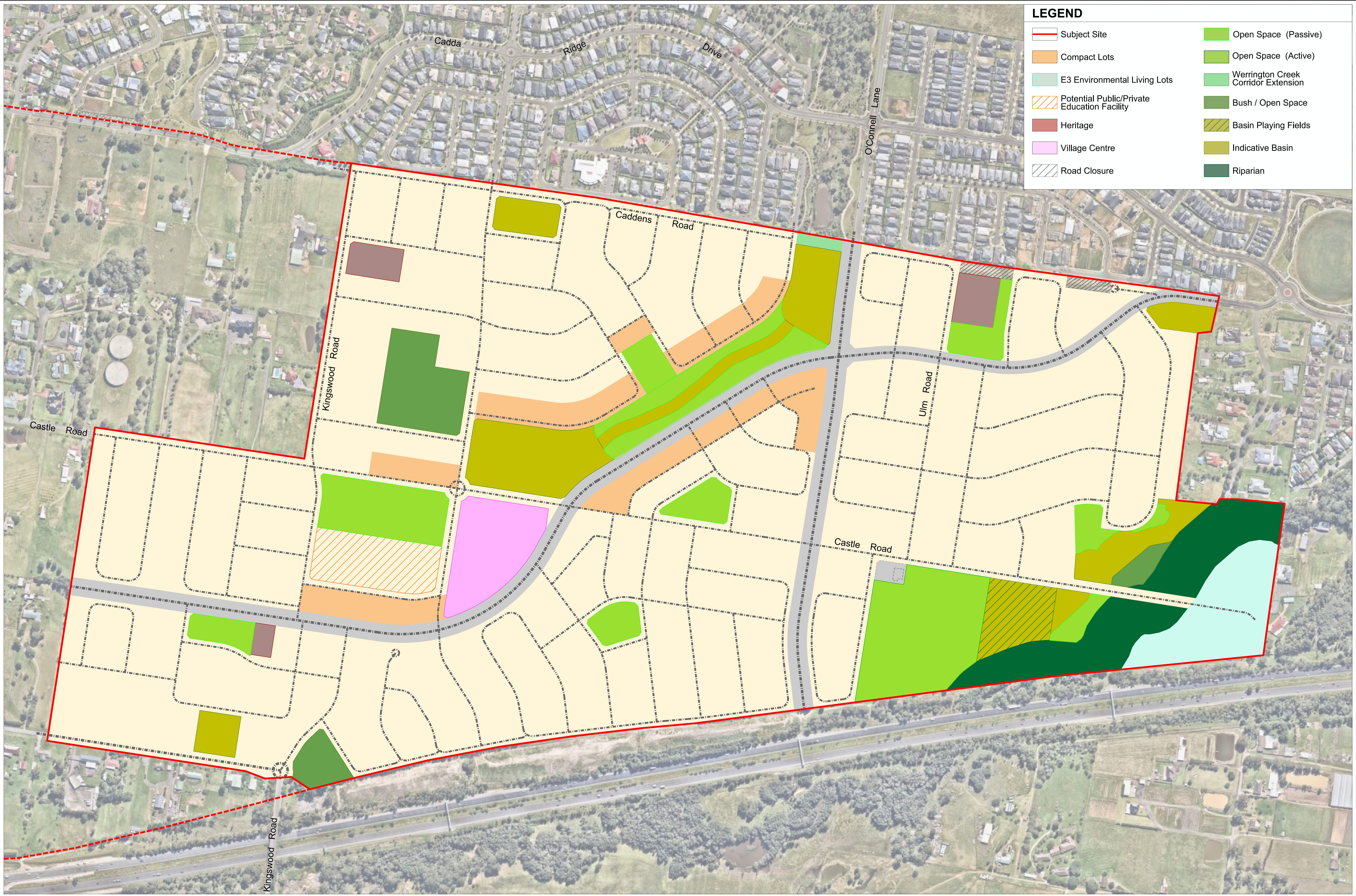
**TABLE 4 – CONCLUSION SUMMARY**

Potable Water	The development can be serviced from the existing WS0038 Reservoir located to the West of the proposed rezoning area. The development will be serviced through standard staged reticulation utilising a combination of new and existing infrastructure.
Wastewater	The existing major wastewater infrastructure will need to be extended from their current locations, outside of the proposed development, into the proposed rezoning area. The development will require Sydney Water to undertake some downstream amplifications works, however, the extent of this is still unknown.
Electrical	Two 11kV feeders will be required to be brought into the proposed development site from the nearby Claremont Meadows Zone Substation. Endeavor Energy has confirmed that the Claremont Meadows Zone Substation currently has the capacity for the proposed development, however, this will need to be review closer to the time of the development due to ongoing developments in the area.
Telecommunications	NBN Co. has confirmed that telecommunication services are available the area of the development. The developer will be required to submit a formal application for the development for NBN Co. to arrange the appropriate lead-in feed to the development.
Natural Gas	Jemena has confirmed that Natural gas is available for the proposed development. Formal supply agreements will need to be entered into with Jemena to ensure the appropriate infrastructure is in place prior to being required by the development.

## **Appendix A – Site Concept Masterplan**

---





**LEGEND**

- |   |                                     |
|---|-------------------------------------|
| Subject Site                                | Open Space (Passive)                |
| Compact Lots                                | Open Space (Active)                 |
| E3 Environmental Living Lots                | Werrington Creek Corridor Extension |
| Potential Public/Private Education Facility | Bush / Open Space                   |
| Heritage                                    | Basin Playing Fields                |
| Village Centre                              | Indicative Basin                    |
| Road Closure                                | Riparian                            |

Detailed Structure Plan  
**ORCHARD HILLS NORTH**

NORTH

20 0 40 80 120 160 200 240 280 metres

Ref: LEGOH-2-004-1 Date: 25/11/2022 Revision: Z Scale: 1:2,000@A0

Note: All areas and dimensions subject to detailed survey



## **Appendix B – Potable Water and Wastewater Assessment**

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## Orchard Hills Preliminary servicing Report

Client – J. Wyndham Prince, Att. Michael Johnson

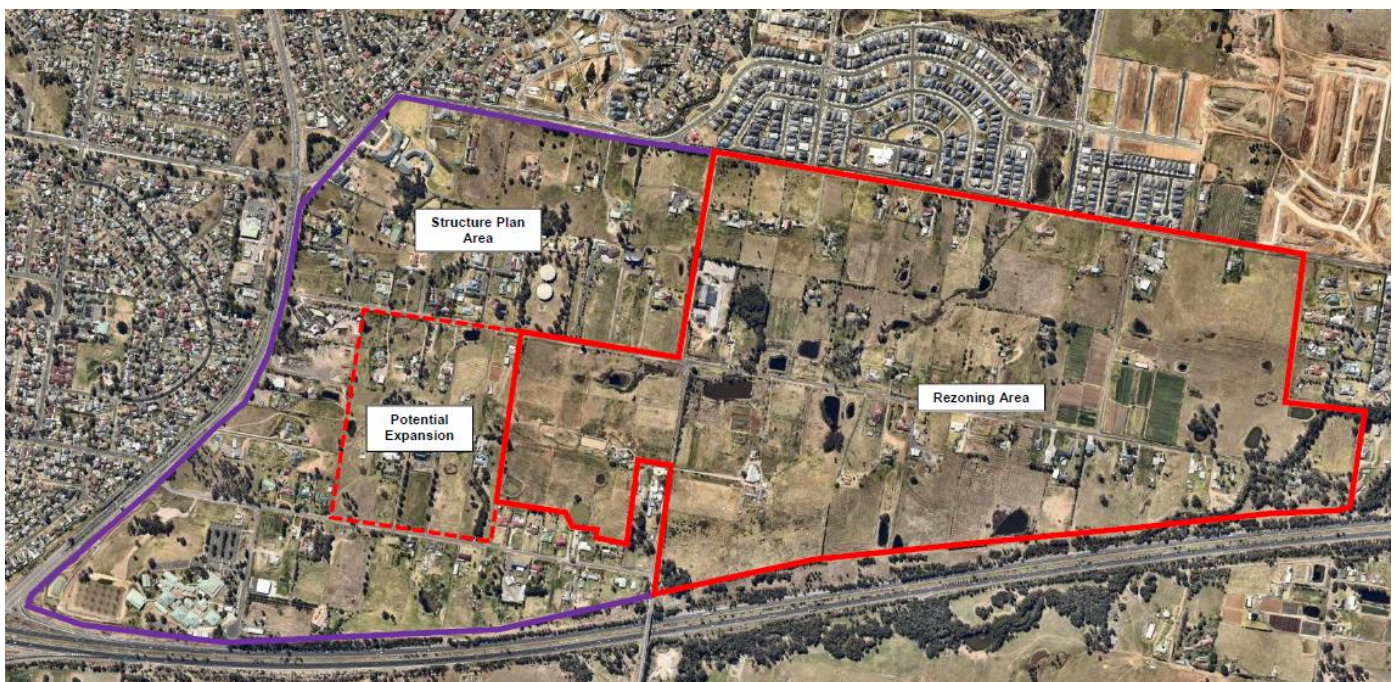
Project Location – Northern Orchard Hills

Scope – Planning Works

This report has been prepared with existing information obtained from HYDRA in conjunction with documentation supplied by the client (see below). Strategy plans are prepared as to evaluate viability of the proposed development of North Orchard Hills based on existing Sydney Water infrastructure and are subject to change based on planning changes, Sydney Water review, and detailed design.

### Location

The proposed development is located in between the M4 Motorway and Caddens Road, bounded by The Northern Road. The existing site consists of rural lots with a very low population density, existing infrastructure to current residents consists of standard reticulation mains for portable water coming directly from the nearby existing reservoir WS0083 along with no Sydney Water sewer assets for wastewater. Current residents rely predominantly on septic tank storage/treatment and other privately maintained means to satisfy wastewater needs, see locality below.



The proposed rezoning consists of creation of a new town centre including special use zones, parks, and roads with low and medium density development. As shown above, the rezoning area is the scope of works undertaken under this strategy plan. The potential expansion and the structure plan area are to be reviewed and are subject to change and thus are not considered in the EP loading calculated in the sewer strategy.

The indicated ridge line shown in the plans is calculated off provided LIDAR data, and the drainable area in the considered catchment is everything west of this. The eastern catchment (predominantly the structure plan area) can potentially be catered for under the Sydney Water Penrith sewerage system, pending further review and detailed design.

## **Sewer**

There are two viable possibilities to service the rezoning area, Case Number 120189WW and 67130WW. Under CN12189WW, an area of 83.2Ha can be serviced. As per the WAC plan, the catchment plan has been calculated and the sizing of the mains have allowed for the drainage area indicated in the plan. Preliminary analysis of the planning drawings provided indicate that there will be approximately 6060EP flowing into the existing system from the proposed development. Receiving manhole is constructed over a DN375 polypropylene carrier main.



Under CN67130WW, the remaining 67.1Ha can be serviced. The indicated extension on the design plan leads to an existing manhole which is constructed over a DN675 glass reinforced polymer carrier main. The catchment as per the planning drawings provided sum to approximately 5050EP which can drain into the existing carrier.

The preliminary analysis of expected loading into existing infrastructure is subject to further flow analysis, expansion of the rezoned area, and changes to the proposed suburb layout. As per the feasibility letter issued by Sydney Water for a similar inquiry, Sydney Water states: "St Marys trunk system has capacity constraints and can only accommodate around 1000 lots for your proposed development". Both of these connection points are part of the St Marys sewerage system and further analysis/upsizing may be required downstream to ensure that the proposed rezoning can be catered for.

## **Portable Water**

The proposed rezoning area is located adjacent to portable water reservoir WS0083 and which has adequate capacity to service North Orchard Hills and has many mains as per the design plan which can be connected into. The aforementioned feasibility letter indicates that the existing portable water system is adequate but stresses the necessity of assessing available system capacity to identify potential amplification requirements.

Under this strategy plan, it is advised that further modelling and analysis be carried out as to ascertain viability of this additional demand on the existing water supply and to maintain dynamic equilibrium with the existing supply flow available in addition to potential amplification works.

## **Appendix**

- PM21299WW Servicing Strategy – A (Design Plan)
- PM21299PW Servicing Strategy – A (Design Plan)

PM21299 – Servicing Strategy Report

Prepared By – Brian Bizoev

Date – 29.01.2018





<p>PLAN TO BE READ IN CONJUNCTION WITH CURRENT SYDNEY WATER STANDARDS SYDNEY WATER CORPORATION</p> <p>PRIOR TO COMMENCEMENT OF EXCAVATION FOR PROPOSED AND EXISTING SERVICES CONTACT :- DIAL BEFORE YOU DIG Ph. 1100 ELECTRICITY Ph. GAS Ph. TELECOMMUNICATIONS Ph. GIVING AT LEAST 48 HOURS NOTICE.</p>	UTILITIES						WORK AS CONSTRUCTED CERTIFICATION				PIPE SCHEDULE		AUSTRALIAN HEIGHT DATUM		<p>NO AMENDMENTS ARE TO BE MADE TO THIS PLAN WITHOUT REFERENCE TO SYDNEY WATER. THIS PLAN IS NOT NECESSARILY UP TO DATE OR CORRECT AND SYDNEY WATER ACCEPTS NO RESPONSIBILITY.</p> <p>U.B. DIRECTORY -</p> <p>SHEET 1 OF 1 File No. N/A</p>	<p><b>Sydney WATER</b> SYDNEY WATER CORPORATION</p> <p>Case No. TBA</p> <p>PORTABLE WATER PLANNING ORCHARD HILLS</p>					
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## **Appendix C – Electrical Supply Assessment**

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# INFRASTRUCTURE REPORT

**Report Prepared For:**

J. Wyndham Prince

Contact: Michael Johnson

Ph.: (02) 4720 3317

Mob: 0400 058 145

**Job Site:**

Orchard Hills North Development, Caddens Road, Orchard Hills

**Supply Authority:**

Endeavour Energy

**Reference Number:**

ENL3001

**Date:**

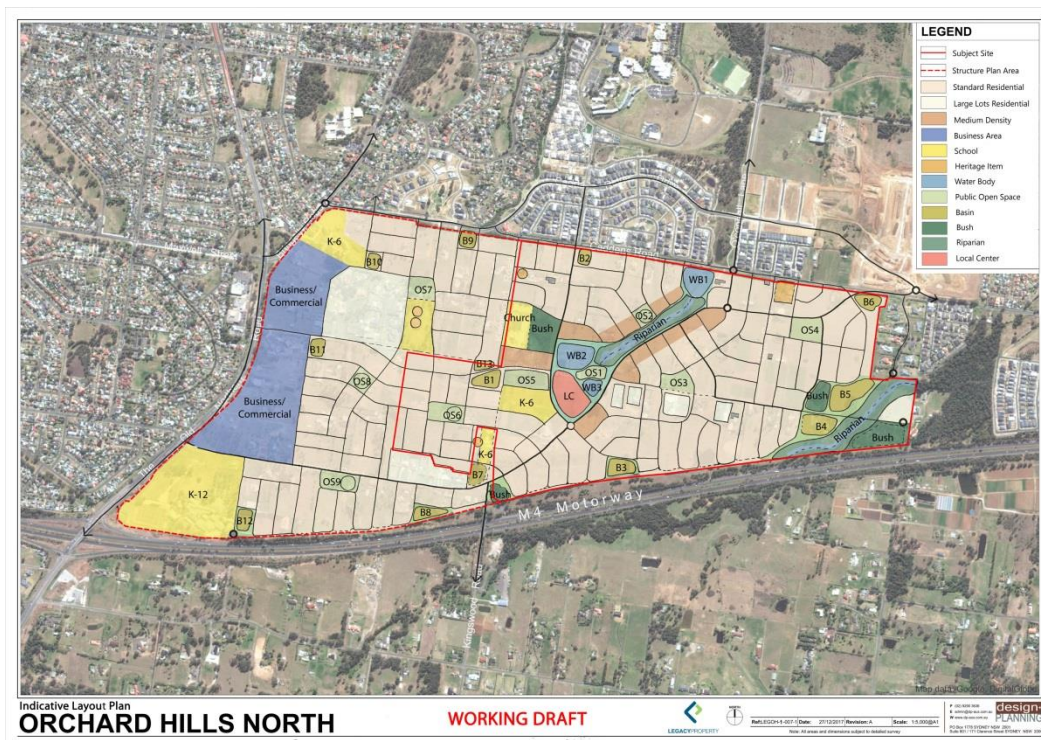
05/03/2018

**Reviewed By:**

Michael Baranowski

**Version:**

1.0



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3.2.1	Load details .....	11
3.2.2	Large Scale Supply .....	11
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# 1.0 Overview

This Electrical Infrastructure Report has been prepared on behalf of John Wyndham Prince in order to perform an infrastructure assessment of a proposed Orchard Hill Site rezoning under Legacy Property. The overall Orchard Hill site is composed of Structure Plan Area, as well as a Rezoning Area. This report details a technical review of the rezoning area within the site.

The purpose of the report is to investigate the feasibility and requirements of the proposed rezoning area within the Orchard Hills North development. Covered in this report is an assessment of the existing Endeavour Energy network assets within the area, as well as of the required infrastructure to allow for the load associated with the development.

Information presented in this report is based on data provided by Endeavour Energy within their Technical Review (ENL3001) dated 26/02/18, and information obtained directly from Endeavour Energy.



## 2.0 The Site

The existing site is comprised of majority RU4 – Primary Production Small lots, with some SP2 – Infrastructure: Water Supply System and School.

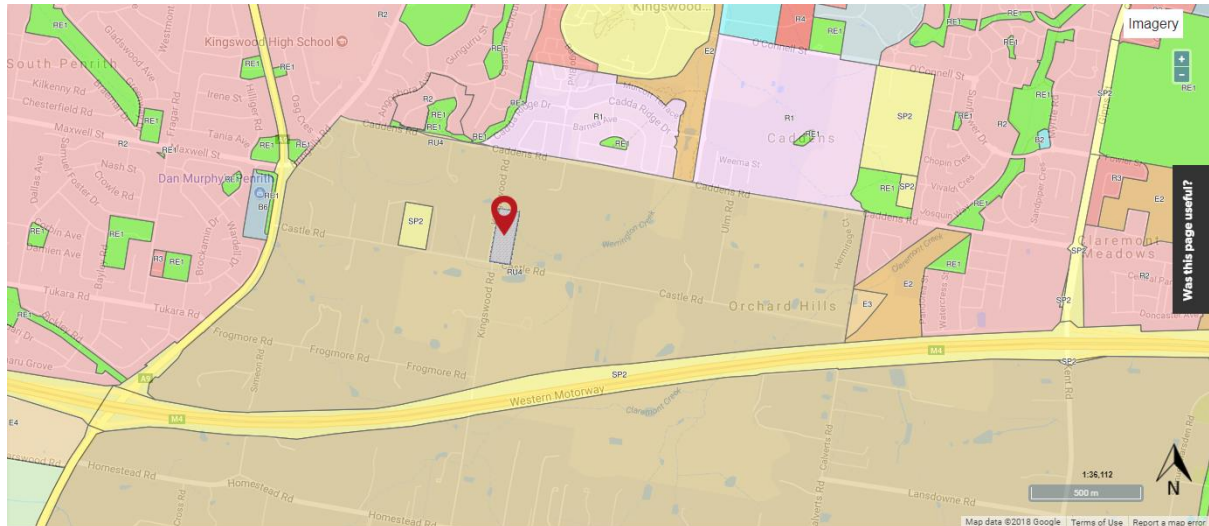


Figure 1. Existing land zoning for the subject site

At the time of the publish date for this report, the lot layout for the site is under determination. The expected yield for the rezoning area is as follows:

- 1,800 dwellings
- 7,000m<sup>2</sup> retail/community
- Retained Brethren church/school located at 26–48 Kingswood Road.

The rezoning area covers an area of 135 hectares. The residential subdividing is expected to commence in 2020 with between 150 and 250 lots delivered annually depending on market conditions. As a result, it is expected that the subdividing for the area will conclude between 7–12 years from this date.

# 3.0 Network Assessment

## 3.1 – Existing Infrastructure

### 3.1.1 Load details

The subject site comprises of a number of existing substations which provide supply to the existing dwellings within the proposed rezoning development site.

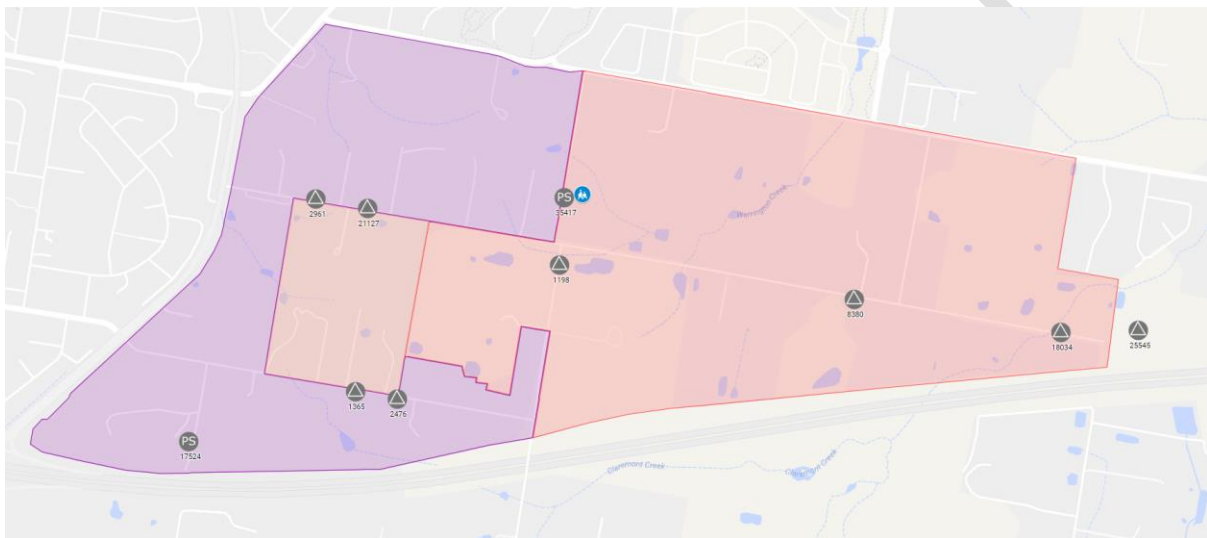


Figure 2. Existing Electrical infrastructure within the subject site

The following 9 distribution substations currently supply into the Rezoning area:

- Pole mount substation 2961,
- Pole mount substation 21127,
- Pole mount substation 13651,
- Pole mount substation 2476,
- Pad mounted substation 35417,
- Pole mount substation 1198,
- Pole mount substation 8380,
- Pole mount substation 18034,
- Pole mount substation 25545,

The existing loading to these substations is as follows:

Date tested	Measured demand (kVA)	Rated capacity (kVA)
4/3/2016	182.5	300
16/4/2013	125	300
16/3/2012	150	300
9/5/2011	162.5	300
15/4/2010	162.5	300

Figure 3. Load History for sub 2961

5-year Average After Diversity Maximum Demand (ADMD) for this substation based on the 5 most recent readings is calculated as follows:

$$ADMD_{Average} = \frac{182.5 + 125 + 150 + 162.5 + 162.5}{5}$$

$$ADMD_{Average} = 156.5 \text{ kVA}$$

Date tested	Measured demand (kVA)	Rated capacity (kVA)
4/3/2016	132	200
16/4/2013	102	200
16/3/2012	15 (Excluded)	200
9/5/2011	126	200
15/4/2010	138	200

Figure 4. Load History for sub 21127

5-year Average ADMD for this substation is:

$$ADMD_{Average} = \frac{132 + 102 + 126 + 138}{4}$$

$$ADMD_{Average} = 124.5 \text{ kVA}$$

Date tested	Measured demand (kVA)	Rated capacity (kVA)
Not Available	Not Available	200

Figure 5. Load History for sub 13651

5-year Average ADMD for this substation is:

$$ADMD_{Average} = \frac{0}{0}$$

$$ADMD_{Average} = NA$$

Date tested	Measured demand (kVA)	Rated capacity (kVA)
4/3/2016	94.5	200
16/4/2013	91.5	200
16/3/2012	97.5	200
9/5/2011	112.5	200
15/4/2010	118.5	200

Figure 6. Load History for sub 2476

5-year Average ADMD for this substation is:

$$ADMD_{Average} = \frac{94.5 + 91.5 + 97.5 + 112.5 + 118.5}{5}$$

$$ADMD_{Average} = 102.9 \text{ kVA}$$

Date tested	Measured demand (kVA)	Rated capacity (kVA)
Not Available	Not Available	500

Figure 7. Load History for PMS 35497

5-year Average ADMD for this substation is:

$$ADMD_{Average} = \frac{0}{0}$$

$$ADMD_{Average} = NA$$



Date tested	Measured demand (kVA)	Rated capacity (kVA)
4/3/2016	80	200
16/4/2013	60	200
16/3/2012	20	200
9/5/2011	160	200
15/4/2010	68	200

Figure 8. Load History for sub 1198

5-year Average ADMD for this substation is:

$$ADMD_{Average} = \frac{80 + 60 + 20 + 160 + 68}{5}$$

$$ADMD_{Average} = 77.6 \text{ kVA}$$

Date tested	Measured demand (kVA)	Rated capacity (kVA)
4/3/2016	122	200
16/4/2013	100	200
16/3/2012	80	200
9/5/2011	100	200
15/4/2010	160	200

Figure 9. Load History for sub 8380

5-year Average ADMD for this substation is:

$$ADMD_{Average} = \frac{122 + 100 + 80 + 100 + 160}{5}$$

$$ADMD_{Average} = 112.4 \text{ kVA}$$

Date tested	Measured demand (kVA)	Rated capacity (kVA)
4/3/2016	0.8	63
16/4/2013	22.5	63
16/3/2012	22.5	63
9/5/2011	33.8	63
31/5/2010	2.3	63

Figure 10. Load History for sub 18034

5-year Average ADMD for this substation is:

$$ADMD_{Average} = \frac{22.5 + 22.5 + 33.80}{3}$$

$$ADMD_{Average} = 26.267 \text{ kVA}$$

Date tested	Measured demand (kVA)	Rated capacity (kVA)
4/3/2016	50	100
16/4/2013	30	100
16/3/2012	30	100
9/5/2011	45	100
31/5/2010	50	100

Figure 11. Load History for sub 25545

Negating outliers, average ADMD for this substation is:

$$ADMD_{Average} = \frac{50 + 30 + 30 + 45 + 50}{5}$$

$$ADMD_{Average} = 41.0 \text{ kVA}$$

The combined loads for all 7 of the 9 distribution substations based on the 5 most recent readings is 0.641MVA. The sum of the combined name plate rating for all 9 distribution substation 1.963MVA.

Presuming that these substations accommodate the majority of the load within the rezoning area, the reduction of load to the network would be approximately 0.641MVA.

### 3.1.2 Large scale supply

The following 11kV feeders extending into and currently supply the existing load within the rezoning area:

- Kingswood Zone Substation, Feeder No. 9032 “Angophora Av”,
- Claremont Meadows Zone Substation, Feeder No. CS1247 “Ulm Rd”,



Figure 12. Existing 11kV feeder layout supplied by Endeavour Energy

As the Claremont Meadows Zone Substation supply area is expeditiously expanding with multiple developments occurring in the area, it is not guaranteed that Claremont Meadows Zone Substation will maintain network capacity.

Endeavour Energy is currently still under determination as to whether a new zone substation is required within the region due to the multiple proposed developments underway.

## 3.2 Proposed Infrastructure

### 3.2.1 Load details

The assessed 11kV load for the rezoning development has been estimated and calculated at 4kVA per lot for residential dwellings, and 100VA per square meter for retail/commercial load.

- Residential Load:  $1,800 \text{ lots} \times 4\text{kVA/lot} = 7.2\text{MVA @ } 11\text{kV}$   
(or  $11.7\text{MVA @ } 240\text{V}$ )
- Retail/Commercial Load:  $7,000\text{m}^2 \times 100\text{VA/m}^2 = 0.7\text{MVA @ } 11\text{kV}$

This totals an estimated load on the 11kV Network to be 7.9MVA for the proposed developments within the rezoning area.

Based on the stated lot release of between 150 and 250 lots per year, the net additional load required from the network will be ~7.26MVA over a period of 7 to 12 years.

Assuming an average utilisation of approximately 400kVA per substation, approximately 32 x 500kVA rated Pad Mount Substations spread evenly across the development would be required. This is expected to be a minimum number as it is expected that some substations may not be able to be fully utilised depending on the staging and distribution of the overall development.

### 3.2.2 Large Scale Supply

In order to supply the required load for the development, it is required by Endeavour to install two new 11kV feeders from Claremont Meadows ZS, located 2.5km away from the north-eastern corner of the development via road.

The existing 11kV feeder CS1247 is at full capacity and will not be able to be utilised for the supply. Endeavour Energy expects that there is to be a new 11kV feeder installed prior to the Orchard Hills North development which would transfer



some existing load from the CS1247 feeder. Thus, some initial developments may utilise feeder CS1247.

At the time of this report, there are currently six spare 11 kV circuit breakers at the Claremont Meadows Zone Substation as follows:

- CS1273
- CS1221
- CS1217
- CS1254
- CS1291
- CS1287

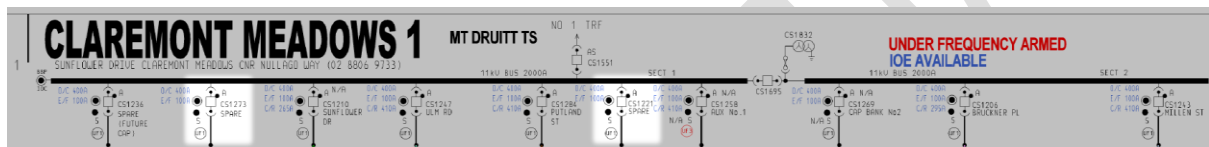


Figure 13. Spare circuit breakers on Claremont Meadows Zone Sub sheet 1

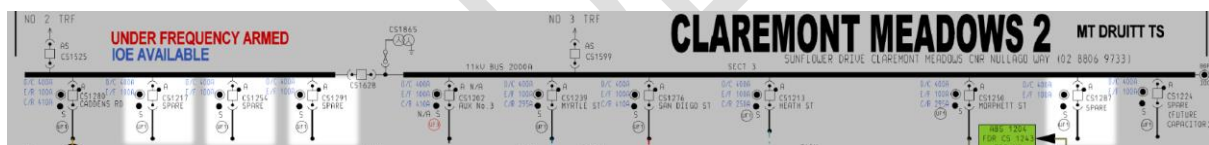


Figure 14. Spare circuit breakers on Claremont Meadows Zone Sub sheet 2

If each of the 6 spare circuit breakers has been utilised by the time the development begins, it is permitted for a circuit breaker to be double cabled in order to accommodate the development.

North-west of the development is Kingswood Zone Substation, although this substation has no capacity remaining due to the upgrade of Nepean Hospital and a new private hospital utilising this substation.

Existing feeder 9032 from Kingswood Zone Substation supplies existing substations within and surrounding the Structure Plan Area which may potentially support a small load, however this would be determined when the connection of load applications are submitted for each portion of the developments.

If it is instead determined that Claremont Meadows Zone Substation will not have sufficient capacity for the proposed load by the time the development initiates, it is possible that Endeavour Energy will seek acquisition of land within the Orchard Hills North development for the purposes of a new Zone Substation installation.

In this case it is likely that Endeavour Energy would install a 132:11kV substation, which would require 10,000m<sup>2</sup> of land to be acquired by Endeavour Energy.

Network capacity would not be reserved by Endeavour Energy without connection applications being submitted and the associated electrical designs being certified or with approvals granted.

## 4.0 Recommendations

It is our recommendation that in order to provide supply, given that capacity remains in the Claremont Meadows Zone Substation, a new 300mm<sup>2</sup> Copper feeder be installed from Claremont Meadows Zone Substation via O'Connell Street and Caddens road to the north-eastern corner of the Orchard Hills North development, dependent on the exact location of where developments begin.

The displacement between Claremont Meadows Zone Sub and the north-eastern corner of the development is ~930m.

An 11kV feeder extension from a spare circuit breaker on Claremont Meadows Zone Substation to the north-eastern corner of the development via O'Connell Street and Caddens Road as shown below would span ~2.5km. Currently there are existing spare conduits along this route, these may be used to limit the amount of excavation required.

Endeavour Energy's current reimbursement scheme would contribute to the cost of 11kV cables, contribute to part of the cost of installation of the cable, along with any spare duct required as mandatory spare. This scheme is currently in operation however it may be revised in the future. Where existing ducts are utilised for the installation of cabling Endeavour Energy duct usage charge may be applicable @ \$23/m.

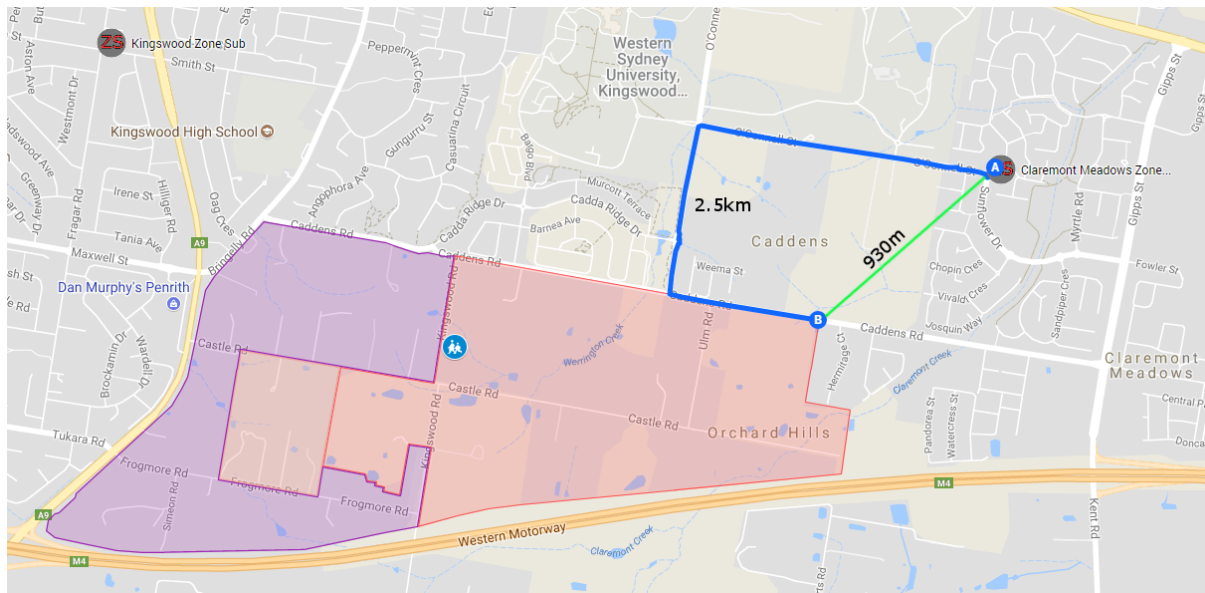


Figure 15. Extension of new feeder from Claremont Meadows Zone Substation to north-eastern corner of development

### **Validity**

This audit report is subject to the conditions at the time of the report, as a result is only valid for a period of up to 31 days after which the report findings should be reviewed.

### **Disclaimer**

This audit report has been prepared with every effort made to ensure its accuracy, neither Power Line Design Pty Ltd nor any of its employees shall be liable on any ground whatsoever to any party in respect of decisions or actions taken as a result of this report.

Should you have any questions regarding this report or its contents please contact the undersigned.

*Yours Sincerely,*

*Michael Baranowski*

*Michael Baranowski – Senior Design Engineer*

*Power Line Design Pty Ltd*

Phone: (02) 4872 1920

E-Mail: [admin@powerdesign.com.au](mailto:admin@powerdesign.com.au)



26 February 2018

**Endeavour Energy Ref: ENL3001 – 2014/02306/001**

Power Line Design Pty Ltd  
PO BOX 338  
MITTAGONG  
NSW 2575

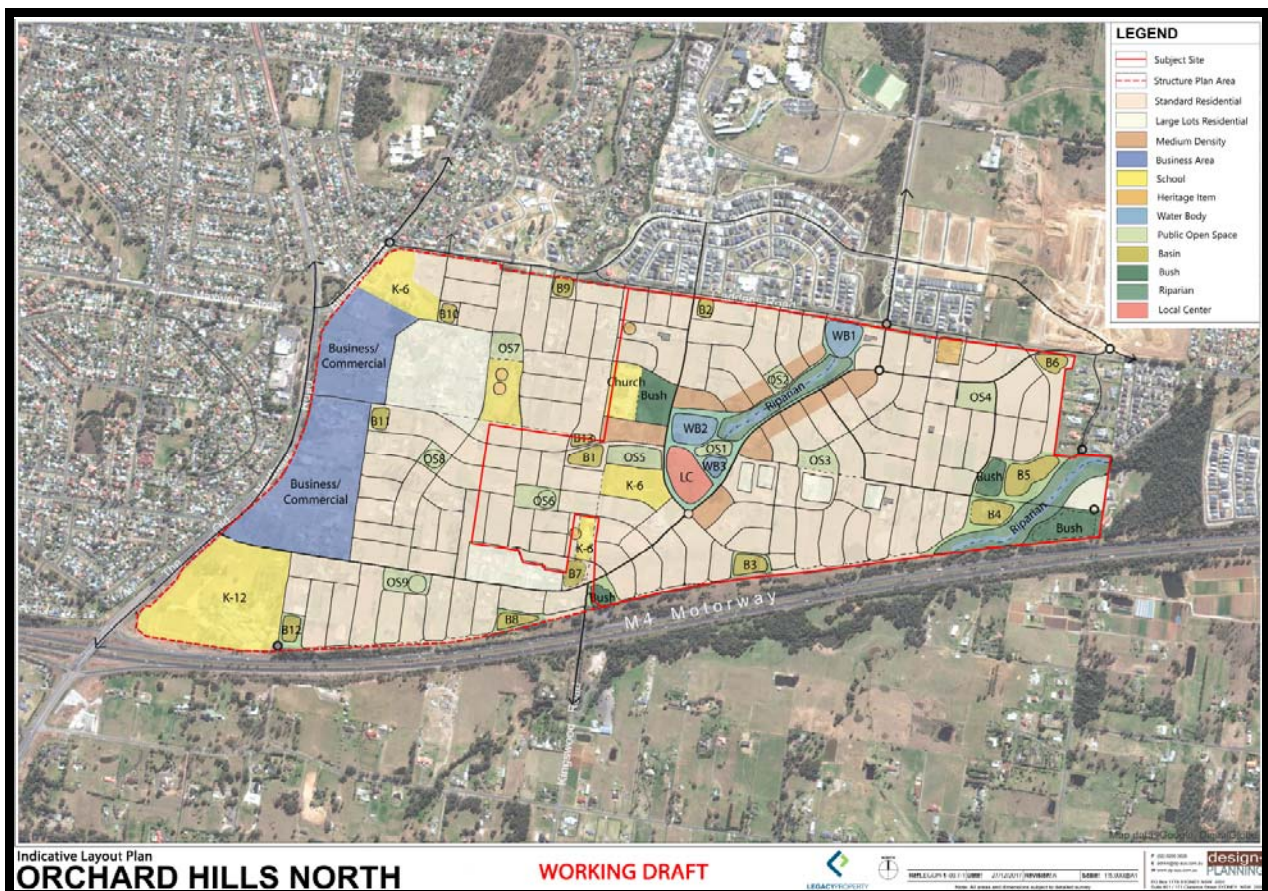
**Attention: Daryl Peckett**

**ENL3001 – Technical Review | Orchard Hills North Development, Caddens Road  
ORCHARD HILLS**

Dear Daryl,

Thank you for your enquiry regarding the proposed residential development at the above address. This enquiry has been registered under our reference numbers – ENL3001. Please quote this number for all future correspondence.

Endeavour Energy acknowledges that proposed Orchard Hills North Development will possibly yield 1,800 lots in initial rezoning areas and 7000m<sup>2</sup> retail floor areas. The developer is expecting to commence the residential subdivision in 2020 with approximately 150 to 250 lots delivered annually depending on the market condition.



## Introduction

There are 10 substations on the proposed developing land, which includes: -

- Sub 2961,
- Sub 21127,
- Sub 17524,
- Sub 13651,
- Sub 2476,
- Sub 35417,
- Sub 1198,
- Sub 8380,
- Sub 18034 and
- Sub 25545.



It is anticipated that these subs will likely be removed to free space for the new development, and approximate maximum demand of these substations is 1.1MVA.

## Load Assessment

Based on the information for scope of development, expected load is estimated as follows:-

- Residential Load:  $1,800 \text{ lots} \times 4\text{kVA/lot} = 7.2\text{MVA}$
- Retail/Commercial Load:  $7,000\text{m}^2 \times 100\text{VA/m}^2 = 0.7\text{MVA}$

Total estimated load of the development is approximately 8MVA.

***Hence, total load required from the network is approximately 7MVA and this load will be required from the network in period of 10 years (based on 150 to 250 lot release rate per year).***



## Supply Arrangements

To supply the required load of the proposed development, it is required to install two 11kV feeders that will originate from Claremont Meadows ZS.

The closest 11kV feeder to the development is CS1247 which is currently loaded up to its full capacity at present. It is expected that sooner a new 11kV feeder will be developed to offload 11kV feeder CS1247, therefore initial stage lots can be supplied by 11kV feeder CS1247.

Once 11kV feeder CS1247 reaches its full capacity, another new 11kV feeder from Claremont Meadows will need to be developed.

Presently there are six spare 11kV CBs at Claremont Meadows ZS, however if none of them is available at the time this development requires a new feeder, one of CBs can be double cabled to accommodate it.

This development is also close to Kingswood ZS, but this ZS has no spare capacity due to upgrade of Nepean Hospital and a new private hospital.

Initial small load may be connected to Kingswood feeder 9032, but this will be assessed at the time of connection of load application.

Existing 11kV feeders' layout can be referred to the following sketch.



In addition, Endeavour Energy would advise that Claremont Meadows ZS supply area is rapidly developing and due to multiple developments occurring in this area, Claremont Meadows ZS may not have sufficient capacity in the medium to long term.

The new zone substation is not required to supply the development associated with this enquiry if considered in isolation. Moreover Endeavour Energy is still assessing its strategy for a new zone substation in the area, given the multiple proposed developments.

It may still be the case that Endeavour Energy pursues the option of seeking acquisition of land within this development, for zone substation in future, when plans are more certain.

**Hope this assists for the meantime and this advice provided is in response to an enquiry only and does not constitute a formal method of supply.** An application must be submitted and subsequent designs have been certified or approvals granted will Endeavour Energy reserve capacity on the network.

Should you have any questions regarding this response to your request for technical review, please contact me.

Yours faithfully,

*David HO*

**David Ho**  
Contestable Works Project Manager  
**Network Connections**

☎ Direct: (02) 9853 7901 | ✉ Email: [david.ho@endeavourenergy.com.au](mailto:david.ho@endeavourenergy.com.au)

## Appendix D – NBN Co Correspondence

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## Blaire Gibbs

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**From:** Andy Every <[andyevery@nbnco.com.au](mailto:andyevery@nbnco.com.au)>  
**Sent:** Monday, 15 January 2018 1:56 PM  
**To:** Michael Johnson  
**Cc:** Greg Clifford  
**Subject:** [110265-06] Orchard Hills Proposed Rezoning and Development- Service Availability - nbn ref AYCA-4ZX3A4 [nbn-Confidential:Commercial]

### **nbn-Confidential: Commercial**

Good afternoon Michael

My colleague, Kristine Lam, has asked me to contact you in Greg Clifford's absence (Greg is back from leave next Mon 22 Jan) as **nbn** Planning team have now completed this new development assessment. Please note there will be a backhaul charge of \$8,450.00 associated with this application (1.3km total route distance).

Please let me know if you require any further information

Regards

Andy

**Andy Every**

**Account Director | Enterprise and Government NSW/ACT**

**nbn Build Partnerships | Demand Deployment**

**P** +61 2 9031 3167 | **M** +61 428 675 268 | **E** [andyevery@nbnco.com.au](mailto:andyevery@nbnco.com.au)



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PLEASE CONSIDER OUR ENVIRONMENT BEFORE PRINTING

## Appendix E – Jemena Correspondence

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## Blaire Gibbs

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**From:** Gregory Knight <Gregory.Knight@jemena.com.au>  
**Sent:** Monday, 11 December 2017 3:13 PM  
**To:** Michael Johnson  
**Cc:** Paul Isaac  
**Subject:** RE: [110265-06] Orchard Hills Proposed Rezoning and Development- Service Availability

Michael,

Thank you for your advice regarding this proposed subdivision, natural gas is in the vicinity to supply this development and sufficient capacity exists at this time to meet the expected loads nominated.

To allow a full design and assessment we require the base Road and lot layout drawing for the subdivision along with the preliminary electrical design in Dwg format once all approvals are in place. In order to reduce any potential contributions the Developer should allow for the provision of all trenching at no cost to Jemena throughout the development, if the development meets our economic viability requirements at the time of assessment & development no contributions are envisaged based on our current Access Arrangement guidelines.

Once we have this information we can provide our requirements documentation in readiness for a formal reticulation offer in line with your site schedules.

Regards

**Greg Knight**  
Network Development Manager  
**Jemena**  
PO Box 8212 Tumby Umpi NSW 2261  
0402 060 241  
[greg.knight@jemena.com.au](mailto:greg.knight@jemena.com.au) | [www.jemena.com.au](http://www.jemena.com.au)



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**From:** Michael Johnson [mailto:mjohnson@jwprince.com.au]  
**Sent:** Friday, 8 December 2017 4:12 PM  
**To:** Gregory Knight <Gregory.Knight@jemena.com.au>  
**Cc:** Paul Isaac <paulisaac@jwprince.com.au>  
**Subject:** [110265-06] Orchard Hills Proposed Rezoning and Development- Service Availability

Good Afternoon Greg,

J. Wyndham Prince have been engaged to prepare a servicing infrastructure report to support the Rezoning of a parcel of land at Orchard Hill, NSW. Legacy Property are proposed to rezone and develop the parcel of land between Caddens Road and The M4 Motorways. Refer attached to marked up aerial phot of the site.

The Proposed development, at this stage, has 2 main stages The Rezoning Area that is the subject of the current assessments and the Structure Plan Area. The Structure plan area is a possible future expansion (not currently proposed for rezoning) however we would like to make sure servicing capacity is allowed for this area as well.

Below is a summary of the current expected yields of the 2 phases of the development.

Rezoning Area (135 hectares)

- \* 1,800 dwellings
- \* 4,000sqm retail / community

- \* Note existing Brethren church/school

#### Structure Plan Area (135 hectares)

- \* 1,000 dwellings
- \* Approx. 20 hectares of non-residential uses - likely to be business/enterprise uses along Northern Road - maybe 12,000-15,000sqm of GFA
- \* Note existing Orchard Hills Primary School (potential expansion), Montgrove College, Penrith Christian School, Imagine Nations Church
- \* Assumes retention of existing small lot subdivisions in current form (ie. No additional dwellings)

Could you please review the current expected lead in requirements to provide gas service to the proposed development?

As part of this review could you advise any expected costs that would be incurred by the developer?

Please feel free to give me a call if you have any questions in regard to this.

Please also let me know if I should contact someone different in regard to these works.

Regards

**Michael Johnson** – Project Manager

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**J. WYNDHAM PRINCE**  
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS  
& PROJECT MANAGERS

**P** 02 4720 3317 **M** 0400 058 145 **W** [www.jwprince.com.au](http://www.jwprince.com.au)  
580 High Street, Penrith NSW  
PO Box 4366 PENRITH WESTFIELD 2750

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