

Appendix A

Sydney Water Feasibility Application

20th February 2018

Wayne Jackson
Sydney Water
PO Box 399
Parramatta NSW 2124

Dear Wayne

Cudgegong Town Centre South: Sydney Water Feasibility Application

1.0 Introduction

The NSW Government is currently building the Sydney Metro Northwest (SMNW) that is due to start operations in 2019. The SMNW is Stage 1 of the overall Sydney Metro project and involves the construction of eight new metro stations supporting infrastructure between Cudgegong Road and Epping and converting five existing stations between Epping and Chatswood. Stage 2 will deliver a new metro rail line from Chatswood through Sydney's CBD to Sydenham (Sydney Metro City and Southwest).

Landcom and the Sydney Metro Delivery Office (SMDO), part of Transport for NSW (TfNSW), are working in collaboration to develop walkable, attractive, mixed use places around the SMNW stations. This includes using the surplus government owned land located around the Cudgegong Road Station.

The subject site, the Cudgegong Road Station Precinct South, is located between Cudgegong Road, Tallawong Road, Schofields Road and the Metro corridor and comprises around 7.8ha of government owned land. It is within the southern part of the broader Cudgegong Road Station Precinct (Area 20) of the North West Priority Growth Area, a substantial land release area for homes and jobs in Sydney's northwest.

AECOM is engaged to carry out an Infrastructure Servicing Strategy to support the State Significant Development Application (SSDA) for the Station Precinct South concept proposal. The concept proposal is for approximately 1,052 dwellings and 9,700 sqm of retail, commercial and community uses. It also includes a central park, new streets and supporting public domain.

The estimated residential and commercial growth within the Cudgegong Road Station Precinct South is summarised below in Table 1. This area is a part of the Area 20 Precinct Plan; this precinct plan contains projected growth in surrounding areas.

Table 1: Indicative Residential Growth

| Investigation Area | Apartments (No.) | Commercial Space (m ²) | Development Timeframe (yrs) |
|------------------------|------------------|------------------------------------|-----------------------------|
| Site 1 | 336 | 9,155 | 0 to 5 |
| Site 2 (Phase 1 and 2) | 675 | 600 | 0 to 5 |
| Total | 1,011 | 9,755 | 5 to 10 |

Note: Apartment numbers and commercial space figures are assumptions only and are subject to review under the Urban Transformation Strategy. They are provided for the determinate of infrastructure capacity analysis.

2.0 Potable Water and Wastewater Demand Rates

A preliminary assessment has been undertaken of the potential water and demand associated with the proposed development.

Demand forecasting and profiles were developed for the study area and individual precincts based on the number of dwellings and gross floor area for retail and commercial development. The demand assessment considered a range of unit rates and peaking factors as summarised in Table 2 and 3.

Table 2: Potable Water Demand Unit Rates

| Land Use | Design Criteria | Units | Potable Water Demand | Sources |
|--|-----------------|-------------|----------------------|--|
| Multi- Unit (>140 unit/net/ha) 6-12 storey apartment | Max Day Demand | kL/unit/day | 0.8 | Water Supply Water Supply Code of Australia WSA 03-2011 - 3.1 (Sydney Water) |
| Suburban Commercial | Max Day Demand | kL/Ha/day | 41 | Water Supply Code of Australia WSA 03-2011 - 3.1 (Sydney Water 2014 Edition) |
| BASIX Reduction | | % | 40 | Building Sustainability Index Targets |

Table 3: Wastewater Demand Unit Rates

| Land Use | Units | Wastewater Demand | Sources |
|--------------------------|-------------|-------------------|---|
| High Density Residential | EP/dwelling | 2.5 | SWC Area Planning Design Criteria Guide: WSA 02-2002- 3.0 (Sewer Code of Australia) |
| Local Commercial | EP/ha | 75 | SWC Area Planning Design Criteria Guide: WSA 02-2002- 3.0 (Sewer Code of Australia) |
| BASIX Reduction | % | 40 | Building Sustainability Index Targets |

3.0 Projected Water and Sewer Demand

Using the demand rates in Section 2.0, estimates for the potable water Maximum Daily Demand (MDD) and the Average Dry Weather Flow (ADWF) were developed.

Table 4 summarises an estimate of the Potable Water Maximum Daily Demand while Table 5 provides a summary of the ADWF estimates. Please note that as the design is still evolving we believe it is appropriate to apply a $\pm 15\%$ factor to these numbers.

Table 4: Estimated Cumulative Maximum Daily Potable Water Demand

| Potable Water Demand - kL/Day - Cumulative (incl. BASIX) | | | | | | | Total Peak kL/Day |
|--|------------|------------|------------|------------|------------|------------|----------------------|
| Area | 0 to 2 yrs | | 2 to 4 yrs | | 4 to 6 yrs | | |
| | Apartments | Commercial | Apartments | Commercial | Apartments | Commercial | |
| Site 1 | 96.0 | 12.3 | 161.3 | 24.6 | 161.3 | 37.5 | 198.8 |
| Site 2 (Phase 1+2) | 0.0 | 0.0 | 144.0 | 1.2 | 324.0 | 2.5 | 326.5 |
| Total Site | 96.0 | 12.3 | 305.3 | 25.8 | 485.3 | 40.0 | 525.3 |

Table 5: Estimated Average Dry Weather Flow (ADWF) including BASIX (L/s)

| Waste Water ADWF (L/s) - Cumulative (incl. BASIX) | | | | | | | Total ADWF L/s |
|---|------------|------------|------------|------------|------------|------------|----------------------|
| Area | 0 to 2 yrs | | 2 to 4 yrs | | 4 to 6 yrs | | |
| | Apartments | Commercial | Apartments | Commercial | Apartments | Commercial | |
| Site 1 | 0.51 | 0.04 | 0.86 | 0.08 | 0.86 | 0.12 | 0.97 |
| Site 2 (Phase 1+2) | 0.00 | 0.00 | 0.77 | 0.00 | 1.72 | 0.01 | 1.73 |
| Total Site | 0.51 | 0.04 | 1.62 | 0.08 | 2.58 | 0.12 | 2.70 |

The above demand estimates do not allow for reductions in existing demand resulting from the demolition of existing land uses.

4.0 Feasibility Assessment Request

As demonstrated in the demand estimate there is projected to be a significant impact on the water and wastewater infrastructure. As such Landcom seeks to actively engage with utility stakeholders to ensure the appropriate planning measures are implemented. Additionally we seek the following information:

- Confirmation on the accuracy of information in regards to the existing Sydney Water infrastructure as shown in the attached plans, particularly future recycled water provision;
- Identification of the existing capacity of the water and sewer network to service the projected growth and any augmentations that may be required to Sydney Water's network;
- Details of any planned infrastructure works to support development within the catchment which could be expanded to support the development;
- Other major developments currently allowed for in the area as part of Sydney Water's infrastructure planning;
- Funding arrangements for infrastructure upgrades to meet the increased water and sewer demand;
- Guidance on timeframes for forward planning of infrastructure works; and
- Advice on any alternative supply strategies that might be feasible for Sydney Water to implement for the proposed development.

AECOM welcomes further discussion and collaboration with Sydney Water as part of the precinct planning and are happy to meet with Sydney Water and Landcom to discuss the implications of this feasibility application.

Should you have any queries in relation to this application please do not hesitate to contact me on the details below. We look forward to working with Sydney Water on the next stages of this development.

Yours faithfully



Daniel Fettell
Principal Engineer
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Daniel.Fettell@aecom.com

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Appendix B

Endeavour Energy Feasibility Application

Technical Review Request



Please return completed form along with all attachments to: Endeavour Energy, PO Box 811 Seven Hills NSW 1730
Email: cwadmin@endeavourenergy.com.au | Fax: 02 9853 7925 | For enquiries about this form, please contact 02 9853 7977

This form can be used for requesting technical assistance to determine preliminary connection requirements prior to lodging a formal application for large or complex developments including master planning for major projects or subdivisions, embedded networks, asset relocations and embedded generator connections.

Site Details

multiple lots,
Lot / DP No. refer below Street No. _____ Street Name Schofield Rd
Suburb/Town Rouse Hill Postcode 2155 UBD Ref UBD128
Nearest Substation: 1027 Pole/Pillar _____ Cross Street L14
Retailer NMI for Existing Sites: TBC (Can be found on your electricity bill)

Retail Customer or Developer Details

Name / Company Landcom Contact Person Kerrie Symonds
Street No. L14, 60 Street Name Station St
PO Box _____ Suburb / Town Parramatta Post Code 2150
Phone 02 9841 8637 Mobile 0433832364 Fax _____
Email: ksymonds@landcom.nsw.gov.au

Applicant / Applicant's Representative Details

Name / Company AECOM Australia Pty Ltd Contact Person Owen Liu
Street No. 420 Street Name George Street
PO Box _____ Suburb / Town Sydney Post Code 2000
Phone 02 8934 0787 Mobile _____ Fax 02 8934 0001
Email: owen.liu@aecom.com
Preferred method of contact: ☐ Mail ☐ Phone ☒ Email

Nature of Request

AECOM is currently conducting feasibility study on the proposed Cudgegong Town Centre development. The proposed development will have a maximum demand of approximately **2716.42kVA**. Due to the project is at planning stage, it is unclear whether the new development will contain harmonic load or other types of load that may affect the network power quality. Developer will be advised to mitigate the effect of any of such load as per NSW Service and Installations rules. A plan has been attached to this application showing the proposed location of the development and Endeavour Energy HV assets nearby. Please carry out a technical review and provide advice on the supply requirements and high level cost for the electrical works required if possible. The impacted lots are listed below:

Site Address Legal Description

| | |
|---------------------------------------|--------------|
| 169 Schofields Road, Rouse Hill, 2155 | 10/DP1168129 |
| 271 Schofields Road, Rouse Hill, 2155 | 11/DP1168129 |
| 373 Schofields Road, Rouse Hill, 2155 | 12/DP1168129 |
| 475 Schofields Road, Rouse Hill, 2155 | 13/DP1168129 |
| 577 Schofields Road, Rouse Hill, 2155 | 14/DP1168129 |
| 679 Schofields Road, Rouse Hill, 2155 | 15/DP1168129 |
| 781 Schofields Road, Rouse Hill, 2155 | 10/DP1185116 |
| 835 Cudgegong Road, Rouse Hill, 2155 | 71/DP208203 |
| 928 Tallawong Road, Rouse Hill, 2155 | 70/DP30186 |

Please Note:

Please provide detailed information describing your development as attachments to support your request including harmonic loads, excessive motor starting or other types of load that may cause quality of supply issues on the network.

The Customer/Developer is the Landowner: ☒ Yes ☐ No
☒ I am authorised by the customer/proponent to make enquiry to Endeavour Energy for this development.

Important Information

As fees associated with normal applications for connection services represent a more cost effective solution, final connection customers are not encouraged to apply for technical reviews unless their projects are staged or of a complex nature, or a review of supply availability is required and application is not possible.

This form is used for both Complex and Simple requests for technical review, which are also called Complex and Simple preliminary enquiries, and must be accompanied, with a cheque made out to Endeavour Energy for the fee amount as shown below. All payments are non-refundable, and are unlikely to substantially reduce other fees associated with submission of applications, as the same information must be reviewed and refreshed in the application phase. The quoted rates below are based on the AER approved fees – Simple Enquiry \$106.557/hr and Complex Enquiry \$252.428/hr including GST.

Complex requests for technical review require input from Network Planners and specialist project management services to determine the voltage of connection and/or the connection point and result in a detailed response. An application for connections services is still required in order to receive a binding offer and proceed to connection.

| Common types of complex requests for technical review | Minimum Hours | Excluding GST | Payment Including GST |
|---|---------------|---------------|-----------------------|
| Master Planning with Transmission | 11 | \$2524.28 | \$2776.708 |
| Master Planning without Transmission | 9 | \$2065.32 | \$2271.852 |
| Subdivision up to 300 lots | 5 | \$1147.40 | \$1262.140 |
| Connection of Load at LV | 5 | \$1147.40 | \$1262.140 |
| Asset Relocations without Transmission | 5 | \$1147.40 | \$1262.140 |

Simple requests for technical review are basic reviews of existing data systems in order to provide a summary response. An application for connection services is still required, in order to receive a binding offer and proceed to connection.

| Types of Simple requests for technical review | Minimum Hours | Excluding GST | Payment Including GST |
|---|---------------|---------------|-----------------------|
| All simple | 1 | \$96.87 | \$106.557 |

EXISTING POLE
SUBSTATION 1027

EXISTING 11kV
FEEDER SC1204

PROPOSED DEVELOPMENT FOOTPRINT

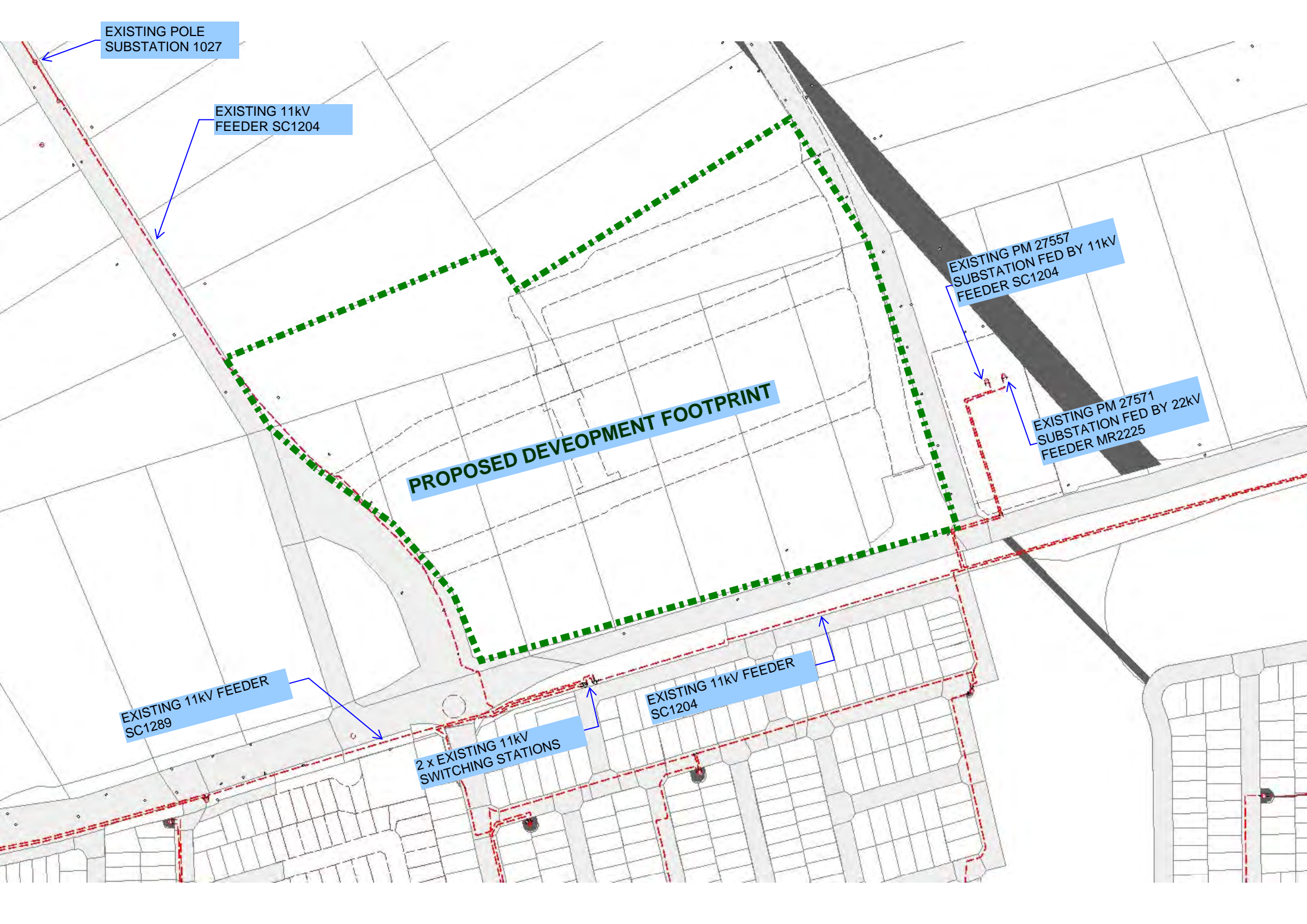
EXISTING PM 27557
SUBSTATION FED BY 11kV
FEEDER SC1204

EXISTING PM 27571
SUBSTATION FED BY 22kV
FEEDER MR2225

EXISTING 11kV FEEDER
SC1289

2 x EXISTING 11kV
SWITCHING STATIONS

EXISTING 11kV FEEDER
SC1204



Appendix C

Jemena Feasibility Application

20th February 2018

Aaron Greaves
Jemena
Level 12, 99 Walker Street
North Sydney, NSW 2060

Dear Aaron

Cudgegong Town Centre South: Jemena Feasibility Application

1.0 Introduction

The NSW Government is currently building the Sydney Metro Northwest (SMNW) that is due to start operations in 2019. The SMNW is Stage 1 of the overall Sydney Metro project and involves the construction of eight new metro stations supporting infrastructure between Cudgegong Road and Epping and converting five existing stations between Epping and Chatswood. Stage 2 will deliver a new metro rail line from Chatswood through Sydney's CBD to Sydenham (Sydney Metro City and Southwest).

Landcom and the Sydney Metro Delivery Office (SMDO), part of Transport for NSW (TfNSW), are working in collaboration to develop walkable, attractive, mixed use places around the SMNW stations. This includes using the surplus government owned land located around the Cudgegong Road Station.

The subject site, the Cudgegong Road Station Precinct South, is located between Cudgegong Road, Tallawong Road, Schofields Road and the Metro corridor and comprises around 7.8ha of government owned land. It is within the southern part of the broader Cudgegong Road Station Precinct (Area 20) of the North West Priority Growth Area, a substantial land release area for homes and jobs in Sydney's northwest.

AECOM is engaged to carry out an Infrastructure Servicing Strategy to support the State Significant Development Application (SSDA) for the Station Precinct South concept proposal. The concept proposal is for approximately 1,052 dwellings and 9,700 sqm of retail, commercial and community uses. It also includes a central park, new streets and supporting public domain.

The estimated residential and commercial growth within the Cudgegong Road Station Precinct South is summarised below in Table 1. This area is a part of the Area 20 Precinct Plan; this precinct plan contains projected growth in surrounding areas.

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| Total | 1,011 | 9,755 | 5 to 10 |

Note: Apartment numbers and commercial space figures are assumptions only and are subject to review, they are provided for the determinate of infrastructure capacity analysis.

2.0 Gas Demand Rates

A preliminary assessment has been undertaken of the potential gas demand associated with the proposed development.

Demand forecasting and profiles were developed for the study area and individual precincts based on the number of dwellings – please note this excludes commercial usage as we understand the rates can vary widely for different uses.

For the purposes of this assessment we used an energy demand of 20 gigajoules (GJ) per year to estimate the average annual domestic usage of natural gas for residential dwellings. We also included a BASIX reduction target of 25% to the residential dwellings.

A factor of 39.6 m³ / GJ was then used to covert the estimated usage into a volume of gas (Parliament of Australia: Natural Gas: Energy for the New Millennium, 2015).

3.0 Projected Gas Demand

Using the demand rates in Section 2.0, estimates for the cumulative residential gas usage were developed as show in Table 2, we recommend applying a $\pm 15\%$ factor to these numbers.

Table 2: Estimated Gas Demand

| Gas - m3/day - cumulative (incl. BASIX) | | | | | | | Total m3/day |
|---|------------|------------|------------|------------|------------|------------|-----------------|
| Area | 0 to 2 yrs | | 2 to 4 yrs | | 4 to 6 yrs | | |
| | Apartments | Commercial | Apartments | Commercial | Apartments | Commercial | |
| Site 1 | 325 | n/a | 547 | n/a | 547 | n/a | 547 |
| Site 2 (Phase 1+2) | 0.00 | n/a | 488 | n/a | 1,099 | n/a | 1,099 |
| Total Site | 325 | n/a | 1,035 | n/a | 1,645 | n/a | 1,645 |

The above demand estimates do not allow for reductions in existing demand resulting from the demolition of existing land uses.

4.0 Feasibility Assessment Request

As demonstrated in the demand estimate there is projected to be a significant impact on the gas infrastructure. As such Landcom seeks to actively engage with utility stakeholders to ensure the appropriate planning measures are implemented. Additional we seek the following information:

- Confirmation on the accuracy of information in regards to the existing Jemena infrastructure as shown in the attached plans;
- Identification of the existing capacity of the gas to service the projected growth and any augmentations that may be required to Jemena's network;
- Details of any planned infrastructure works to support development within the catchment which could be expanded to support the development;
- Other major developments currently allowed for in the area as part of Jemena's infrastructure planning;
- Funding arrangements for infrastructure upgrades to the meet the increased gas demand;
- Guidance on timeframes for forward planning of infrastructure works; and
- Advice on any alternative supply strategies that might be feasible for Jemena to implement for the proposed development.

AECOM welcomes further discussion and collaboration with Jemena as part of the precinct planning and are happy to meet with Jemena and Landcom to discuss the implications of this feasibility application.

Should you have any queries in relation to this application please do not hesitate to contact me on the details below. We look forward to working with Jemena on the next stages of this development.

Yours faithfully



Daniel Fettell

Principal Engineer

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Appendix D

NBN Feasibility Application

20th February 2018

Matthew Schwabrow
NBN Co
Level 11, 100 Arthur Street
North Sydney, NSW 2060

Dear Matthew

Cudgegong Town Centre South: NBN Feasibility Application

1.0 Introduction

The NSW Government is currently building the Sydney Metro Northwest (SMNW) that is due to start operations in 2019. The SMNW is Stage 1 of the overall Sydney Metro project and involves the construction of eight new metro stations supporting infrastructure between Cudgegong Road and Epping and converting five existing stations between Epping and Chatswood. Stage 2 will deliver a new metro rail line from Chatswood through Sydney's CBD to Sydenham (Sydney Metro City and Southwest).

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2.0 NBN Rollout

We understand the NBN is currently upgrading the existing fixed line phone and internet network infrastructure throughout the corridor as shown below in Figure 2.

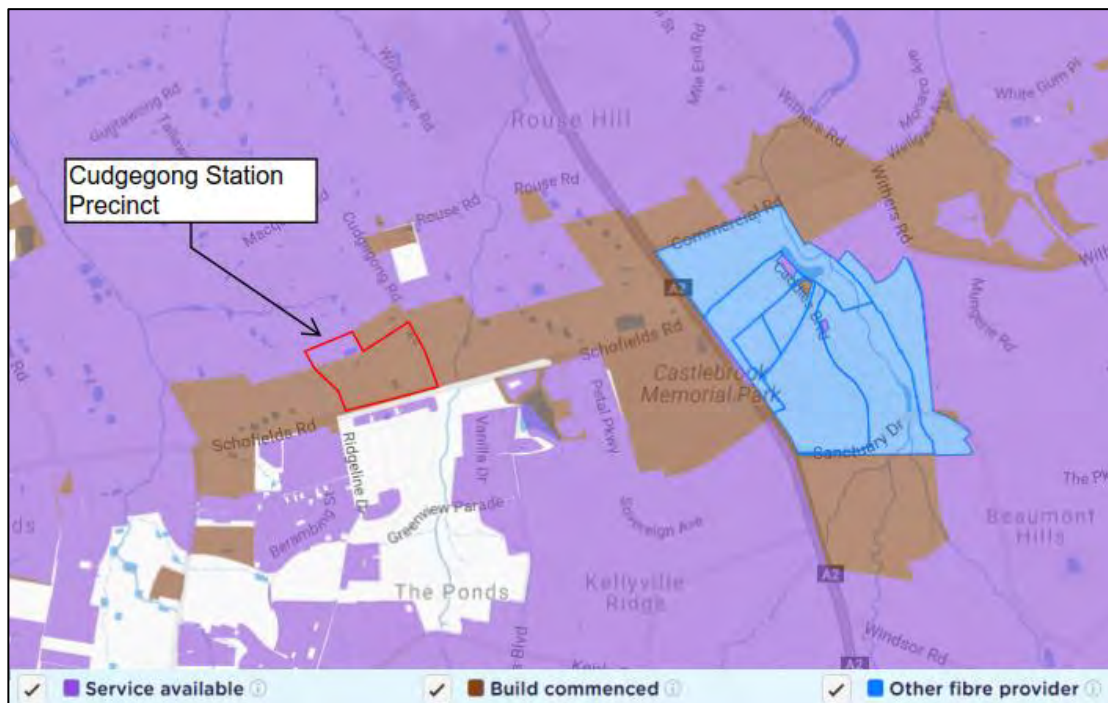


Figure 2: NBN Rollout Map (2017)

We understand adjacent existing dwellings are predominately serviced by the existing Telstra infrastructure. We would appreciate the chance to coordinate a strategy with NBN to supply this infrastructure with new NBN cables and conduits.

3.0 Feasibility Assessment Request

Landcom seeks to actively engage with utility stakeholders to ensure the appropriate planning measures are implemented. To this end we would appreciate the following information:

- Outline of the current NBN servicing arrangements for the proposed development;
- Identification of the existing capacity of the NBN network to service the projected growth;
- Details of any planned infrastructure works to support development within the catchment which could be expanded to support the development;
- Other major development currently allowed for in the area as part of NBN's infrastructure planning;
- Summary of the infrastructure augmentations likely required to the NBN network to service the development;
- Funding arrangements for infrastructure upgrades to meet the increased telecommunications demand; and
- Guidance on timeframes for forward planning of infrastructure works.

AECOM welcomes further discussion and collaboration with NBN Co as part of the precinct planning and are happy to meet with NBN Co and Landcom to discuss the implications of this feasibility application.

Should you have any queries in relation to this application please do not hesitate to contact me on the details below. We look forward to working with NBN Co on this development.

Yours faithfully



Daniel Fettell
Principal Engineer
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