Woodstock Precinct Structure Plan

Utilities Servicing and Infrastructure Assessment

Project Number: CG130061

Prepared for Metropolitan Planning Authority

9 September 2014

Cardno Victoria Pty Ltd

ABN 47 106 610 913
150 Oxford Street, Collingwood
Victoria 3066 Australia
Telephone: 03 8415 7777
Facsimile: 03 8415 7788
International: +61 3 8415 7777
victoria@cardno.com.au
www.cardno.com.au

Document Control

Version	Date	Description	Prepared	Reviewed	Principal Approval
A	1/03/13	Draft Report	A Kane	S Warner	
B	10/04/13	GAA Review	A Kane	S Warner	
C	19/04/13	GAA Draft issue	A.Kane	S.Warner	R.Lowe
D	23/06/14	Revised following stakeholder review	A Kane	S.Warner	
E	4/09/14	Revised following MPA review	A Kane	S.Warner	S.Warner
F	9//09/14	MPA references updated	A Kane	S.Warner	S.Warner

Table of Contents

Annexes

Executive Summary

Cardno has been commissioned by the Metropolitan Planning Authority to investigate and report on the feasibility of servicing development in the Woodstock Precinct (PSP 1096). Services investigated are main drainage, drinking water, recycled water, sewerage, electricity, gas and telecommunications.

Investigations have determined that the infrastructure required to cater for the proposed development of the Woodstock Precinct can be provided, based on the strategies prepared for the Precinct by the relevant authorities.

The following significant constraints regarding development of the Precinct have been identified for consideration:

- Timing of strategic water supply infrastructure works which are required for the development and are not currently programmed for early construction
- Existing transmission gas pipeline passing north-south through the site and the associated 35 metre wide easement, with two proposed citygate pressure reducing stations (one proposed south of Donnybrook Road and the other potentially located within the Precinct), and the adjoining buffer zone with development type restrictions.
- Land required to be reserved for stormwater retarding basins and wetlands.
- Land required for the water supply east-west feeder main through the middle of the precinct, water supply distribution mains along Donnybrook Rd, and a booster pump station.
- Land required for buffer for the sewer pump station servicing the south east corner of the Precinct.
- Congestion of utility services in Donnybrook Road.

1 Introduction

The Metropolitan Planning Authority (MPA) is overseeing the preparation of a Precinct Structure Plan for Woodstock (PSP 1096). To assist in this process, MPA has engaged Cardno to investigate and report on the requirements for the provision of services infrastructure to cater for new urban development in Woodstock Precinct.

As a part of this investigation, we have reviewed existing services asset information and liaised with the relevant authorities regarding servicing strategies to cater for the development of the land in question.

Services assessed are sewerage, potable water, recycled water, electricity, gas, telecommunications, and general stormwater management and drainage.

This report summarises the outcomes of this investigation.

2 Site Description

The area under consideration for the Precinct Structure Plan is within the City of Whittlesea. It is defined in the south by Donnybrook Road, and in the north and east by the Outer Metropolitan Ring Road (E6) reservation and Merriang Road. Adjoining to the west is the Donnybrook PSP (PSP1067) assessed separately by Cardno which separates Woodstock Precinct from the Melbourne-Sydney railway line. The Precinct boundary is approximately midway between the railway and Merriang Road.

The Woodstock PSP Precinct is approximately 759 hectares in gross area.

Existing land use is predominately agricultural and grazing with an extended area of rural-residential development (the township of Woodstock) along Merriang Road in the east of the Precinct.

3 Development Proposal

The primary proposed land use of the Woodstock Precinct is residential. It is expected that the precinct will eventually accommodate approximately 7,500 residential lots. There will be local town centres, community hub facilities, active recreation, passive reserves and conservation areas. The Donnybrook Principal Town Centre is expected to be the main commercial centre; this is located in the Lockerbie Precinct west of the railway line.

4 Services Infrastructure

Service infrastructure requirements for each service within the precinct are outlined within the following sections.

The general servicing strategy and any service infrastructure which may require specific land provision or which will impact on the nature of the adjoining development has been identified. Otherwise the local reticulation of services is generally assumed to occur within normal road reserve widths in accordance with normal practice.

4.1 Main Drainage

Melbourne Water is the responsible authority for the provision of main drainage for Woodstock Precinct.

Woodstock Precinct lies predominately within the Darebin Creek North catchment.

Some land along the western boundary of the Precinct falls within the Lockerbie East Development Services Scheme which is currently under investigation. The Lockerbie East Scheme is currently (August 2014) in the consultation period and is expected to be finalised by Melbourne Water shortly.

The balance of the land has not yet been investigated by Melbourne Water. It is expected that a new Development Services Scheme will be prepared to cover the Woodstock Precinct prior to development commencing.

Investigation of the Donnybrook Precinct by Melbourne Water identified the need for three retarding basins and wetlands, and some pipeline and channel alignments. It is reasonable to assume that similar requirements will be identified when investigation is done for Woodstock.

Melbourne Water Planning is shown in Annex 2. Retarding basins and wetlands shown in Annex 2 are approximate only and subject to change.

4.2 Yarra Valley Water strategy

Yarra Valley Water (YVW) is the water and sewerage provider for the Woodstock Precinct. There are no current YVW water or sewerage assets within the Precinct.

YVW is currently preparing strategies for sewerage, water supply and recycled water servicing for the entire Northern (Hume Highway) Corridor of which Woodstock forms a part. The strategies will form the basis of a five year Water Plan recently approved by the Essential Services Commission (ESC) for approval in April this year. The current strategy plans have been published on the YVW website as “Kalkallo” and “Hume” Infrastructure Plans.

While Yarra Valley Water has identified the assets required to service the Northern Corridor, it has not finalised all asset sizes or the land requirements for these assets.

The timing of the construction of the various elements will be determined in part by development demand. The Water Plan will programme works into 5 year periods e.g. 2013-2017, 2018-2022 etc. Most of the assets required for Woodstock Precinct will not be included in the 2013-2017 Plan.

The strategic assets will classified as "shared assets" and therefore YVW funded. However, bring-forward charges will be levied on the developer where the assets are required ahead of the YVW Infrastructure Works Programme to service a particular development. Under new ESC guidelines the developer must pay a bring-forward charge for assets which need to be constructed earlier that YVW programming.

The bring forward or incremental financing charge is calculated by

IFC = $(1 - [1/ (1+r)^n]) \times$ cost of capital being provided sooner than planned

where:
r = estimated pre-tax WACC
n = the number of years the asset is required sooner than planned.

In summary, full development of this and adjoining precincts will require very extensive capital works by Yarra Valley Water possibly partly funded by bring-forward contributions by developers. Works will require coordination with the YVW development programme.

Developers will be required to pay New Customer Contributions dependent on the lot area, which are set by the ECC as follows (New Urban Growth Boundary Zone): which are assessed as follows for 2013-14 financial year:

Lots smaller than 450 m^2

Water	$705.21
Sewer	$705.21
Recycled water	$640.64

Lots larger than 450 m^2

Water	$1320.23
Sewer	$1320.23
Recycled water	$640.64

4.2.1 Potable Water

Yarra Valley Water's proposed strategy for the Northern Corridor includes provision for Woodstock Precinct.

The closest existing water main to the precinct is at the corner of Brookville Drive and Donnybrook Road, approximately 4.3 km west of the south west boundary of the Precinct. This main is in any case not adequate to service the Precinct although some interim servicing of initial development may be possible.

Yarra Valley Water's servicing strategy is to construct supply tanks on Bald Hill within the nearby Lockerbie Precinct which is the highest point in the region. Land for the tank has not yet been purchased. The tanks will be charged by a feeder main from Yan Yean Reservoir to the east and this feeder main will traverse the Woodstock Precinct from east to west. Distribution mains will also be required to service the Precinct, from Bald Hill south to Donnybrook Road, along the Donnybrook Road frontage of Donnybrook Precinct, including a rail crossing, and within the development.

An additional smaller reservoir on Hayes Hill within Woodstock Precinct has also been proposed although visual amenity considerations have not yet been resolved.

These works are not included within the 5 year plan and the estimated period for construction is 2018-2023. Early development of the Woodstock Precinct will be dependent on bringing forward the programming of the initial Bald Hill tank and the Yan Yean-Bald Hill transfer main.

An interim arrangement to service initial development within the Precinct using a connection to the 600mm diameter water main at Brookville Drive may be investigated. Modelling by Yarra Valley Water will be required to determine the available capacity in this system but available capacity would be competed for by neighbouring precincts. Adoption of this system as an interim supply would also require early construction of the water main along Donnybrook Road constituting 5 km of main including a railway crossing to bring an interim supply to the site. In a letter to MPA dated 2 August 2013, YVW estimated that this system could cater for an initial 500 lots. The actual number would depend on many factors including competition from development in other precincts.

Land allocation will be required to allow for water supply assets. Currently YVW planning is not yet at the point where these land requirements can be quantified.

Pipeline alignments shown on YVW strategy plans should be regarded as tentative and would be adjusted to coincide with road alignments. The east west pipeline and major water mains through the site may need to be considered when determining road reservation widths to make allowance for these assets. Significant pipelines are shown in Annex 3 and are

- Yan Yean to Bald Hill transfer main, tentatively 900mm diameter, location adjacent to OMR at northern fringe of precinct. Conservation issues may need to be addressed. Main is likely to require a pipe reserve.
- Bald Hill to Hayes Hill transfer main, traversing the site, tentatively 450mm diameter, likely to require pipe reserve,
- East-west distribution main, tentatively 525 mm diameter, along Donnybrook Road alignment but not crossing railway at Donnybrook Road.
- Second east west distribution main, tentatively 300-375mm diameter, along Donnybrook Road alignment including rail crossing.
- East-west distribution main, tentatively 300-450mm diameter, approximately 1.6 km north of Donnybrook Road. Location probably in road reserve and location will be adjusted to match road layout. Access to rail reserve for crossing is required.
- North-south distribution main, tentatively 600mm diameter, between Hayes Hill and Donnybrook Road. May be within Donnybrook Precinct or may be in Woodstock Precinct. Location will be shared with the pipe reserve required for recycled water (4.2.2).

Currently YVW planning of water main sizes is tentative, however the increased road reserve widths is unlikely to exceed 2 metres for single feeder water mains. The Yan Yean-Bald Hill pipeline may require a dedicated Pipe Track rather than be contained in a road reserve; this will need to be confirmed by YVW, and the alignment considered through the site.

The Yarra Valley Water strategy requires a booster pumping station along the boundary of the Donnybrook and Woodstock precincts. The location indicated on the YVW strategy plan is preliminary and it is not definite whether the pump station will be in Donnybrook or Woodstock precinct. This pumping station will require some land allocation including a buffer zone. The size of the buffer zone is not yet known but a radius of 50 metres may be indicative. There may be scope to have the buffer zone coincide with other land uses such as passive recreation.

Yarra Valley Water is considering early installation of the distribution main along Donnybrook Road, from Brookville Drive to Hayes Hill, in conjunction with the APA gas main works. If installed this main will provide for the ultimate solution as well as facilitating the interim supply arrangement for initial development.

Yarra Valley Water is installing a scheme to augment the drinking water supplies with treated water from storm water harvesting. Construction of this system is currently proceeding near the Hume Freeway/Donnybrook Road intersection at Kalkallo.

An extract from the YVW Water Supply Strategy Plan covering the Donnybrook and Woodstock Precincts is attached in Annex 3.

4.2.2 Recycled Water

The Precinct is within a Class A Recycled Water mandated area. Developers will be required to provide dual pipe systems to all allotments.

Yarra Valley Water proposes to supply Class A Recycled water to the development area. This water would be treated sewage from the Kalkallo Sewerage Treatment Plant (refer to 4.2.3) pumped to a recycled water tank on Bald Hill. There is also provision to augment this supply with a pipeline from Mount Ridley tank to the south.

Transfer mains from the sewerage treatment plant to Bald Hill, and from Bald Hill to the Precinct

As with potable water, a reservoir is planned on Hayes Hill and a booster pumping station is planned which would be located along the west boundary of the Woodstock Precinct. Whether the location is within the Woodstock or Donnybrook precincts is not yet determined. It is expected that the land for the potable and recycled water booster stations would be shared. The pump station would be required for development of land higher than 256 metres AHD – i.e. the northern portion of the Precinct only.

Internal distribution mains include

- A 300mm main on an east west alignment approximately 1.6km north of Donnybrook Road, in a road reserve
- 375mm transfer main from Kalkallo STB to Hayes Hill Reservoir, requiring a pipe reserve along a north south alignment and along Donnybrook Road
- 300-375mm distribution main along Donnybrook Road, in the road reserve

In the event of allotments being released prior to availability of Class A recycled water, a temporary cross connection from the drinking water system would be required. Delays in the availability of Class A recycled water or the external infrastructure should not be a constraint on development timing.

An extract from the YVW Recycled Water Supply Strategy Plan covering the Donnybrook and Woodstock Precincts is attached in Annex 4.

4.2.3 Sewerage Reticulation

Yarra Valley Water's proposed sewerage strategy for the Northern Corridor includes provision for Woodstock precinct.

Elements of the YVW strategy critical to serving Woodstock PSP are:

- Amaroo Branch Sewer (tentatively 1500mm diameter) is proposed to transfer sewage south parallel with the railway alignment to existing development in the Craigieburn area and thereby connect with the greater Melbourne system. The Amaroo Branch Sewer is to be included in the current 5 year plan (up to 2017) and is expected to be constructed within 3-5 years. The Amaroo Branch Sewer will not be sized to provide capacity for total sewerage disposal for the corridor.

- Kalkallo Sewerage Treatment Plant is proposed to be located approximately 1km south of the Donnybrook Road and east of the railway line. The plant will service all land in the Corridor north of Donnybrook Road extending north as far as Wallan. The purpose of the plant is to remove volume from ultimate sewer discharges and, utilising sewer mining and treatment, create flows for local distribution to allotments as Class A Recycled water. Balance of flows including solids will be discharged to the Amaroo Branch Sewer.

The Kalkallo Sewerage Treatment Plant is not included in the proposed YVW 5 year plan and the estimated date for construction is 5-10 years. Actual construction date is likely to be determined by development demand.

Although the long term sewer strategy requires the Kalkallo Treatment Plant, some degree of development can take place utilising the Amaroo Branch Sewer temporarily as the sewerage outlet.

- Sewer pump station required for the south eastern part of the precinct near the Donnybrook Road/Merriang Road intersection, together with a rising main along Donnybrook Road. The pumping station itself will require a very small land allocation but EPA requirements may dictate a emergency storage provision, and a buffer zone may also be required to housing development. YVW has not yet assessed the land requirements for the pump station.

The following elements will be required within Woodstock Precinct, none of which are in the current 5 year programme:

- Branch sewer along much of the length of Donnybrook Road including a railway crossing
- Internal branch sewers

For a typical gravity-fed sewerage system, development would preferably commence in the south west corner of the precinct and proceed progressively east and north. If the development order is different to this (for example due to land parcels under different ownership), either temporary facilities or sewers through undeveloped land may be required.

An extract from the YVW Sewer Strategy Plans for Kalkallo and detail for Donnybrook-Woodstock are attached in Annex 5.

4.3 Electricity Supply

SP Ausnet is the responsible authority for the provision of electricity supply facilities to Woodstock.

SP Ausnet has provided its 30 year strategy plan for the area. The strategy plan includes a zone substation adjacent to the precinct, south of Donnybrook Road and west of Merriang Road. The location indicated is not within the Precinct, but due to the preliminary nature of SP Ausnet's planning the location must be regarded as tentative.

A network of underground high voltage cables and kiosk substations will be extended across the precinct to provide the backbone of the electricity supply network for development.

As an interim measure, it is expected that the 22kV overhead supply along Donnybrook Road and the existing Kalkallo substation, can provide electrical supply to initial development. Upgrade of this alignment to 66kV in the near future is planned and ultimate development provision of a further two 22kV supply lines (three 22kV lines and one 66kV line are ultimately required).

SP Ausnet does not support undergrounding of 66kV lines. If undergrounding is required, e.g. for aesthetic reasons, the cost would need to be borne by other parties.

An extract from SP Ausnet's current network planning is shown in Annex 6.

4.4 Gas Supply

APA Group is the responsible authority for the provision of gas supply facilities to Woodstock Precinct.

An existing APA transmission pressure gas main (Keon Park-Wodonga West transmission main, 300mm diameter) traverses the adjoining Donnybrook Precinct from north to south. A short portion is located in Woodstock precinct in a 35 metre easement (Annex 7).

The 35 metre easement is unavailable to development due to APA requirements to access the easement and pipeline for maintenance and future upgrades. Additionally a buffer or "measurement length" will be required on either side of the easement. The eventual form of development within the buffer will likely meet the Australian Standard AS2885 for pipelines and will be determined through the precinct structure planning process, with input from APA and Energy Safe Victoria

Gas reticulation to the local development requires a pressure reduction station or citygate to be installed on the APA high pressure gas main. APA Group has planned to install this in the vicinity of the Donnybrook Road crossing and have advised the location is likely to be on the south side of Donnybrook Road.

APA has indicated that a second citygate is required within the Donnybrook precinct to service Donnybrook, Woodstock and adjacent precincts. An indicative area for the citygate and buffer zone, advised by APA would be in the order of 50m by 50m, the actual location is yet to be determined by APA.

A proposed east / west distribution gas main is to be constructed by APA along Donnybrook Rd, initially required to service the Merrifield development to the west, commencing at the point the north south pipeline crosses Donnybrook Road. A pipeline east from this point can be inferred. APA has advised the distribution main is to be located on the north side of Donnybrook Road. The gas main offset and alignment along Donnybrook Rd will require coordination with future road widening and other planned Authority infrastructure proposed along Donnybrook Road.

4.5 Telecommunications

NBN Co. will be the provider of last resort of telecommunications facilities to the Precinct with Woodstock identified as being within the NBN 'fibre footprint' and where development is expected to exceed 100 premises. NBN does not release planning information except in response to specific development applications.

Developers within the precinct will be required to install pit and pipe infrastructure as a part of their subdivisional works with the installation of fibre optic cable to be carried out by NBN Co. including any backhaul works connecting to the external NBN Co. network.

Developers also have the option of alternative arrangements for fibre optic systems with other telecommunications providers.

There are currently two 100 mm Telstra conduits located in the road reserve along Donnybrook Road. These provide for local services to existing properties and the existing cables are unlikely to be of value for subdivisional development. Telstra has indicated that four 100 mm conduits will ultimately be required for servicing with fibre optic if Telstra is engaged as the service provider.

4.6 Whittlesea City Council

Whittlesea City Council (WCC) is responsible for the Woodstock Precinct.

WCC requirements include the provision of communications conduit. WCC has advised that this requirement would be satisfied by a formal agreement with NBN Co for each development.

5 Staging and Order of Development

For the non-gravity-based services, it is expected that services will become available at the Donnybrook Road frontage. Road networks and development will then extend northward from Donnybrook Road.

For sewerage and drainage, which are gravity controlled, development would best commence at the south west corner and extend northwards and eastwards. If this does not occur, sewerage and drainage connections through undeveloped land will be required in advance of development to service the initial development areas.

Water supply for the whole area, including precincts to the west, will depend on construction of the supply tanks at Bald Hill and the Yan Yean-Bald Hill pipeline though the Donnybrook Precinct. This will necessitate a pipeline reserve, whether an internal road or dedicated Pipe Track being locked in at an early stage.

6 Service locations in Donnybrook Road

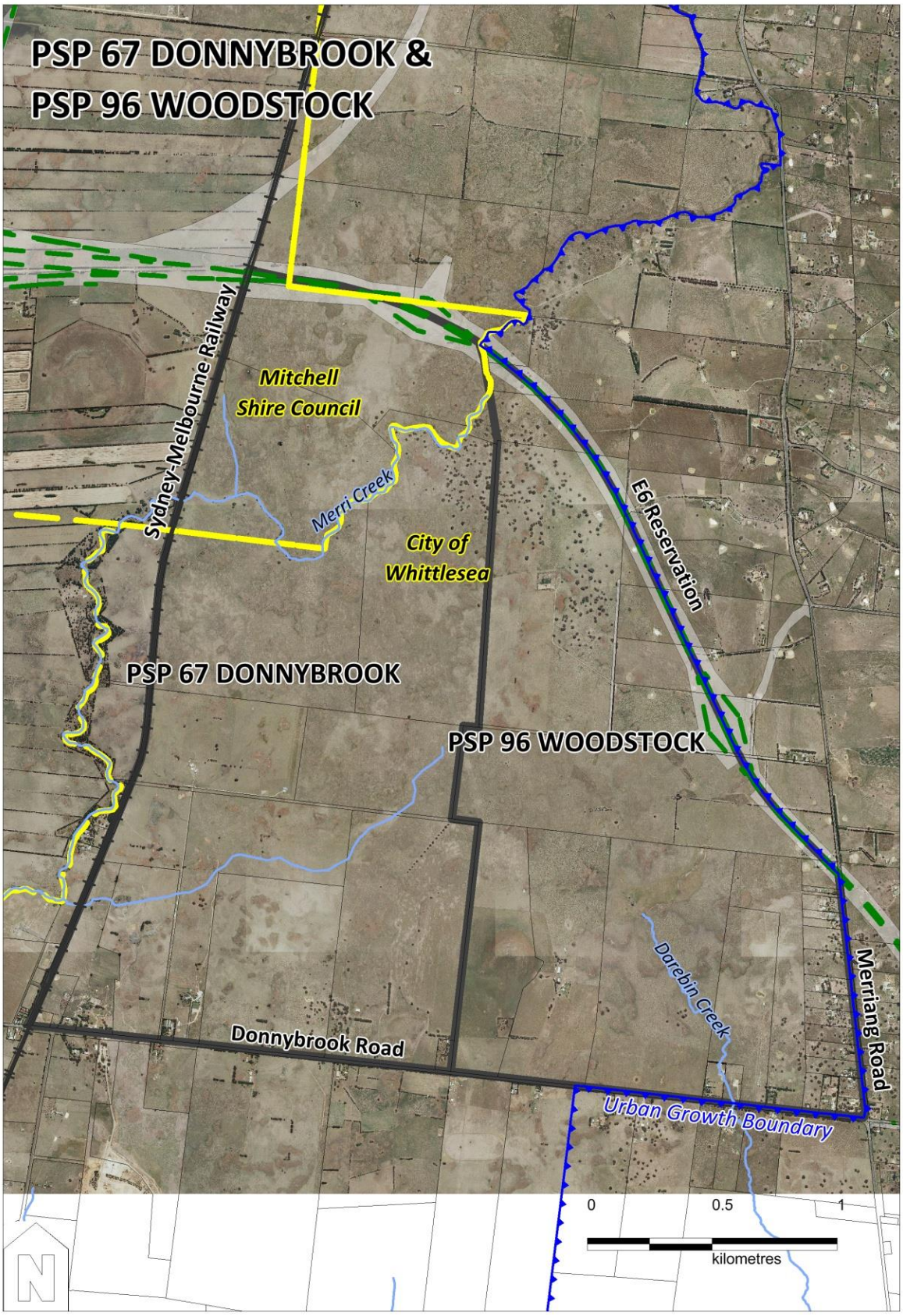
Space for provision of utility services in Donnybrook Road has been identified as a significant concern. Existing services in Donnybrook Road are 22kV overhead electricity, and Telstra conduits. Provision will need to be made for additional 22kV and 66kV electricity, telecommunications, gas, drinking water, and recycled water mains and sewers as well as street lighting.

There is very limited space on the north side of the existing carriageway for these services. Location of utility services under the carriageway is generally opposed by the utility companies , VicRoads and Council. Location on the south side of the carriageway is not practicable because VicRoads has yet to acquire the future road widening into private property and in some cases would require the removal of existing buildings.

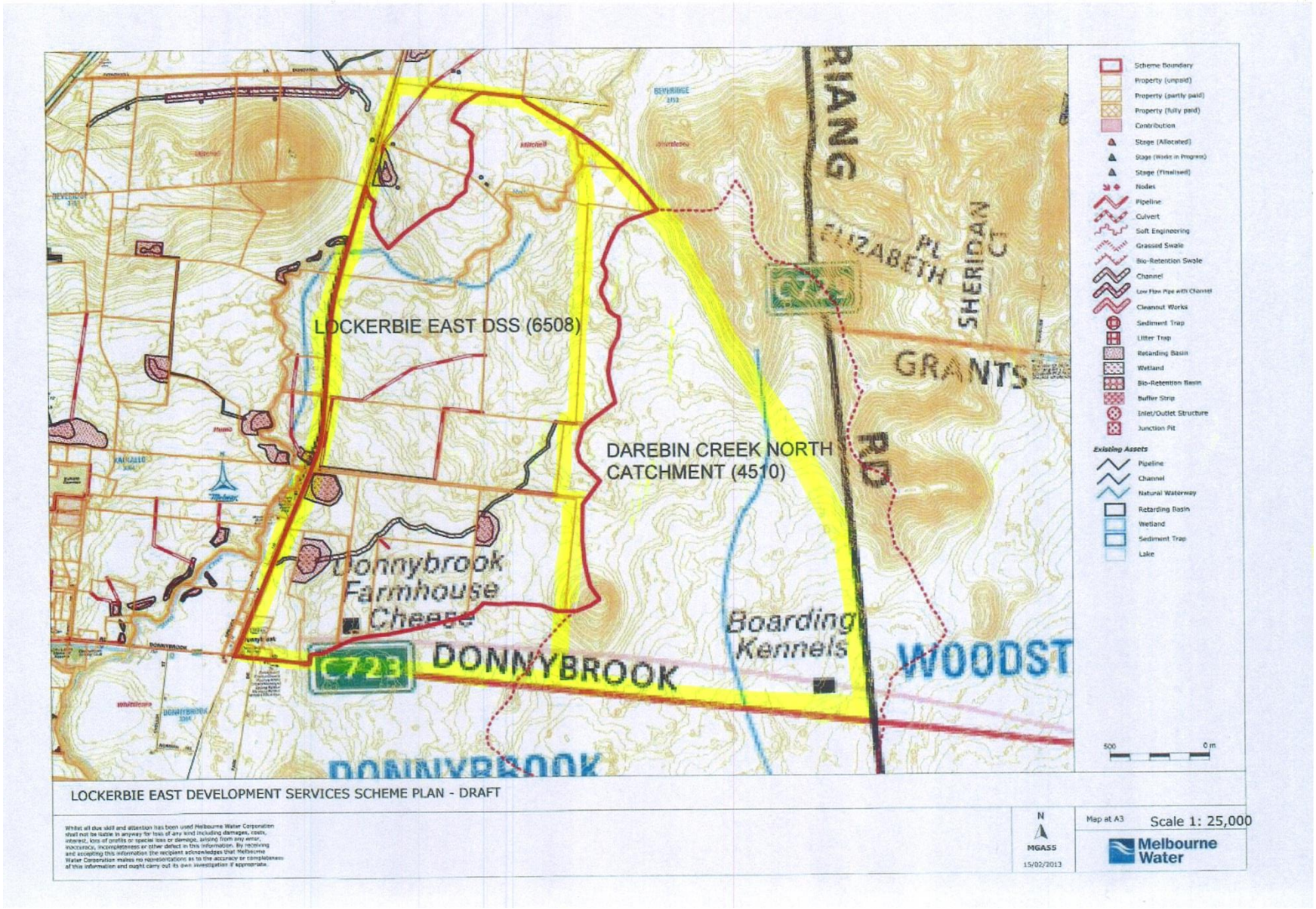
A possible solution is the creation of a service corridor along the northern boundary. Some or all of the utility services would be constructed in this corridor. In the long term this land would become either tree reserve, lot setback or local service road, so there would be no loss of developable land. Estimated minimum width of the corridor is 6 metres.

A proposed layout scheme for the services in Donnybrook Road is shown in Annex 8.

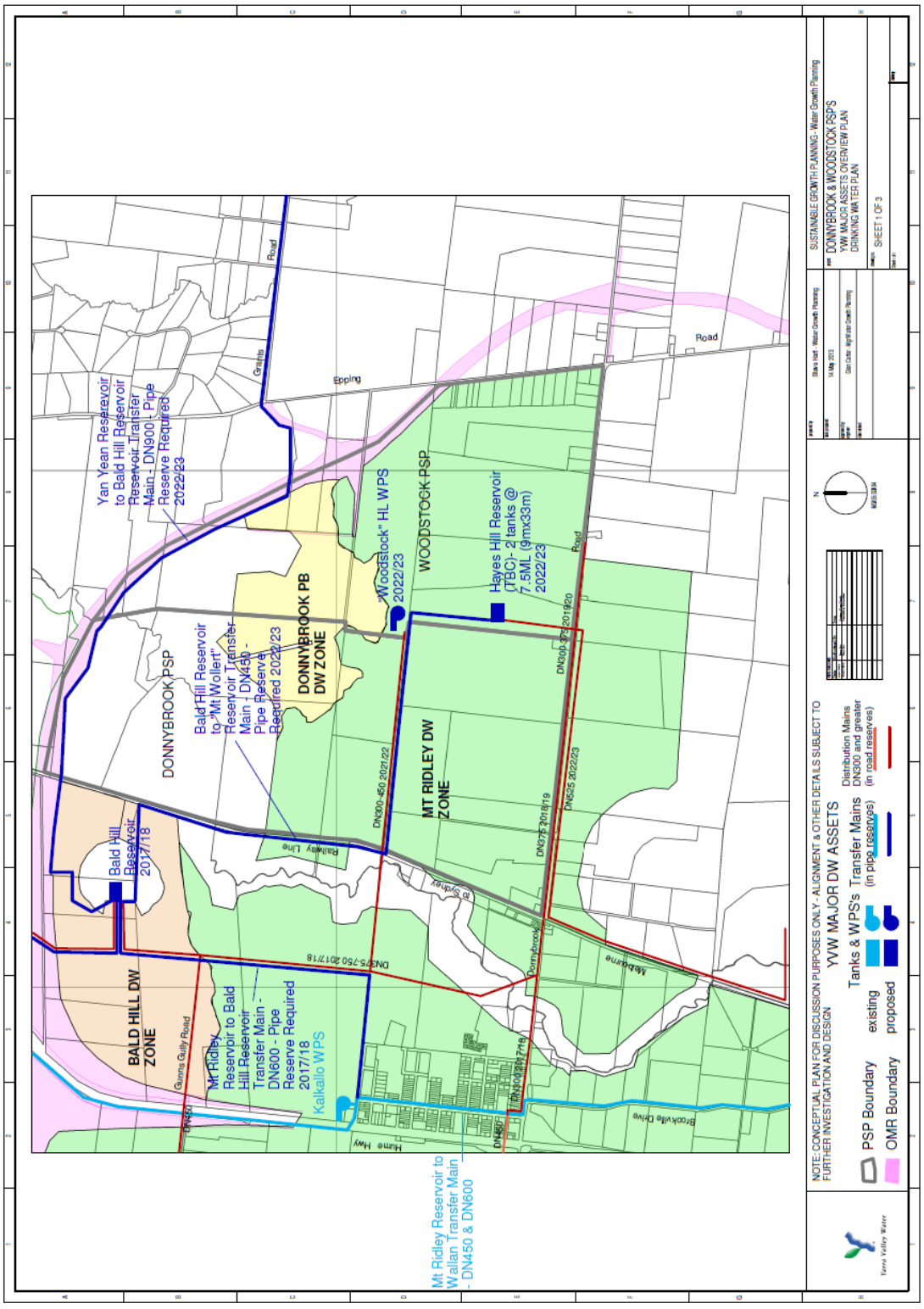
Annex 1:
Site Area Plan


PSP 67 DONNYBROOK &
PSP 96 WOODSTOCK
Sydney-Melbourne Railway
Mitchell
Shire Council
Merri Creek
City of
Whittlesea
E6 Reservation
PSP 67 DONNYBROOK
PSP 96 WOODSTOCK
Darebin Creek
Merriang Road
Donnybrook Road
Urban Growth Boundary
0
0.5
1
kilometres
N

Annex 2:
Melbourne Water planning

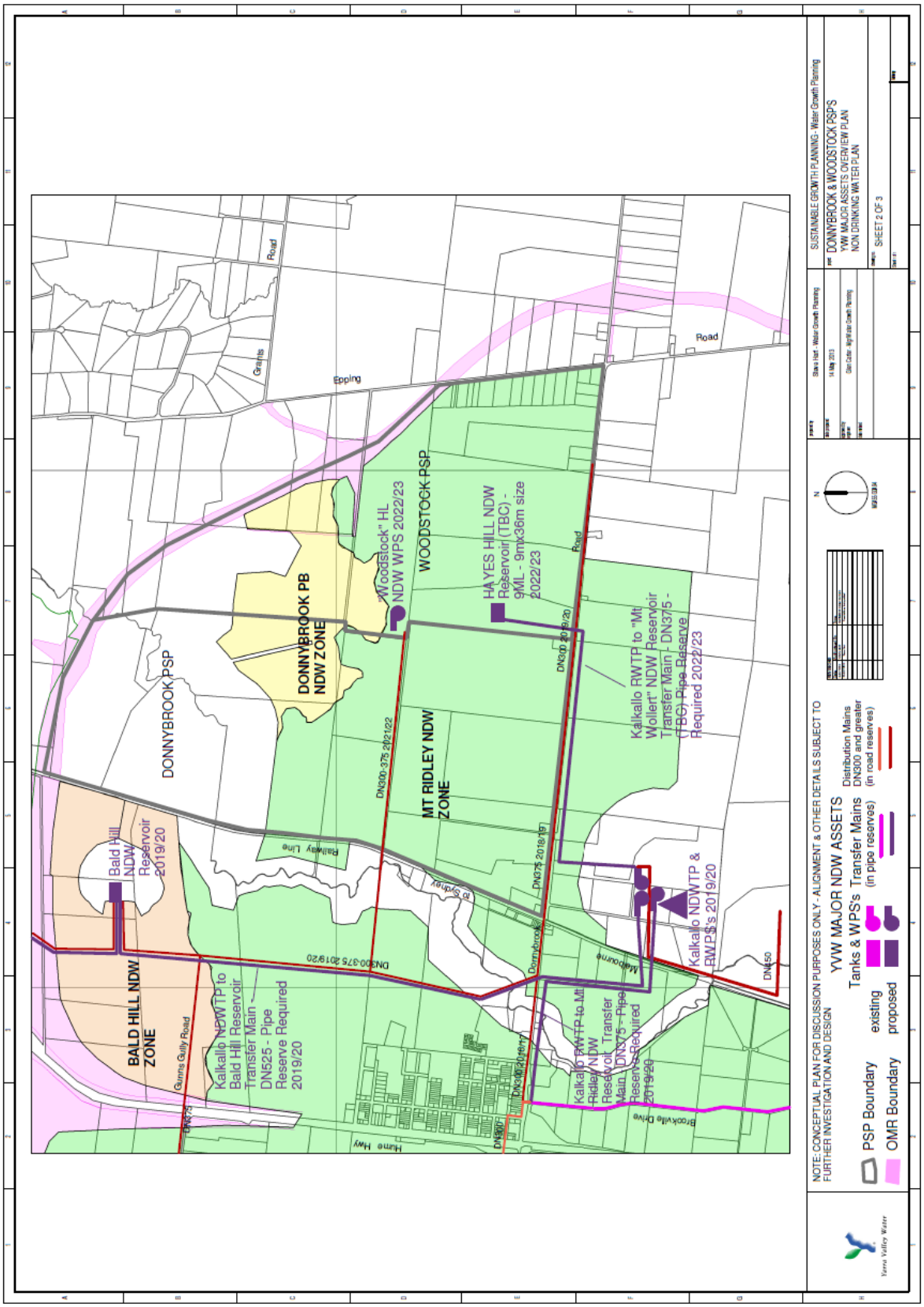

LOCKERBIE EAST DSS (6508)
DAREBIN CREEK NORTH CATCHMENT (4510)
Donnybrook Farmhouse Cheese
Boarding Kennels
C723
DONNYBROOK
WOODST
GRANTS
RD
PL
SHERIDAN
Scheme Boundary
Property (unpaid)
Property (partly paid)
Property (fully paid)
Contribution
Stage (Allocated)
Stage (Works in Progress)
Stage (Finalised)
Nodes
Pipeline
Culvert
Soft Engineering
Grassed Swale
Bio-Retention Swale
Channel
Low Flow Pipe with Channel
Cleanout Works
Sediment Trap
Litter Trap
Retarding Basin
Wetland
Bio-Retention Basin
Buffer Strip
Inlet/Outlet Structure
Junction Pit
Existing Assets
Pipeline
Channel
Natural Waterway
Retarding Basin
Wetland
Sediment Trap
Lake
500
0 m
LOCKERBIE EAST DEVELOPMENT SERVICES SCHEME PLAN - DRAFT
Whilst all due skill and attention has been used Melbourne Water Corporation shall not be liable in anyway for loss of any kind including damages, costs, interest, loss of profits or special loss or damage, arising from any error, inaccuracy, incompleteness or other defect in this information. By receiving and accepting this information the recipient acknowledges that Melbourne Water Corporation makes no representations as to the accuracy or completeness of this information and ought carry out its own investigation if appropriate.
N
MGASS
15/02/2013
Map at A3
Scale 1: 25,000
Melbourne Water

Annex 3:
Yarra Valley Water
Potable Water Supply Strategy Plans
Donnybrook and Woodstock



Extract - *Yarra Valley Water Donnybrook-Woodstock potable water infrastructure supply strategy May 2013*

Annex 4:
Yarra Valley Water
Recycled Water Supply Strategy Plan
Donnybrook and Woodstock

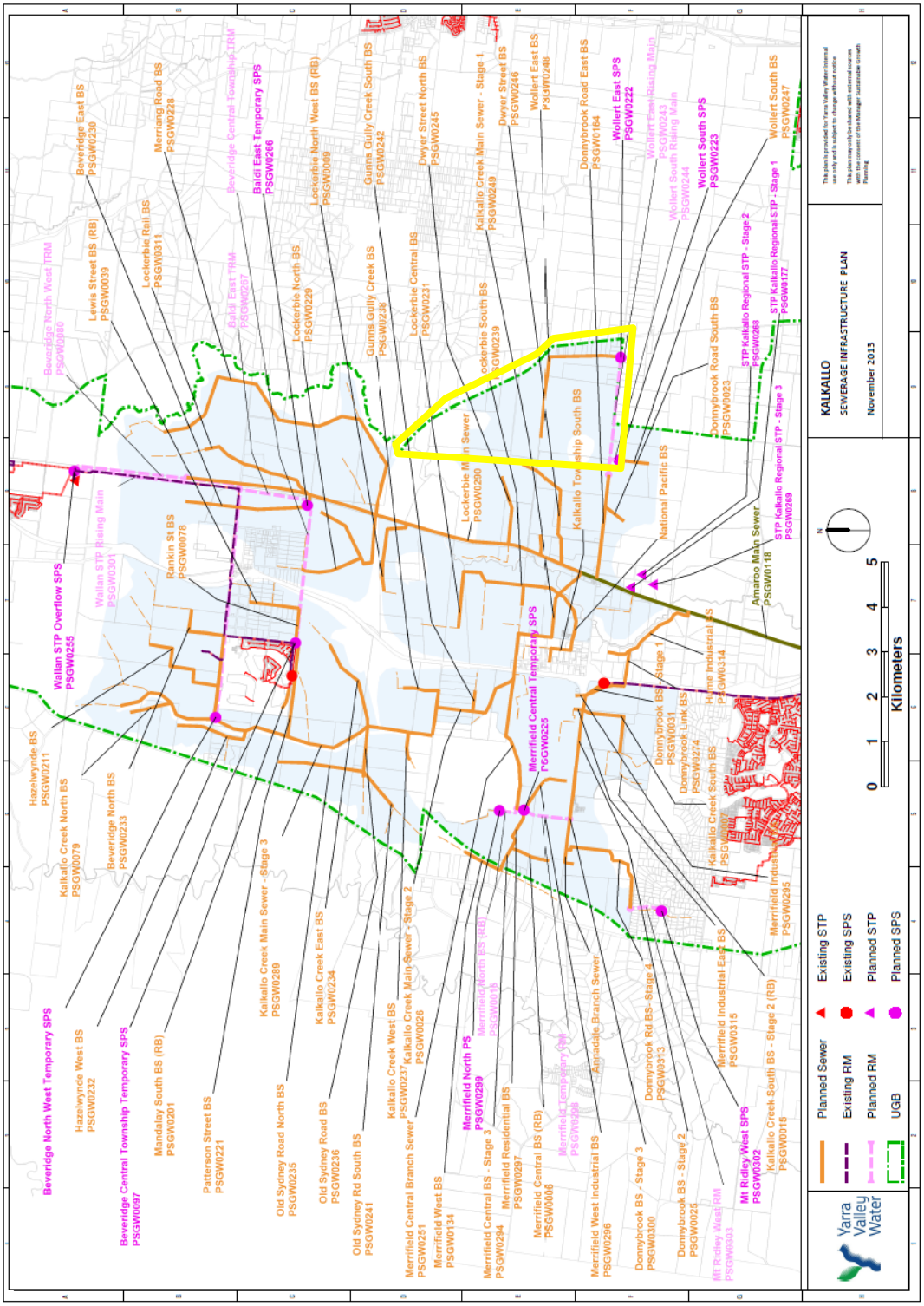


Extract - *Yarra Valley Water Donnybrook-Woodstock non drinking water infrastructure supply strategy May 2013*

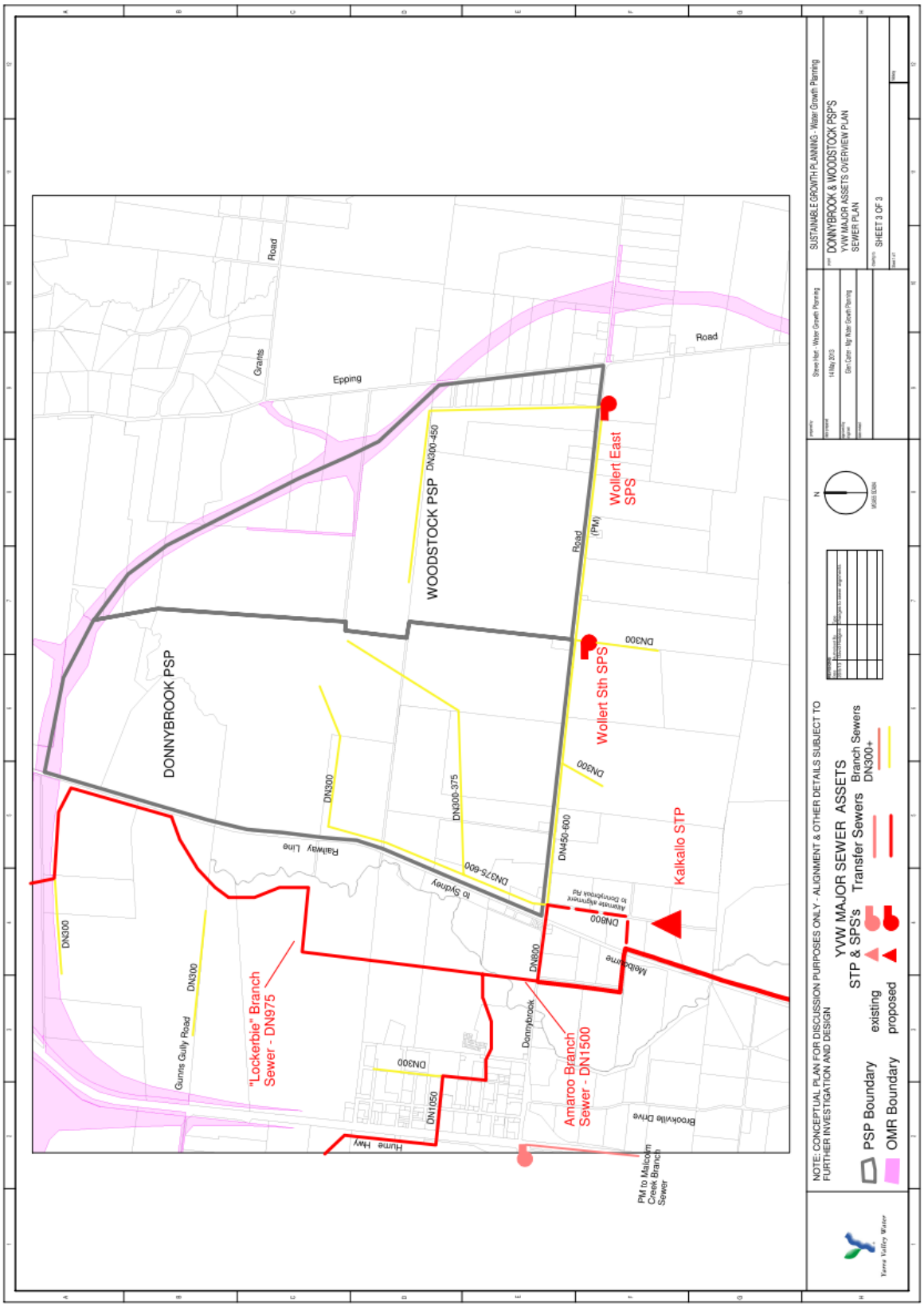
Annex 5:
Yarra Valley Water

Sewerage Infrastructure Plan

Donnybrook and Woodstock



Extract - *Yarra Valley Water Kalkallo sewer infrastructure strategy November 2013*



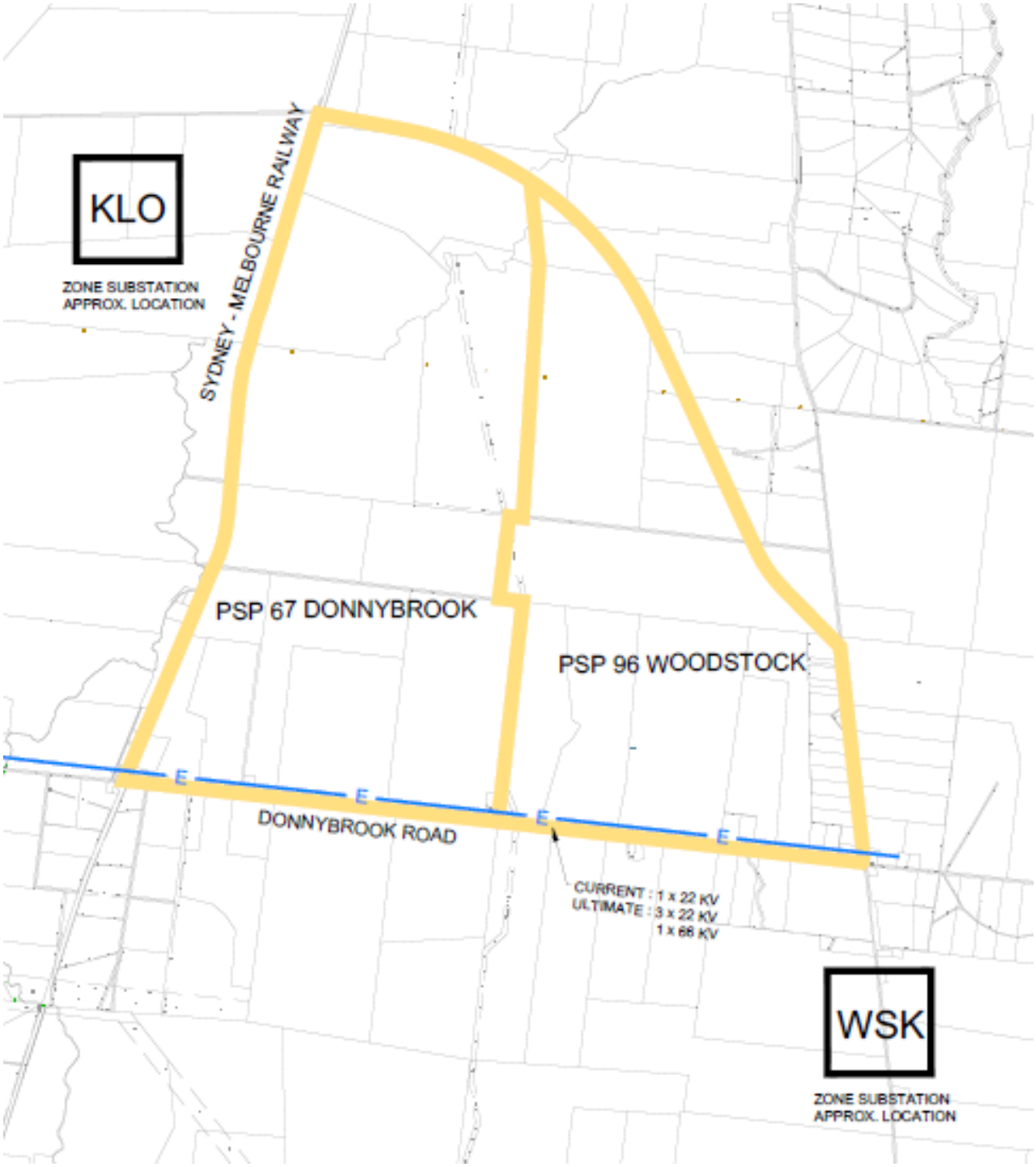
Yarra Valley Water Donnybrook-Woodstock sewer infrastructure strategy May 2013

Annex 6:

SP Ausnet

Electricity Supply Strategy Plan

Kalkallo

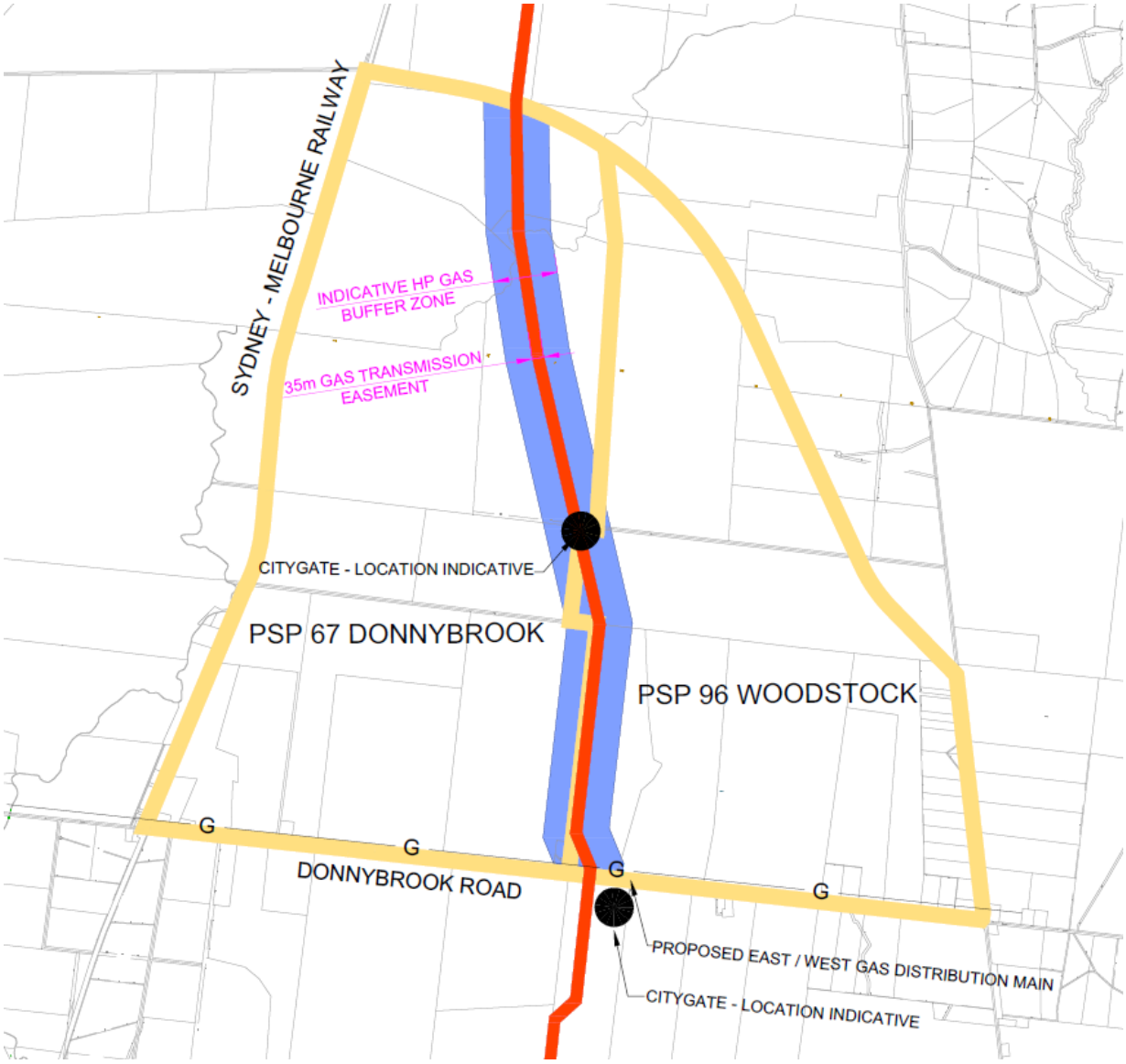


SP Ausnet Distribution network 30yr strategy development plan, Submission System 2011-2041

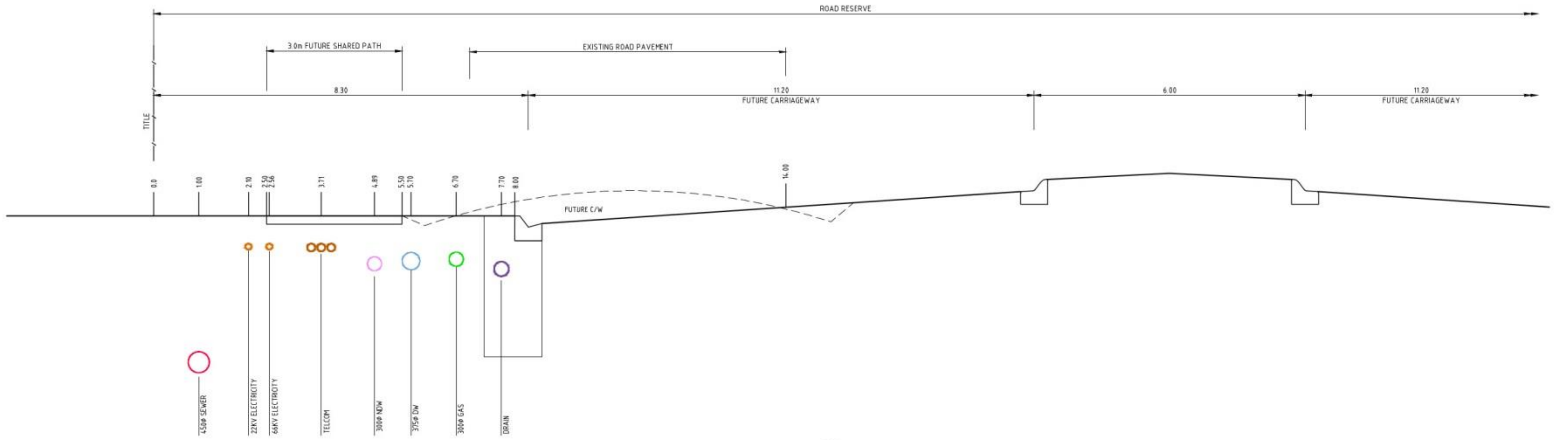
Annex 7:
APA

Gas Transmission & Distribution Pipeline

Kalkallo


SYDNEY - MELBOURNE RAILWAY
INDICATIVE HP GAS BUFFER ZONE
35m GAS TRANSMISSION EASEMENT
CITYGATE - LOCATION INDICATIVE
PSP 67 DONNYBROOK
PSP 96 WOODSTOCK
G
G
G
G
DONNYBROOK ROAD
PROPOSED EAST / WEST GAS DISTRIBUTION MAIN
CITYGATE - LOCATION INDICATIVE

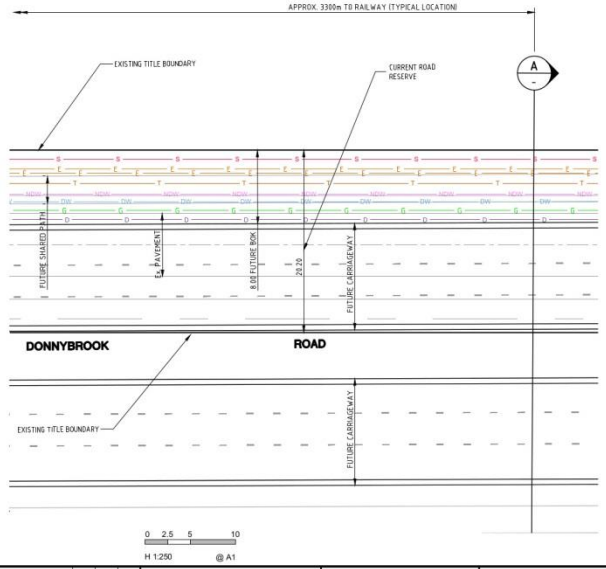
Annex 8
Utility services location – Donnybrook Road



SECTION A
SCALE: 1:50

0 0.5 1 2

H 1:50 @A1



0 2.5 5 10

H 1:250 @ A1

SERVICE ALLOCATION - DONNY BROOK ROAD
RAIL CROSSING TO HAYES HILL VICINITY

SERVICE	DIA/RATING	OUTER DIA	APPROX. COVER	CONSTRUCT	OFFSET FROM NORTH TITLE	MINIMUM CLEARANCE	ADOPTED CLEARANCE	COMMENT
SEWER	0.45	0.48	3.0	2019	1.0	0.80		
							0.78	
ELECTRICITY	22KV	0.16	0.60	2015	2.10	0.75		IN 150 CONDUIT
							0.30	
ELECTRICITY	66KV	0.16	0.60	2019	2.56	0.75		IN 150 CONDUIT
							0.75	
TELCOM	3 x 0.15	0.65	0.60	2019	3.11	0.30		ALLOW 3 x 150 CONDUITS WIDE, 0.1 SEP, TOTAL 0.6 VERT AS REQUIRED
							0.70	
NDW DISTRIBUTION	0.30	0.32	0.90	2019	4.89	0.45		
							0.45	
DW DISTRIBUTION	0.375	0.40	0.80	2019	5.70	0.45		
							0.64	
GAS	0.30	0.33	0.80	2019	6.70	0.30		
DRAIN	UNKNOWN		1.0	2040	7.70			SIZING UNKNOWN, PART OF ROAD CONSTRUCTION - BOK+8.0

Rev.	Date	Description	Dm.	Des.	Appr.
P1	28.10.13	PRELIMINARY ISSUE	HM	AK	

WARNING - EXTERNAL APPROVAL
THIS DRAWING IS SUBJECT TO THE APPROVAL OF **GROWTH AREA AUTHORITY** AND IS A PRELIMINARY ISSUE

Cardno
Shaping the Future
ABN: 47 106 610 913
150 Oxford Street, Collingwood, VIC Australia 3066
Phone +61 3 9415 7777 Fax +61 3 9415 7788
Email: victoria@cardno.com.au Web: www.cardno.com/victoria

Drawn: H. MINA
Designed: A. KANE
Checked:
Authorised:

Client: GROWTH AREA AUTHORITY
Project: DONNYBROOK ROAD
HAYES HILL VICINITY TO MERRIANG ROAD
Title: SERVICES COORDINATION PLAN

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Date: OCT. 2013
Scale: AS SHOWN
Size: A1
Project Number: CG130061
Sheet Number: C 03
Revision: P1

DATE PLOTTED: 29 October 2013 11:49 AM BY: HANAA MINA (MELBOURNE)
XREFs: Donnybrook Road_3004773_X_PL_00_FUNCTIONAL_DESIGN; 3004773_X_PL_00_GEOMETRIC_DESIGN; 3004773_X_ROAD_NAMES; 3004773_X_PL_00_FUNCTIONAL_DESIGN_EXTRA
CAD FILE: O:\DRAC\VIL\2013\CG130061\CG130061C03.dwg