



WALLBRIDGE & GILBERT
Consulting Engineers

Planning Aspects Pty Ltd

VICTOR HARBOR RESIDENTIAL CAPITAL STRATEGIC REVIEW



INFRASTRUCTURE ASSESSMENT REPORT

Job No. WAD141024
Rev C
22nd March 2016



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1

INTRODUCTION

Wallbridge and Gilbert (W&G) has been engaged by Planning Aspects Pty Ltd to complete an infrastructure assessment review on three potential development sites within Victor Harbor identified as a part of the larger residential land capacity study. Figure 1 below identifies the three sites which include:

- Site 1 Waitpinga Road – 59.2 ha / 690 allotments
- Site 2 Hindmarsh Valley (Deferred Urban) – 220.7 ha / 2000 allotments
- Site 3 Hindmarsh Valley (Rural Living) – 63.3 ha / 610 allotments

The sites have been identified to cater for the future population growth, with land usage primarily residential with elements of mixed use and other supporting community developments such as education, medical facilities, and neighbourhood centres. For the purposes of engaging in discussion with various service authorities the site areas were converted into allotments yields based upon 11.6 allotments per hectare (Department of Planning, Transport and Infrastructure, area of residentially zoned broad hectare land in the Council area as a December 2014). Detailed locality plans of the proposed development sites are located in Appendix A.

A high level analysis of the respective land parcels has been completed largely based on information sourced through meetings and discussions with the relevant service authorities in attaining infrastructure constraints and potential augmentation works required to provide servicing infrastructure.

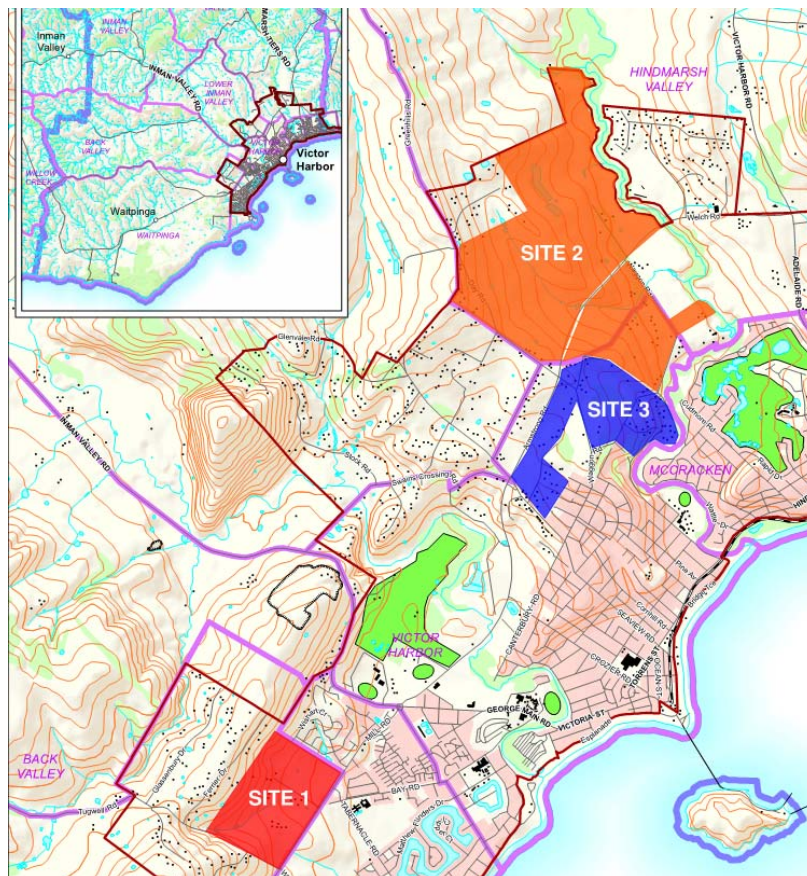


Figure 1 - Site Location

The following authorities have been consulted in seeking infrastructure input:

- Council infrastructure requirements – City of Victor Harbor
- Potable Water and Wastewater – SA Water
- Electricity Supply – South Australian Power Networks (SAPN)
- Gas – Environmental Land Services (ELS)
- Communications – National Broadband Network (NBN)

2 COUNCIL INFRASTRUCTURE

Council infrastructure requirements and background information on the land parcels have been obtained through discussions with Council's engineering staff, a review of the Victor Harbor Development Plan (consolidated 10th January 2013), the Council engineering standards publication (refer Appendix B) and the KBR Infrastructure Scoping Study Report (AEU507-U-REP-001 Rev 0, issued 21st July 2006).

2.1 General Stormwater Requirements

In accordance with the Victor Harbour Development Plan the following is noted:

Major Stormwater System Design (Clause 49)

The design of the land development should facilitate the major storm drainage system having the capacity to safely convey major stormwater flows. The design of the land division should facilitate the major storm drainage system having the capacity to safely convey stormwater flows for the 100 year ARI event, assuming 50% minor system blockage; and the major storm drainage system design outflow is matched to the capacity of any existing downstream system.

In order to maintain pre development flow conditions stormwater detention will need to be achieved via retarding basins or similar. Contained within the site locality plans in Appendix A are potential detention basin location based upon a high level review of the land topography.

Water Quality Management (Clause 52)

The design of the land development should facilitate the storm drainage system:

- (a) Maximising the interception, retention and removal of water-borne pollutants (including sediment, litter, nutrients, microbial contaminants and other potential toxic materials) prior to their discharge to receiving water, whether surface or underground;
- (b) Ensuring the continuation of, or assist in the establishment of, healthy and diverse wetland environments.

Current Water Sensitive Urban Design (WSUD) practices are to be incorporated into the stormwater master planning for future developments. WSUD is to be implemented based on an individual allotment assessment, ultimately aiding in the reduction of stormwater discharge flow rates and increasing the overall water quality leaving the urbanised developed site.

Further master planning and a detailed analysis of the larger catchment will need to be undertaken in order to consider pre and post development effects on the greater catchment. This will provide the basis for infrastructure structure plans to be established in optimising the infrastructure requirements and implementation strategies for the broader area.

Site One - Waitpinga

The western end of Site One is situated within the Tabernacle Road Drainage catchment as defined by the Ullman & Nolan (U&N) Tabernacle Road Drainage Strategy Report (VH 079, issued March 1994), refer Appendix B for a copy of the report catchment plan. The City of Victor Harbor has implemented the principles of the drainage strategy since the study was undertaken in 1994 and it has formed the basis for stormwater management in the previously built Tabernacle Estate development downstream. Therefore, it is important that the stormwater master planning of Site 1 is aligned with this drainage strategy to ensure downstream infrastructure is not compromised. The proposed scheme comprises a series of three detention

basins, one in each of the respective downstream parcels ensuring pre development flow rates are maintained post development.

The eastern end of Site One discharges into the Council's '10 Drain' with outfall along Bay Road. Council has advised that the drain does not have any known capacity issues. The implementation of detention (post to pre development) on the subject parcel will be required.

Site Two – Hindmarsh Valley (Deferred Urban)

Site Two is located on the western side of the Hindmarsh River, with site topography directing overflow towards this water course.

As outlined within the Development Plan the Hindmarsh Valley Concept Plan integrates future development with a linear reserve via the use of a shared path or walking trails providing pedestrian interconnection across the respective land parcels. As development is planned on the western side of the river, similar philosophies should be maintained in providing development interconnection.

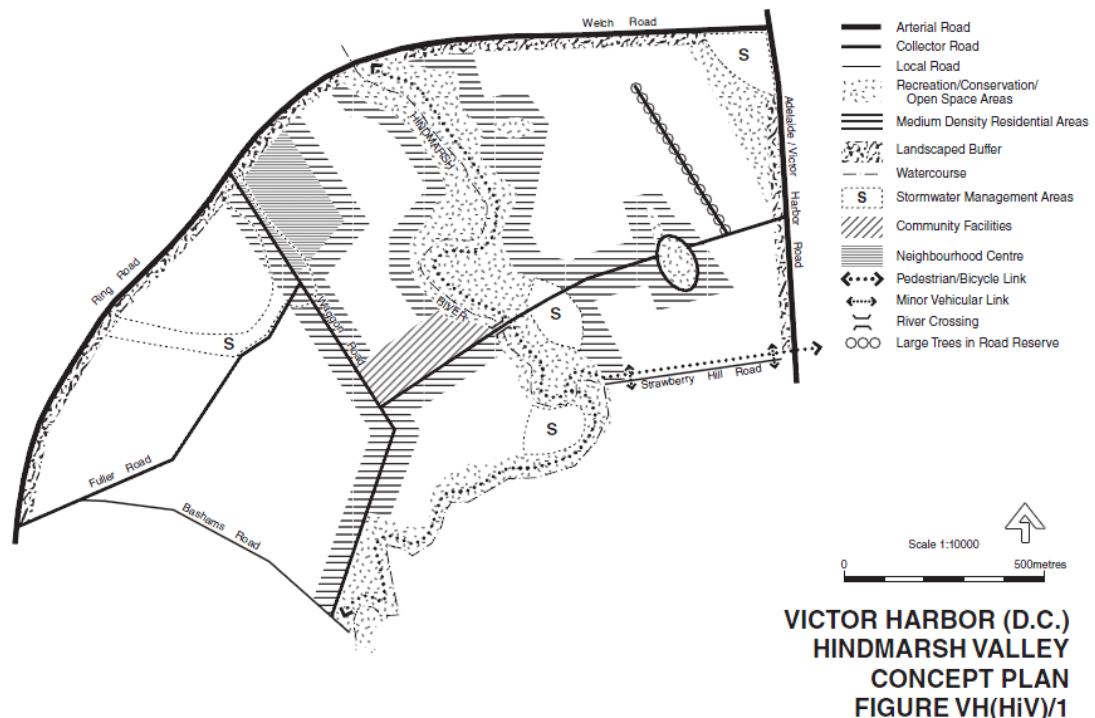


Figure 2 – Hindmarsh Valley Concept Plan

Council has advised that the low lying areas on the south eastern and south western intersection of Waggon Road and the Ring Road are prone to flooding (surface pooling). Development within these locations will need to be lifted/ built up and drainage infrastructure implemented accordingly.

Site Three – Hindmarsh Valley (Rural Living)

Site three is located directly above a developed area within Victor Harbor, hence effective flood mitigation control measures will need to be carefully designed to protect the lower lying areas.

Based upon the topography of the land it would appear a large percentage of the catchment finds its way into the Hindmarsh River. Water quality treatment and scour prevention solutions will need to be effectively established in order to maintain and enhance the condition of the existing water course.

Site Three contains a significant proportion of remnant vegetation, coupled with a number of existing occupancies thus providing a number of planning challenges in achieving yields to offset infrastructure costs to develop the land.

2.2 General Topography

The three identified parcels have effective fall across the sites with a number of areas where the terrain is quite steep. The following summary is provided on the respective parcels (refer Appendix A for further details):

Site 1 – Waitpinga

- Average slope across the site is in the order of 6%.
- The rear of the site is quite steep, approximately 10% before flattening off closer to Waitpinga Road.

Site 2 – Hindmarsh Valley (Deferred Urban)

- The majority of the site ranges between 6 to 10%.

Site 3 – Hindmarsh Valley (Rural Living)

- Site 3 is relatively flat ranging between 2 to 6%.

Council requirements for new road infrastructure are as follows:

- Minimum road grade = 0.7%.
- Maximum road grade = 15% (12% desirable).

As planning progresses minimum allotment sizes and associated density in areas where the slope is greater than 5% will need to be reviewed and established accordingly to ensure effective construction of the residential infrastructure can be achieved.

3

POTABLE & RECYCLED WATER SUPPLY

A meeting with SA Water (Danny Troiano – Major Development Proposal Officer and Sheida Poroushani – Planner) was held in December 2015 in seeking advice on the proposed land parcels.

3.1 Potable Water

Water supply for the Victor Harbor township originates from the Myponga Reservoir.

SA Water have identified that the three Victor Harbor future development sites can be supplied with potable water via SA Water infrastructure either currently within the area or within the future capital works plan. The land parcels fall within “South Coast Townships” Water Supply Augmentation Charge Area which is currently under review by SA Water with outcomes planned for release in mid-2016.

SA Water has noted that the elevations across the proposed sites are relatively high, hence potentially requiring additional infrastructure to supply these sites with higher pressure zones, which may result in additional augmentation costs. Refer Appendix C for a copy of the SA Water correspondence and relevant background information.

Site One - Waitpinga

Site One is located in close proximity to established in ground supply infrastructure. SA Water advises there is some capacity in the existing system, however this will be handled on a first come first served basis ie the available system capacity will be allocated to the first development application ready for connection prior headwork’s augmentation required for subsequent developments.

The elevation associated with the Waitpinga site indicates that it will be necessary to supply the site with potable water from a higher pressure zone ie requiring re-pressurisation of the available water supply to service the higher parts of the site. The augmentation charges associated with the site will be subject to final design and configuration.

Site Two – Hindmarsh Valley (Deferred Urban)

Site Two has varying topography which will more than likely require some form of augmentation of SA Waters network to service the site. Augmentation charges will be subject to the final composition and configuration of any future residential or urban land division.

Site Three – Hindmarsh Valley (Rural Living)

Site Three will require some form of augmentation to service the site; this augmentation will require the site to be serviced by a higher pressure zone within the existing system and/ or from Port Elliot (EL95) via a booster pump. Due to the site being zoned as Rural Living, delivery of the infrastructure is not covered in the augmentation charged and will need to be completed via a commercial agreement by any future developer. Any required augmentation will be subject to the final development type and internal configurations.

3.2 Recycled Water

SA Water advises that there are no plans to implement a recycled water reticulation system within the region at this point in time. A small local system is currently in operation using recycled water from the Waste Water Treatment Plant to water the Victor Harbor Golf Course.

4

WASTEWATER

SA Water has advised that all three of the identified future Victor Harbor development sites can be serviced by waste water infrastructure. SA Water has assessed each site to identify existing infrastructure and the impacts the proposed developments would have given future loading as a result of increased population density. Refer Appendix C for a copy of the SA Water correspondence and relevant background information.

Site One - Waitpinga

The Waitpinga site is located within the Victor Harbor augmentation charge zone, however the charges associated with developments within this area are currently undergoing review by SA Water. As a result of the augmentation charge review, no definitive augmentation rate has been provided by SA Water at this stage.

Within the SA Water augmentation review it was assumed that the Waitpinga site would not be developed for some time, however SA Water advises that should development be advanced in the short term this may result in any proposed network augmentation being brought forward to service this area.

The catchment which the Waitpinga site forms part of is an existing pumping catchment, which depending on the rate of growth of the development may require the site drain to a future catchment that would require new pump station infrastructure.

The extent of augmentation that is applicable to the site will ultimately be the result of the final configuration of the internal system and finalising of the augmentation charge rate currently under review by SA Water.

Site Two – Hindmarsh Valley (Deferred Urban)

SA Water advise that the Hindmarsh Valley Deferred Urban site falls outside of the current Victor Harbor augmentation charge zone and currently does not have any SA Water wastewater infrastructure running though and/ or adjacent to the site.

However, it is noted that Site Two is anticipated to form part of a proposed new sewage pumping catchment that would capture most of the eastern extremities of the existing Victor Harbor Augmentation Charge area, in addition to other newer development areas along this pumping route. The alignment of the new main is currently in the planning/ design phase with the infrastructure required to service the new Fleurieu Regional Aquatic Centre located on Waterport Road. The installation of this new trunk main is expected to open up a large percentage of the land parcel, in providing accessible sewer headwork's infrastructure for future interconnection along the new trunk main alignment.

It was also noted the proposed yields assumed within this report are higher than what SA Water has used within their planning and as a result if these are realised moving forward additional augmentation maybe required. All augmentation charges will be subject to final design of the Hindmarsh Valley site.

Site Three – Hindmarsh Valley (Rural Living)

Site Three falls within the SA Water augmentation charge zone, however there is currently no existing infrastructure traversing the subject site. Consequently, the site is likely to be serviced via a new pumping system to the North, which would require new headwork's infrastructure.

Due to the existing rural living zoning, SA Water's current planning study has not accommodated any allotment yields being generated for this area over its planning period, and, as a result, may require augmentation of the currently proposed transfer pumping system to be brought forward.

The extent of any additional network augmentation required to connect Site Three will be dependent on the final development type and configuration.

5

ELECTRICAL SUPPLY

A 66 kV electricity feeder main from Willunga supplies Victor Harbor. The incoming line is reticulated from the Waggon Road/ Day Road substation via 11 kV supply lines to the surrounding district. In recent discussions with South Australian Power Networks (SAPN) they have not identified any short term supply issues, however should development progress at a rapid rate, this may trigger the need for a new substation and transmission line works and associated augmentation costs.

SAPN have advised that there will be applicable augmentation charges for the three earmarked land parcels within the Victor Harbor area with all additional associated costs to supply and install light pole arrangements and the backbone power infrastructure/conduits for the future building development.

All associated upgrades and augmentation costs as stated below would be the responsibility of the purchaser of the future sub divided parcels of land.

Note that due to the conceptual nature of the development layout, it has been assumed that the internal power supply network will consist primarily of a series of pad mount transformers and switching cubicles with underground low voltage (LV) cabling to supplying residential allotments throughout the development.

The following augmentation and infrastructure recommendations have been made by SAPN for the three identified land parcels.

Refer Appendix D for a copy of the SAPN correspondence and relevant background information.

Site One - Waitpinga

Existing 11kV overhead infrastructure travels along Waitpinga Road and connects into the site just south of the Bay Road / Waitpinga Road intersection where there is 11kV underground infrastructure adjoining the northern end of Site One.

On the presumption that Site One will be developed as a residential development, under the current SAPN standard each allotment is allocated 8kVA with a current augmentation charge of \$223/ kVA.

- Site One - 690 allotments
- Estimated Maximum Demand (EMD) 5,520kVA
- Applicable augmentation cost is the order of \$1.2 million dollars

If the total site area is developed within a 5 year period, then additional augmentation charges apply as the substation and sub transmission line threshold are triggered.

- Substation threshold 5,000kVA, where exceeded additional charged of \$259 /kVA are applicable
- Sub-transmission threshold 4,060kVA, where exceeded additional charged of \$179 /kVA are applicable

If the total area is developed over a period longer than 5 years, then the zone substation and sub-transmission line charges may not apply. Extension charges will be applicable to reticulate both HV and LV infrastructure within the development.

Where existing redundant infrastructure within this area exists, these assets will need to be removed/ relocated at cost to the developer.

Site Two – Hindmarsh Valley (Deferred Urban)

There is existing 11kV infrastructure located in various areas of the site available for connection in servicing future land parcels within this area.

There is a 66kV overhead line that traverses through this site that would require a registered 26m wide easement to be established. It should be noted future planning of this site for residential purposes will need to take into consideration the position of the this large overhead line. Consideration maybe given to underground this infrastructure within future road alignments, however based on previous development experience this has often been cost prohibitive.

On the presumption that Site Two will be developed as a residential development, under the current SAPN standard each allotment is allocated 8kVA with a current augmentation charge of \$223/ kVA.

- Site Two - 2000 allotments
- Estimated Maximum Demand (EMD) 16,000kVA
- Applicable augmentation cost is the order of \$3.6 million dollars (excluding any substation thresholds that may be triggered).

Site Three – Hindmarsh Valley (Rural Living)

There is existing 11kV infrastructure located within and surrounding this area that is available for connection in servicing future land parcels.

The 66kV overhead line continues through Site Three, hence similar considerations to Site Two in relation to the registered easements will need to be taken into consideration.

On the presumption that Site Three will be developed as a residential development, under the current SAPN standard each allotment is allocated 8kVA with a current augmentation charge of \$223/ kVA.

- Site Three - 610 allotments
- Estimated Maximum Demand (EMD) 4,880kVA
- Applicable augmentation cost is the order of \$1.1 million dollars

6

GAS SUPPLY

Through discussions with APA Group W&G has been advised that there is currently no existing underground gas infrastructure within the area of Victor Harbor to service the proposed developments.

There are no plans to service Victor Harbor with mains supplied natural gas from Adelaide in the short term. Given the significant headwork's infrastructure costs this would require significant demand increases from population projections or a new large industrial demand to justify this expenditure.

In further considering options to provide a gas service, W&G has sought advice from a private supplier Environmental Land Services (ELS) who currently supply natural gas to rural areas of South Australia, in particular the Mount Barker area. ELS have indicated that there is potential to service the three Victor Harbor parcels of land earmarked for future development and would be interested in considering this opportunity into the future.

ELS construct, maintain and monitor underground gas supply infrastructure that typically is installed within common service trenches during the civil development of a subdivision. This underground internal gas infrastructure is then connected to a gas tank farm located on the extremities of the site to minimise visual impact. The tank farms are then topped up as required by an ELGAS mobile gas supply trucks.

ELS have indicated that to make the provision of internal gas supply to the proposed land parcels a viable solution, the following commitments and contributions would be required.

- A commitment of a minimum 1500 allotments
- A \$500.00/ allotment contribution would need to be provided by the developer
- An additional \$814/ allotment connection fee would be imposed to the individual resident
- An encumbrance agreement would need to be made mandating a gas connection to each allotment, inclusive of a minimum fixture connection arrangement (ie connection of two gas appliances be hot water, heating/cooling, cooking etc)

Note that these requirements are purely applicable for residential development only, if however there is potential for commercial development proposed to utilise the gas supply this would need to be assessed on a case by case basis and would be highly dependent on the gas demand requirements of the customer.

It has been identified by ELS that as a result of the conceptual nature of the development a more detailed investigation would need to be conducted as planning and detailed design progress.

7

COMMUNICATIONS (NBN)

A formal inquiry and meeting with the National Broad Band Company (NBN) Territory Manager has been undertaken in seeking the communication availability within the vicinity of the subject land parcels, refer Appendix F for a copy of the correspondence.

Site One - Waitpinga

Victor Harbor was one of the first rural towns to receive the NBN roll out, hence a large amount of backbone infrastructure has been installed or planned for installation in the near future. As a result of this pre-establishment no backhaul charges are applicable to Site One. The following developer costs have been advised by NBN:

- Supply and installation the pit and pipe infrastructure within the development
- Deployment charge of \$600/lot single dwelling units (\$400/lot multi dwelling units)

Site Two – Hindmarsh Valley (Deferred Urban) and Site Three – Hindmarsh Valley (Rural Living)

NBN have advised the existing network is available 2.1km away for the subject land parcels. The following developer costs have been advised by NBN:

- Supply and installation the pit and pipe infrastructure within the development
- Deployment charge of \$600/lot single dwelling units (\$400/lot multi dwelling units)
- Backbone infrastructure cost of \$13,650 ex GST

8

TRANSPORT

8.1 Introduction

The transport assessment has reviewed the road network, vehicular traffic, pedestrian and cyclist's links and public transport.

Data for this assessment has been collected from existing reports and other publicly available information.

8.2 Road Network

Site One – Waitpinga (Deferred Urban)

This parcel of land will link into Mill Road which is local collector road under the care and control of the City of Victor Harbor. Within the extent of this site, Mill Road is a 7m wide kerbed two lane road. Mill Road forms part of the Victor Harbor Ring Road which allows through traffic to bypass the Town Centre.

Traffic volumes on Mill Road within the extent of this site are understood to be in the order of 3,500 vehicles per day.

The posted speed limit of Mill Road is 60kph.

Site Two – Hindmarsh Valley (Deferred Urban)

The Site Two land would link into Armstrong Road. Armstrong Road is a local collector road under the care and control of the City of Victor Harbor. Within the extent of this site, Armstrong Road is a 7.6m wide unkerbed two lane road which forms part of the Victor Harbor Ring Road, and which allows through traffic to bypass the Town Centre.

The posted speed limit of Mill Road is 100kph.

It is estimate traffic volumes on Armstrong Road within the extent of this site would be in the order of 3,500 vehicles per day.

Site Three – Hindmarsh Valley (Rural Living)

Site 3 is located adjacent to Site 2 and would also link into Armstrong Road.

8.3 Traffic Operation

Site visits indicate the traffic flows with minimal congestion throughout the day along Mill and Armstrong Roads.

8.4 Road Safety

A review of the road crash records for Armstrong and Mill Roads has not been completed and is recommended to be undertaken as planning for the proposed junctions and associated upgrades is progressed in future.

8.5 Traffic Generation and Analysis

Traffic generations for each site are based on the following estimated dwelling numbers with allotments yields based upon 11.6 allotments per hectare.

- Site One Waitpinga (DU) - 690 allotments
- Site Two Hindmarsh Valley (DU) - 2000 allotments
- Site Three Hindmarsh Valley (RL) - 610 allotments (note in reality allotment yields will be lower given the existing vegetation and occupancy site constraints across this land parcel)

Traffic generation rates adopted are based on recent research undertaken by the Department for Planning, Transport and Infrastructure. This research indicates trip data for residential houses will be in the order of 9.0 trips per allotment. We therefore anticipate each site to generate the following number of trips.

- Site One Waitpinga (DU) - 6,300 trips per day (2,800 vehicles entering and exiting per day)
- Site Two Hindmarsh Valley (DU) - 18,200 trips per day (7,000 vehicles entering and exiting per day)
- Site Three Hindmarsh Valley (RL) - 5,600 trips per day (*3,000 vehicles entering and exiting per day*)

The above information represents a one way vehicular movement from one point to another excluding the return journey. Therefore, a return trip to / from each site is counted as two trips. A proportion of internal trips have been factored into the predicted vehicles entering and exiting the sites).

8.6 Traffic Conclusions

The level of traffic generation is considered relatively high. Access to these areas has been reviewed, and may potentially be:

- Site One: Primary access to Mill Road, with potential to convert the existing Tabernacle Road T-Junction to a four-way intersection controlled by a roundabout. A secondary junction access maybe established further to the west of the site, with the interaction of the existing Whalers Road intersection to be considered in the positioning of a new junction.
- Site Two: Primarily access likely to be via Waggon Road and Days Road. Days Road access raises the potential to convert the existing Days Road overpass to an interchange arrangement to manage traffic flows to and from the Victor Harbor Ring Road. Waggon Road and Days Road would require upgrading, and the level of upgrade would be subject to further assessment and establishing the access arrangement for this area. Council are keen to keep the ring road a main road, maintaining the current speed limit requiring interchanges or junctions to be designed accordingly.
- Site Three: Is relatively well connected by the existing road network, with a number of roads dissecting this area. An interchange at Days Road for Area 2 would complement Area 3 and allow full access onto the Ring Road.

Upgrade of existing intersections and junctions immediately downstream of each site may also be required subject to further detailed analysis.

Midblock road upgrades are not anticipated based on Mill Road and Armstrong Road currently having relatively high amounts of spare capacity.

9

LAND RELEASE RECOMENDATIONS

Based upon the infrastructure review completed, the following orderly release of land is recommended in order to provide the most economical delivery of infrastructure and sequential interconnection with the existing residential zoned land parcels in meeting the future growth within the area. Refer Figure 3 below outlining the recommended release of the respective land parcels under consideration.

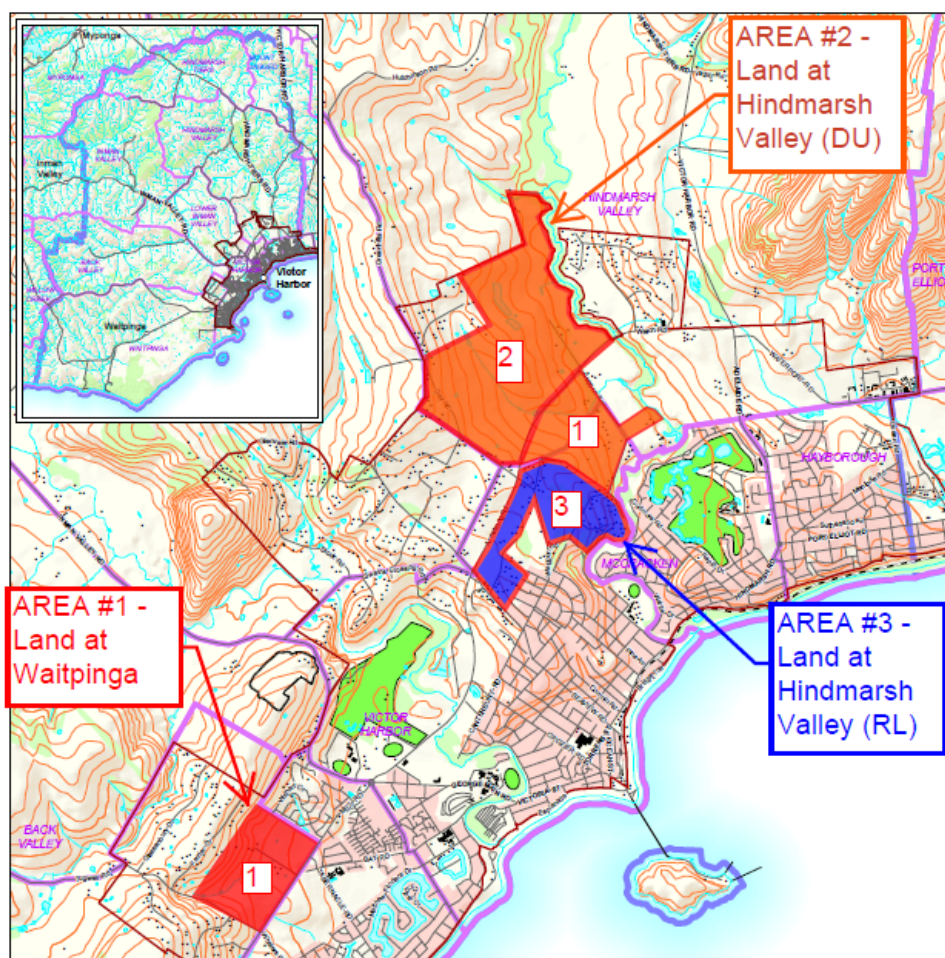


Figure 3 – Recommended Order of Release

Release 1 - Waitpinga Land and the Hindmarsh Valley Area #2 (South)

- Waitpinga Land – this parcel of land has been ‘ready to go’ for a while with planning associated with proposed development on this site not progressing. The site is located above the proposed Country Allotments residential development to the South which has a Development Approval but yet to commence site works.
- Hindmarsh Valley Area #2 South – This area is zoned ‘Deferred Residential’ and borders the existing residential zoned area. The current Victor Harbor Development plan contains a concept identifying a high level master plan for this area identifying road infrastructure interconnections with this subject parcel of land.

- Both parcels are contained within the forward planning of the respective services authorities and are logical initial releases based upon the geographical position relative to the current growth boundary and cost of infrastructure delivery requiring the least amount of headwork's.

Release 2 - Hindmarsh Valley Area #2 (North)

- Building on from Release 1, this area appears to be a logical progression from the area to South. The open terrain will provide good yield recoverability and flexibility for proposed developers moving forward as the land parcel contains minimal existing site constraints that would otherwise need to be incorporated into future plans.
- This land parcel is also currently contained within the forward planning of the respective service authorities.

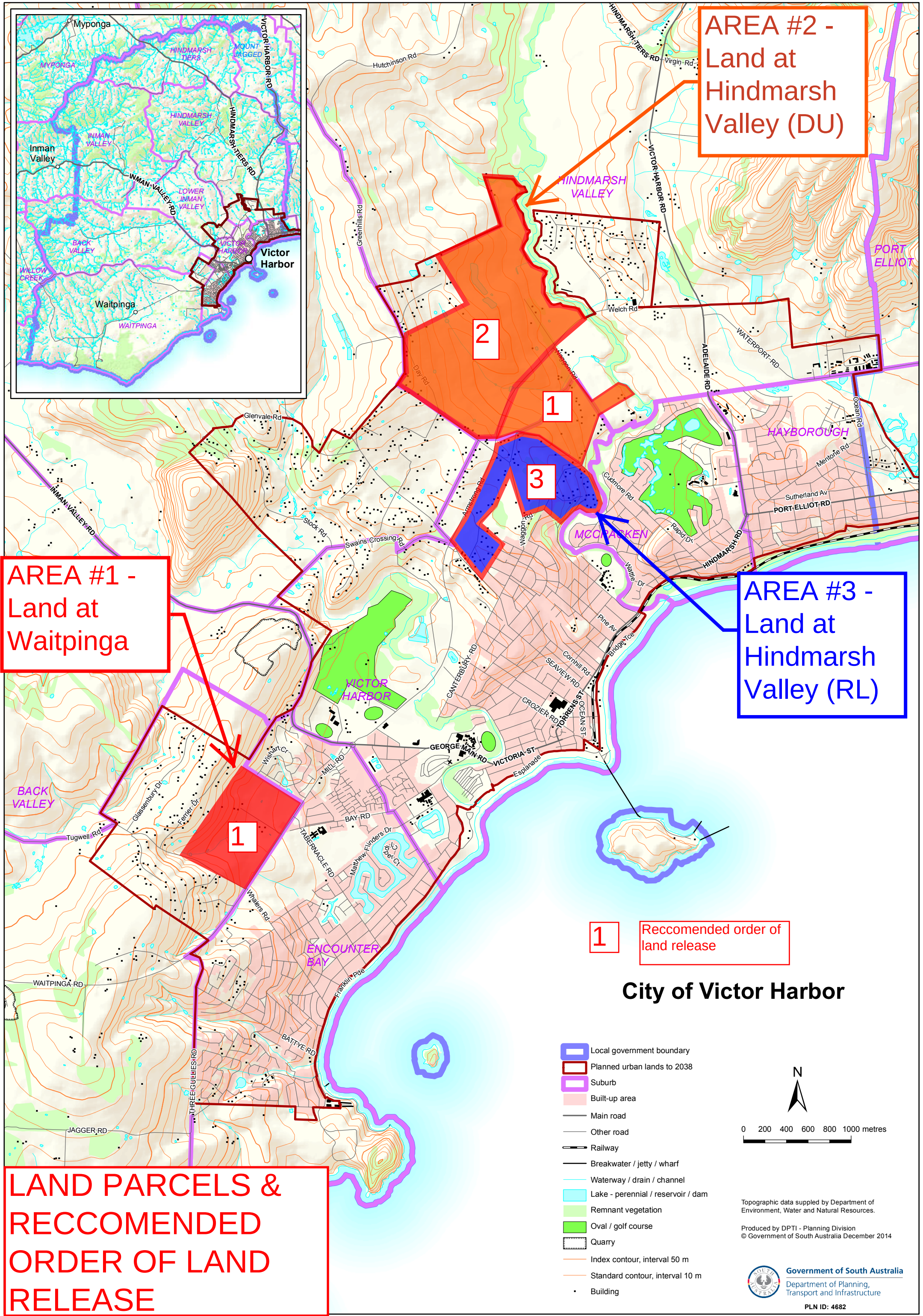
Release 3 Hindmarsh Valley Rural Living Area #3

- This subject parcel is currently zoned 'rural living' and has not been captured in the future planning of a number of service authorities. Should it be considered in the short term for release further engagement with the respective service authorities will be required and large upfront, capital contributions will likely be required in bringing forward the required headwork's infrastructure.
- From a developer perspective, Area #3 has limited future land division potential due to supply of land available. The existing rural living dwellings and a large amount of remnant native vegetation are significant constraints within this parcel in attaining effective yields.
- Given the geographical positioning of the parcel it would 'make sense' to re-zone this land in the long term, however in the short term it is unlikely to provide the residential land supply needs of the area based upon limitation of the reduce yields and costs of headwork's infrastructure.

APPENDIX A – SITE LOCALITY PLANS



SPRINGWOOD, GAWLER EAST, SA





AREA #2 - Land at Hindmarsh Valley (DU)

DASH LINE
REPRESENTS
THE AREA

Existing low lying flood prone areas

Land Development
DA 453/D007/14

168.547ha

@ 11.6 dwellings/ha
= Approx 2000 allotments

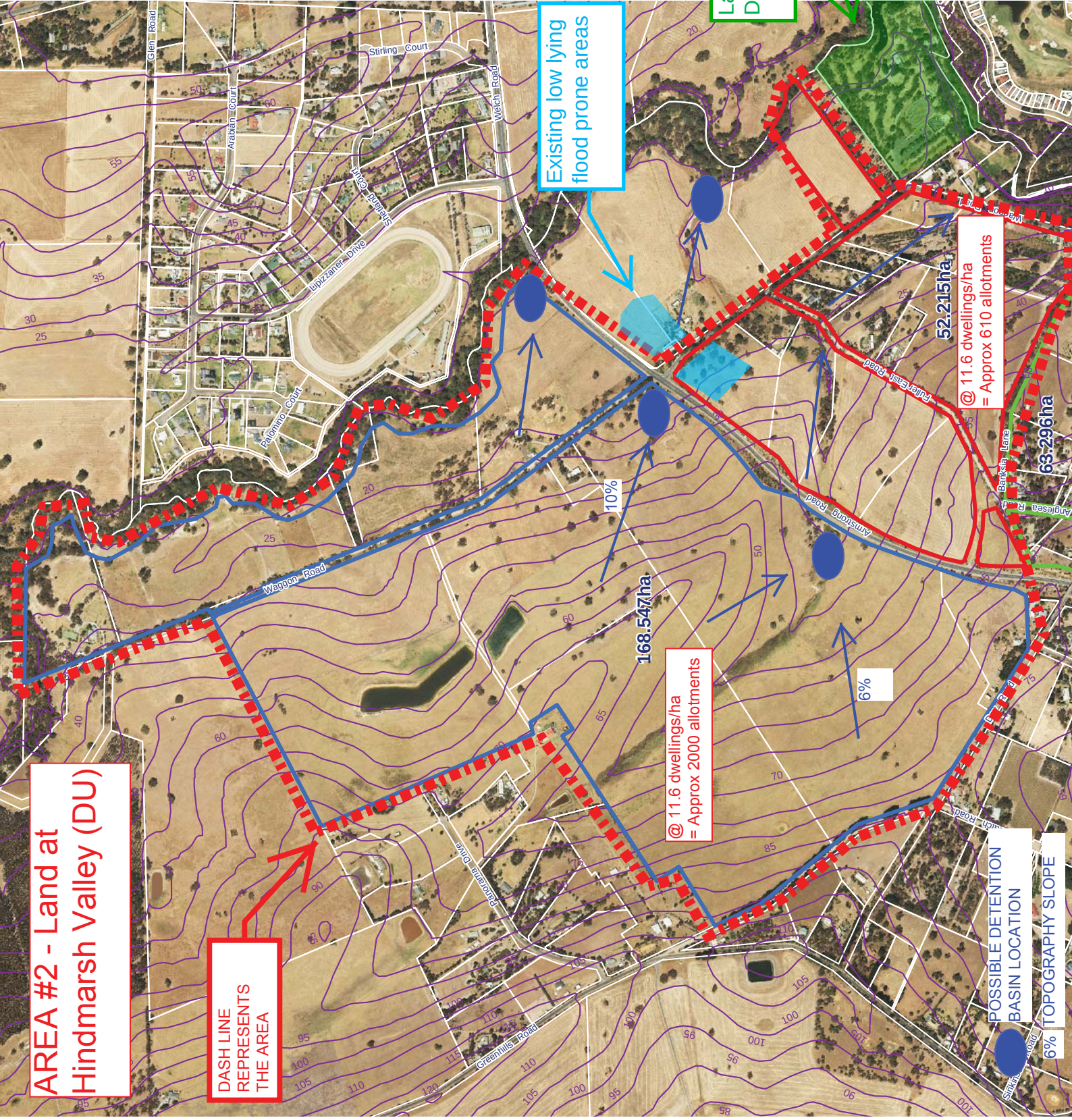
52.215ha

@ 11.6 dwellings/ha
= Approx 610 allotments

63.296ha

POSSIBLE DETENTION BASIN LOCATION

6% TOPOGRAPHY SLOPE





AREA #3 - Land at Hindmarsh Valley (RL)

DASH LINE REPRESENTS THE AREA

@ 11.6 dwellings/ha
= Approx 740 allotments

POSSIBLE DETENTION BASIN LOCATION

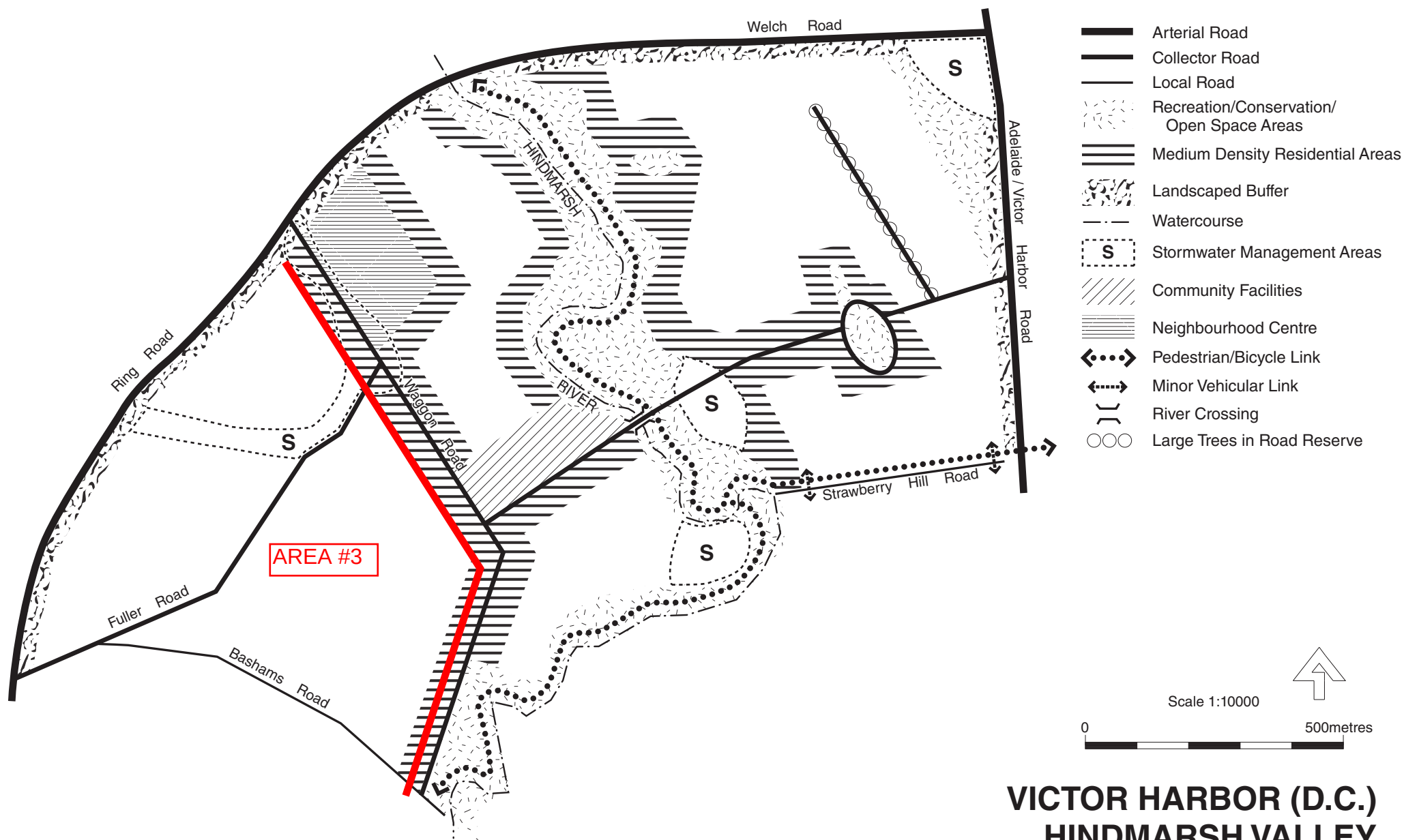
6% TOPOGRAPHY SLOPE

APPENDIX B – COUNCIL INFRASTRUCTURE



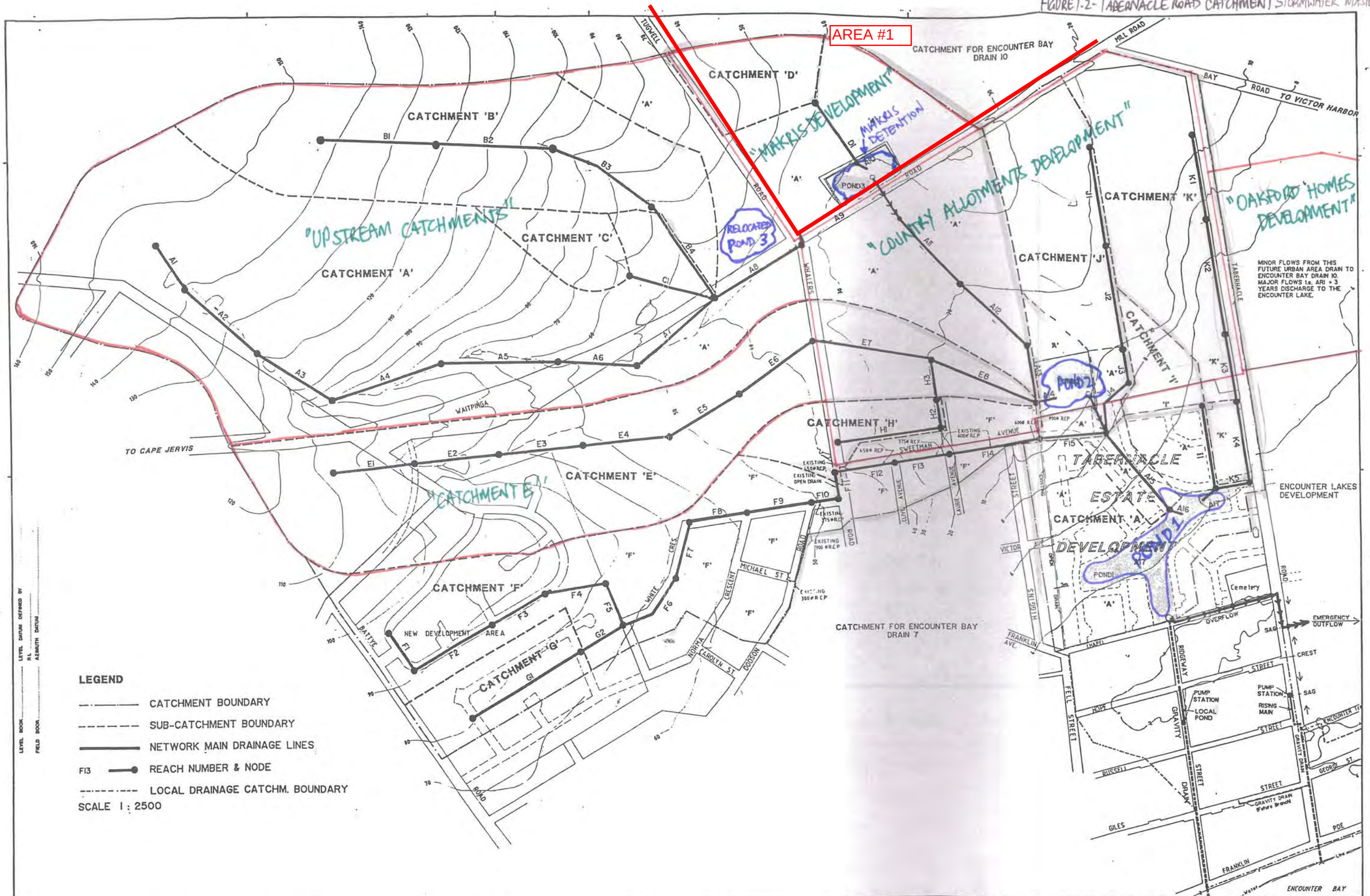
ANDREWS FARM WETLAND, SA

WALLBRIDGE & GILBERT



**VICTOR HARBOR (D.C.)
HINDMARSH VALLEY
CONCEPT PLAN
FIGURE VH(HiV)/1**

FIGURE 1-2: TABERNACLE ROAD CATCHMENT STORMWATER MASTER PLAN

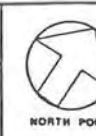
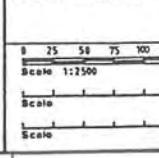


LEGEND

- CATCHMENT BOUNDARY
 - - - SUB-CATCHMENT BOUNDARY
 - NETWORK MAIN DRAINAGE LINES
 - F13 —●— REACH NUMBER & NODE
 - - - LOCAL DRAINAGE CATCHM. BOUNDARY
- SCALE 1 : 2500

No.	DATE	REVISION	BY	CHKD	APPROVED
1/93	CATCHMENT BOUNDARY UP-DATED		JD		

ASSOCIATED DRAWINGS



LEVEL DATUM DEFINED BY A.M.D.

SURVEYED	DESIGNED	DP 3/91
LEVEL BOOK	DRAWN	DP 4/91
FIELD BOOK	TRACED	JD 7/91
PLOTTED	CHECKED	

ULLMAN & NOLAN Pty. Ltd.

BRISBANE	MACKAY	ADELAIDE
PERSEPHONE	BLADSTONE	DANBURY
SUBMITTED	APPROVED	
DATE 24.02.1993	DATE	

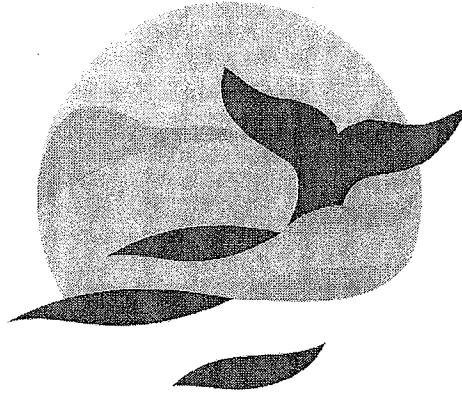
DISTRICT COUNCIL OF VICTOR HARBOR

TABERNACLE ROAD DRAINAGE STRATEGY
(ENCOUNTER BAY CATCHMENT No. 8)
ILSAX MODEL
CATCHMENT & DRAIN NETWORK DETAILS

JOB No. 27514 A

No. 1 OF 1 DRAWINGS	REV
DWG. No. VH 079	

city of
Victor Harbor



Department of Technical Services

ENGINEERING DESIGN GUIDELINES

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1. STORMWATER MANAGEMENT AND DESIGN

A stormwater management plan and design for the construction of infrastructure shall be prepared to control and manage all stormwater runoff from the development prior to Civil Works commencement.

The stormwater drainage system shall be designed in accordance with the 2001 edition of "Australian Rainfall and Runoff", and AS3500 and shall meet the following requirements:

- Detailed stormwater design calculations shall be provided prior to approval of the design plans;
- The stormwater management plan shall consider ultimate development of all catchment areas contributing to runoff over or through the development;
- The management plan and design shall incorporate measures to limit the rate of runoff from the site and incorporate measures to detain or store stormwater runoff for reuse. (Refer to On site Detention or Retention Policy)
- The design shall provide for rear allotment drainage systems and appropriate easements where necessary.

System Design Criteria

The drainage system shall be designed making provision for future development (buildings and paved areas) as described below:

Land Division Type	Indicative Allotment Area (sqm)	% Impervious Area	ARI (years)
High Density Residential	350 - 500	80%	20
Medium Density Residential	500 - 1200	60%	10
Low Density Residential	1200 - 5000	40%	5
Rural Living	> 5000	20%	5
Road Reserve	-	95%	As per development type
Open Space Areas	-	25%	As per development type

Land Use or Site Improvement	Indicative Allotment Area (sqm)	% Impervious Area	ARI (years)
Industrial/Commercial	-	100%	20
Consolidated Urban (Strata/Flats/Apartments)	-	85%	20

Overflow paths shall be provided for a 1:100 year ARI storm event that will prevent stormwater runoff inundating properties.

Drainage Infrastructure Specifics

Required drainage infrastructure shall be designed in accordance with the following requirements:

- Minimum pipe size for road drainage shall be 375mm and rubber ring jointed.

- Example spreadsheets/calculations displaying appropriate pipe cover, bedding and construction loads for random pipe installations shall be forwarded to Council for approval.
- Kerb stormwater outlets shall be provided for all allotments that are graded towards the kerb and watertable.
- Rip rap energy dissipaters shall be installed at all headwall outlets to prevent potential erosion.
- Trash racks/litter collectors shall be installed on all headwall outlets.
- A minimum cover of 600mm shall be provided for all flexible pipe installations. Flexible pipes shall only be utilised within back of allotment easements.
- Open drainage channels shall only be utilised in Low Density and Rural Living land divisions and shall be lined with geo fabric and rock.
- Stormwater pollutant treatment systems shall be employed in land uses with significant open air impervious vehicle standing areas.
- A minimum width of three metres shall be provided for all drainage easements.
- Rear of allotment connections shall be designed in accordance with figure 2 (shown below)

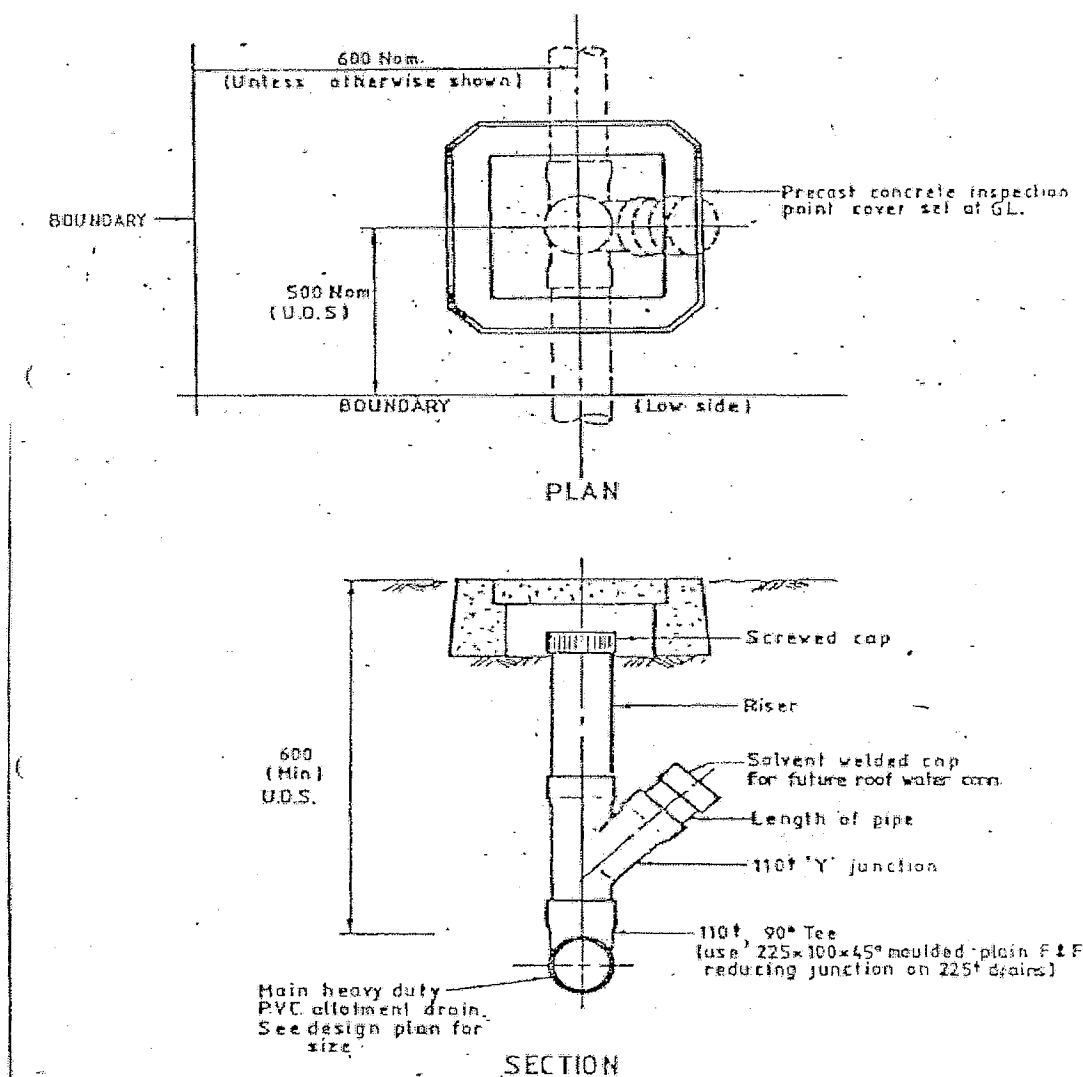


Figure 2 – Required Rear of Allotment Connection

2. ON SITE DETENTION OR RETENTION*

No additional stormwater which is generated by a development or site improvement shall be discharged from the site. Therefore, the developer must provide on-site storage facilities to accommodate the additional generated flows or demonstrate to Council that the external impact of additional stormwater generated from the development site can be managed so as not cause detriment to Councils' external drainage system or surrounding property or developments.

NOTE: In the event that the applicant determines it appropriate, and as an alternative to the above condition, the applicant may provide a financial contribution to external storm water provision as determined by hydraulic calculation. The amount of contribution will be determined as a ratio of storm water capacity generated from the site compared to the total cost of construction of the storm water provision.

Runoff from the developed site shall be contained within the site so as that it does not affect adjoining properties.

Detention or Retention Basins

Detention/Retention Basins shall be designed in accordance with the below requirements:

- Basins shall be designed to detain or retain flows from all potentially developed areas of a land division or site improvement.
- A copy of all design calculations and drawings shall be provided to Council for review and approval.
- A landscaping plan outlining the proposed plant species and plant locations shall be forwarded to Council for review and approval.
- Geotechnical investigation and analysis of the proposed basin site shall be undertaken and provided to Council for reference.
- From the Geotechnical analysis, appropriate soakage times and building clearances shall be accounted for in the design.
- Batters shall be designed at a gradient that may be accessed by a ride on lawn mower and top soiled at a minimum thickness of 100mm.
- Basins shall be designated drainage reserve shall be granted to Council for ownership and future maintenance.
- Spillways shall be lined with rock or grassed out utilising an appropriate product (enviromat etc.)

Aquifer Storage and Recharge (ASR) Schemes

Where feasible, Aquifer storage and recharge (ASR) schemes shall be investigated and implemented.

Appropriate Geotechnical analysis shall be conducted and relevant regulations followed in implementing ASR systems.

*Note: Detention = temporary storage Retention = permanent storage

Other

Underground Tanks

Underground Tanks shall be designed in accordance with the below requirements:

- A copy of all design calculations and drawings shall be provided to Council for review and approval.
- Underground tanks shall be constructed from precast or insitu reinforced concrete and shall provide easy access to submersible pumps – for maintenance purposes.
- A set aside area within each allotment shall be provided to prevent traffic loading on the tanks. If this cannot be achieved, specific design calculations for adequate slab thickness and reinforcement to handle relative traffic loads shall be forwarded to Council for assessment and approval.
- The outflow rate to the kerb shall form underground sumps and tanks shall not exceed 20 L/sec.

Oversized Pipe Systems

Over sizing certain pipes within a network shall be implemented where open space area is limited. By over sizing, detention within an underground network may be achieved.

Rainwater Tanks

Rainwater tanks shall be implemented in medium to high density developments where:

- Roof area accounts for a significant proportion of the development or site improvement;
- There is insufficient ground area to allow for detention/retention basin design.

Rainwater tank capacity shall be designed in proportion to the available area.

3. ROAD RESERVES

The designated road reserve within a land division shall consist of a road carriageway and a verge and footpath area (Refer to Figure. 1). Road Reserves shall be designed in accordance with the following requirements:

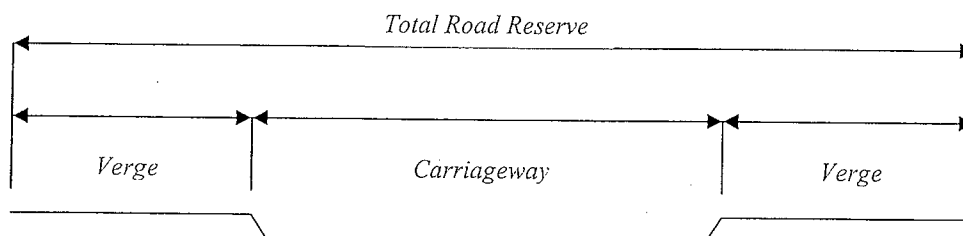


Figure 1 – Typical Road Reservation

Required Minimum Road Reserve, Carriageway and Verge Widths

Street Type	Target Maximum Speed (km/h)	Predicted Maximum Traffic Volume (vpd)	Required Min. Reserve Width (m)	Required Min. Carriageway Width (m)	Required Min. Verge Width (m)
Access Lane	15	100	10.0	4.0 (one way)	3.0
Access Place	15 - 50	300	12.0	6.0	3.0
Local Street	50	<2000	15.0	7.0	4.0
Collector Street	50	<3000	18.0	8.0	5.0
Major Collector	50 or 60	<6000	20.0	8.0	6.0
Cul-de-sac or turnaround	-	-	26.0		3.0

Table 1 – Road Reserve characteristics (adopted from Planning SA's Good Residential Design Guide).

- If on street parking is required, indented bays shall be implemented.
- Bicycle lanes may be required if identified by the Victor Harbor Bicycle Strategy.
- Predicted Maximum Traffic Volumes shall be calculated by determining the total traffic generation rate for the land division, land use or site improvement – utilising that particular road.
- All terminating road reserves within a staged land division shall be provided with a temporary turnaround area (Refer to Cul de sac and temporary turnaround guidelines for further detail).

4. ROAD CARRIAGEWAYS

Road carriageways within a land division road reserve or site improvement shall be designed in accordance with the following requirements:

Grades

Longitudinal: Minimum: 0.7
 Maximum: 12%

(Council may accept Grades up to 15% in certain circumstances)

Cross-falls: Preferred: 1:30 (3.3%)
 Minimum: 1:40 (2.5%)
 Maximum: 1:20 (5.0%)

One way cross falls are not favoured by Council, but their necessity is acknowledged when natural surface cross fall exceeds 500mm.

Should one-way cross fall be used, an in fall water table of 450mm width on the high side is required. In addition, care will be taken to ensure major drainage routes are adequate for ARI = 100 years flows.

Widths

Carriageway widths shall be designed in accordance with table 1 – Road reserve policy.

Kerb Inverts and Crossing Places

All roads shall be provided with semi mountable kerb and gutter. Rural living and low density land divisions may not require kerbing. This will be determined during the approval process. Where upright kerbing is deemed necessary, kerb inverts and crossing places shall be provided for safe and convenient access to allotments.

Pavement Design

- Pavement design calculations shall be provided to Council for approval.
- Pavement thickness design shall be based on predicted maximum traffic volumes for the Development (Refer to Road Reserve Policy)
- For staged land divisions, pavements in preliminary stages shall be designed to provide for construction traffic used in the following stages.
- In-service traffic, potential bus traffic and garbage truck traffic shall be accounted for in the design.
- Minimum total pavement thickness shall be 250mm. Variation may be required after inspection of sub grade by Council.
- Pavements shall be designed for a design life of 20 years.
- Pavement material shall be designed to 300mm past the back of kerb.
- Geotechnical analysis and pavement thickness design review shall take place during the construction phase.
- A minimum hot mix seal of 30mm shall be provided. A min. 14/7mm spray seal may be approved for rural living land divisions.
- All Pavement materials shall comply with Transport SA specifications.

5. CUL-DE-SAC ENDS AND TURNAROUNDS

Cul-de-sacs and turnaround areas shall be designed in accordance with the following requirements:

General

- Cul-de-sac ends or T shaped turnarounds shall be provided at every road termination.
- The dimensions of the cul-de-sac end or turnaround shall be as such to provide sufficient area for waste disposal truck to manoeuvre easily.
- A chosen treatment shall be used uniformly throughout the land division.
- The road reserve required for a cul-de-sac or turnaround shall be a minimum of 26m.
- All terminating road reserves within a staged land division shall be provided with a temporary turnaround area.
- All turnarounds shall be provided with a D4-5 hazard board.

Cul-de-sac Ends

- A 20m diameter (10m radius) cul-de-sac end shall be provided as a minimum.
- In bush fire prone areas, the diameter shall increase to 25m to allow sufficient manoeuvring room for fire trucks.

T shaped Turnarounds

- T shaped turnarounds shall be designed in accordance with the dimensions shown in figure 3.
- In bushfire prone areas, the dimensions shall be increased to those specified in Principal 200 of the Victor Harbor Development Plan.

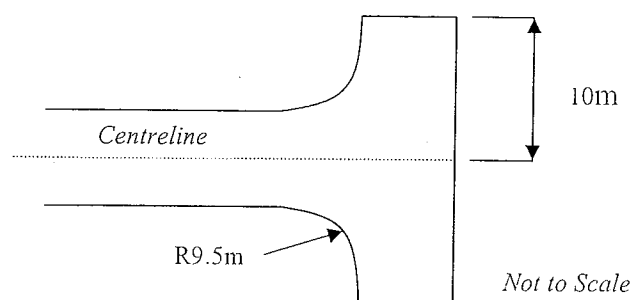


Figure 3. - Required dimensions for T shaped turnarounds.

Temporary Turnarounds

- All terminating road reserves within a staged land division shall be designed with a temporary turnaround or cul-de-sac end.
- The turnaround cul-de-sac shall have full pavement depth for the continuing nominated carriageway width, with the remainder of the turnaround or cul-de-sac end having a minimum pavement depth of 100mm.
- A minimum 7mm spray seal shall be provided on all temporary turnarounds or cul-de-sac ends.

If a temporary turnaround is designed within the extents of the existing stage, easements over the adjacent allotments shall be granted to Council until such time the following stage is constructed.

6. VERGE AREAS

Verge Areas within a road reserve shall be designed in accordance with the following requirements:

Grades

First 2.0 metres width from back of kerb:

up 2%

From 2.0 metres out to the property line:

maximum slope (up or down as required)
at 1 vertical to 8 horizontal;

Within property:

Cut batters - maximum slope of 1 vertical
to 2 horizontal;

Fill batters: maximum slope
of 1 vertical to 4 horizontal.

General

- At least one verge shall be provided with a footpath in accordance with the footpath policy.
- Verge areas shall be clear of any debris and loose rock, and topped with 100mm of topsoil or compacted rubble depending on council's requirements.
- Plantings in verges shall be as such so as that required sight lines and distances are maintained.
- Plantings in verges shall be consistent with Council's Street Tree Policy.

7. FOOTPATHS

Footpaths shall be designed in accordance with the below requirements:

- A brick paved footpath with a minimum width of 1.2m shall be provided as a minimum on one side adjacent to the roadway on Access Lanes, Access Places and Local Streets – as defined in section 3.
- Footpaths shall be provided adjacent to both sides of the road way on Collector Streets and Major Collectors – as defined in section 3.
- 'Hotmix' asphalt footpaths may be used upon approval of Council.
- As a preferred alternative to the construction of footpaths, Council will accept cash in lieu amounting to \$50/m as a contribution towards their future construction by Council. This will obviate any damage that may be caused to the footpath during the construction of residential buildings. Further to this, pram ramps are still required to be installed.
- Pedestrian pram ramp access shall be provided by the Developer to comply with the requirements of the Disability and Discrimination Act 1992 and AS 1428.1
- Where required, tactile ground surface indicators shall be installed to comply with the requirements of the Disability and Discrimination Act 1992 and AS1428.4.
- Landscaping and lighting designs shall be as such that they allow a straight continuous footpath run.

8. TRAFFIC MANAGEMENT, SIGNAGE AND ON SITE CAR PARKING

Traffic management treatments, on site car parking and required signage within a land division or site improvement shall be designed in accordance with the following requirements:

References

Traffic Management devices and required signage shall be designed in accordance with the following references:

- AS 1742;
- AS 2890;
- AUSTROADS - Guide to Traffic Engineering Practice;
- The Code of Practice for the installation of Traffic Control Devices in South Australia; And;
- The Legal and Technical responsibilities for Traffic Control Devices.

General

- All required statutory approvals for the installation of traffic control devices shall be obtained from Transport SA.
- All lighting requirements for a particular traffic control device shall be investigated and implemented.
- Guide posts shall be installed at all culvert crossings within a Rural Living land division.
- Land divisions that may adversely effect the external road network may require the design and implementation of a external traffic control treatment or turning lane. This decision will be made during the application approval process.
- Perimeter thresholds and slow point treatments are encouraged to be utilised at ingress/egress points to a land division to discourage through traffic and identify a potential change in environment.
- All traffic management treatments shall be designed taking into account the Victor Harbor Local Area Traffic Management Plan (yet to be developed).
- Landscaping of a traffic management device shall be taken as part of the design requirements and shall not affect required sight lines.
- Landscaping of a traffic management device shall be consistent with Council's Landscaping and Street Tree Policies.

9. RESERVES AND OPEN SPACE AREAS

Reserves and Open Space Areas shall be designed in accordance with the following requirements:

- Any land division application shall provide for a 'useable open space' reserve area in accordance with the Development Act. A reserve area is defined as 'useable' open space if all of the following criteria are met:
 1. Slope on any part of the reserve does not exceed 1 in 20 (5%).
 2. A minimum width of 30m is provided.
 3. The reserve area is not utilised for drainage retention/detention purposes.
 4. The reserve area is free of visible drainage infrastructure (i.e. headwalls, outlets).
- All Reserves should be where possible greater than 1Ha in area.
- All allotment boundaries abutting reserves shall be adequately fenced using 1800mm high "Good Neighbour" colorbond fencing or such other fencing as submitted by the developer and approved by the Director of Technical Services. All fencing costs shall be borne by the Developer.
- Reserves and Open Space Areas shall be graded at a slope so as that surface runoff does not adversely effect adjoining properties.
- Reserves shall provide sufficient 'flat' area to enable the installation of a children's playground (Dimensions generally greater than 20m x 20m).
- Lawn areas are to be established with Kikuyu turf, planted in at least 150mm topsoil as approved by Council's Parks & Recreation Section.
- Paths within reserves should be constructed using 25mm hotmix on 100mmmm compacted rubble base.
- Paths in reserves should link in with the footpath network and provide access to picnic / barbeque facilities and playgrounds.
- Irrigation shall be provided to lawn & garden areas in accordance with Council's Irrigation Guidelines and Water Conservation Policy.
- Plantings in reserves should be consistent with Council's planting policies, using predominantly local indigenous plants.
- Garden areas are to be mulched with at least 120mm organic mulch.
- Trees are not to be planted within 5m of reserve boundaries, other than along streets where trees are to be planted 3m from the kerb with root-barrier or green-well installed.

10. EARTHWORKS

During construction of infrastructure, temporary debris and sediment control measures shall be installed to prevent debris and sediment from leaving the site during all construction stages. Control measures shall be in accordance with a soil erosion and drainage management plan, which shall provide such pollution prevention measures as required to comply with the "Environmental Protection Authority's Stormwater Pollution Prevention Codes of Practice":

- for the Community;
- for Local, State and Federal Government;
- for the Building and Construction Industry.

Temporary debris and sediment control measures shall be in place prior to construction commencing and shall be maintained at all times during construction. Prior to construction, a copy of the soil erosion and drainage management plan shall be provided to the Director of Technical Services for approval.

Any allotments that are filled shall be compacted in accordance with AS 2870 – clause 6.4.2.

Allotment fill is to be placed in layers no thicker than 200mm and compacted to 95% MSDD for residential dwellings and 98% MSDD for industrial allotments.

The fill shall be tested in accordance with AS 1289. Test Certificates for each allotment shall be forwarded to Council.

APPENDIX C – SA WATER CORRESPONDENCE



NEWPORT QUAYS PRECINCT

WALLBRIDGE & GILBERT

Ryan Byrne

From: Troiano, Danny [Danny.Troiano@sawater.com.au]
Sent: Friday, 18 December 2015 9:13 AM
To: Ryan Byrne
Cc: Fisher, Daniel
Subject: Vic Harbor Assessment

Hi Ryan.

Please find below a high level response to your enquiry (see land parcels below).

Area 1 (Waitpinga): Proposed 690 allotments

Sewage:

- This site is currently within the Victor Harbour sewer augmentation charge area.
- SA Water has the Victor Harbour sewer augmentation charge area currently under review.
- SA Water had made a current planning estimate for Area 1, with a similar order of allotment yields.
- Currently SA Water planning estimates that Area 1 will not be developed for some time yet, which means any proposed network augmentation may need to be brought forward to service this area.
- Area 1 currently forms part of the existing SPS029 pumping catchment, which, depending on surrounding development growth, may have Area 1 drain into a future SPS027 catchment.
- The extent of any additional network augmentation required to connect Area 1 into SA Water's system is dependent on the final development type and configuration.

Water:

- The site is within the current "South Coast Townships" Water Supply Augmentation Charge Area. The charge is currently under review. The elevations on the proposed affected site are relatively high and network augmentation will be required to supply this site from a higher pressure zone. The final composition of the network augmentation will be subject to final development type and configuration.

Area 2 (Hindmarsh Valley-DU): Proposed 2610 allotments

Sewage:

- This site is **outside** the current Victor Harbor sewer augmentation charge area, and currently does not have any SA Water sewerage infrastructure traversing the subject site.
- Area 2 is anticipated to form part of a proposed new sewage pumping catchment that would capture most of the eastern extremities of the existing Victor Harbor Augmentation Charge area, in addition to other newer development areas along this pumping route.
- Area 2 allotment yields are higher than the SA Water's planning yields. As a result the proposed new sewage pumping system is likely to require augmentation.
- The extent of any additional network augmentation required to connect Area 2 into SA Water's system is dependent on the final development type and configuration.

Water:

- The site is within the current "South Coast Townships" Water Supply Augmentation Charge Area. SA Water is currently reviewing the augmentation charge for this area. It is very likely that network augmentation will be required to service the development site. The final composition of the required network augmentation will be subject to final development type and configuration.

Area 3 (Hindmarsh Valley-RL): Proposed 740 allotments

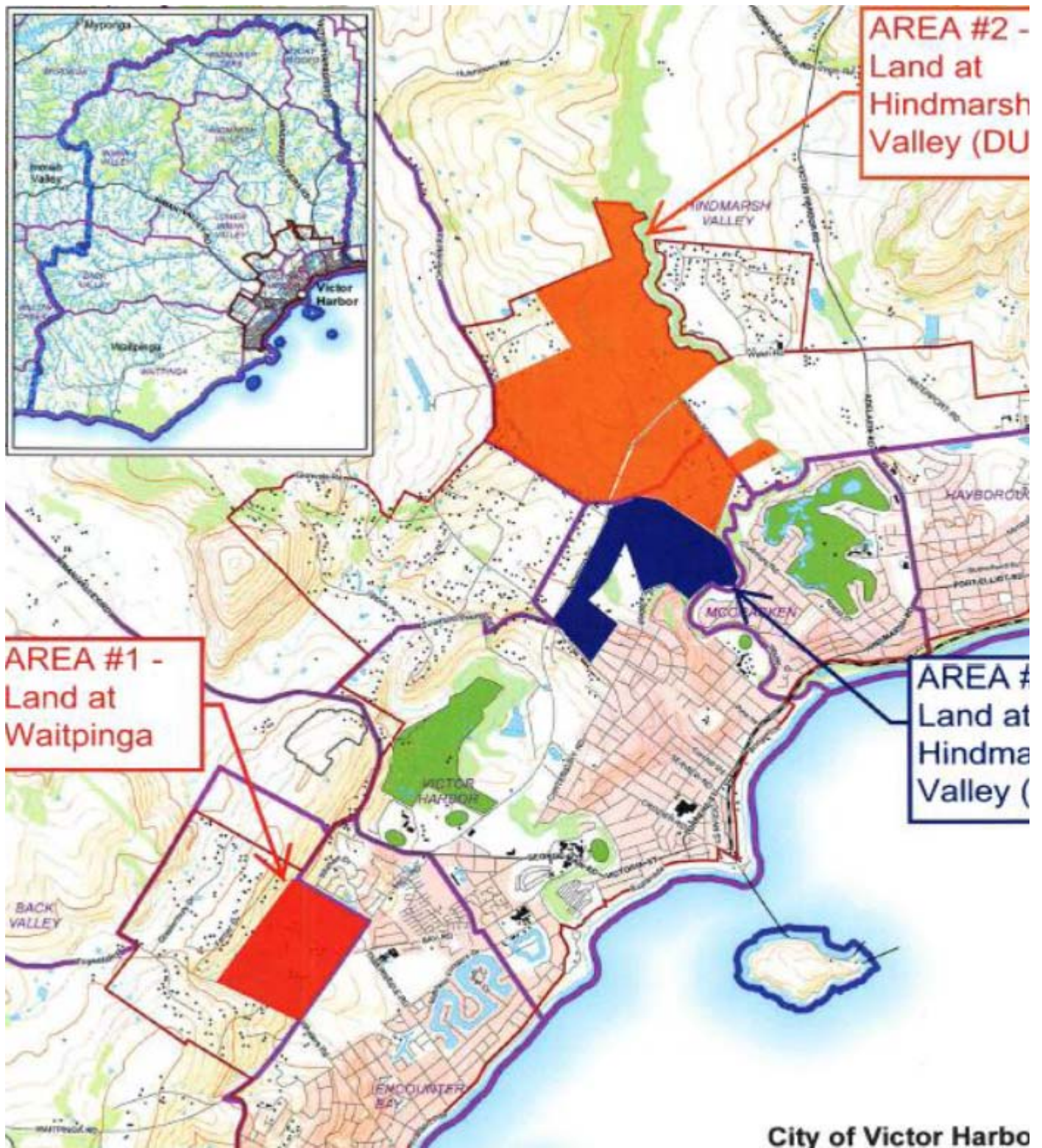
Sewage:

- This site is currently within the existing Victor Harbour sewer augmentation charge area.
- SA Water currently does not have any SA Water sewerage infrastructure traversing the subject site.
- The development site is currently zoned Rural Living, with current preliminary indications from Council suggesting no immediate plans for rezoning. However, it is highly recommended that the proponent take up these discussions directly with Council.
- Area 3 servicing is likely to be directed to a new SA Water pumping system to the north, requiring approach works to that system. SA Water's current planning study has not accommodated any allotment yields being generated for this area over its planning period, and, as a result may bring forward augmentation of the currently proposed transfer pumping system.
- The extent of any additional network augmentation required to connect Area 3 into SA Water's system is dependent on the final development type and configuration.

Water:

- The site is within the current "South Coast Townships" Water Supply Augmentation Charge Area. The charge is currently under review. The elevations on the proposed affected site are relatively high and network augmentation will be required to supply this site from either higher pressure zone or from Pt Elliot EL95 via a booster pump. Noting that the development site is currently zoned Rural Living, the delivery of the infrastructure is not covered in the augmentation charge and will be by commercial agreement. The final composition of the required network augmentation will be subject to final development type and configuration.

If you have any questions please do not hesitate to contact me.



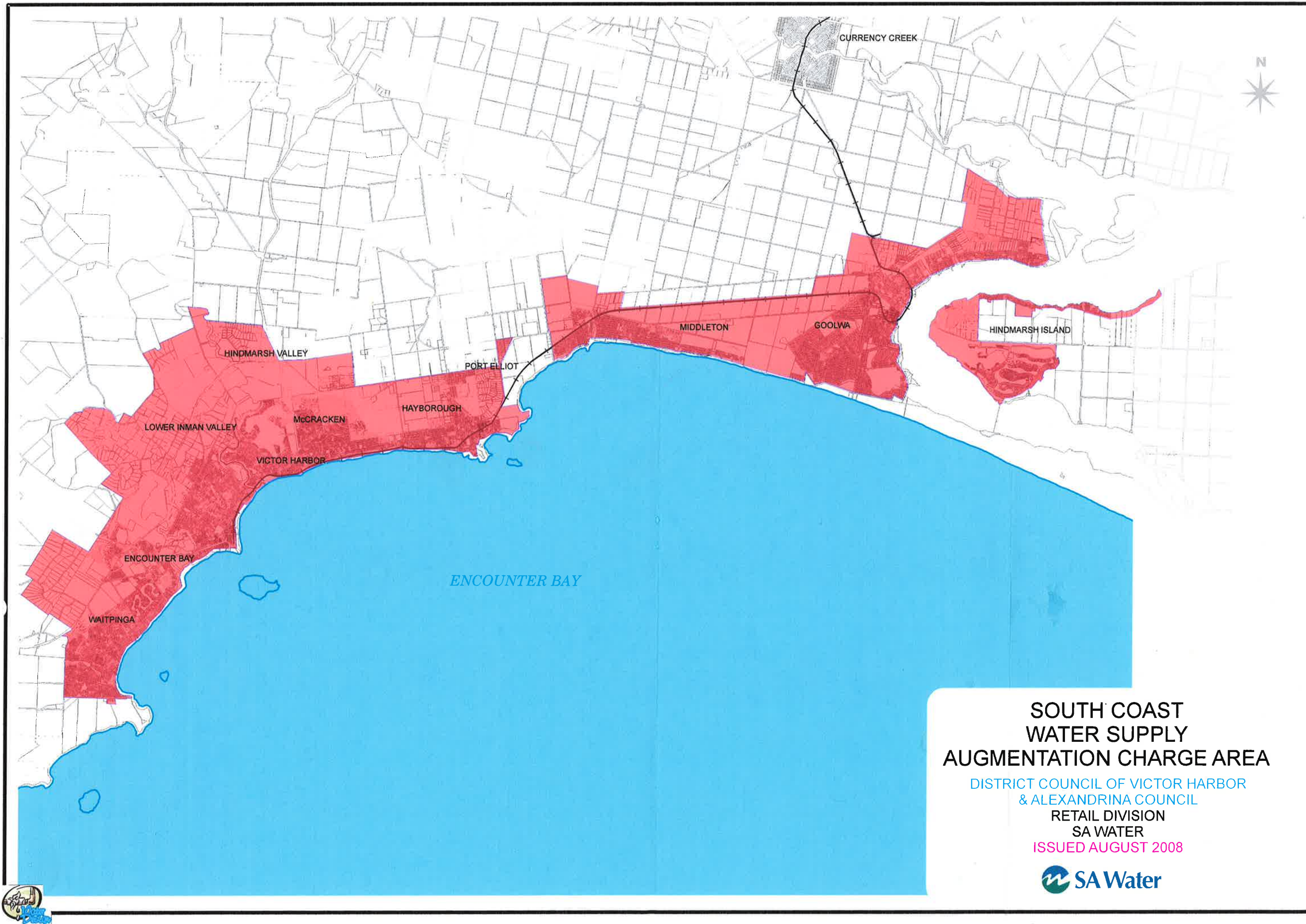
Regards

Danny Troiano

SA Water
Major Development Proposal Officer
Level 7
250 Victoria Square
ADELAIDE SA 5000

2015-16 Water Augmentation Fees

Water Augmentation Charges 2015/16	Residential (Torrens / Community Title)			Multiple Dwellings (Units, Apartments, Retirement Villages)	Commercial/ Industrial	Reserves	
	100%	70%	60%	50%	225%	100%	225%
	>401m ²	200-400m ²	0-199m ²			≤400m ²	>400m ²
Mount Barker	\$5,500	\$3,850	\$3,300	\$2,750	\$12,375	\$5,500	\$12,375
Port Broughton	\$4,235	\$2,965	\$2,541	\$2,118	\$9,529	\$4,235	\$9,529
Port Vincent	\$4,875	\$3,413	\$2,925	\$2,438	\$10,969	\$4,875	\$10,969
Port Wakefield Pipeline - per kilolitre of peak daily flow ***	\$651						
Robe	\$6,128	\$4,290	\$3,677	\$3,064	\$13,788	\$6,128	\$13,788
Roseworthy	\$1,539	\$1,077	\$923	\$770	\$3,463	\$1,539	\$3,463
Skye ***	\$25,900						
South Coast Townships	\$1,752	\$1,226	\$1,051	\$876	\$3,942	\$1,752	\$3,942
Stansbury	\$16,572	\$11,600	\$9,943	\$8,286	\$37,287	\$16,572	\$37,287
Strathalbyn	\$1,444	\$1,011	\$866	\$722	\$3,249	\$1,444	\$3,249
Tumby Bay	\$3,036	\$2,125	\$1,822	\$1,518	\$6,831	\$3,036	\$6,831
*** Augmentation Charge application has special conditions **** Charge is applied per hectare or connection size Refer Augmentation Policy for additional information on application fees							



**SOUTH COAST
WATER SUPPLY
AUGMENTATION CHARGE AREA**

DISTRICT COUNCIL OF VICTOR HARBOR
& ALEXANDRINA COUNCIL

RETAIL DIVISION
SA WATER

ISSUED AUGUST 2008



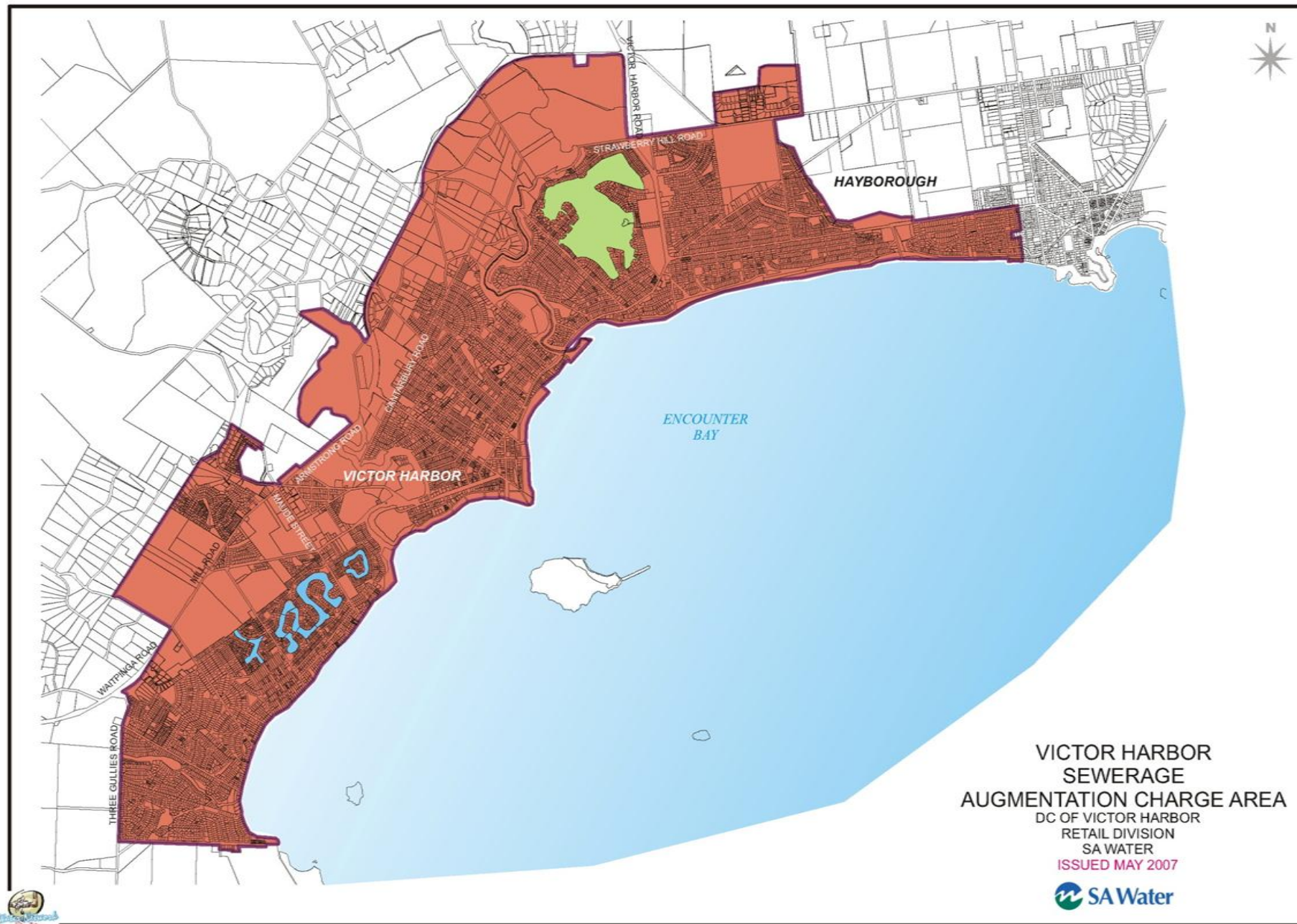
2015-16 Sewer Augmentation Fees

Sewer Augmentation Charges 2015/16	Residential (Torrens / Community Title)	Multiple Dwellings (Units, Apartments, Retirement Villages)	Commercial/Industrial	Reserves
	100%	50%	225%	225%
Burton (per hectare) ****	\$1,720			\$0
LeFevre Peninsula	\$1,033	\$517	\$2,324	\$2,324
Buckland Park (and Virginia) ¹	\$1,300	\$650	\$2925	\$2925
Lonsdale (per hectare) ****	\$9,069			
Northern Suburbs	\$1,307	\$654	\$2,941	\$2,941
Sheidow Park (per hectare) ****	\$5,355			
Victor Harbor	\$2,596	\$1,298	\$5,841	\$5,841
Virginia (and Buckland Park) ¹	\$1,300	\$650	\$2925	\$2925

*** Augmentation Charge application has special conditions **** Charge is applied per hectare or connection size

Refer Augmentation Policy for additional information on application of fees.

¹ Developers are also required to pay the Northern Suburbs Wastewater augmentation charge as discharge from the Buckland Park/Virginia scheme impacts on infrastructure requirements for the Northern Suburbs.

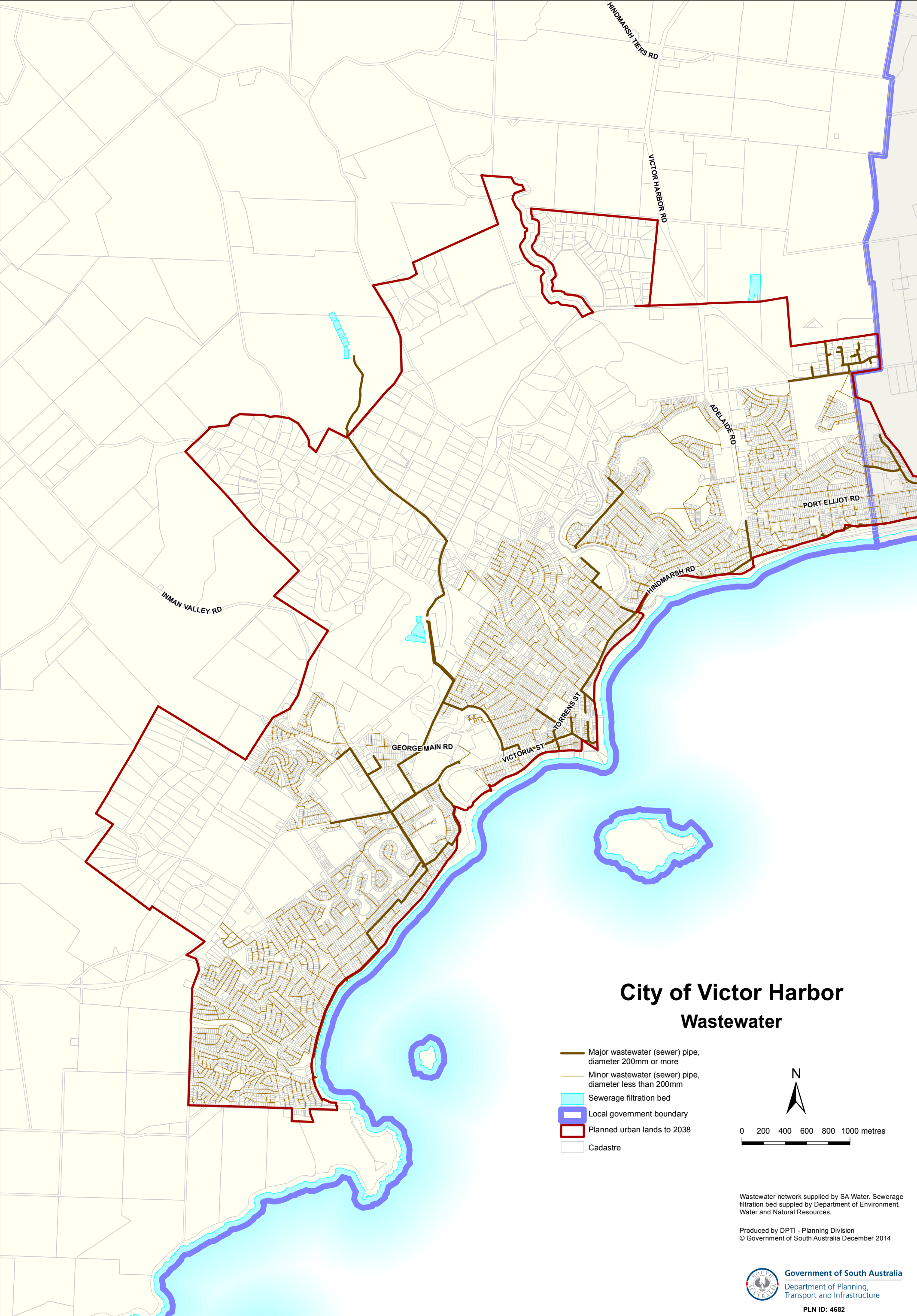


**VICTOR HARBOR
SEWERAGE
AUGMENTATION CHARGE AREA**

DC OF VICTOR HARBOR
RETAIL DIVISION
SA WATER

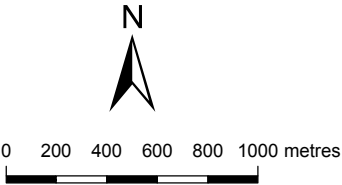
ISSUED MAY 2007





City of Victor Harbor Wastewater

- Major wastewater (sewer) pipe, diameter 200mm or more
- Minor wastewater (sewer) pipe, diameter less than 200mm
- Sewerage filtration bed
- Local government boundary
- Planned urban lands to 2038
- Cadastre



Wastewater network supplied by SA Water. Sewerage filtration bed supplied by Department of Environment, Water and Natural Resources.

Produced by DPTI - Planning Division
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Government of South Australia
Department of Planning,
Transport and Infrastructure

PLN ID: 4682

APPENDIX D – SAPN CORRESPONDENCE



BLAKES CROSSING, BLAKEVIEW, SA

WALLBRIDGE & GILBERT

Ryan Byrne

From: Malcolm Farmer [Malcolm.Farmer@sapowernetworks.com.au]
Sent: Friday, 20 November 2015 1:41 PM
To: Josh Bessell
Subject: FW: Victor Harbour Development Infrastructure Assessment
Attachments: 141024lt003.pdf

Josh,

With regards to your enquiries regarding the proposed developments I offer the following comments:

Area 1 - Waitpinga:

Existing 11kV overhead infrastructure along Waitpinga Road, 11kV overhead infrastructure goes into Area 1 just south of the Bay Road / Waitpinga Road intersection and there is 11kV underground infrastructure adjoining the northern end of Area 1.

On the presumption that Area 1 will be developed as an Underground Residential Development, under the current standard each allotment is allocated 8kVA and there is an augmentation charge is \$223/kVA. If there are 690 allotments (as per your plan), then the load will be $8 \times 690 = 5,520\text{kVA}$. If the total area is developed within a 5 year period, then additional augmentation charges apply once the load exceeds 5,000kVA for the Zone Substation threshold and 4,060kVA for the Sub-transmission threshold. The additional charges are \$259/kVA for the Zone Substation threshold and \$179/kVA for the Sub-transmission line threshold. If the total area is developed over longer than 5 years, then the Zone Substation and Sub-transmission line charges may not apply. Extension charges will be applicable to reticulate both HV and LV infrastructure within the development. There is also existing infrastructure within this area. These assets may need to be removed/relocated at a cost to the developer.

Area 2 – Hindmarsh Valley (DU):

There is existing 11kV infrastructure in various areas of the proposal. The same comments for augmentation and extension charges as described above are applicable to this proposal. There is a 66kV overhead line through this development that would have a registered easement

Area 3 – Hindmarsh Valley (RL)

Again, there is 11kV overhead infrastructure within and surrounding this area. The comments provided for Area 1 above for augmentation, extension and relocation/removal works are applicable.

For any application where a load is to be connected there will also be an Incremental Revenue Rebate component. Until the size and nature of this load is provided then this rebate amount is an unknown factor.

Please be aware that this advice is indicative only and is based on the information that you have provided to SA Power Networks. If this information is incomplete or inaccurate, SA Power Networks reserves the right to vary its response. In particular this information is given without the benefit of other authorities' requirements or a detailed site inspection.

Please contact me if you require any further information.

Regards

Malcolm Farmer
Customer Solutions Manager St Marys

Direct: 08 8275 0902
Mobile: 0403 582 102
Facsimile: 08 8275 0901
malcolm.farmer@sapowernetworks.com.au



From: Josh Bessell [mailto:JBessell@wga.com.au]
Sent: Thursday, 12 November 2015 10:33 AM
To: Malcolm Farmer
Subject: Victor Harbour Development Infrastructure Assessment

Morning Malcolm

Wallbridge and Gilbert has recently been engaged by Planning Aspects Pty Ltd to undertake a service assessment within Victor Harbour, South Australia.

We are currently in the preliminary stages of the analysis and are seeking the assistance of SA Power Networks to understand how the Victor Harbour development plan will affect the power services.

Please find the attached letter with further information.

If you have any further question regarding the letter please do not hesitate to contact me on the below details.

Regards

Josh Bessell CIVIL ENGINEER
BE Civil & Structural Engineering (Hons), MIEAust

WALLBRIDGE & GILBERT
60 Wyatt Street, Adelaide SA 5000
PHONE 08 8223 7433
WEB www.wallbridgeandgilbert.com.au

Structural Civil Environmental Geotechnical Traffic+Transport

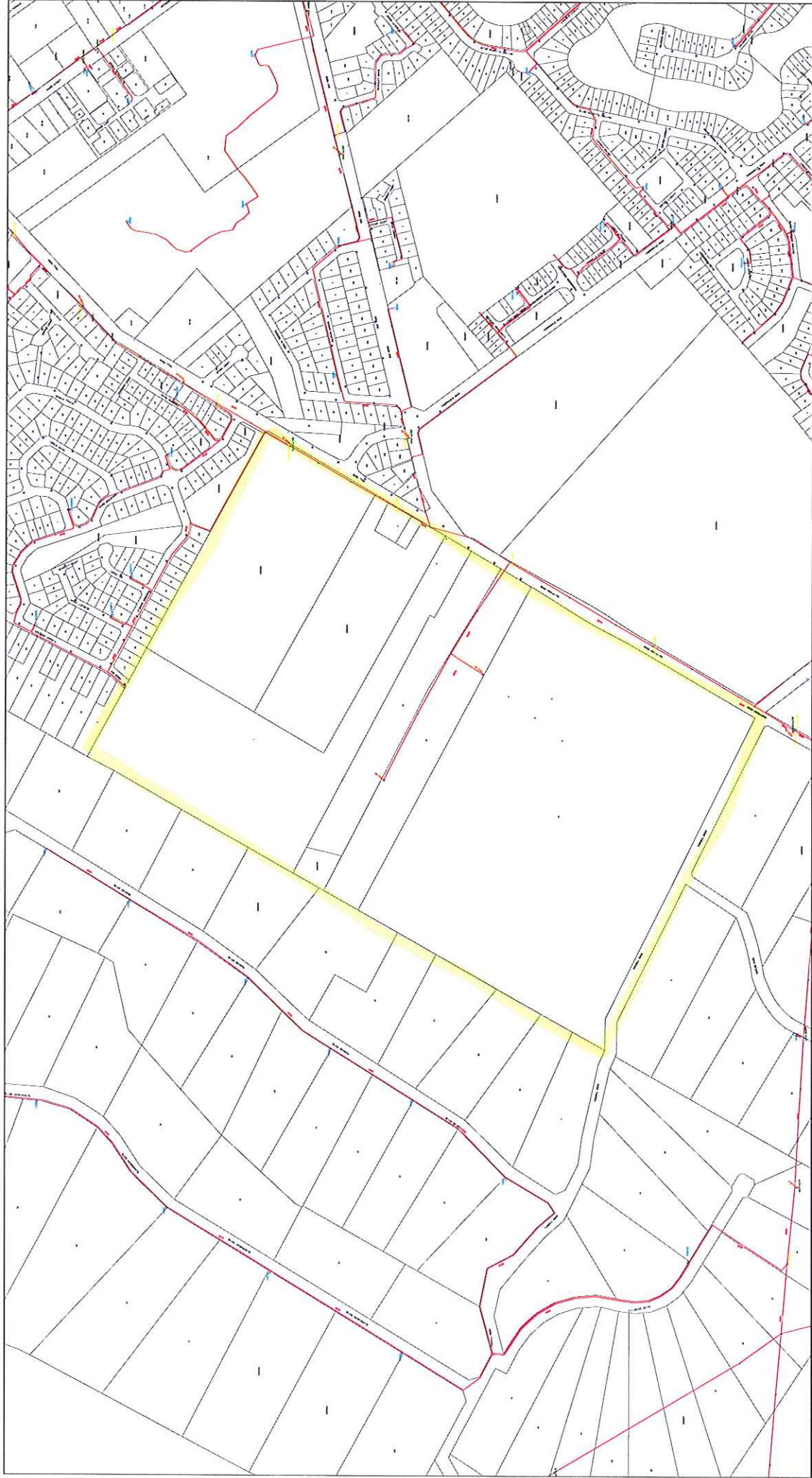
Adelaide | Darwin | Melbourne | Perth | Whyalla

ABN 90 743 056 456 ACN 052 528 926 | W&G Engineers Pty Ltd trading as Wallbridge & Gilbert www.wallbridgeandgilbert.com.au

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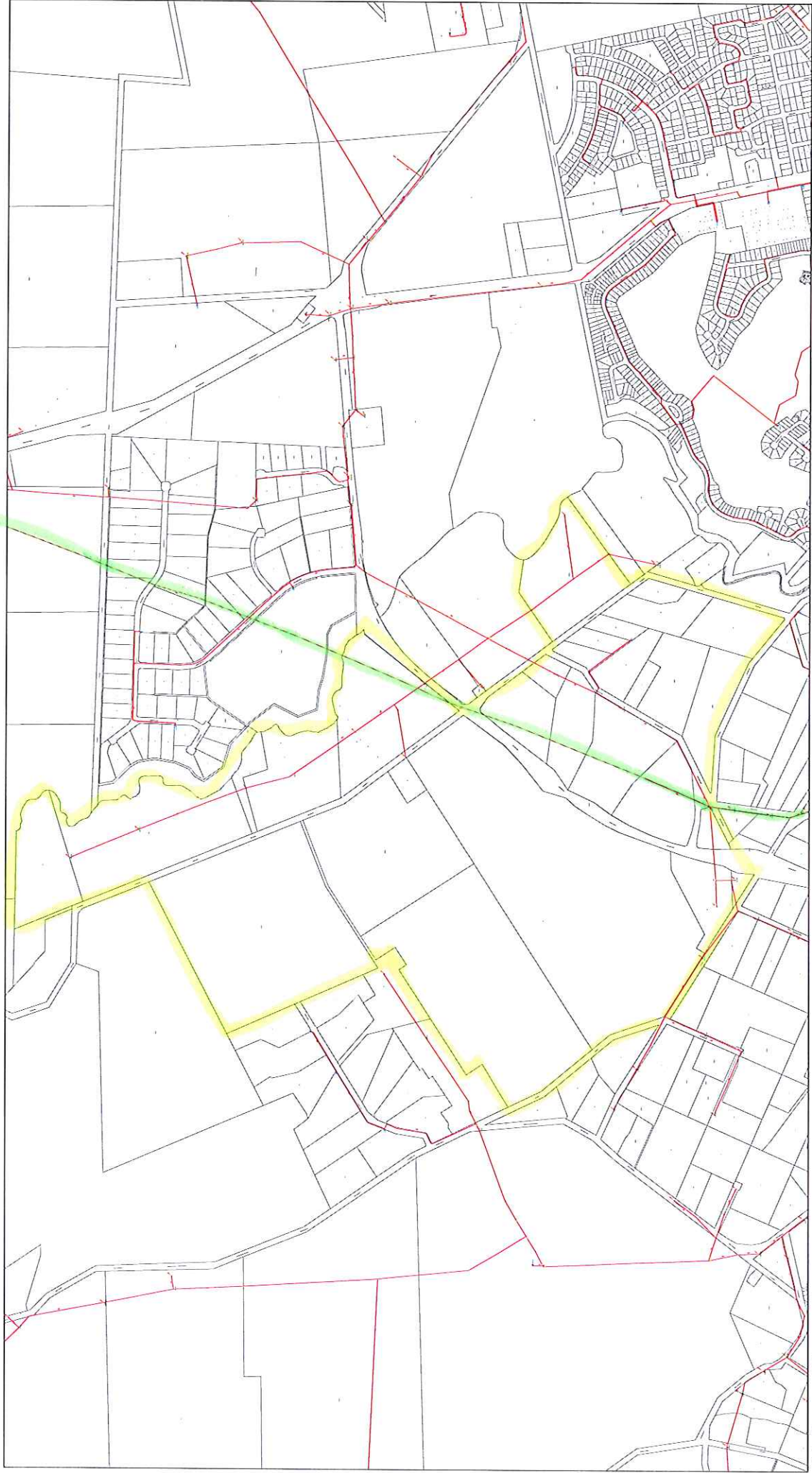
Avenue #1



SA Power Networks

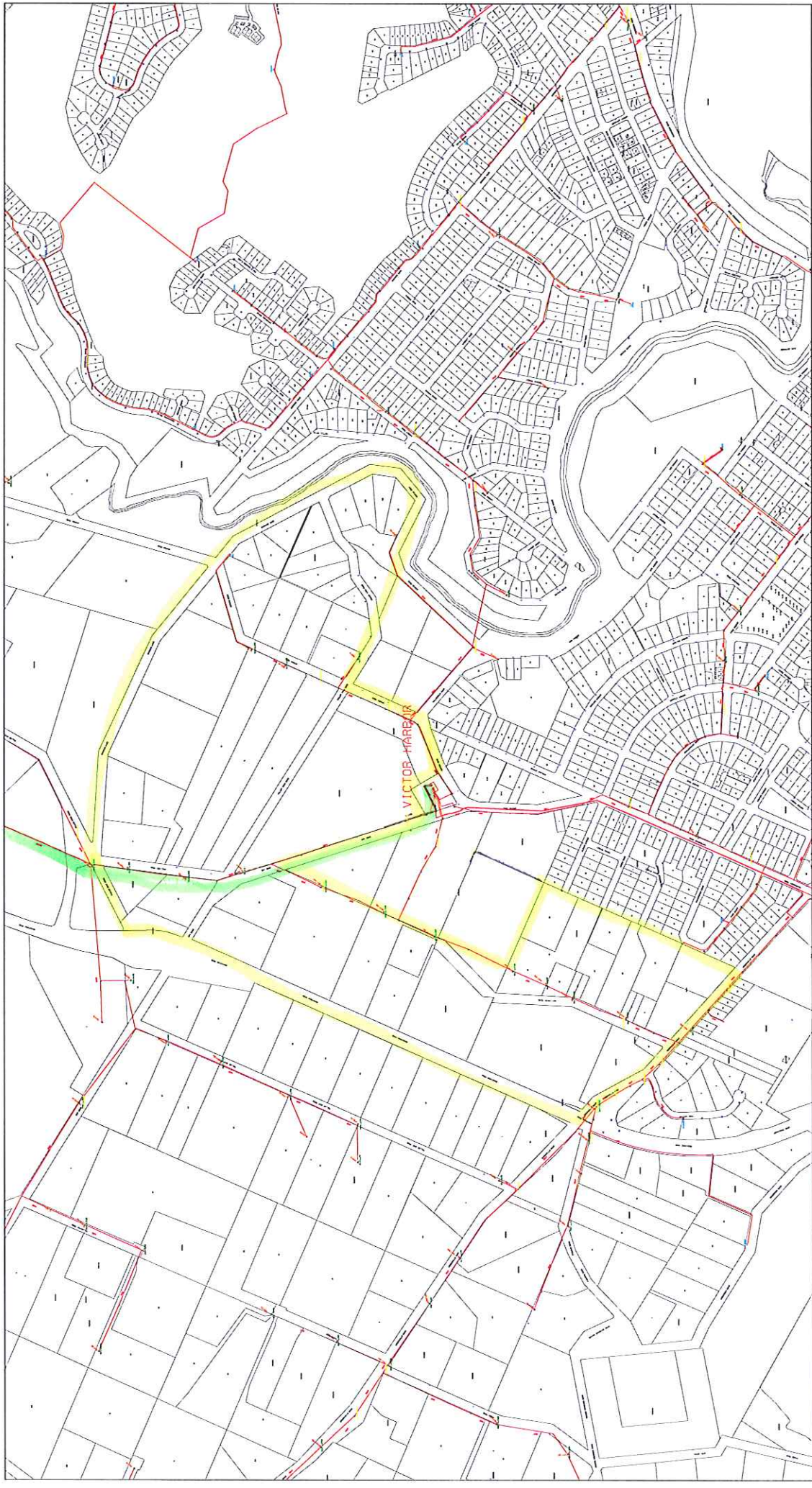
Existing 66 KV Line

Area #2



SA Power Networks

Area #3



SA Power Networks

APPENDIX E – GAS SUPPLIER CORRESPONDENCE



SPRINGWOOD, GAWLER EAST, SA

WALLBRIDGE & GILBERT



15th November 2015

Ryan Byrne
Senior Civil Engineer
Wallbridge and Gilbert
60 Wyatt Street
ADELAIDE SA 5000

Dear Ryan,

RE: Supply and Distribution of LP Gas to Victor Harbor

Further to our meeting 17th November 2015 we discussed the viability of the Design, Construction and Operation of a Gas Distribution Network in Victor Harbor.

Currently ELS is Licenced to distribute liquefied petroleum gas (LPG) in the rezoned residential area of Mount Barker South Australia. The estimated potential size of this network in future years is approximately 10,000 connections. As part of the maintenance of the Gas Distribution Licence, ELS in conjunction with the Office of Technical Regulator (OTR) must develop and maintain a "Safety Reliability and Technical Management Plan" (SRMTMP). The operation and maintenance of this (SRMTMP) is not inexpensive and requires a minimum number of gas connections to justify.

ELS believe the preliminary plans in Victor Harbor outlining the land comprising of Waitpinga, Hindmarsh Valley DU and Hindmarsh Valley RL could sustain a network to reticulate gas. The plans indicate the potential for approximately 4000 lots could be achieved throughout the development.

ELS provide confirmation that it would be interested in investing in the construction and ongoing operation of a gas distribution network in Victor Harbor subject to the following:

- ESCOSA varying ELS Licence to incorporate Victor Harbor. In our view not considered difficult to achieve
- The approval of a (SRMTMP) for Victor Harbor by (OTR). In our view not considered difficult to achieve
- All lots developed to be connected to gas network with a minimum of 1500 connections in total.

All other terms and conditions would be the same as agreed with the current developers in Mount Barker.

If you have any questions or require further information please do not hesitate to contact me on 0414 303 519.

Yours sincerely,

Brett Gallagher
Managing Director

Environmental Land Services (Aust) Pty Ltd.
A.C.N 132 441 608

Environmental Land Services (Aust) Trust.
A.B.N 14 380 892 123

11 Garden Boulevard DINGLEY VILLAGE Vic 3172
Telephone: 1300 482 228 Fax: 1300 726 221
E-mail: accounts@elservices.com.au

APPENDIX F – NBN CORRESPONDENCE



ANDREWS FARM WETLAND, SA

WALLBRIDGE & GILBERT

Ryan Byrne

From: Ryan Byrne
Sent: Tuesday, 8 December 2015 1:14 PM
To: 'jodielunn@nbnco.com.au'
Cc: Josh Bessell
Subject: RE: Infrastructure Assessment Victor Harbor (NBN)
Attachments: 1410241t004.pdf

Jodie,

As discussed last week I was to confirm approximate timeframes on the development areas under consideration at Victor, in speaking with the planner can you please base your response on the following (ie timeframes when development is expected to commence):

- Area #1 - 2 to 5 years
- Area #2 - 5 to 10 years
- Area #3 - 7 to 12 years

Any questions please call to discuss.

Regards,

Ryan Byrne SENIOR CIVIL ENGINEER

BE Civil (Hons), BE Finance, MIEAust, CPEng, NPER (Civil), RPEQ (Civil)

WALLBRIDGE & GILBERT

60 Wyatt Street, Adelaide SA 5000

PHONE 08 8223 7433

MOBILE 0402 843 459

EMAIL rbyrne@wga.com.au

WEB www.wallbridgeandgilbert.com.au

Structural Civil Environmental Geotechnical Traffic+Transport

Adelaide | Darwin | Melbourne | Perth | Whyalla



Please note that our office will be closed for the Christmas period from 5.30pm on Tuesday 22nd of December and will re-open at 8.30am on Monday 11th of January.

ABN 90 743 056 456 ACN 052 528 926 | W&G Engineers Pty Ltd trading as Wallbridge & Gilbert www.wallbridgeandgilbert.com.au

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From: Josh Bessell
Sent: Monday, 23 November 2015 1:36 PM
To: Ryan Byrne
Subject: FW: Infrastructure Assessment Victor Harbor [SEC=UNCLASSIFIED]

Ryan Do you have any issues with this date?

From: Jodie Lunn [<mailto:jodielunn@nbnco.com.au>]
Sent: Sunday, 22 November 2015 10:03 AM
To: Josh Bessell
Subject: FW: Infrastructure Assessment Victor Harbor [SEC=UNCLASSIFIED]

**Confidential**

15th December 2015

Email: Ryan Byrne RByrne@wga.com.au

Dear Ryan,

Waitpinga : Results of your Feasibility Assessment

Thank you for considering **nbn** for the delivery of network infrastructure to your development.

We have carefully reviewed your development and undertaken a feasibility assessment to estimate the anticipated costs you may be required to pay when connecting to the **nbn**TM network.

The purpose of this estimate is to provide you with early planning information and indicative costs to consider before applying for **nbn**TM network infrastructure via the [online application form](#).

Based on the information you have provided on the location and size of your development we have calculated the below estimate.

DEPLOYMENT CONTRIBUTIONS

SDU \$600 @ 690 per premises/NTD = \$414,000

BACKHAUL ESTIMATE

Distance of backhaul required = 0 km

nbnTM Access Infrastructure required = no

Estimated Backhaul Cost Contribution = \$0 / \$0 per premise/NTD (inclusive of GST)

TOTAL ANTICIPATED COSTS

\$414,000

Explanation of Costs

*Backhaul charges apply to the distance of infrastructure required to connect the development to the **nbn**TM access infrastructure. For new developments where there is no existing **nbn**TM access infrastructure (i.e. Fibre Access Node) charges will apply for this installation.*

It is important to note that this is an estimate only.

The estimate has been calculated on current infrastructure costs, the distance of your development from the existing **nbn**TM network and is based on the premise count and the location of the first stage that will require service.

Actual amounts charged by **nbn** may change between now and the point when you ultimately enter into a contract for **nbn** to connect your development. For example, costs may reduce over time as additional network is rolled out. Conversely, costs may increase if the details, premise count or staging of your development changes. In any case, a new estimate will be provided prior to work commencing.

Once you have reviewed the above estimate please contact me to discuss the next steps.

I look forward to working with you to deliver quality broadband services to your development.

Yours sincerely

Jodie Lunn

Territory Manager SA/NT

M +61 412 050 773 | **E** jodielunn@nbnc.com.au

Level 2, 33 Richmond Road, Keswick SA 5035

**Confidential**

15th December 2015

Email: Ryan Byrne RByrne@wga.com.au

Dear Ryan,

Hindmarsh Valley : Results of your Feasibility Assessment

Thank you for considering **nbn** for the delivery of network infrastructure to your development.

We have carefully reviewed your development and undertaken a feasibility assessment to estimate the anticipated costs you may be required to pay when connecting to the **nbn™** network.

The purpose of this estimate is to provide you with early planning information and indicative costs to consider before applying for **nbn™** network infrastructure via the [online application form](#).

Based on the information you have provided on the location and size of your development we have calculated the below estimate.

DEPLOYMENT CONTRIBUTIONS

SDU \$600 @ 3350 per premises/NTD = \$2,010,000

BACKHAUL ESTIMATE

Distance of backhaul required = 2.1 km

nbn™ Access Infrastructure required = no

Estimated Backhaul Cost Contribution = \$13,650 / \$4.07 per premise/NTD (inclusive of GST)

TOTAL ANTICIPATED COSTS

\$2,023,650

Explanation of Costs

*Backhaul charges apply to the distance of infrastructure required to connect the development to the **nbn™** access infrastructure. For new developments where there is no existing **nbn™** access infrastructure (i.e. Fibre Access Node) charges will apply for this installation.*

It is important to note that this is an estimate only.

The estimate has been calculated on current infrastructure costs, the distance of your development from the existing **nbn™** network and is based on the premise count and the location of the first stage that will require service.

Actual amounts charged by **nbn** may change between now and the point when you ultimately enter into a contract for **nbn** to connect your development. For example, costs may reduce over time as additional network is rolled out. Conversely, costs may increase if the details, premise count or staging of your development changes. In any case, a new estimate will be provided prior to work commencing.

Once you have reviewed the above estimate please contact me to discuss the next steps.

I look forward to working with you to deliver quality broadband services to your development.

Yours sincerely

Jodie Lunn

Territory Manager SA/NT

M +61 412 050 773 | **E** jodielunn@nbnc.com.au

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WALLBRIDGE & GILBERT
Consulting Engineers



AZTEC ANALYSIS
Engineers & Project Managers



TECHNICAL EXCELLENCE
INNOVATION
PROFESSIONALISM

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Telephone: 08 8223 5190 (Aztec)

Facsimile: 08 8232 0967

DARWIN

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Telephone: (08) 8941 1678

Facsimile: (08) 8941 5060

MELBOURNE

20 Market Street

Southbank VIC 3006

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Telephone: 03 9696 5635 (Aztec)

Facsimile: 03 9696 9577

PERTH

634 Murray Street

West Perth, WA 6005

Telephone: (08) 9336 6528

WHYALLA

Level 1, 15 Darling Terrace

Whyalla SA 5600

Telephone: 08 8644 0432

Facsimile: 08 8645 0544

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