

Services Investigation Report Engineering Servicing Advice

Cardinia Creek South – Part 2
Precinct Structure Plan

City of Casey
December 2025

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1 EXECUTIVE SUMMARY

The City of Casey and the Department of Transport and Planning (DTP) propose to implement the Cardinia Creek South – Part 2 Precinct Structure Plan (PSP) enabling development of land at 95 and 125 McCormacks Road, Clyde North.

Taylor's has been engaged by the City of Casey and the DTP to undertake an investigation into the location of existing services and determine their ability to service proposed development of the PSP. The investigation included consultation with key service authorities, including Melbourne Water, South East Water, APA Group, AusNet Electricity Services and NBN Co.

This report has identified that while the existing PSP study area is not fully serviced at present, the adjoining developments to the north and east of the PSP are fully serviced and that economical extensions of the key services can be undertaken to ensure the proposed Cardinia Creek South – Part 2 PSP is fully serviced in the future.

The following table provides a summary of the availability of each of the major services.

Drainage	Available	Drainage outlet available. Melbourne Water scheme infrastructure to be constructed and outlet to Cardinia Creek
Sewerage	Available	Existing 450mm diameter trunk sewer runs through the Study Area
Potable Water	Available	Potable Water network has been constructed to the north and west of the Study Area. Shared asset construction is required to the west of the Study Area with reticulation assets required to service developments.
Recycled Water	Available	Recycled Water network has been constructed to the north and west of the Study Area. Shared asset construction is required to the west of the Study Area with reticulation assets required to service developments.
Electricity	Constrained	Existing overhead 22kV feeder in McCormacks Road will not support additional development and will require upgrade. Existing underground network in Smiths Lane Estate may be extended into the Study Area.
Telecommunications	Available	Existing NBN Fixed Line, Fibre to the Premises (FTTP) network to be extended into the Study Area from the Smiths Lane Estate to the north and Orana Estate to the west.
Gas	Available*	Existing distribution pressure gas network to the north of the Study Area within Smiths Lane Estate. Planning Scheme Amendment VC250 prevents connection of natural gas to development or subdividing of land for residential purposes.

*Natural Gas available for certain non-residential uses only.

It is likely that development of the Cardinia Creek South – Part 2 PSP will be staged from along the northern and southern boundaries initially. This advice is based upon availability to existing services. It does not preclude Developers from pursuing properties in the north-west corner of the precinct and extending services with bring-forward costs.

Funding of shared sewer and water assets is typically achieved by levies collected by the Water Authority and put towards financing trunk infrastructure and shared asset projects that are essential to service development areas. These assets are typically programmed by the Authority into staged delivery over a number of years based on anticipated development of the Precinct. Should sections of these shared assets be required by developers ahead of anticipated program, then the financing costs associated with bringing forward the provision of shared assets would be borne by the developer.

Construction of shared electricity, gas and telecommunications assets is funded by levies or forecast revenue from usage charges.

South East Water has advised that the Cardinia Creek South – Part 2 PSP will be a mandated recycled water supply zone meaning developers will be required to supply a recycled water connection to each new allotment. Recycled or Class A Water is wastewater that has been treated to a standard that makes it suitable for uses in the home that include washing clothes, watering of gardens, washing of vehicles and flushing of toilets.

There are several opportunities within the Cardinia Creek South – Part 2 PSP to incorporate innovative technologies and sustainable initiatives to assist with Climate Change Mitigation and Adaptation. These including strategies for Urban Cooling, Carbon Storage and Resource Management.

Further consultation with all service authorities is to be conducted during the preparation of the Cardinia Creek South – Part 2 PSP masterplan to determine the location and spatial requirements for proposed infrastructure.

2 INTRODUCTION

It is understood that the City of Casey and the Department of Transport and Planning propose to implement the Cardinia Creek South – Part 2 Precinct Structure Plan (PSP) enabling development of land at 95 and 125 McCormacks Road, Clyde North (Study Area). It is required that all of the developable land within the Cardinia Creek South – Part 2 PSP be provided with essential services such as water, electricity, sewerage, drainage and telecommunications. While Natural Gas is no longer required to service new residential developments, commercial and industrial applications may still require natural gas, and so information regarding natural gas infrastructure is to be included. A services investigation report detailing the availability of these services is required to assist the City of Casey in understanding any constraints in servicing the PSP and to assist future Developers understand timing and/or cost of service delivery.

3 COMMISSION

Taylors has been engaged by the City of Casey to undertake an investigation into the location of existing services and determine their ability to service proposed development of the PSP. Accordingly, the objective of this report is to identify existing and future infrastructure servicing requirements within the precinct area and to identify any associated implications that need to be considered during the preparation of the PSP.

This assessment will enable the City of Casey to plan the future urban structure with greater certainty and identify infrastructure which will be required and should be encouraged within the study area to serve the needs of the local community.

The assessment will include:

- Site description and existing conditions summary
- Provision of a services plan
- Identification of all current service and utility infrastructure
- Identification of current capacity of all service and utility infrastructure
- Identification of key opportunities and constraints for the provision of all future service and utility infrastructure
- Consideration of opportunities for innovative approaches to servicing, based on projected land use
- Identification of specifications and notional routes through the PSP area for future service and utility infrastructure
- Investigation of access to services and recommendation of how provision of these services can be achieved in the short and long-term
- Consideration of expected funding arrangements (based on the views of relevant servicing agencies and any relevant principles established by the Essential Services Commission)
- Provision of advice on probable staging (relative to service infrastructure location and capacity)
- Address water recycling and reuse practices and identify potential options suitable for the PSP area
- Anticipate location and approximate cost of trunk infrastructure
- Take into account both existing and expected conditions and consider the requirements generated by the future development of the area (i.e. How much land or size of easement is required for particular items of infrastructure?)
- Provision of recommendations to assist in the preparation of the PSP
- List issues requiring further investigation at each stage of the development process following finalisation of the PSP
- Preparation of maps, plans and documentation, particularly in regard to location of all existing and future service and utility infrastructure and its staging to support the investigation and advice.

4 SITE DESCRIPTION

The Cardinia Creek South – Part 2 PSP (Study Area) has a site area of approximately 103.8 hectares. An aerial photograph is provided in Figure 1, and a locality plan is provided in Figure 2. The study area is bounded by McCormacks Road to the south, Cardinia Creek to the east, Smiths Lane Estate to the south, and by rural residential properties 55 & 75 McCormacks Road to the west, both of which fall within the Cardinia Creek South (McPherson) Precinct Structure Plan.



*Figure 1 – Aerial Photograph, Rotated for Context
(MetroMap, August 2025)*

The land is predominantly zoned Urban Growth Zone (UGZ). Cardinia Creek falls in a Rural Conservation Zone (RCZ) and an Urban Floodway Zone (UFZ) bisects the Study Area connecting the constructed waterway in Smiths Lane Estate to Cardinia Creek in the south-east corner of the study area, following the existing alignment of a tributary of Cardinia Creek.

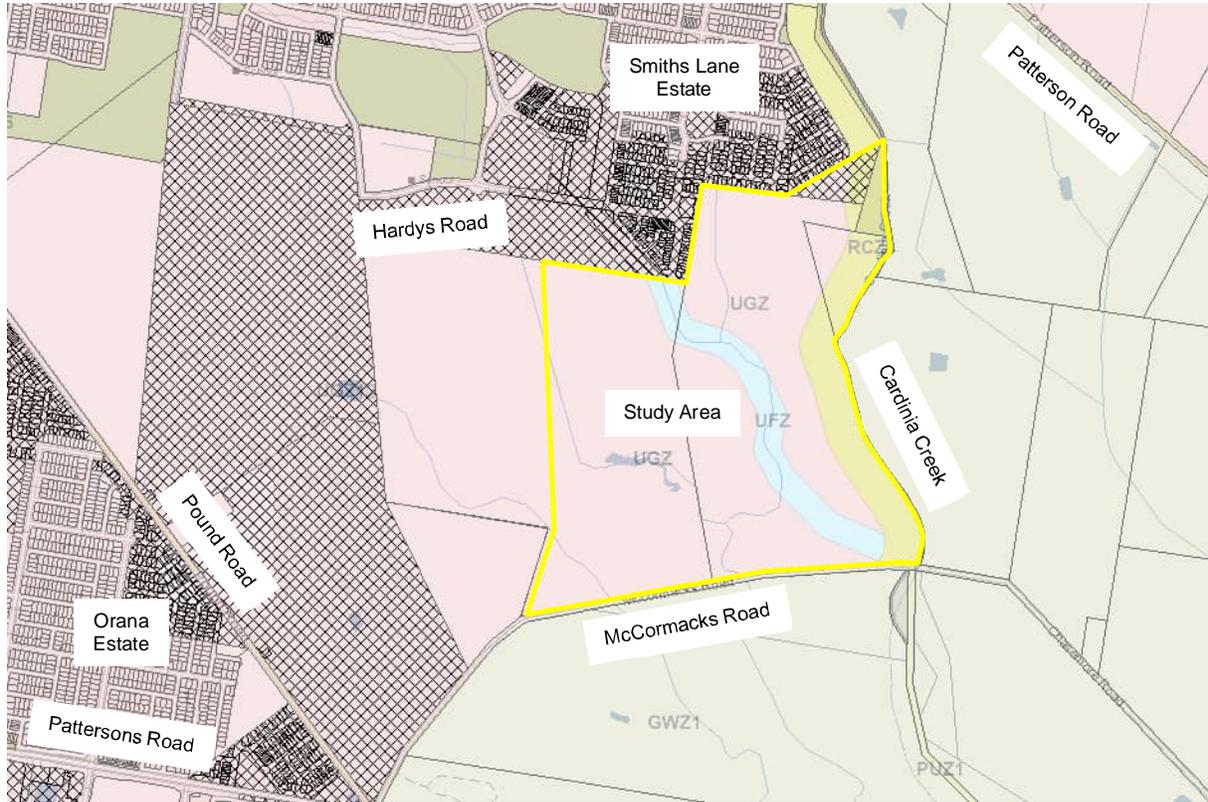


Figure 2 – Locality Plan (VicPlan, December 2025)

5 PROPOSAL

The Cardinia Creek South - Part 2 PSP study area is in preliminary stages of planning however it will be largely a residential precinct with passive open space, drainage reserves and the conservation land adjacent to Cardinia Creek. It is expected that the precinct will generate up to 1,300 new residential allotments.

6 INVESTIGATION:

The investigation into the availability of services to the Study Area has been prepared via a desktop assessment. The desktop assessment comprised obtaining existing service information from the following sources:

- City of Casey
- South East Water
- Telstra
- National Broadband Network Co (NBN)
- Opticomm
- APA Group Gas Networks
- AusNet Electricity Services
- Melbourne Water
- Land Channel Victoria
- MetroMap
- Site Visit

7 LIMITATIONS AND ASSUMPTIONS

This investigation has been scoped and undertaken as a desktop study to provide preliminary advice on the anticipated servicing works within the Study Area. There are limitations on the level of detail that is able to be given due to the nature of this review. Desktop studies such as this are reliant on information that is made available from service authorities, with an assumption that it provides an accurate representation of existing site conditions.

8 FINDINGS & DISCUSSION

8.1 WATER SUPPLY – Potable Water

8.1.1 Existing Services

The responsible authority for potable water supply is South East Water.

South East Water has provided information on the location of existing potable water main infrastructure which shows existing 100mm and 150mm diameter reticulation sized assets immediately to the north of the Study Area within the Smiths Lane Estate. There is no potable water main infrastructure in McCormacks Road.

There is a 375mm diameter PVC trunk main on the north side of Hardys Road and a 280mm diameter PE main on the eastern side of Alexander Boulevard. A 355mm diameter PE stub has been extended south of the Hardys Road and Alexander Boulevard intersection ready to be extended south towards 75 McCormacks Road.

To the west of the Study Area, there is a 500mm diameter PE trunk main in Pattersons Road, west of Pound Road.



Figure 3 – Existing Potable Water Main Infrastructure
(South East Water Infrastructure Master Plan, December 2025)

8.1.2 Future Servicing Arrangements

South East Water has advised that a 300mm diameter potable water supply main is required to be extended from Alexander Boulevard south to McCormacks Road and then south-west to Pound Road then increasing in diameter to 375mm in Pattersons Road connecting to the existing 500mm PE main.

A 150mm diameter reticulation main will need to be extended along McCormacks Road to the Study Area and additional 100mm and 150mm connections will be made to the existing assets to the north in Smiths Lane Estate and the proposed 300mm diameter main to the west. Confirmation of these alignments, and timing of delivery will require confirmation with SEW upon completion of the Cardinia Creek South – Part 2 PSP. All future water mains are to be constructed within future road reserves. No dedicated water transfer easements will be required within the Study Area.

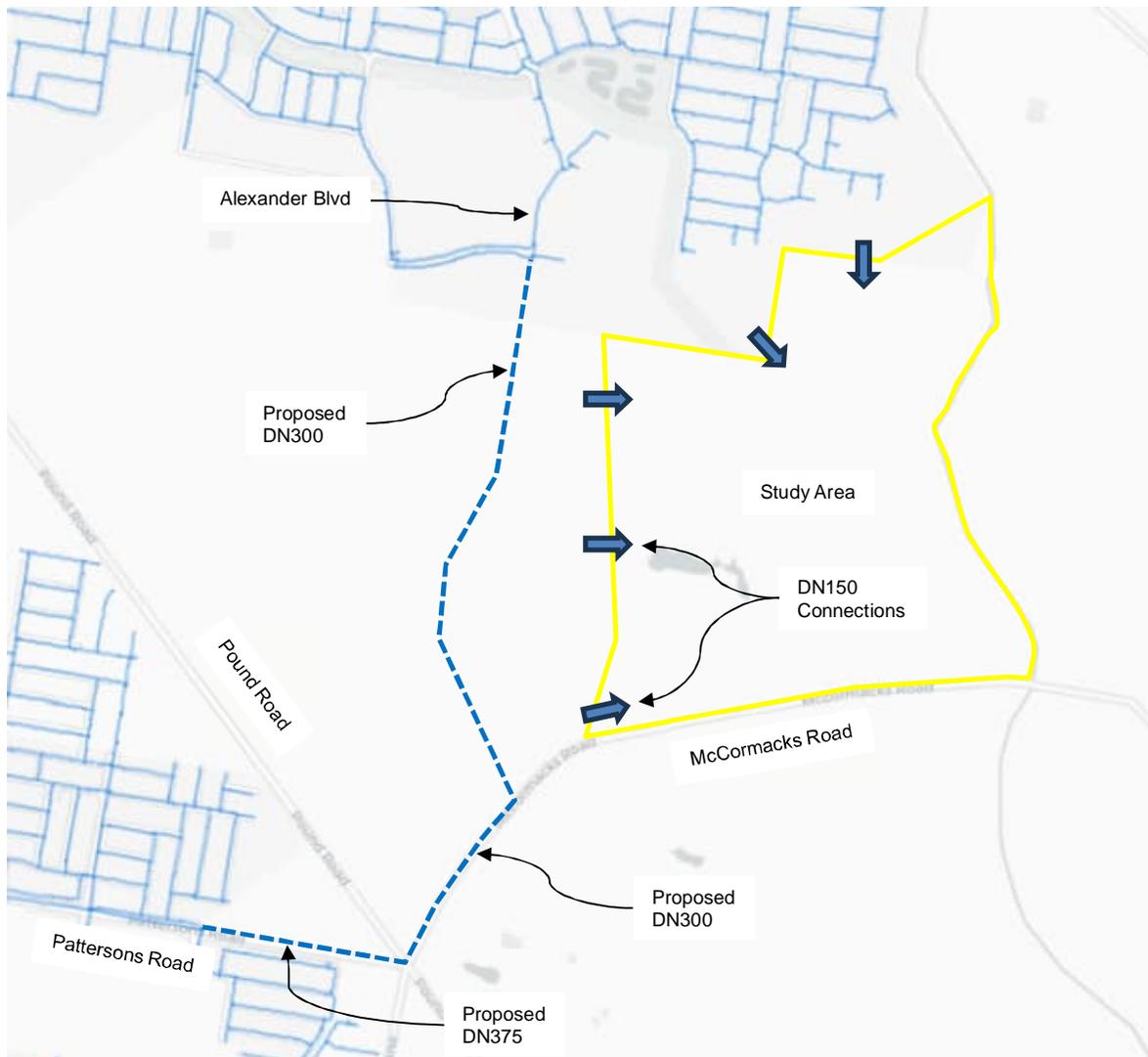


Figure 4 – Proposed Shared Potable Water Main Infrastructure
(South East Water Infrastructure Master Plan, December 2025)

8.1.3 Expected Funding Arrangements

The Essential Services Commission (ESC) specifies how water businesses levy new customer contributions (NCC). South East Water applies this levy on a per lot basis. The levies collected by South East Water are utilised to fund trunk infrastructure and shared asset projects which are essential to service areas of new development.

The Cardinia Creek South – Part 2 PSP currently falls within the South East Water “Casey” supply zone meaning that the current charge (2025/26) of \$1,017.85 will be applied per allotment for potable water. The supply zone and NCC charge are subject to change.¹

South East Water is responsible for funding trunk infrastructure and shared assets. Developers are responsible for providing reticulation assets and temporary reticulation works and the cost to connect the development to the South East Water network. Developers are also responsible for the financing costs associated with bringing forward the provision of shared assets and temporary shared works that South East Water had programmed to be constructed at a future date. The ESC guidelines determine that South East Water may levy a charge that will cover the financing costs associated with bringing forward the provision of Shared Assets. This is referred to as an Incremental Financing Cost (IFC) charge.

The potable water mains shown on the servicing plan in Figure 4 have been identified by South East Water as being Shared Assets.

8.1.4 Summary of Outcomes

- South East Water’s master planning notes that a 300mm diameter potable water main is required to be delivered by others to the west of the Study Area. Additionally, a 300/375mm diameter potable water main extension is required along Patterson Road.
- Future servicing of the Study Area with potable water will rely upon developers extending a 150mm diameter main along McCormacks Road and interconnecting mains between the Smiths Lane Estate to the north and the proposed main 300mm diameter main to the west of the Study Area.
- South East Water will reimburse developers for construction of shared assets (Water mains with a diameter of 225mm or greater) using funds collected from new customer contributions. Where shared assets are proposed to be constructed by developers prior to their scheduled delivery, then developers may be liable for incremental finance costs.

¹ South East Water 2025-26 Pricing Handbook, 1 July 2025

8.2 WATER SUPPLY – Recycled Water

8.2.1 Existing Services

The responsible authority for recycled water supply is South East Water.

South East Water has provided information on the location of existing recycled water main infrastructure which shows existing 100mm and 150mm diameter reticulation sized assets to the north of the Study Area within the Smiths Lane Estate. There is no recycled water main infrastructure in McCormacks Road.

There is a 560mm diameter PE trunk main reducing to a 375mm diameter PVC trunk main on the north side of Hardys Road and a 560mm diameter PE trunk main on the eastern side of Alexander Boulevard. A 280mm diameter PE stub has been extended south of the Hardys Road and Alexander Boulevard intersection ready to be extended south towards 75 McCormacks Road.

To the west of the Study Area there a 280mm diameter PE trunk main in Pattersons Road, west of Pound Road.

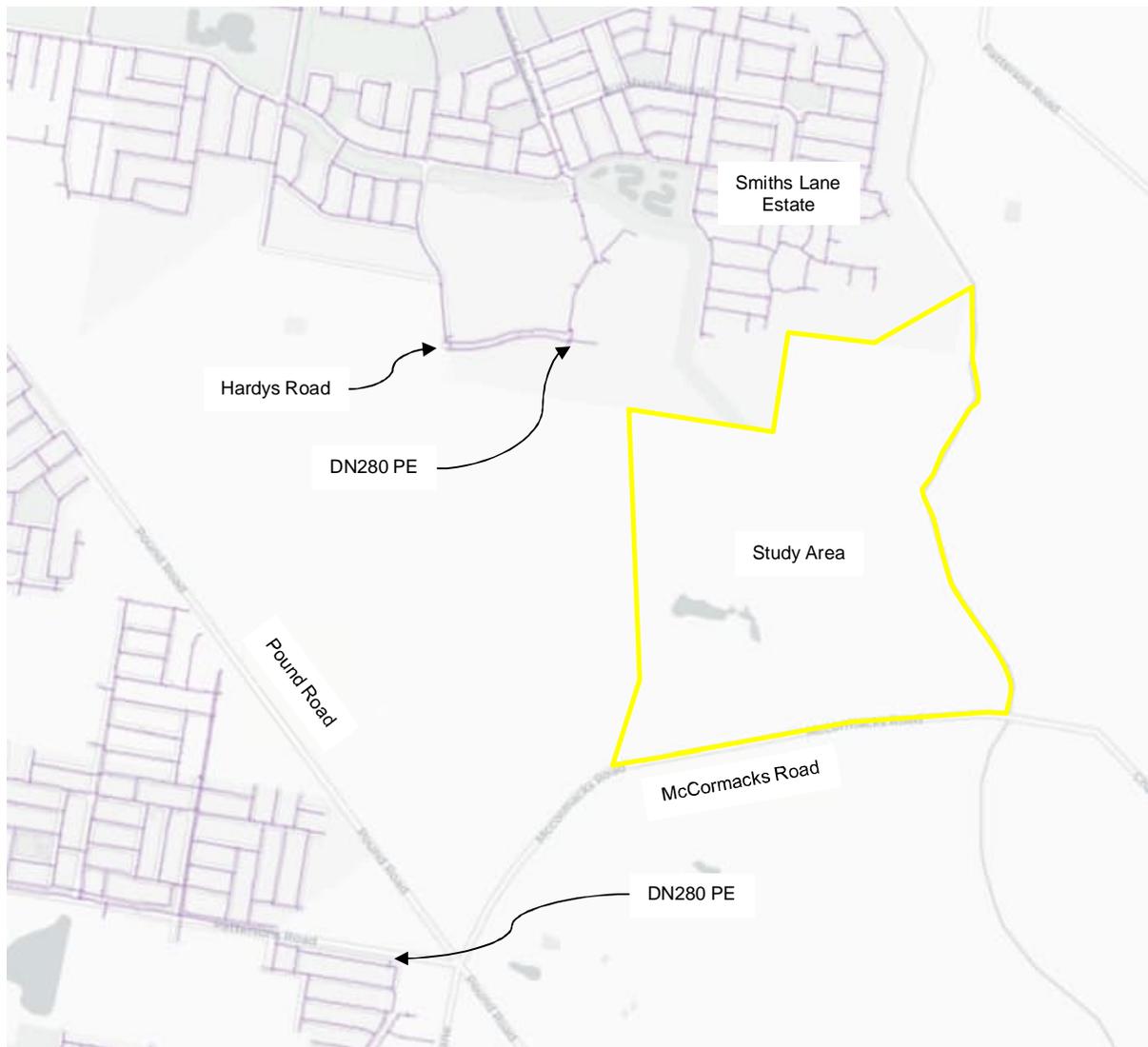


Figure 5 – Existing Recycled Water Main Infrastructure
(South East Water Infrastructure Master Plan, December 2025)

8.2.2 Future Servicing Arrangements

South East Water has advised that a 225mm diameter recycled water supply main is required to be extended from Alexander Boulevard south to McCormacks Road and then south-west to Pound and finally a 225mm in Pattersons Road connecting to the existing 280mm PE main. Class A recycled water is wastewater that has been treated to a standard that makes it suitable for uses in the home that include washing clothes, watering of gardens, washing of vehicles and flushing of toilets.

A 150mm diameter reticulation main will need to be extended along McCormacks Road to the Study Area and additional connections will be made to the existing assets to the north in Smiths Lane Estate and the proposed 225mm diameter main to the west. Confirmation of these alignments, and timing of delivery will require confirmation with SEW upon completion of the Cardinia Creek South – Part 2 PSP. All future water mains are to be constructed within road reserves. No dedicated water transfer easements will be required within the Study Area.

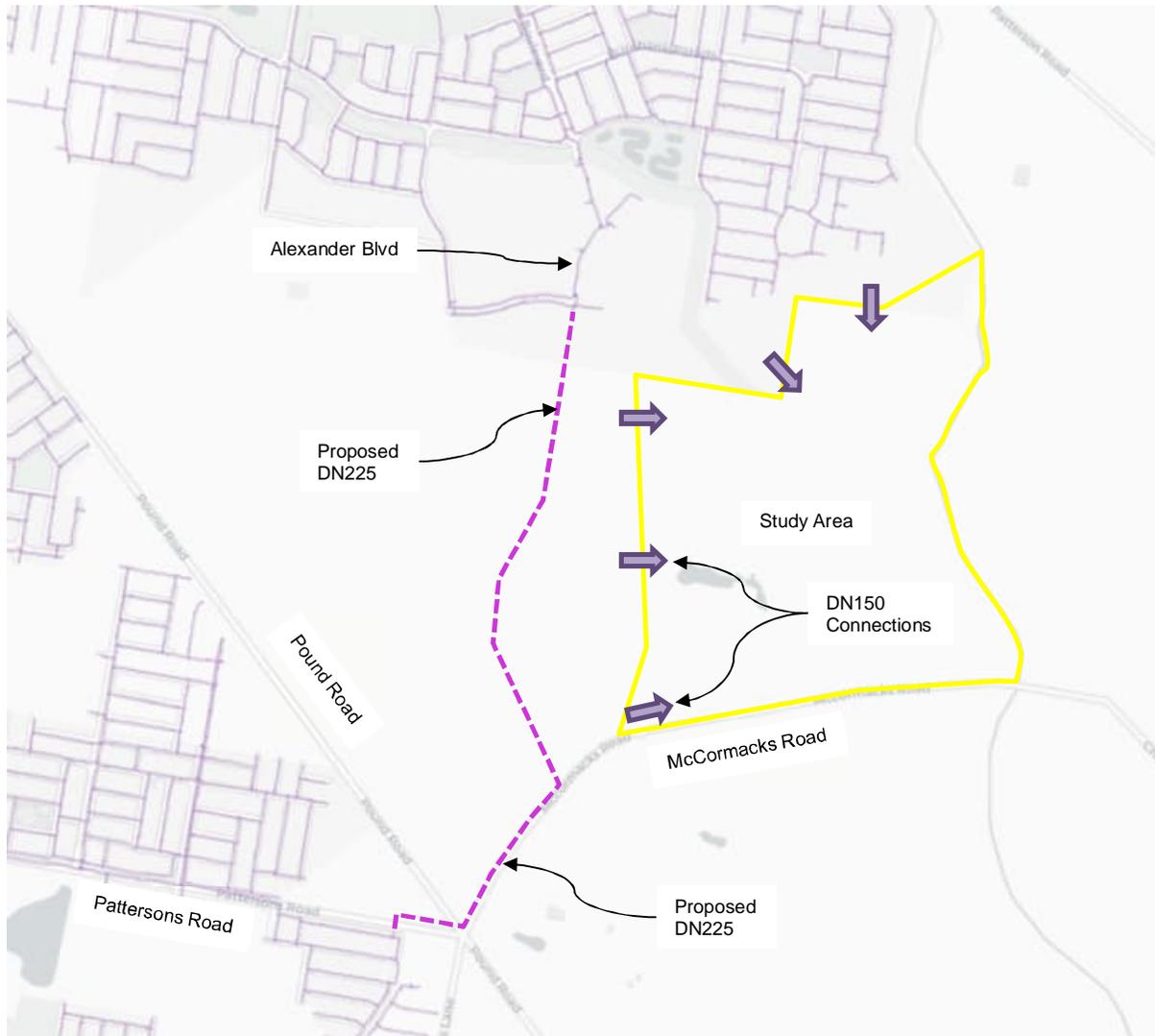


Figure 6 – Proposed Shared Recycled Water Main Infrastructure
(South East Water Infrastructure Master Plan, December 2025)

8.2.3 Expected Funding Arrangements

The Essential Services Commission (ESC) specifies how water businesses levy new customer contributions (NCC). South East Water applies this levy on a per lot basis. The levies collected by South East Water is then put towards financing trunk infrastructure and Shared Asset projects that are essential to service development areas.

The Cardinia Creek South – Part 2 PSP is currently within the South East Water “Casey” supply zone meaning that the current charge of \$2,700.53 will be applied per allotment for recycled water. The supply zone and NCC charge are subject to change.²

South East Water is responsible for trunk infrastructure and Shared Assets (Water mains with a diameter of 225mm or greater). Developers are responsible for providing reticulation assets and temporary reticulation works and the cost to connect the development to the South East Water network. Developers are also responsible for the financing costs associated with bringing forward the provision of shared assets and temporary shared works that South East Water had programmed to be constructed at a future date. The ESC guidelines determine that South East Water may levy a charge that will cover the financing costs associated with bringing forward the provision of Shared Assets. This is referred to as an Incremental Financing Cost charge.

The recycled water mains (225mm or greater) shown on the servicing plan in Figure 6 have been identified by South East Water as being Shared Assets.

8.2.4 Summary of Outcomes

- South East Water has advised that the Cardinia Creek South – Part 2 PSP Study Area will be a mandated recycled water supply zone.
- South East Water master planning notes a 225mm diameter recycled water main is required to the west of the Study Area with a 225mm diameter recycled water main extension in Patterson Road.
- Future servicing of the Cardinia Creek South – Part 2 PSP with recycled water will rely upon developers extending a 150mm diameter main along McCormacks Road and interconnecting mains between the Smiths Lane Estate to the north and the proposed main 225mm diameter main to the west of the Study Area.
- South East Water will reimburse Developers for construction of shared assets using funds collected from new customer contributions. Where shared assets are proposed to be constructed by Developers prior to their scheduled delivery, then Developers may be liable for incremental finance costs.

² South East Water 2025-26 Pricing Handbook, 1 July 2025

8.3 SEWERAGE

8.3.1 Existing Services

The responsible authority for sewer reticulation is South East Water.

South East Water has provided information on the location of existing sewer main infrastructure which shows existing network 150mm diameter reticulation sized assets to the north of the Study Area within the Smiths Lane Estate. There is a 300mm diameter PVC main on the eastern side of Burnbank Parade and a 375mm diameter main on the north side of Hardys Road. These two mains combine at the intersection of Burnbank Parade and Hardys Road, increasing to a 450mm diameter GRP trunk main and heads south through the Study Area, approximately 55 meters west of the common boundary between 95 McCormacks Road and 125 McCormacks Road. The 450mm diameter trunk main continues through to McCormacks Road, increasing in size to 525mm diameter and heads west along the northern side of McCormacks Road. This trunk main was constructed in 2021 and ultimately discharges to the Ballarto Road Sewer Pump Station.

During initial planning of the Cardinia Creek South (McPherson) PSP, South East Water had envisaged an interim sewer pump station at McCormacks Road at the common boundary of the 75 and 95 McCormacks Road. This pump station was superseded by the 2021 construction of the 450/525mm diameter trunk sewer.

The 450mm diameter sewer has an invert level of approximately 8.7m (AHD) when it bends at McCormacks Road which is a depth to invert of approximately 6 metres from the existing surface. At the south-west corner of the Study Area, the sewer has increased to a diameter of 525mm and has an invert level of approximately 7.3m (AHD) which is a depth to invert of approximately 8 metres. The developers of the land in the Study Area should confirm that the existing sewer is at an adequate depth to control any proposed development.

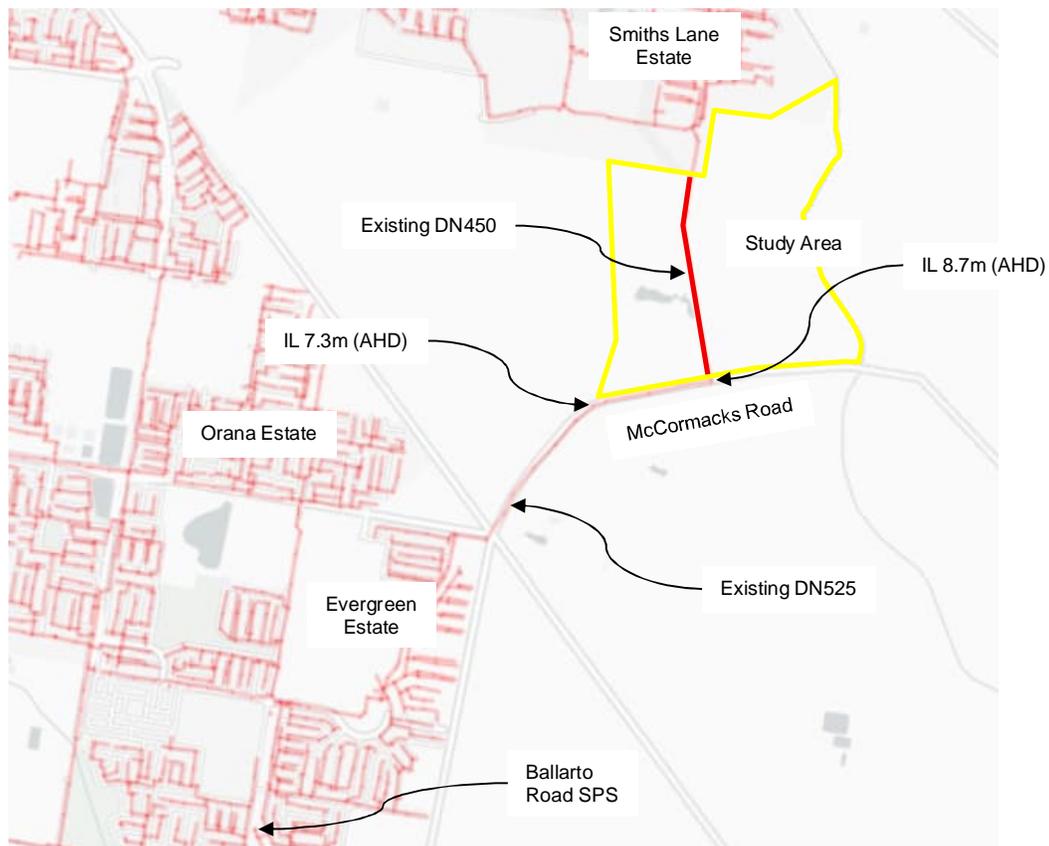


Figure 7 – Existing Sewer Infrastructure
(South East Water Infrastructure Master Plan, December 2025)

8.3.2 Future Servicing Arrangements

At the time of writing this report, preliminary servicing advice has yet to be provided by South East Water, however it is anticipated that future servicing of the Cardinia Creek South – Part 2 PSP with reticulated sewer will rely upon developers extending reticulation sized (150/225mm diameter) sewer mains connecting to the 450mm diameter trunk sewer constructed through 95 McCormacks Road. All new sewers can be routed along road reserves or within easements along drainage reserves or through allotments. Reticulation sewer easements are typically 2.5 to 3.0 metres wide. The existing 450mm sewer which traverses the Study Area will be required to be located in a road reserve.

8.3.3 Expected Funding Arrangements

The Essential Services Commission (ESC) specifies how water businesses levy new customer contributions (NCC). South East Water applies this levy on a per lot basis. The levies collected by South East Water is then put towards financing trunk infrastructure and Shared Asset projects that are essential to service development areas.

The Cardinia Creek South – Part 2 PSP is currently within the South East Water “Casey” supply zone meaning that the current charge of \$1,195.63 will be applied per allotment for sewer supply. The supply zone and NCC charge are subject to change.³

South East Water is responsible for trunk infrastructure and Shared Assets. Developers are responsible for providing reticulation assets and temporary reticulation works and the cost to connect the development to the South East Water network. Developers are also responsible for the financing costs associated with bringing forward the provision of shared assets and temporary shared works that South East Water had programmed to be constructed at a future date. The ESC guidelines determine that South East Water may levy a charge that will cover the financing costs associated with bringing forward the provision of Shared Assets. This is referred to as an Incremental Financing Cost charge.

8.3.4 Summary of Outcomes

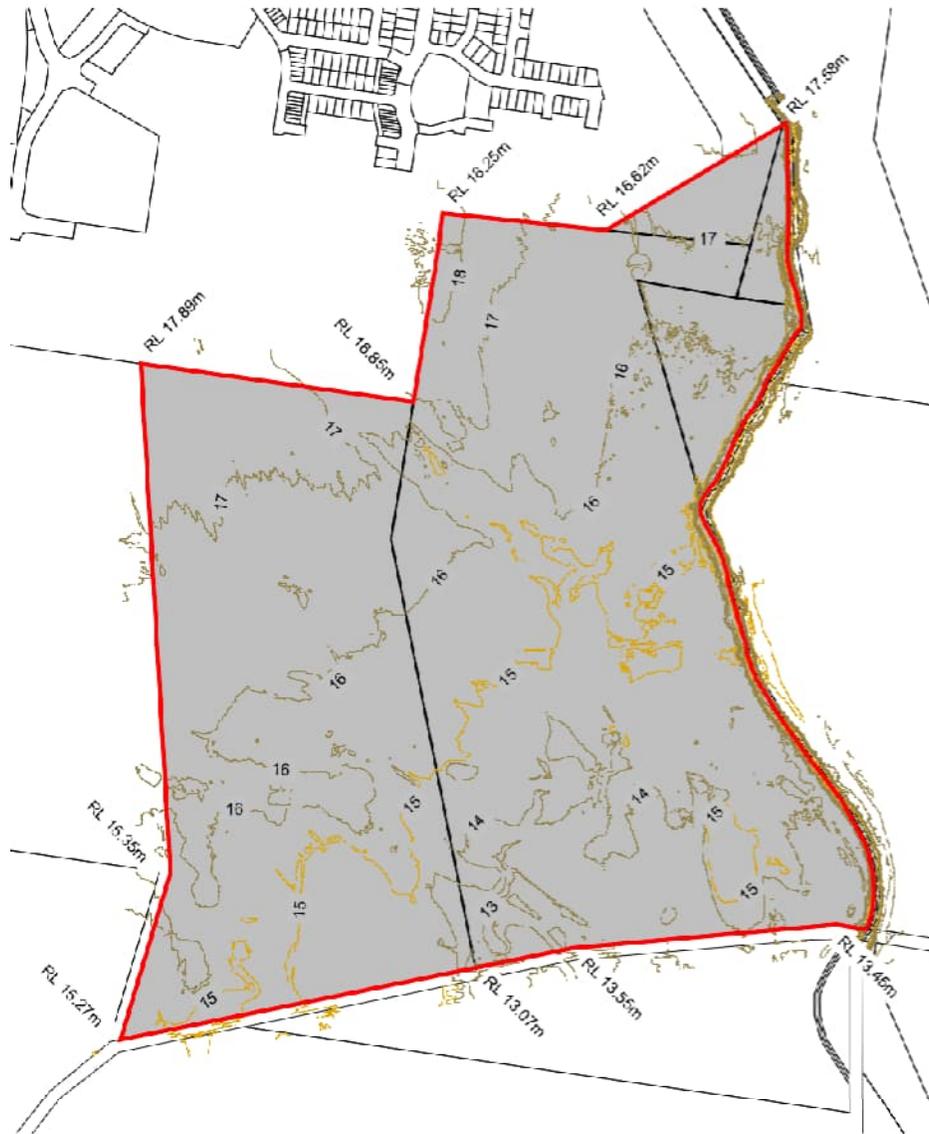
- South East Water has confirmed that there is an existing 450mm diameter GRP trunk main that directs flows south through 95 McCormacks Road, increasing in size to 525mm diameter in McCormacks Road.
- The Cardinia Creek South – Part 2 PSP is well serviced with major trunk infrastructure already constructed, reducing timing uncertainty and cost risk.
- Future servicing of the Cardinia Creek South – Part 2 PSP with sewerage will rely upon developers extending reticulation sized sewer mains at their cost.

³ South East Water 2025-26 Pricing Handbook, 1 July 2025

8.4 DRAINAGE

8.4.1 Existing Services

The topography for Study Area typically falls from the north-west towards the south-east, towards Cardinia Creek. There is a high-point of approximately 18.3m (AHD) at the north-west corner of 125 McCormacks Road, and a high-point of approximately 17.9m (AHD) at the north-west corner of 95 McCormacks Road and falls towards a low-point of approximately 13.5m (AHD) at the south-east corner of 125 McCormacks Road. This equates to an average grade of approximately 0.4 percent of a gradient of 1 in 250.



*Figure 8 – Existing Topography
(City of Casey, 2017 LiDAR Data)*

There is no existing City of Casey drainage infrastructure within the Study Area of within McCormacks Road. The Smiths Lane Estate to the north of the Study Area currently drains into a temporary retarding basin adjacent to the north-west corner of 125 McCormacks Road and drains south through 125 McCormacks Road via a temporary channel into the tributary of Cardinia Creek. All flows currently discharge from the Study Area via an existing culvert under McCormacks Road approximately 100 metres east of the common boundary between 95 and 125 McCormacks Road.

8.4.2 Future Servicing Arrangement

The Cardinia Creek South – Part 2 PSP sits within the Melbourne Water, McCormacks Road Drainage Scheme (DS). Drainage schemes comprise of a catchment-based drainage strategy outlining the relevant infrastructure require to service urban growth and includes conceptual designs for works such as, pipeline, overland flow paths, retarding basins, wetlands, floodways and other drainage and water quality infrastructure.

Melbourne Water has provided an extract of the current McCormacks Road DS plan showing the infrastructure required to service the Cardinia Creek South – Part 2 PSP Study Area. There are two key items servicing the PSP, a constructed waterway connecting between Smiths Lane Estate to the north and Cardinia Creek, and two Wetland / Retarding Basin structures located to the north and south of the constructed waterway. These assets are predominately located within 125 McCormacks Road, with only a small section of the constructed waterway traversing the north-east corner of 95 McCormacks Road. Additionally, a network of scheme pipelines is required to convey minor flows from each property within the catchment to each of the wetlands.

Furthermore, a small sediment basin is currently shown in the south-east corner of 95 McCormacks Road and treats a local catchment which is not being treated within the larger wetland system. A decision on whether this sediment basin can be incorporated into the larger southern wetland system is yet to be made by Melbourne Water. Melbourne Water has requested that the sediment basin be shown on any draft PSP plans until advised by Melbourne Water.

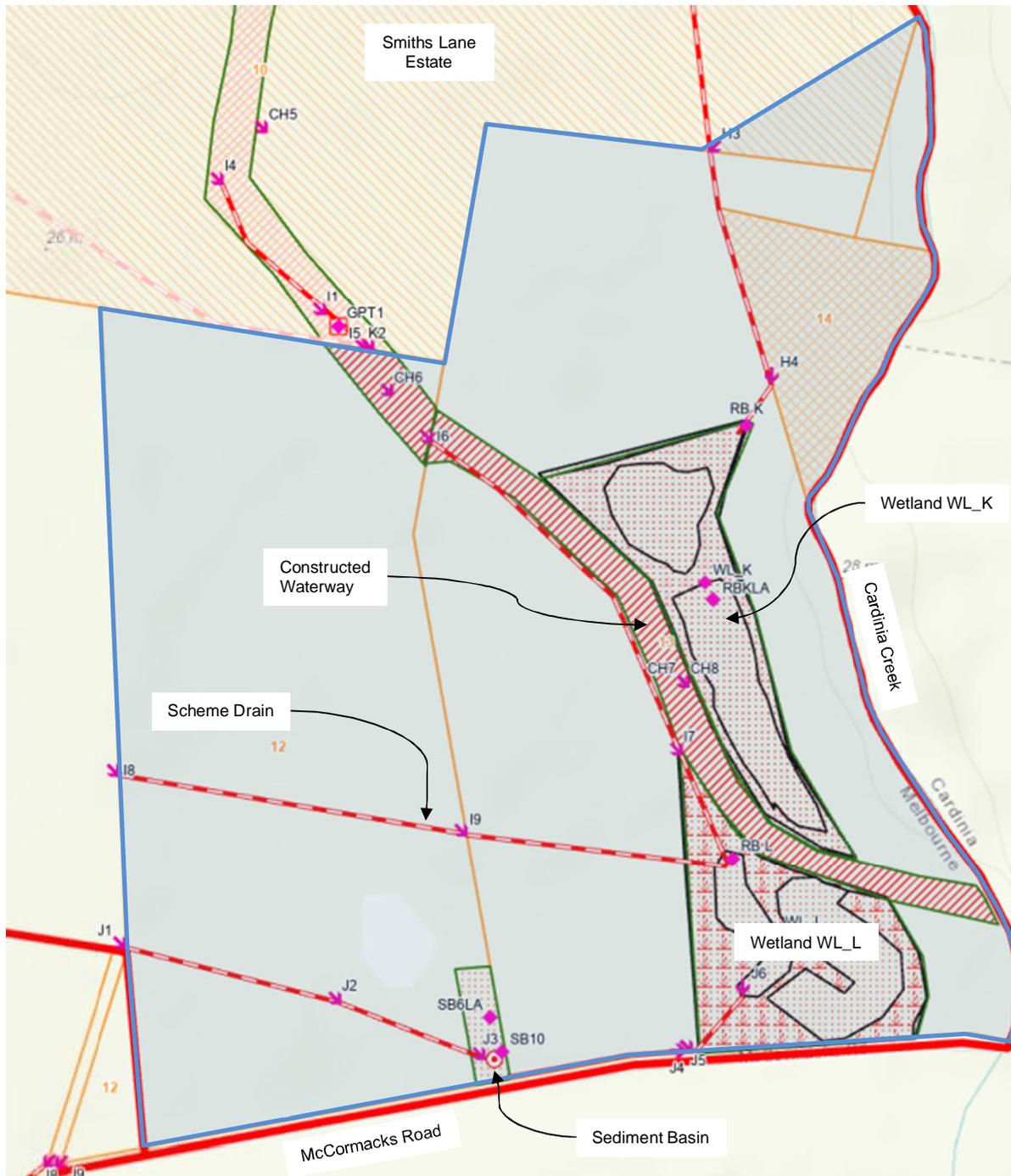
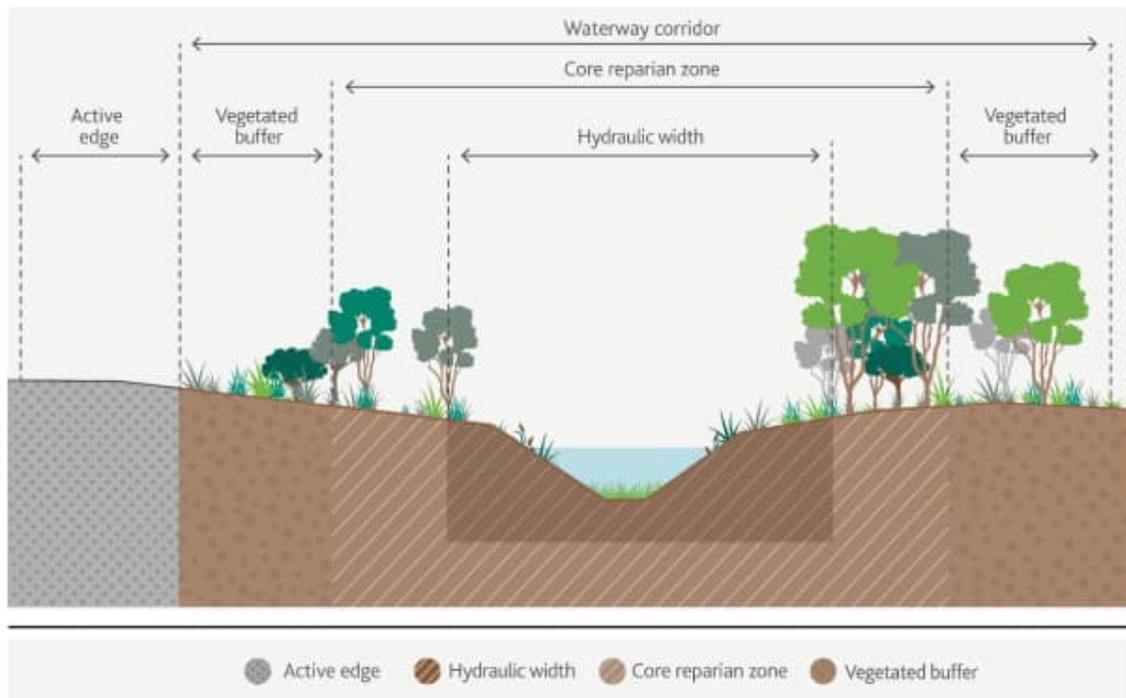


Figure 8 – Melbourne Water McCormacks Road DS Extract
 (McCormacks Road DSS 1317, Draft Plan, November 2025)

The Constructed Waterway, which requires a minimum corridor width of **50 metres**, has an upstream invert level of approximately 17.30 metres (AHD) at the upstream boundary. At the proposed outlet to Cardinia Creek, the waterway has an invert level of 9.20 metres (AHD). With a proposed reach length of approximately 2,000 metres, this results in a bed gradient of approximately 1 in 250. In accordance with Melbourne Water's Constructed Waterway Design Manual, the maximum bed gradient should be 1 in 200. The waterway will require a low flow meandering channel approximately 0.6 metres deep, with a base width of 3 metres and slopes of 1 (V) : 3 (H).

The low flow channel is to meander across the base of the channel (base width of high flow channel of 18.6m). The low flow channel will convey flows between the 4EY to 1EY events. The high flow channel has the capacity of the 1% AEP event and has a depth of about 1.10 metres.



*Figure 9 – Melbourne Water Constructed Waterway Typical Section
(Constructed Waterway Design Manual, Melbourne Water, December 2019)*

The northern wetland (WL-K) has an approximate catchment area of 146 hectares and has a proposed Normal Water Level (NWL) of 10.0 metres (AHD). The volume above the NWL within the wetland will be used to attenuate developed flows prior to discharge to Cardinia Creek. The maximum potential storage volume is to be 85,165 m³ at RL12.0 metres (AHD). Aerial photography obtained from MetroMap indicates that works have commenced on Wetland WL_K.

The southern wetland (WL-L) has an approximate catchment area of 96 hectares and has a proposed Normal Water Level (NWL) of 13.0 metres (AHD). The volume above the NWL within the wetland will be used to attenuate developed flows prior to discharge to Cardinia Creek. The maximum potential storage volume is to be 49,739 m³ at RL14.5 metres (AHD).

Subdivision roads and allotments will need to be designed with freeboard requirements in accordance with Melbourne Water and City of Casey. Earthworks may be required in order to achieve these requirements. Developers will need to prepare a Stormwater Management Strategy and concept earthworks design to show Melbourne Water and City of Casey that freeboard and conveyance of stormwater flows can achieve design standards.

8.4.3 Expected Funding Arrangements

Drainage Schemes are funded by financial contributions paid when development occurs. All developable properties pay a drainage contribution based on the development size and type. Contributions include a hydraulic component which funds the flood protection works, and a water quality component which funds water quality treatment infrastructure. Contributions for each scheme are calculated so that the income derived is designed to equal the planned expenditure over the life of the scheme, using a discounted cashflow methodology. Most scheme works are constructed by developers and are reimbursed from the contributions received.

The McCormacks Road DS is currently in preliminary status however the Hydraulic Contribution is currently \$73,170 per hectare and Water Quality Contribution is \$143,019 per hectare for standard density residential development (average lot sizes between 300 – 600m²).⁴

8.4.4 Summary of Outcomes

- The Study Area typically falls from the north-west towards the south-east, towards Cardinia Creek with an average gradient of 1 in 250.
- There is no existing City of Casey drainage infrastructure within the Study Area of within McCormacks Road. All flows currently discharge from the Study Area via a culvert under McCormacks Road approximately 100 metres east of the common boundary between 95 and 125 McCormacks Road.
- The Cardinia Creek South – Part 2 PSP sits within the Melbourne Water, McCormacks Road Drainage Scheme (DS). The scheme requires the construction of a constructed waterway through 95 and 125 McCormacks Road discharging to Cardinia Creek with a northern and southern wetland.
- A small sediment basin is currently shown in the south-east corner of 95 McCormacks Road and treats a local catchment which is not being treated within the larger wetland system. A decision on whether this sediment basin can be incorporated into the larger southern wetland system is yet to be made by Melbourne Water. Melbourne Water has requested that the sediment basin be shown on any draft PSP plans until advised by Melbourne Water.
- Scheme Infrastructure is to be funded by collection of contributions from each developer based on catchment area and development type.

⁴ Melbourne Water Website – Building and Works, December 2025

8.5 ELECTRICITY

8.5.1 Existing Services

AusNet Electricity Services is the responsible authority for the provision of electricity supply to the Cardinia Creek South – Part 2 PSP Study Area.

The Study Area is currently serviced by a 22-kV overhead high-voltage feeder located on the southern side of McCormacks Road. This feeder (CLN22) is supplied by the Clyde North Zone Substation, located approximately 5.8 kilometres to the north-west of the Study Area on Berwick – Cranbourne Road. Pole-mounted substations supply overhead low voltage lines which in turn supply the existing rural residential properties. Underground high and low voltage cables have been constructed to the north of the Study Area within the Smiths Lane Estate to service the residential allotments.

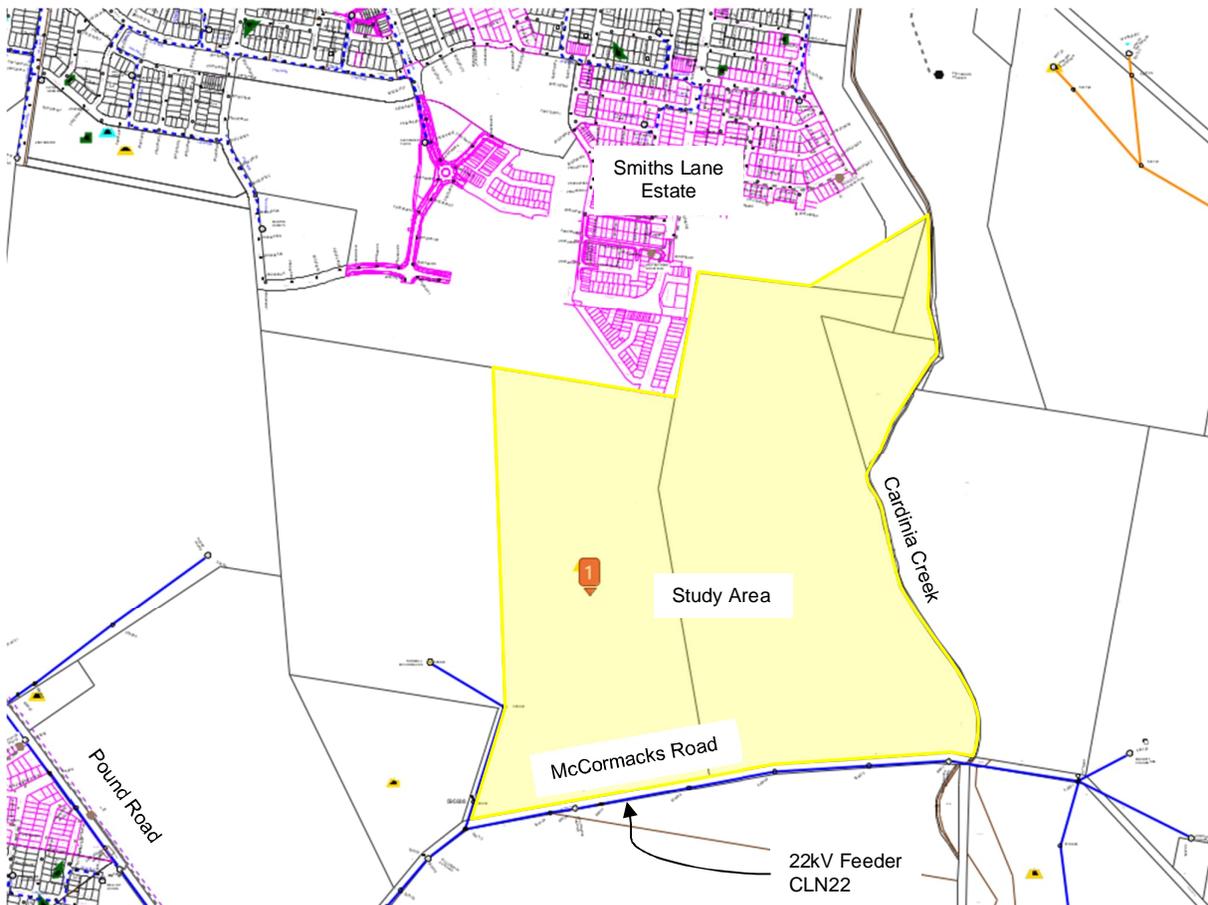


Figure 10 – Existing Electricity Infrastructure

8.5.2 Future Servicing Arrangements

At the time of writing this report, preliminary servicing advice has yet to be provided by AusNet Electricity Services, however AusNet has advised that the existing 22-kV overhead feeder in McCormacks Road will be unlikely support any additional load as a result of development in the Cardinia Creek South – Part 2 PSP and will need to be upgraded. It is likely that a high voltage supply will also be obtained through Smiths Lane Estate to the north to create a ring main feeder.

The Study Area is to be provided with underground reticulated electricity in accordance with AusNet’s normal subdivisional development guidelines. Kiosk substation will be required within the proposed development to provide adequate low voltage electrical supply to all allotments. Typically, a 315 kVA can supply approximately 60 allotments, allowing for all electric supply (i.e. no natural gas for heating/cooking) and allowance for electric vehicle (EV) charging. Based on these assumptions, approximately 22 kiosks will be required to service the Study Area. Kiosks substation reserves are typically located at the rear/side of corner allotments are approximately 8 metres deep by 5.6 metres wide or approximately 45 square metres. Kiosks are typically spaced so that they are centrally located to the load; street type/hierarchy is less important. Kiosks can also be located within public open spaces, such as local parks.



*Figure 11 – Example Kiosk Substation
(Goodwill Road, Google Streetview – March 2025)*

8.5.3 Expected Funding Arrangements

Zone substations and sub-transmission network augmentation would likely be funded by AusNet Electricity Services as part of the shared upstream network augmentation. Out of sequence upgrades to the 22kV feeder network may incur cost to the developer, however this cannot be confirmed until an application is made to Aus-Net.

8.5.4 Summary of Outcomes

- The Study Area is currently serviced by a 22-kV high voltage overhead feeder (CLN22) on the southern side of McCormacks Road however it is unlikely that it will support development of the Cardinia Creek South – Part 2 PSP without being upgraded.
- The Study Area is to be provided with underground reticulated electricity in accordance with AusNet's normal subdivisional development guidelines. Kiosk substation reserves will be required within the proposed development to provide adequate low voltage electrical supply to all allotments.
- Based on assumptions of all electric supply including allowance for EV charging, approximately 22 kiosk substations will be required to service the Cardinia Creek South – Part 2 PSP Study Area.
- Kiosks substation reserves are typically located at the rear/side of corner allotments are approximately 8 metres deep by 5.5 metres wide or approximately 44 square metres.

8.6 TELECOMMUNICATION SERVICES

8.6.1 Existing Services

The Cardinia Creek South – Part 2 PSP is not currently serviced by the NBN fixed line network. There is existing Telstra network infrastructure, predominately along the southern side of McCormacks Road which services the existing rural residential properties, however this infrastructure does not continue along the southern boundary of the Study Area in McCormacks Road. It appears that 95 McCormacks Road is connected to the existing Telstra network, however 125 McCormacks Road is not connected. There are no NBN assets in McCormacks Road.

NBN network rollout has commenced in the vicinity of the Cardinia Creek South – Part 2 PSP with the Smiths Lane Estate to the north and the Orana Estate and Evergreen Estate to the west of the Study Area already connected to the NBN fixed line, Fibre to the Premises (FTTP), network.

Alternatively, the St Germain Estate to the north-west and the Delaray Estate to the west are connected to the Opticomm optic fibre network which is a private telecommunications provider and could be considered by the developers within the Cardinia Creek South – Part 2 PSP.

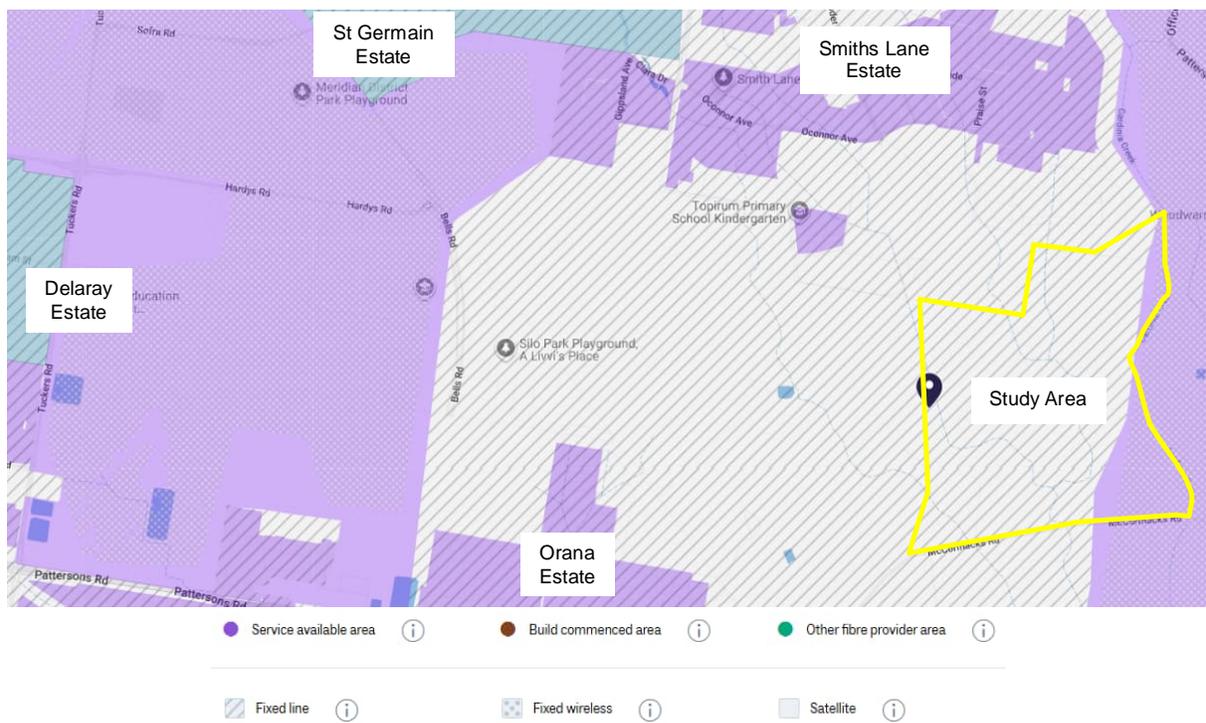


Figure 12 – NBN Coverage Map

There are no Mobile Phone towers located within the Cardinia Creek South – Part 2 PSP Study Area. The nearest Telstra 4G/5G tower is located at Heather Grove approximately 4.5 kilometres west of the Study Area. The nearest TPG Telecom 4G/5G tower is located at Hardys Road, approximately 2.5 kilometres north-west of the Study Area and the nearest NBN tower is located at Cardinia Road, approximately 3.9 kilometres to the south-east. City of Casey advises that new lease agreements for mobile phone towers have been applied for at the parcel 80i Manton Road, which is a future active open space precinct within Smiths Lane Estate, and 2003i Thompsons Road which is a future active open space precinct within Berwick Waters Estate.

Taylors has reviewed the Mobile Infrastructure Report prepared by the Australian Competition and Consumer Commission (ACCC) which shows mobile phone coverage data for the major Mobile Network Operators (MNO); Telstra, Singtel Optus and TPG Telecom. Taylors has reviewed 4G and 5G technologies coverage maps released at the 31st of January 2025. The ACCC report advises that coverage maps are modelled on predictive coverage and therefore may not reflect the ‘on the ground’ experience for all end users. The report also advises that ‘users’ should refer to the coverage maps available on the public website of the service provider. For completeness of the review, Taylors has also reviewed the coverage maps made available on the public websites for each service provider. Below is a summary of the findings from the ACCC Mobile Infrastructure Report data.

MNO	Network	Spectrum Band	Study Area Coverage
Optus	4G	700 MHz	Full
		900 MHz	Full
		1800 MHz	Full
		2100 MHz	Full
		2300 MHz	None
Optus	5G	2600 MHz	Partial
		700 MHz	None
		900 MHz	Full
		2100 MHz	Full
TPG	4G	2300 MHz	None
		700 MHz	None
		850 MHz	Full
TPG	5G	1800 MHz	Full
		2100 MHz	Partial
		3600 MHz	Partial
Telstra	4G	700 MHz	Full
		1800 MHz	Full
		2100 MHz	Full
		2600 MHz	Partial
Telstra	5G	850 MHz	Full
		2600 MHz	Full
		3600 MHz	Partial

*Table 1 – ACCC Mobile Infrastructure Report Findings Summary
 (ACCC January 2025 Mapping)*

A high-level review of the above coverage summary suggests that the 4G network for the MNO's has good coverage throughout the Study Area. The 5G network would appear to have less coverage although at least one frequency from all MNO's provides full coverage of the Study Area. Optus and TPG's online mapping support this with the Study Area showing full coverage for 4G and 5G networks. Refer Figures 13 and 14 below. In contrast, Telstra's online mapping shows a significant portion of the Study Area that does not have 5G network coverage. Refer Figure 15 for Telstra's online mapping.

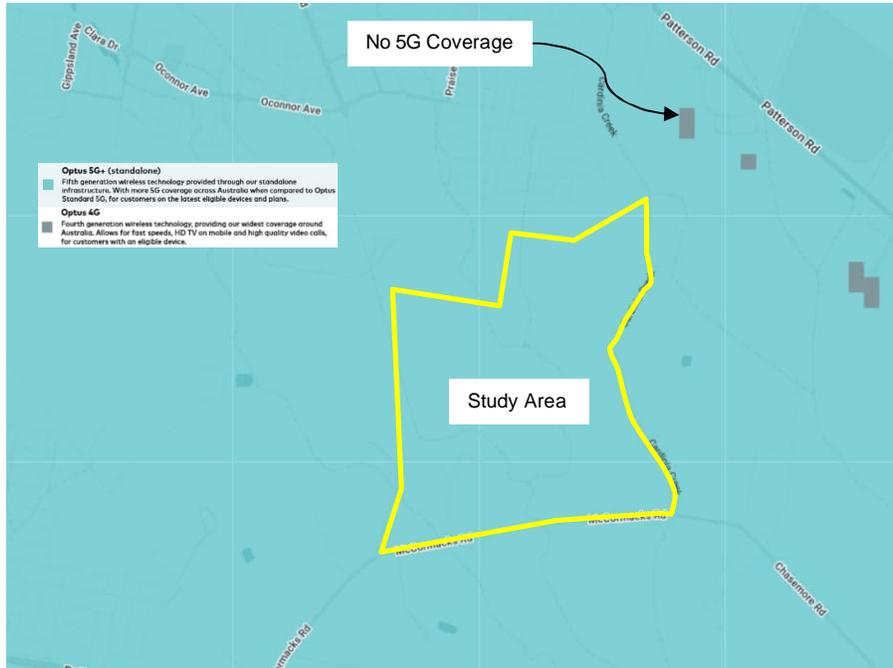


Figure 13 – Optus 4G & 5G Coverage Map
(Optus.com.au/living-network/coverage, December 2025)

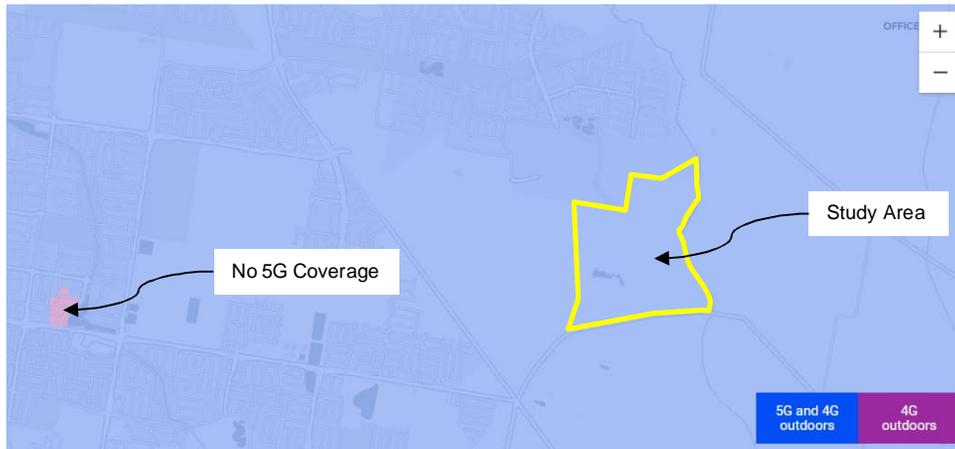


Figure 14 – TPG 4G & 5G Coverage Map
(Tpg.com.au/coverage, December 2025)

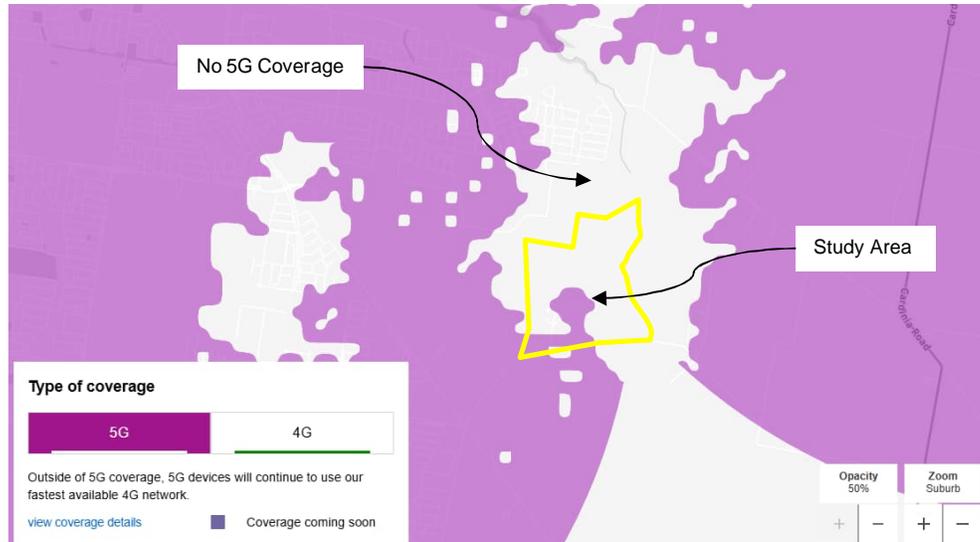


Figure 15 – Telstra 5G Coverage Map
(Telstra.com.au/coverage-networks/our-coverage, December 2025)

8.6.2 Future Servicing Arrangements

NBN Co has confirmed that due to proximity of the existing NBN network to the north and west of the Study Area, there is no foreseeable impediment to expansion of the network to include the Cardinia Creek South – Part 2 PSP. It is likely that fixed line, Fibre to the Premises (FTTP), technology would be made available to new developments within the PSP. Logical extension of the network would occur from the north utilising the existing infrastructure in Smiths Lane Estate. Should development commence along McCormacks Road, it may be necessary to extend the network from the west along McCormacks Road to the Study Area. As the NBN network will be likely to service the Cardinia Creek South – Part 2 PSP, the existing Telstra copper network will not require augmentation.

All NBN conduits and cabling is to be routed along existing and proposed precinct road reserves. No dedicated easements through the precinct will be allowed.

Alternatively, telecommunications services can be provided by private suppliers such as Opticomm who have a significant network already in Clyde North, including the St Germain Estate to the north-west of the Study Area.

8.6.3 Expected Funding Arrangements

The developer's responsibilities will include:

- Design of pit and pipe infrastructure to NBN's specifications and standards and submit to NBN for review prior to installation
- Installation of pit and pipe infrastructure to NBN's specifications and standards
- Payment of NBN deployment contributions in accordance with the Telecommunications Infrastructure in New Developments (TIND) policy. Developer contribution charges only apply to developers and builders. It is a flat rate charged for:
 - Single Dwelling Units (SDUs): \$600 inc. GST per premises⁵
 - Multi Dwelling Units (MDUs): \$400 inc. GST per premises
- Payment of Backhaul contributions if applicable

⁵ Nbnco.com.au/develop-or-plan-with-the-nbn/new-developments/government-policy-for-new-developments

8.6.4 Summary of Outcomes

- NBN Co has confirmed that Fixed Line, Fibre to the Premises (FTTP) service has been constructed with the Smiths Lane Estate to the north of the Study Area and within the Orana and Evergreen Estates to the west of the Study Area.
- Extension of the NBN Fixed Line network will occur as development progresses within the Cardinia Creek South – Part 2 PSP.
- Alternatively, telecommunications services can be provided by private suppliers such as Opticomm who have a significant network already in Clyde North, including the St Germain Estate to the north-west of the Study Area.
- A high-level review of the above coverage summary suggests that the 4G network for the MNO's has good coverage throughout the Study Area. The 5G network would appear to have less coverage although at least one frequency from all MNO's provides full coverage of the Study Area. Optus and TPG's online mapping support this with the Study Area showing full coverage for 4G and 5G networks. In contrast, Telstra's online mapping shows a significant portion of the Study Area that does not have 5G network coverage.
- New lease agreements for mobile phone towers have been applied for at the parcel 80i Manton Road, which is a future active open space precinct within Smiths Lane Estate, and 2003i Thompsons Road which is a future active open space precinct within Berwick Waters Estate.

8.7 GAS

8.7.1 Existing Servicing

APA Group Gas Networks is the responsible authority for gas transmission pipelines within Victoria and is responsible for the gas distribution network within the Cardinia Creek South – Part 2 PSP Study Area. Natural Gas is conveyed through transmission pressure pipelines at pressures greater than 2,500 kPa. The high gas pressures are reduced at specific locations along the transmission network, known as City Gates. The City Gate includes a custody transfer meter and gas regulator heater. The custody transfer meter allows APA to monitor gas volumes extracted from the transmission pipeline. The gas regulator heater is used to regulate temperature fluctuations that occur due to pressures changes. Once the gas pressures have been reduced, they are transferred to the gas distribution network which supplies customers.

There are no transmission pipelines within the Cardinia Creek South – Part 2 PSP Study Area. Furthermore, there is currently no distribution pipelines within the Study Area, however there is distribution infrastructure to the north within the Smiths Lane Estate and to the west in Orana Estate and Evergreen Estate at Pattersons Road.

8.7.2 Future Servicing Arrangements

As of January 1st 2024 gas connections for new dwellings, apartment buildings, and residential subdivisions requiring planning permits are being phased out. This impacts on electrical supply with new dwellings requiring all electric supply including heating and cooking appliances. This policy has been implemented through amendment VC250 to the Victoria Planning Provisions and all planning schemes in Victoria. Amendment VC250 was gazetted on 1st January 2024 and introduces new requirements for the construction of new dwellings, apartments and residential subdivisions that require a planning permit through a new particular provision at Clause 53.03. Clause 53.03 prevents a permit being granted to connect to reticulated natural gas when constructing a new dwelling, apartment development or subdividing land for residential purposes. The clause also requires a mandatory condition to be applied to a planning permit to construct a new dwelling, apartment development or subdivide land for residential purposes to ensure no gas connections can be constructed after the development is completed.

At the time of writing this report, APA Group Gas Networks has not provided servicing advice for the Cardinia Creek South – Part 2 PSP.

8.7.3 Summary of Outcomes

- There are no transmission pipelines within the Cardinia Creek South – Part 2 PSP Study Area.
- The Study Area is not impacted by the measurement length of transmission pressure gas pipelines in the immediate area.
- There are no distribution pipelines within the Study Area however there is distribution infrastructure to the north within the Smiths Lane Estate and to the west within the Orana Estate and Evergreen Estate at Pattersons Road.
- Planning Scheme Amendment VC250 gazetted on 1st January 2024 introduces Clause 53.03 which prevents a permit being granted to connect to reticulated natural gas when constructing a new dwelling, apartment development or subdividing land for residential purposes.

9 STAGING

It is anticipated that initial development of the Cardinia Creek South – Part 2 PSP will occur along the northern boundary of the PSP with extension of the Smiths Lane Estate into 95 McCormacks Road. The developer of 125 McCormacks Road will have immediate access to the northern area of their property through the Smiths Lane Estate however may seek to develop from the McCormacks Road to the south from a marketing and identity point of view.

This staging advice is based on availability of existing services and the view to extend services in accordance with authority timing. This does not preclude developers from pursuing other opportunities within the precinct and extending services with bring-forward costs.

The upgrade requirements of McCormacks Road to cater for additional traffic volumes is beyond the scope of this report, however it is recommended that any future service construction in McCormacks Road is coordinated with the construction of the upgraded road pavement. This will avoid temporary works or any re-work in the future and minimise service disruptions to new residents.

The follow table highlights potential development opportunity and constraints based on development staging.

Staging Direction	Opportunity	Constraints
Staging from North	<p>Water: Access to existing network in Smiths Lane Estate</p> <p>Sewer: Immediate access to trunk sewer</p> <p>Drainage: Access to constructed waterway and northern wetland</p> <p>Elec: Access to electrical network in Smiths Lane Estate</p> <p>Telco: Access to NBN network in Smiths Lane Estate</p>	<p>Water: Capacity of network will limit number of allotments until trunk infrastructure is required</p> <p>Sewer: Nil, sewer available</p> <p>Drainage: Limited catchment until south wetland is required. Need to bring forward outfall works to Cardinia Creek</p> <p>Elec: Potentially limited capacity until ring feeder main is required from the south</p> <p>Telco: Nil, NBN available</p>
Staging from South	<p>Water: Will require extension of trunk main from Pattersons Road</p> <p>Sewer: Immediate access to trunk sewer</p> <p>Drainage: Access southern wetland, sediment pond and outfall to Cardinia Creek</p> <p>Elec: Access to electrical network in McCormacks Road</p> <p>Telco: Nil, NBN not available</p>	<p>Water: Number of allotments will be limited until full trunk main is completed</p> <p>Sewer: Nil, sewer available</p> <p>Drainage: Nil, drainage constructed as required</p> <p>Elec: Existing overhead lines in McCormacks Road have limited capacity and will need to be augmented</p> <p>Telco: Need to extend NBN network along McCormacks Road from Orana Estate</p>

10 SERVICING INNOVATION & SUSTAINABILITY OPPORTUNITIES

There are several opportunities for innovative servicing strategies and sustainability outcomes within the Cardinia Creek South – Part 2 PSP. These range from established strategies such as reticulation of recycled water and integrated water management, to resource management and urban cooling strategies.

10.1 Non-Drinking Water & Urban Cooling

South East Water has confirmed that the Cardinia Creek South – Part 2 PSP will be a mandated recycled water supply zone. This will require all developments to install reticulated recycled water and provide connections to each allotment. The installation of Recycled Water however can be further utilised to enhance Urban Cooling. Urban Heat Island effect (UHI) occurs when an urban area is significantly warmer than rural environment due to human activities and development. Over-night temperatures are also higher as an effect of UHI as heat is trapped buildings, roads and carparks for example. Urban Cooling is one strategy that is being implemented globally to combat Urban Heat Island effects. Release of water vapour via transpiration combined with increased tree canopy coverage plays an important role in reducing Urban Heat Island effect.

The use of non-drinking water for irrigation and increased tree planting can aid Urban Cooling by providing shade and moist environments that improve thermal comfort. Increased tree canopy coverage in open spaces and along roadways, supported by Water Sensitive Urban Design, along with passive irrigation of landscaped areas and open spaces can reduce the Urban Thermal Climate Index, a measure of human thermal comfort, by as much as 10 degrees Celsius. The PSP can support Urban Cooling initiatives by increasing density of tree planting and canopy coverage in open spaces and irrigation through use of non-drinking water or stormwater harvesting. If this is to occur the PSP will need to set specific and measurable standards for the provision of trees in streetscapes including the prioritisation of tree planting over infrastructure services, particularly within in nature strips on narrow roads.

Leveraging Class A recycled water for toilet flushing and irrigating streetscapes and open space strengthens Urban Cooling by sustaining shade and evapotranspiration; evidence shows irrigated green infrastructure can reduce local temperatures by up to approximately 4 degrees Celsius on hot days, and irrigated turf can be approximately 15 degrees Celsius cooler than dry grass or pavements, improving thermal comfort during heat events. In line with PSP Guidelines: New Communities in Victoria (2021), the PSP should embed best-practice IWM and WSUD, including greening and tree canopy for cooling and shade to manage UHI, integrated use of water resources (passive stormwater irrigation supplemented by recycled water where available), and facilitation of renewable energy infrastructure, with detailed design using CRC guidance for passively irrigated landscapes (e.g., tree pits/raingardens, wicking beds) and performance confirmed at subdivision/permit stage.⁶

10.2 Carbon Storage

Increased tree planting to improve canopy coverage has an important secondary feature – Carbon Sequestration. Carbon sequestration is the capture and long-term storage of carbon dioxide. Release of Carbon Dioxide into the atmosphere through burning of fossil fuels is the leading cause of Climate Change. Carbon Sequestration seeks to remove Carbon Dioxide from the atmosphere by enhancing storage capabilities of soils, trees and vegetation. Carbon Sequestration from revegetation and mass plantings can provide a significant short-term contribution to Climate Change Mitigation. Longer-term, however, additional strategies are required to reduce reliance on fossil fuels and over-use of natural resources. The PSP can support Carbon Sequestration by increasing density of planting in landscaped areas and in public and active open spaces.

⁶ Melbourne Water. (2023). Urban cooling. Melbourne Water. <https://www.melbournewater.com.au/water-and-environment/climate-change/urban-cooling>

Tapper, N. (2021). Creating Cooler, Healthier and More Liveable Australian Cities Using Irrigated Green Infrastructure. In C. Ren, & G. McGregor (Eds.), *Urban Climate Science for Planning Healthy Cities* (Vol. 5, pp. 219-237). (Biometeorology, Vol. 5). Springer. https://doi.org/10.1007/978-3-030-87598-5_10

10.3 Resource Management

One strategy to reduce over-use of natural resources, that has been adopted by many Victorian Council's, including City of Casey, is a Climate Action Plan. The Climate Action Plan seeks to increase resilience to Climate Change impacts. City of Casey and Developers can assist by using drought resistant turfs for sports grounds and passive open space areas and irrigation management including use of non-potable sources of water. Additionally, developers should seek to balance earthworks throughout their estates to ensure that fill resources are kept within urban areas and balanced within the PSP and not dumped into green wedge zones or carted away to landfill.

Other strategies that could be implemented within the Cardinia Creek South – Part 2 PSP is the use of recycled products in road pavement construction. Studies supported by Sustainability Victoria have shown the use of recycled road pavement materials reduce impact on the environment through efficient use of extractive industries, reduced waste to landfill (and increased life of local landfill facilities) and reduce energy required to produce pavement construction materials as recycled products are less energy intensive to produce than quarry materials. City of Casey can support these initiatives by encouraging developers to use recycled road construction products.

11 CONCLUSION

The City of Casey and the Department of Transport and Planning propose to implement the Cardinia Creek South – Part 2 Precinct Structure Plan enabling development of land at 95 and 125 McCormacks Road, Clyde North.

The Cardinia Creek South – Part 2 PSP Study Area is currently not fully serviced, however the adjoining developments to the north (Smiths Lane Estate) and to the west (Orana and Evergreen Estates) have access to all essential services and can be readily extended into the Cardinia Creek South – Part 2 PSP.

The Service Authorities for Potable Water, Recycled Water, Sewerage, Drainage, Electricity, Telecommunications and Natural Gas have advised that they have existing service networks adjacent to the Cardinia Creek South – Part 2 PSP Study Area. These services will need to be extend into the Cardinia Creek South – Part 2 PSP as required by development.

The following table provides a summary of the availability of each of the major services.

Service	Status	Comments	Risks
Drainage	Available	Drainage outlet available. Melbourne Water Scheme Infrastructure to be constructed and outlet to Cardinia Creek	
Sewerage	Available	Existing 450mm diameter trunk sewer through the Study Area	
Potable Water	Available	Potable Water network has been constructed to the north and west of the Study Area. Shared asset construction is required to the west of the Study Area with reticulation assets required to service developments.	Access to 75 McCormacks Road (outside the PSP) to complete Trunk Watermain Infrastructure will limit capacity and potential time delay.
Recycled Water	Available	Recycled Water network has been constructed to the north and west of the Study Area. Shared asset construction is required to the west of the Study Area with reticulation assets required to service developments.	Access to 75 McCormacks Road (outside the PSP) to complete Trunk Watermain Infrastructure will limit capacity and potential time delay.
Electricity	Constrained	Existing overhead 22kV feeder in McCormacks Road will not support additional development and will require upgrade. Existing underground network in Smiths Lane Estate may be extended into the Study Area.	Upgrade of overhead feeder in McCormacks Road could delay construction is staging development from the south.
Telco	Available	Existing NBN Fixed Line, Fibre to the Premises (FTTP) network to be extended into the Study Area from the Smiths Lane Estate to the north and Orana Estate to the west.	Staging from the south will require NBN to be extended from Orana Estate which could cause delay.
Gas	Available*	Existing distribution pressure gas network to the north of the Study Area. Planning Scheme Amendment VC250 prevents connection of natural gas to development or subdividing of land for residential purposes.	

*Natural Gas available for certain non-residential uses only.

The Essential Services Commission (ESC) specifies how South East Water levies new customer contributions (NCC) to developers. The levies collected by South East Water are utilised to fund trunk infrastructure and shared asset projects that are essential to service development areas. Developers are also responsible for the financing costs associated with bringing forward the provision of shared assets that South East Water had programmed to be constructed at a future date.

NBN Co levies deployment contributions, in accordance with the Telecommunications Infrastructure in New Developments (TIND) policy, which is payable by the developer.

It is anticipated that initial development of the Cardinia Creek South – Part 2 PSP will occur along the northern boundary of the PSP with extension of the Smiths Lane Estate into 95 McCormacks Road. The developer of 125 McCormacks Road will have immediate access to the northern area of their property through the Smiths Lane Estate however may seek to develop from the McCormacks Road to the south from a marketing and identity point of view.

The upgrade requirements of McCormacks Road to cater for additional traffic volumes is beyond the scope of this report, however it is recommended that any future service construction in McCormacks Road is coordinated with the construction of the upgraded road pavement. This will avoid temporary works or any re-work in the future and minimise service disruptions to new residents.

South East Water has advised that the Cardinia Creek South – Part 2 PSP will be a mandated recycled water supply zone meaning developers will be required to supply a recycled water connection to each new allotment. Class A recycled water is wastewater that has been treated to a standard that makes it suitable for uses in the home that include washing clothes, watering of gardens, washing of vehicles and flushing of toilets.

There are several opportunities within the Cardinia Creek South – Part 2 PSP to incorporate innovative technologies and sustainable initiatives to assist with City of Casey's Climate Action Plan. These including strategies for Urban Cooling, Carbon Storage and Resource Management initiatives.

This report comprises 35 pages and should not be reproduced except in full.

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