HIGH LEVEL SERVICING AND INFRASTRUCTURE ASSESSMENT REPORT

OF

PARWAN STATION PSP

AND

PARWAN EMPLOYMENT PRECINCT

CLIENT: VICTORIAN PLANNING AUTHORITY

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EXECUTIVE SUMMARY

This high-level servicing report has been prepared at the request of the Victorian Planning Authority to provide an infrastructure assessment of the Parwan Employment Precinct (PEP) and the Parwan Station Precinct Structure Plan (PSP).

At present, Parwan is primarily used for agricultural and rural purposes, with isolated special use businesses that include the Bacchus Marsh Aerodrome, Parwan Valley Mushrooms, Genetics Australia, Graeme Spargo Transport, two broiler farms, the Western Water Recycled Water Plant and the Sir Jack Brabham Park motor sport complex.

Parwan is well located in terms of its regional proximity to Bacchus Marsh, Melbourne, Geelong, Ballarat and the associated major transport hubs of each city. The development of the PEP into an agribusiness area and the Parwan Station PSP into a residential precinct is a logical extension of nearby existing development, however this development will be dependent upon provision of services to the area.

Reeds Consulting have met with all servicing authorities to discuss the future servicing of the Parwan precincts, and their advice has been incorporated into this report. The infrastructure needs of the immediate Parwan areas have been assessed in consideration of the wider Bacchus Marsh, Maddingley, Hopetoun Park, Melton and future Merrimu PSP areas.

Parwan is currently serviced by scattered infrastructure that is by-and-large already at capacity. Although both a gas transmission main and sewer main are located within the PEP, the precincts do not have functional use of these facilities without significant augmentation of infrastructure. There is a lack of trunk infrastructure in the precincts for all essential services, and significant infrastructure extensions will be required to be constructed to provide services for the future development of the precincts.

This report considers the presence of existing services, anticipates the likely future servicing requirements including specific alignments of trunk utilities, considers the interim and ultimate staging of trunk installation, and nominates ballpark costs and expected funding arrangements of each utility construction.

This report should be read in conjunction with the Bacchus Marsh Urban Growth Framework document and previous reports completed for the Parwan Agribusiness Precinct.

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1 INTRODUCTION

This high-level servicing report has been prepared at the request of the Victorian Planning Authority (VPA) to provide an infrastructure assessment of the Parwan Employment Precinct (PEP) and the Parwan Station Precinct Structure Plan (PSP).

The Parwan Employment and Parwan Station Precincts have been identified as strategic precincts in the Bacchus Marsh Urban Growth Framework (UGF). Moorabool Shire Council (Council) in collaboration with Regional Development Victoria and the VPA have previously funded development studies in the Parwan area; and all pertinent authorities are actively considering development of the Parwan areas.

In conjunction with the servicing plans prepared by Reeds Consulting, this report reviews and confirms the engineering servicing infrastructure requirements for the application area, and considers adequate provision is made for future servicing of the area.

This report provides preliminary costing estimates for both interim and ultimate servicing of the Parwan precincts. The report notes existing funding mechanisms in place for the construction of utility infrastructure and makes recommendation for alternative funding arrangements where capital works costs exceed independent development's and relevant authority's capacity to deliver.

The information contained in this report is based on investigations by Reeds Consulting that have been facilitated by our inquiries and dealings with Moorabool Council, Western Water, APA Group, Ausnet, Powercor and NBN. The servicing outcomes detailed in this report should be read in conjunction with the following planning documents:

- Victorian Planning Authority: **Project Brief**
- Moorabool Shire Council:
  - **Bacchus Marsh Urban Growth Framework (August 2018)**
  - **Parwan Employment Precinct Business Case (March 2018)**
  - **Agribusiness Analysis Proposed Parwan Employment Precinct (2015)**
  - **Parwan Servicing Plan (12 June 2015)**
- Western Water
  - **Development Servicing Plan (June 2018)**
  - **Parwan South Industrial Estate Feasibility Study, Bacchus Marsh (April 2012)**

The proposed Parwan Station PSP will likely comprise of conventional density and medium density residential development, and the PEP will likely compromise of mixed use industrial and agribusiness developments. To facilitate the development of the site through the construction of internal roadworks, drainage infrastructure, sewerage, water reticulation, electrical, telecom and gas extensions will be required.

2 GENERAL

2.1 SITE LOCATION

Both precincts are located approximately 45km north-west of Melbourne CBD in Moorabool Shire Council and have a range of existing zonings. Refer to **Figure 1** below for the general location of the subject site and its immediate surrounds.

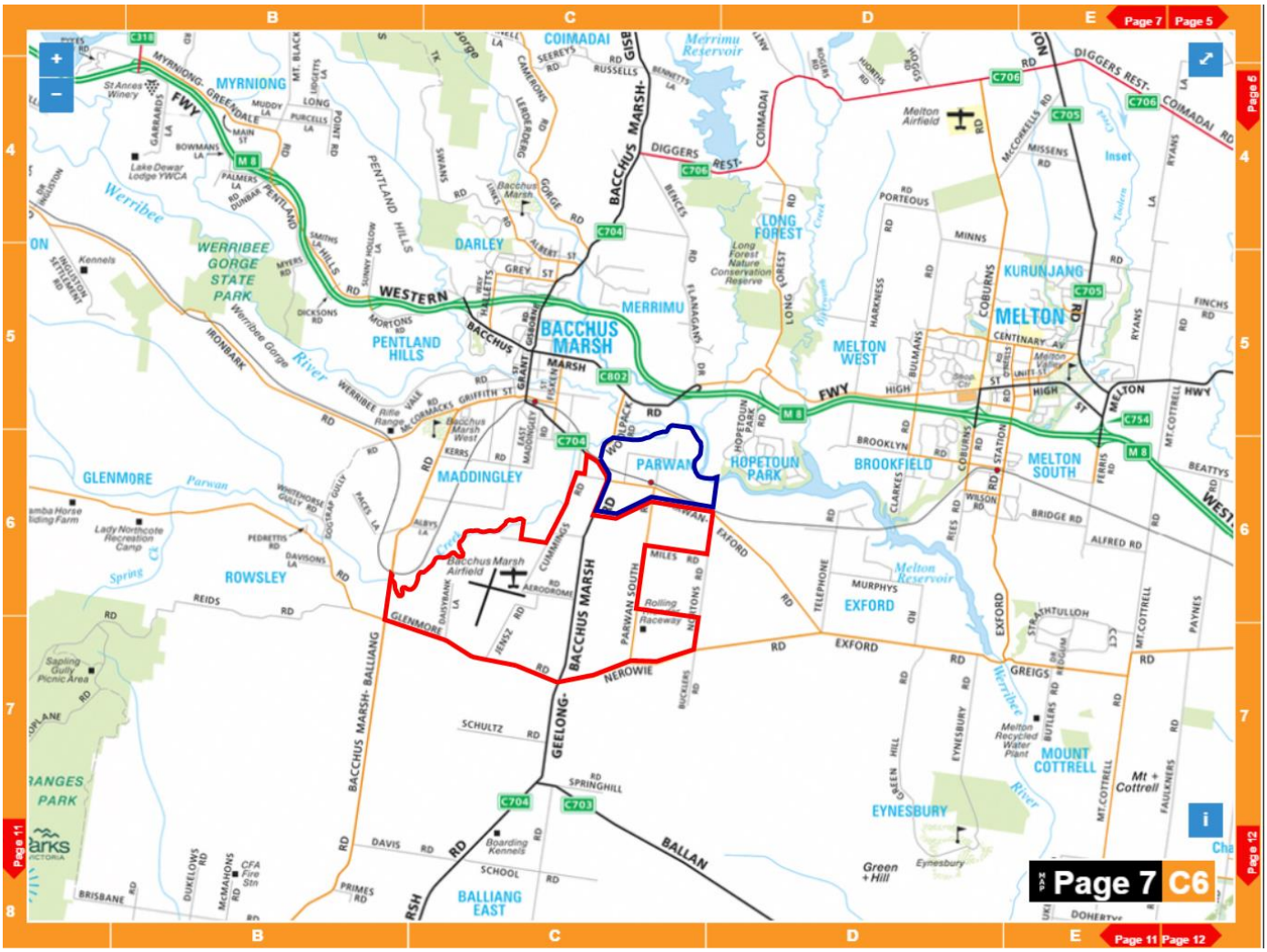

Figure 1: Parwan Site Location (*Source: Melways online*)

Both proposed precincts are located within the Parwan Valley. The Parwan Valley lies between the Brisbane Ranges, Werribee Gorge State Park and the You Yangs. The nearest town to Parwan is Bacchus Marsh to the immediate north, with Melton located approximately 8km to the north east of Parwan. Other major population centres are Werribee 22km to the south east, Ballarat 56km to the north-west and Geelong 48km to the south.

2.2 PROPOSED SITE DESCRIPTION

Parwan Employment Precinct (PEP)
The aim of the PEP is to unlock the economic and job growth potential of the Bacchus Marsh area to provide local employment opportunities relating to agribusiness. This will encourage local job growth, assist the Victorian strategic vision of de-centralising the Melbourne employment market and mitigate the number of work destination trips into the CBD.

The PEP is located south of the current Bacchus Marsh town centre, adjacent to Geelong-Bacchus Marsh Rd. It is an area of approximately 2,480ha, incorporating over 80 separate properties and is intended for employment and agribusiness only uses. Much of the land within the precinct is currently used for agriculture and rural residential uses, with a limited range of commercial, recreation and utility uses.

Parwan Station PSP
The Parwan Station precinct is directly north of the PEP boundary at an area of approximately 472 hectares and comprises of a mix of rural living and individual homesteads, as well as a range of rural activities. The precinct is expected to cater to up to 13,000 people including the potential delivery of Parwan Train Station.

2.3 EXISTING SITE OVERVIEW

The Parwan precincts are bordered by the Parwan Creek on the west boundary of the PEP, Werribee River (Melton Reservoir) on the north boundary of the PSP, the Moorabool-Melton Council boundary line on the east boundary of the PEP, and Glenmore Road – Nerowie Road on the south boundary of the PEP. See Figure 2 below for the aerial image of the precincts.

Figure 2: Parwan Aerial Image (*Source: NearMap*)

The Parwan area has historically been used as farming land from the mid 1850's onwards, with isolated homesteads and scattered rural living present across the area. At present, both Parwan precincts are still predominantly used for agriculture. Parwan recorded a population of 170 at the 2016 census and was estimated to provide 168 jobs as of 2018.

The Parwan precincts are generally undulating, with a minor fall from the south to the north. The highpoint of the precinct is along the Nerowie / Glenmore Roads on the south boundary of the site, with a high point of ~177m Real Level (RL). The low-point of the precincts is the north Werribee River, which has a nominal normal water level of 85m RL. The majority of the PEP varies between 177m to 124m RL, while the majority of the Parwan Station PSP is lower at levels generally between 150m and 95m.

Currently the majority of stormwater runoff is not controlled on-site. Due to the undeveloped nature of the precincts, stormwater runoff currently discharges directly into site dams, local depressions, and local informal water courses. The existing Parwan Creek and Werribee River serve the ultimate catchment of the precincts, however there are multiple depressions located within the employment district that act as local trapped low-points.

Natural features within the precincts include the Bingham Swamp and Parwan Lava caves located within the PEP, and the Parwan Gorge located within Werribee River in the north-east of the Parwan PSP.

The Melbourne to Ballarat train line is located within the Parwan Station PSP area, with the Parwan Railway Station opening in 1886, but closing in the 1980's. It is noted that a future re-opening of the Parwan station is planned to be constructed as part of the Parwan Station PSP development.

There are a number of existing special use properties in the precincts. In summary, these properties and businesses of note include:

- Parwan Valley Mushrooms
- Genetics Australia
- Graeme Spargo Transport
- Two Broiler Farms
- Edenhills Pet Cremation
- Western Water's Bacchus Marsh Treatment Plant
- Sir Jack Brabham Park motor sport complex
- Proposed Abattoir for Westside Meats

It is noted that the Maddingley Composting, Coalmine, Landfill & Waste and Resource Recovery Hub is located along the north-west boundary of the PEP. Although technically outside of the Parwan precincts, the buffers will impact sensitive land use within the precincts. The summary of existing land uses which impact sensitive land use are listed below, with corresponding buffer distances.

- Mushroom Farm – **400m buffer (estimated)**
- Western Water Bacchus Marsh Treatment Plant – **1,414m buffer**
- Maddingley Composting, Coalmine, Landfill & Waste and Resource Recovery Hub – **1,000m from mining licence buffer, 2,000m from composting operations buffer, 500m landfill buffer**
- Browns lane broiler farm **- 425m buffer**
- Geelong-Bacchus Marsh broiler farm **- 686m buffer**
- Brooklyn-Ballan Gas Pipeline – **210m buffer**
- Proposed Abattoir **– 1,000m buffer**

It is assumed that the future development of the precincts will accommodate the above existing land uses, and that Parwan sensitive land uses will be located outside of the buffer zones.

2.4 PROPOSED STRATEGIC DEVELOPMENT

The Parwan Station PSP and the PEP are both VPA planning precincts within Moorabool Shire Council in close proximity to the existing Bacchus Marsh township and Hopetoun Park. It is noted that in a wider regional strategic context, that two additional precinct structure plans are currently in progress to the north of Parwan. These PSP areas are the Merrimu and the Hopetoun Park North precincts, as seen in **Figure 3** below.

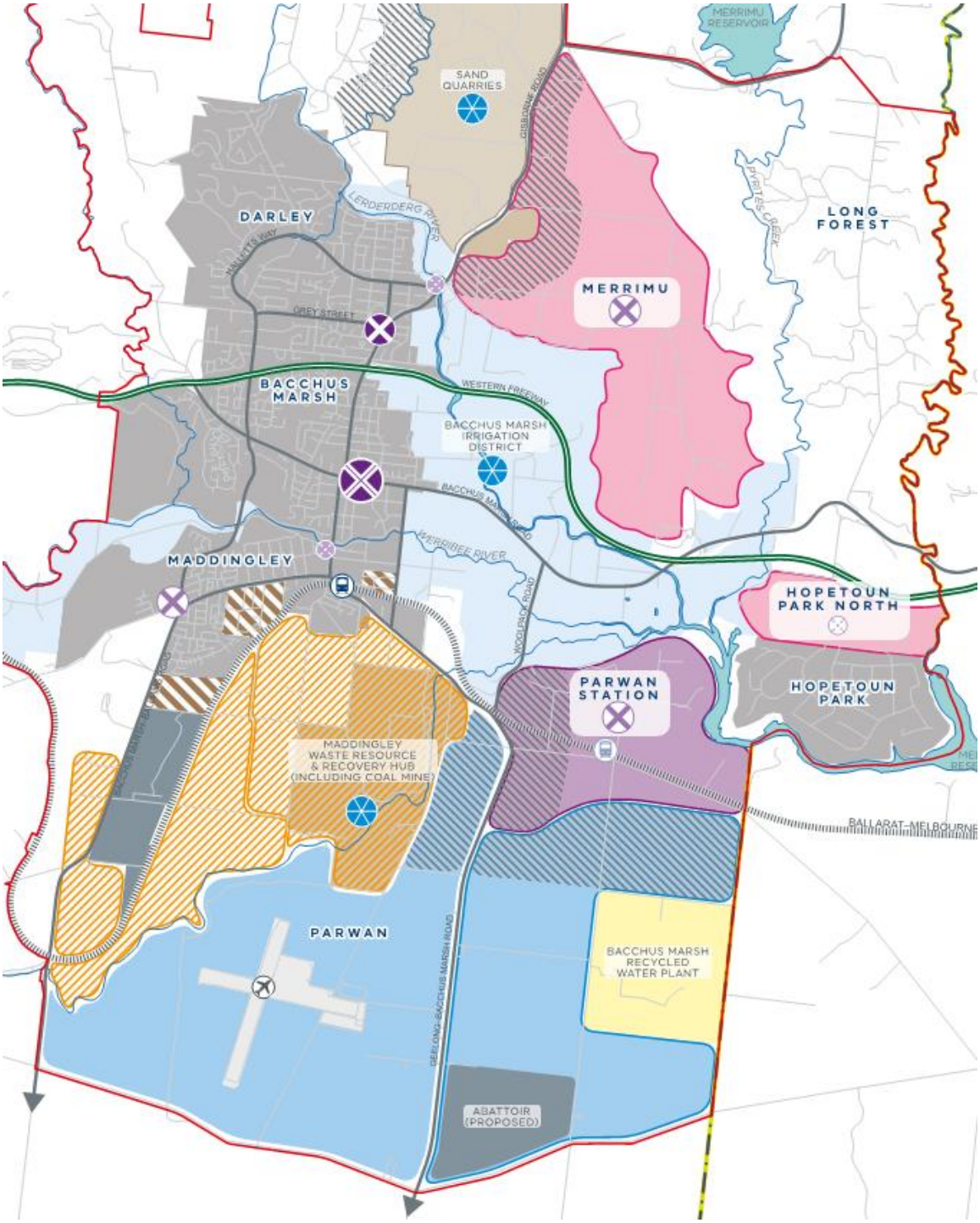

Figure 3: Existing and Future Bacchus Marsh Precincts (*Source: Plan 5, Bacchus Marsh UGF 2018*)

Further detail regarding existing development and these development precincts follow below.

2.4.1 BACCHUS MARSH TOWNSHIP

Bacchus Marsh is the nearest urban centre to the proposed Parwan precincts and is the largest population centre in the immediate vicinity.

Currently the population of Bacchus Marsh is 6,394 as recorded in the 2016 census. According to the Forecast ID (Nov 2019), by 2041 there is expected to be a population of 13,628; a growth of 106% across 25 years.

This sustained growth of ~3% per year is unprecedented for Bacchus Marsh and will result in significant infill development of previously undeveloped land within Bacchus Marsh and increase pressure for additional housing stock in the fringe areas.

It is noted that Bacchus Marsh is unable to develop further east. The Bacchus Marsh Irrigation District (BMID) is located east of Bacchus Marsh and cannot be developed as it is a regionally significant farming zone and subject to major flood inundation from the Lerderderg River. The Maddingley Waste & Resource Recovery Hub prevents further development to the south-east and the Sands Quarry prevents development to the north-east. Land to the west of Bacchus Marsh is currently zoned rural/farming, with availability of services and steepness of existing terrain not conducive for immediate development.

2.4.2 MADDINGLEY EXISTING DEVELOPMENT

Currently, the population of Maddingley is 3,539 as recorded in the 2016 census. According to Forecast ID (Nov 2019), by 2041 there is expected to be a population of 5,403; a growth of 56%.

This growth will likely be facilitated through continued build-out of existing zoned residential areas such as Stonehill Estate. It is noted that future density of Maddingley is likely be higher than the existing development in Bacchus Marsh to provide sufficient housing for future growth.

The proximity of Maddingley to the Parwan precincts will create a shared reliance on the construction of new infrastructure to service both precincts.

2.4.3 MADDINGLEY PLANNING STUDY AREA

New planning controls are currently being developed for the Maddingley area by developers and Moorabool Council through the Maddingley Planning Study. This study seeks to investigate options for non-sensitive land uses in Maddingley, determine appropriate new planning zone and overlay controls for the study area and identify future infrastructure requirements. It is expected that the study area will likely be re-zoned into employment zone due to the proximity of the Maddingley Waste and Resource Recovery Hub.

The proximity of the Maddingley area to the Parwan precincts will create a shared reliance on the construction of new infrastructure to service both precincts.

2.4.4 HOPETOUN PARK DEVELOPMENT

Hopetoun Park is the next nearest urban centre to the proposed Parwan precincts, and is the newest residential development to be recently constructed in the regional vicinity of Parwan.

Currently the population of Hopetoun Park is 798 as recorded in the 2016 census. According to Forecast ID (Nov 2019), by 2041 there is expected a shared population with Merrimu of 11,426.

The ultimate capacity of Hopetoun is anticipated to reach an upper region of 3,200 people, pending densities.

This growth will be facilitated through the Hopetoun Park North Precinct. This precinct is currently in planning phase with Moorabool Shire Council with assistance from the local developer; and anticipated to be developed at the same time as Parwan Station. It is noted that future density of Hopetoun Park north will be significantly higher than the existing Hopetoun Park.

The proximity of the new Hopetoun Park development to the Parwan precincts will contribute to a shared reliance on the construction of new infrastructure to service both precincts.

2.4.5 PROPOSED MERRIMU PRECINCT

Merrimu is the largest PSP proposed in the vicinity of Bacchus Marsh and also consists of previously undeveloped land, similar to Parwan.

This growth will be facilitated through two Merrimu precincts, North and South. The Merrimu precincts are expected to be developed in similar timing to the Parwan Station PSP.

Currently the population of Merrimu as recorded as 184 in the 2016 census. According to Forecast ID (Nov 2019), by 2041 there is expected a shared population with Merrimu of 11,426. The ultimate capacity of both precincts is expected to be between 14,000 – 20,000 people.

The proximity of the new Merrimu PSPs to the Parwan precincts will create a shared reliance on the construction of new infrastructure to service both precincts, particularly water main infrastructure from the Merrimu Reservoir.

2.5 PROPOSED PARWAN DEVELOPMENT YIELD

The PEP is currently recorded to have a population of 393, with 162 jobs.

The PEP is proposed to be developed for agribusiness/employment purposes, with no proposed residential development. According to the VPA it is expected by 2041 that there will be 1,304 jobs in the area, with an ultimate capacity of 2,000+ pending future land uses, investments and provision of utility infrastructure.

The Parwan Station PSP area is currently recorded to have a population of 42, with 2 recorded jobs in the area.

The Parwan Station PSP is proposed to be dominantly a residential precinct, with a new train station and adjacent commercial/retail areas. According Forecast ID (Nov 2019) it is expected by 2041 that there will be a population of 6,056 and 1,250 jobs in the area. The ultimate capacity of Parwan Station will be ~13,000 people.

To facilitate the above development, significant new infrastructure will be required to provide access, essential services and amenities to the Parwan precincts. As noted above, due to the proximity of nearby precincts being concurrently developed, much of the below proposed infrastructure will be mutually beneficial to all Bacchus Marsh precincts.

3 ROAD NETWORK

3.1 EXISTING ROAD NETWORK

Parwan is currently only serviced by one major arterial road, the Geelong-Bacchus Marsh Road. This road is managed by the Department of Transport and is classified as a 'Road Zone Category 1' under the planning scheme.

Geelong-Bacchus Marsh Road runs through the centre of the PEP in a north-south alignment; and is currently a single traffic lane sealed road with narrow sealed shoulders in each direction.

This road provides inter-connectivity to Bacchus Marsh, Geelong and Werribee; and through access to the Western Freeway greater access to regional centres in Melbourne and Ballarat.

It is noted that there are other Council sealed roads in the area, being Nerowie and Glenmore Road on the south Boundary of Parwan, Parwan South Road, Parwan-Exford Road, Aerodrome Road, Cummings Road, Smiths Road, Jenz Road, Whelans Road, Browns Lane and Woolpack Road. All other existing roads are crushed rock, or 'paper roads' (crown land with no constructed road).

3.2 PROPOSED ROAD NETWORK

The proposed road network for the Parwan precincts is currently undetermined and subject to detailed traffic reports to be prepared by qualified traffic engineers.

It is anticipated that the Geelong-Bacchus Marsh Road will be ultimately widened and upgraded by the Department of Transport to a 4-lane arterial road. Funding for part of the construction of this ultimate road may be facilitated through a future Infrastructure Contribution Plan (ICP) levy for the Parwan Station PSP and PEP.

Major intersections are also anticipated to be constructed along the length of Geelong-Bacchus Marsh Road. These proposed intersections and associated turning lanes will be subject to a detailed traffic impact reports and functional design by traffic engineers to the requirements and approval of Moorabool Council and VicRoads.

The internal roadworks for the proposed precincts will be designed in accordance with the agreed road cross section and functional requirements detailed in Consultant Traffic Reports and Moorabool Council standards. All roads will be fully sealed with approved surfacing, kerb and channel, footpaths, drainage, and incorporate underground power and other services.

4 SERVICES

4.1 SEWERAGE

Western Water (WW) is the Sewerage Authority for the Parwan Precincts and surrounding area.

4.1.1 EXISTING SERVICES

Existing sewerage infrastructure in the vicinity of Parwan includes the Parwan South (Bacchus Marsh) Recycled Water Plant (RWP) and a 450mm dia. rising main sewer that runs along Parwan South Road, Parwan-Exford Road and Geelong-Bacchus Marsh Road. This existing 450mm dia. rising main is connected to the Avenue of Honour Sewer Pump Station (SPS) and discharges directly into the RWP. This SPS and rising main provides the effective sewer outfall for the entire Bacchus Marsh township.

The existing Bacchus Marsh RWP is located on the east boundary of Parwan South Road on a title of approximately 269 ha of area. The RWP currently consists of a winter storage pond and six primary lagoons, see **Figure 4** below. There are no existing anaerobic pots or activated sludge modules in the RWP. The plant currently produces Class C recycled water.

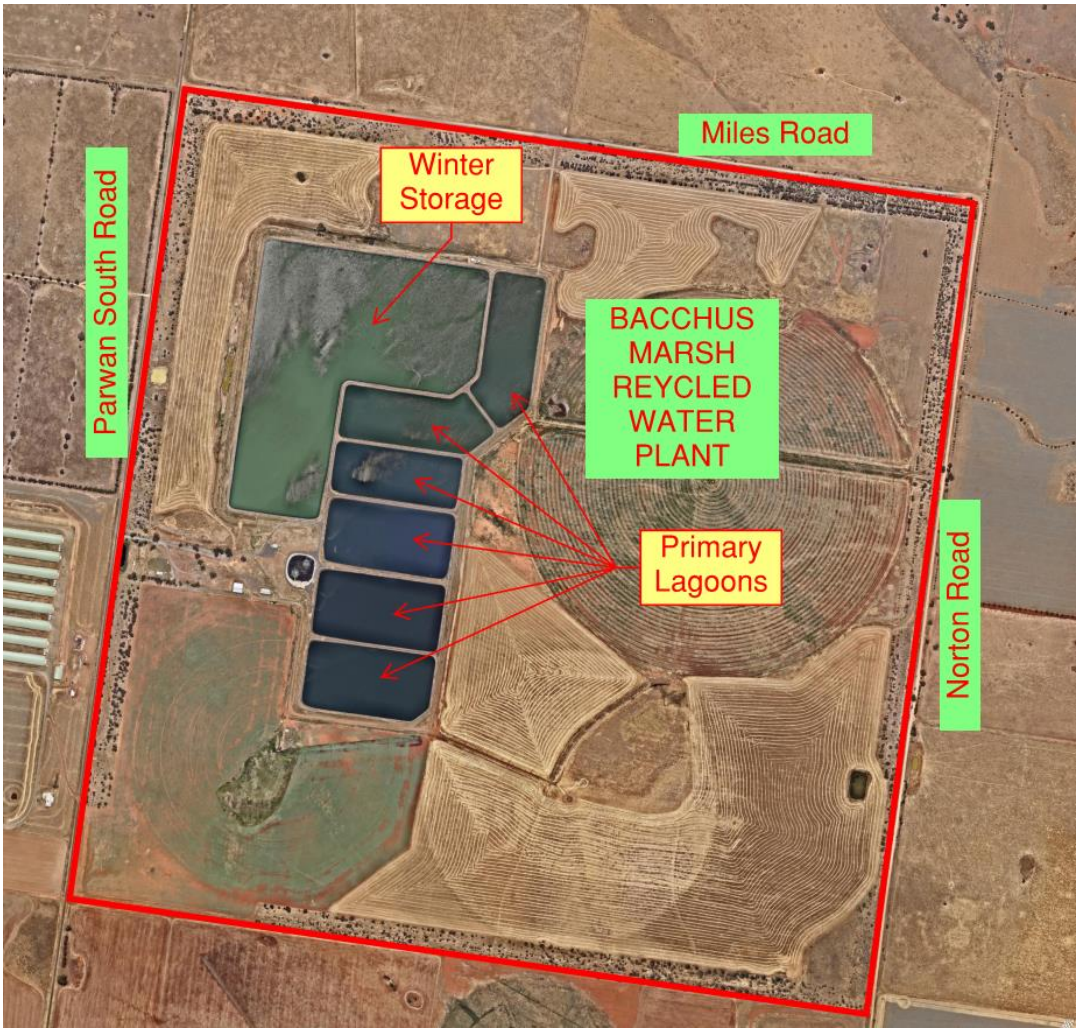

Figure 4: Bacchus Marsh Recycled Water Plant (RWP) (*Source: NearMap*)

There are no existing gravity sewers in the Parwan area, no existing businesses and rural homesteads are connected to sewerage reticulation and all are assumed to be serviced by private on-site septic systems.

4.1.2 CURRENT SERVICING STRATEGIES

Western Water has released a servicing strategy for their relevant service areas, dated June 2018. This servicing strategy was prepared in support of their submission to the Essential Services Commission for the pricing period between 2018 – 2023.

Sheet 3 of this servicing strategy shows the wider Bacchus Marsh area, is attached in **Annexure 1** of this report, and an excerpt is shown below in **Figure 5**.

The current servicing strategy proposes to upgrade the existing Avenue of Honour SPS and construct a new SPS in the west of Bacchus Marsh north of Werribee River.

New 450mm dia. rising main sewers are proposed to be constructed along both Geelong-Bacchus Marsh Road and Woolpack Road to cater for the future Bacchus Marsh growth, to then combine into a new 600mm dia. rising main sewer proposed to be constructed along Parwan-Exford and Parwan South Road. This 600mm dia. rising main will then discharge into the Bacchus Marsh RWP, and as per the strategy is nominated to be constructed within the 2021 financial year.

It is noted that the future Parwan and Merrimu precincts are not considered in the current Western Water strategy, and no allowance has been made for their growth.

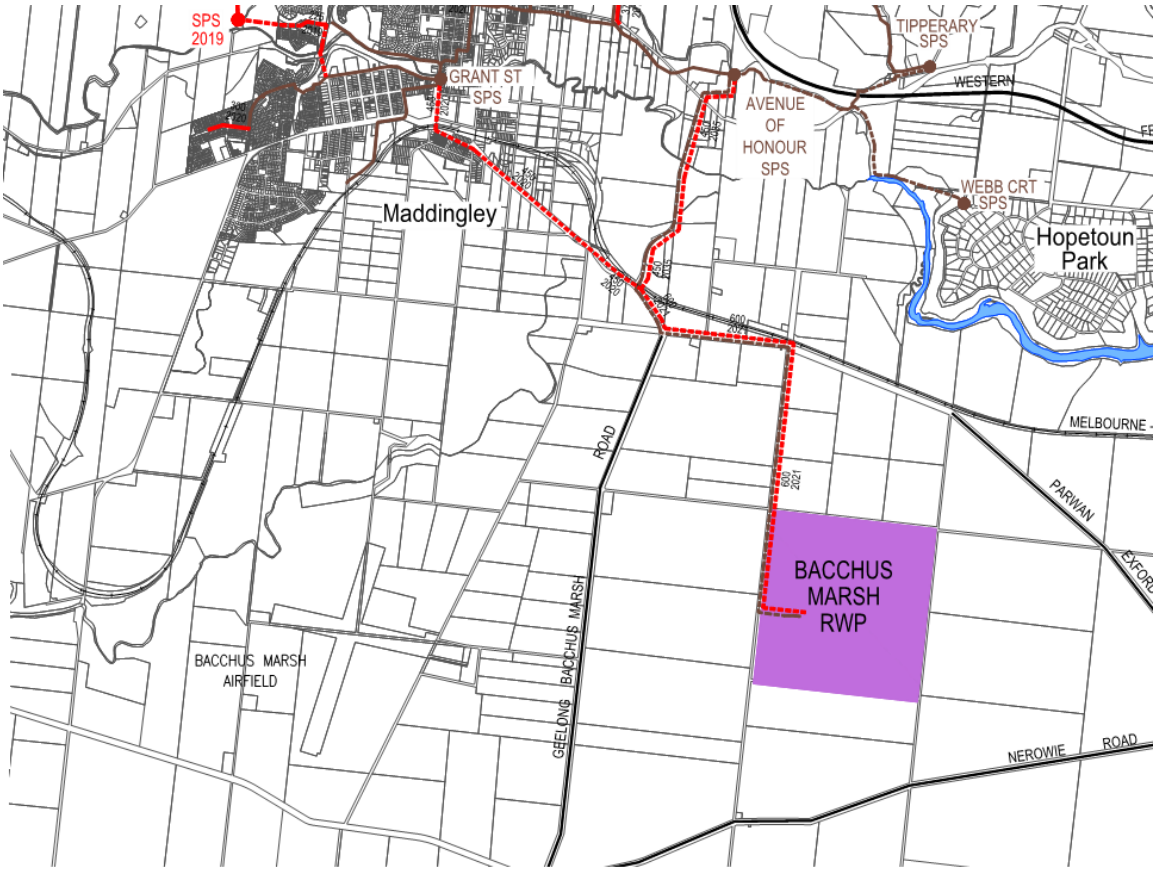

Figure 5: Bacchus Marsh/Melton Sewer Servicing Strategy (*Source: Western Water, June 2018*)

4.1.3 INTERIM SERVICING ARRANGEMENTS

Western Water provided servicing advice at a workshop held at their offices on 2 December 2019.

Advice received from WW confirms that the Avenue of Honour SPS is functioning at capacity with a discharge rate of 105 L/s, which caters for 7,000 lots (existing Bacchus Marsh township). The new 600mm dia. rising main will deliver an effective discharge rate of up to 500L/s, which will cater for a total of 15,000 lots. Western Water are currently designing the upgrade of the Avenue of Honour SPS to cater for the ultimate growth of Bacchus Marsh, and Maddingley only – Parwan or Merrimu is not serviced by the new 600mm dia. rising main or the SPS upgrade.

WW have indicated that the existing Bacchus Marsh RWP does not have any volume capacity issues, however it only has capability for an additional ~1,000 residential lots to treat the additional nutrient load.

Any additional residential development in the Parwan or Bacchus Marsh area that exceeds 1,000 lots will trigger a significant upgrade of the treatment plant.

It is expected that by the time the Parwan Station PSP is gazetted, developments proceed, and houses come online into the sewerage system; that an additional 1,000 lots would have already been delivered by the anticipated growth in Bacchus Marsh and Maddingley.

As such, interim servicing of the Parwan Station PSP and PEP is anticipated to require the upgrade of the Bacchus Marsh RWP. Upgrades to the Bacchus Marsh RWP due to additional residential flows are subject to further WW investigation, which WW are currently undertaking.

It is noted that a proposed abattoir and protein recovery facility is proposed in the south of the PEP and a planning permit has been granted from Moorabool Council for the protein recovery facility (PRF). As this development proceeds, the additional nutrient load from this site would also trigger a significant upgrade of the RWP, that would be in addition to the residential lot triggered upgrade. The upgrade to cater for the full development of the abattoir and PRF (equivalent of 30,000 EP) would require an additional two anaerobic pots, primary lagoon, and additional HV power upgrades to the Powercor network; based on advice from WW. Conceptual pricing estimates put this cost at $50 million.

To service the Parwan Station PSP, new sewer infrastructure will be required to be constructed. Considering the existing contours of the precinct, there is a consistent grade from Parwan-Exford Road at the south, towards the Werribee River at the north boundary of the precinct. Due to the surface level of Parwan Station being similar than that of the RWP, it is not practical or economically viable to discharge gravity sewers from the north boundary of the Parwan Station Development south towards the treatment plant.

Noting that there is no formal Western Water servicing strategy for the Parwan areas yet; based on discussions with WW, it is anticipated that Parwan Station will have one or two new sewer pump stations located at low points of the precinct to suit the future development layouts. See **Figure 6** below, two nominal locations have been proposed for these two SPS. It is anticipated that these will be permanent SPS, and rising mains will be required (nominal size 300mm dia.) to discharge south into the Bacchus Marsh RWP.

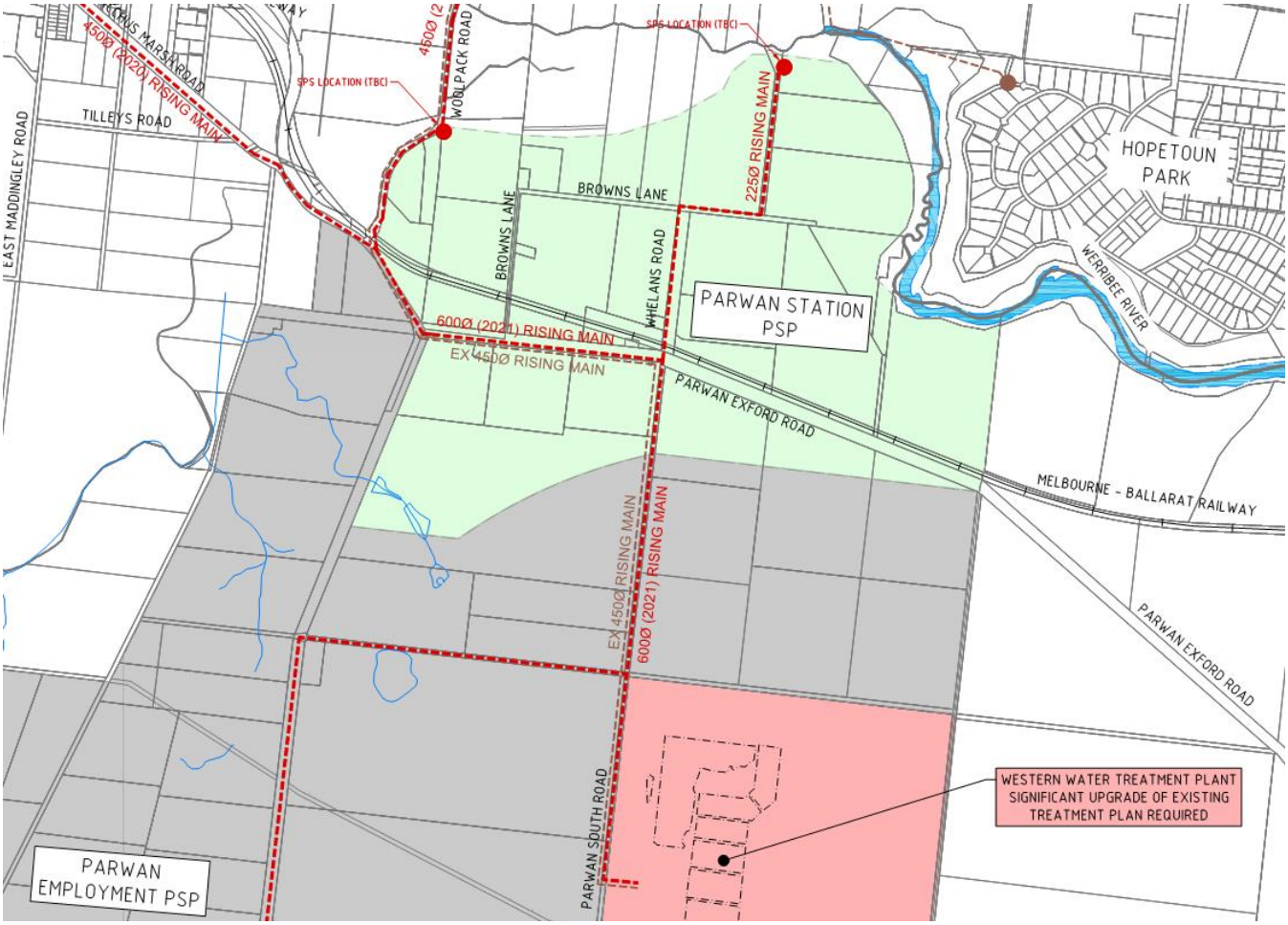

Figure 6: Parwan Station Sewer Servicing Strategy (*Source: Reeds Consulting*)

Western Water note that the upgrade of the Grant St SPS is currently out to tender, and the 600mm dia. rising main will likely commence construction within the next 18 months. The proposed 600mm dia. rising main may require future augmentation due to the Merrimu and Parwan precincts, subject to the timing of development.

To service the PEP, new sewer infrastructure will be required to be constructed. Considering the existing contours of the precinct, there is a consistent grade from Glenmore & Nerowie Road at the south-west and south-east reaches to the north boundary of the precinct. Due to the large distances, the presence of multiple large local depressions and the unknown land uses of the industrial precinct, it is not practical or economically viable to plan gravity sewers for the PEP.

It is anticipated that a mixed rising main / pressure sewer system will be implemented for the PEP. Future sizing and loadings of this system are currently unknown due to the unknown future uses of the precinct and the wide variety in typical loading from different use developments. At minimum is it expected that a rising main / pressure sewer system will discharge directly into the Bacchus Marsh RWP on Parwan South Road.

Further investigation is required by WW into the specific upgrade works required for the treatment plant, and the future loadings of the Parwan, Maddingley and Merrimu precincts.

4.1.4 ULTIMATE SERVICING ARRANGEMENTS

Western Water has confirmed that for the next Essential Services Commission pricing period of 2023 – 2028 that the Parwan and Merrimu precincts will be accommodated into the future servicing plans.

Advice received from WW indicates that the ultimate 2061 treatment capacity of the WW treatment plant will be 27,000 lots. This will cater for the Bacchus Marsh, Maddingley, Merrimu and Parwan areas. The design discharge into the treatment plant will be 800 L/s, which will be much greater than the current capacity of the existing plant, 105 L/s.

As noted above, significant upgrades to the Bacchus Marsh RWP will be required to cater for the future growth of the Bacchus Marsh, Parwan and Merrimu areas. Due to the significant cost, the upgrade of the RWP is likely to be staged to provide additional treatment capacity as required.

The interim servicing of the Parwan Station PSP is in line with the ultimate servicing strategy. Based on WW advice, the sewer pump stations will be permanent fixtures and the rising mains to Parwan South Road and then into the Bacchus Marsh RWP will also complement the ultimate servicing strategy.

The delivery timing for the sewer pump stations and associated rising mains is developer-driven, by being dependent upon development to trigger & construct down-stream headworks. Bring-forward construction costs may apply if development is required to construct the down-stream sewer in its entirety.

The Parwan Station PSP will typically require the construction of normal developer designed and constructed 150mm & 225mm diameter gravity sewerage reticulation mains within each development to service the proposed lots plus payment of New Customer Contributions.

The PEP will typically require the construction of normal developer designed and constructed 63mm & 150mm diameter pressure sewer reticulation mains within each development to service the proposed lots plus payment of New Customer Contributions.

The sewers servicing each individual lot within the precincts must accommodate full gravity drainage of the serviced area of the lot as defined in the WSA 02-2014-3.1 Sewerage Code of Australia.

Accordingly, the precincts will be able to progress in a planned and logical sequence without the need for major on-site temporary infrastructure facilities. If required, temporary management of sewer flows by eduction based on a specific eduction management plan may be implemented subject to specific requirements and approval of WW.

4.1.5 EXPECTED FUNDING ARRANGEMENTS

Current Western Water policy, under WW's New Customer Contributions Guidelines, as approved by the Essential Services Commission, is to fund sewers that are typically 300mm diameter and larger, and generally permanent fixtures such as sewer pump stations, where the inlet sewer is equal to or greater than 300mm diameter. This infrastructure is partly funded through New Customer Contributions paid by greenfield developers, typically on a per lot basis for residential. New Customers Contributions, which are standardised within growth areas

across the WW region, also partly fund new headworks assets, including treatment upgrades, required to service new growth. Developers fund sewerage infrastructure smaller than 300mm diameter.

WW do not provide any reimbursement or funding for temporary or interim assets.

Based on discussion with WW, Reeds have prepared a conceptual costing for the significant interim and ultimate branch infrastructure required to service the Parwan precincts. The interim costings noted below are works required upfront to provide immediate supply and can be viewed more as a 'Stage 1' of ultimate infrastructure to be delivered. Further investigation is required by WW into the specific staged upgrade works required for the treatment plant, and to provide firm cost estimates.

Table 1 - Sewer Estimate Costing Table

Item	Rates Used	Interim Costing	Ultimate Costing
Sewer Pump Station	$2.0 million each	$ 2,000,000	$ 2,000,000
Rising Main	$700 per linear metre	(~2.0km) = $ 1,400,000	$ 2,500,000
Bacchus Marsh RWP Upgrade	$10 million each primary lagoon $20 million each anaerobic pot	$ 50,000,000	$ 60,000,000
TOTAL		**$ 53,400,000**	**$ 64,500,000**

Where a specific area or facility contributes to significant upgrades of Western Water's infrastructure, WW may require a specific infrastructure charge for that area or facility, to avoid burdening the wider customer base. The PEP, or specific customers within that precinct, may trigger a specific infrastructure charge.

Further investigation is required by WW into the specific upgrade works required for the provision of sewer services to the areas, including treatment plant upgrades, to provide firm cost estimates and funding arrangements.

4.2 POTABLE WATER RETICULATION

Western Water (WW) is the Potable Water supply Authority for the Parwan Precincts and surrounding area.

4.2.1 EXISTING SERVICES

Existing water infrastructure in the vicinity of Parwan Station is a 100mm dia. water main in Geelong-Bacchus Marsh Road, which then continues into an 80mm dia. water main in Browns Lane and Whelans Road. See **Figure 7** below for a screenshot from the Dial Before You Dig asset service.

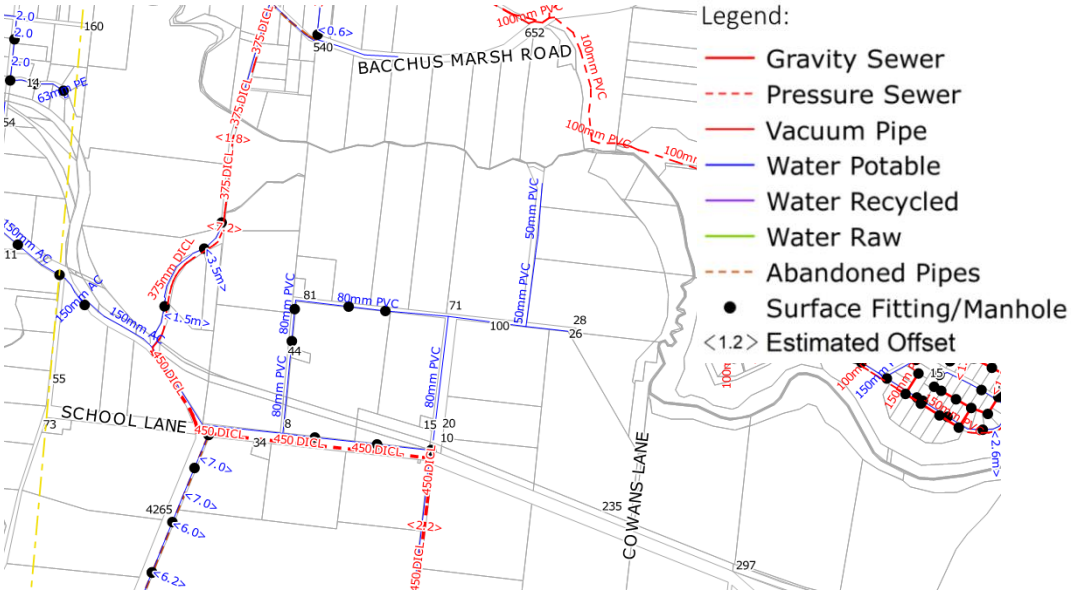

Figure 7: Existing Western Water Assets - Parwan Station (*Source: DBYD*)

Existing water infrastructure in the vicinity of the PEP includes a 100mm dia. water main in Geelong-Bacchus Marsh Road, which terminates south of the Aerodrome Road entrance and a 150mm dia. water main in Parwan South Road at the frontage of the Bacchus Marsh RWP. See **Figure 8** below for an excerpt from the Dial Before You Dig asset service.

Figure 8: Existing Western Water Assets - PEP (*Source: DBYD*)

The existing water mains service the existing rural homesteads and have no additional capacity for future development of the Parwan precincts.

4.2.2 CURRENT SERVICING STRATEGIES

Western Water has released a servicing strategy for their relevant areas, dated June 2018. This servicing strategy was prepared in support of their submission to the Essential Services Commission for the pricing period between 2018 – 2023.

Sheet 3 of this servicing strategy shows the wider Bacchus Marsh area; is attached in **Annexure 2** of this report, and an excerpt is shown below in **Figure 9**.

The current servicing strategy proposes to upgrade the existing 150mm dia. main in Geelong-Bacchus Marsh Rd up to Woolpack Road into a 225mm dia. water main. As per the strategy, this upgrade is to be constructed into two parts, with the west 1.5km portion nominated to be constructed within the 2019 financial year, and the east 2.1km portion to be constructed in the 2025 financial year.

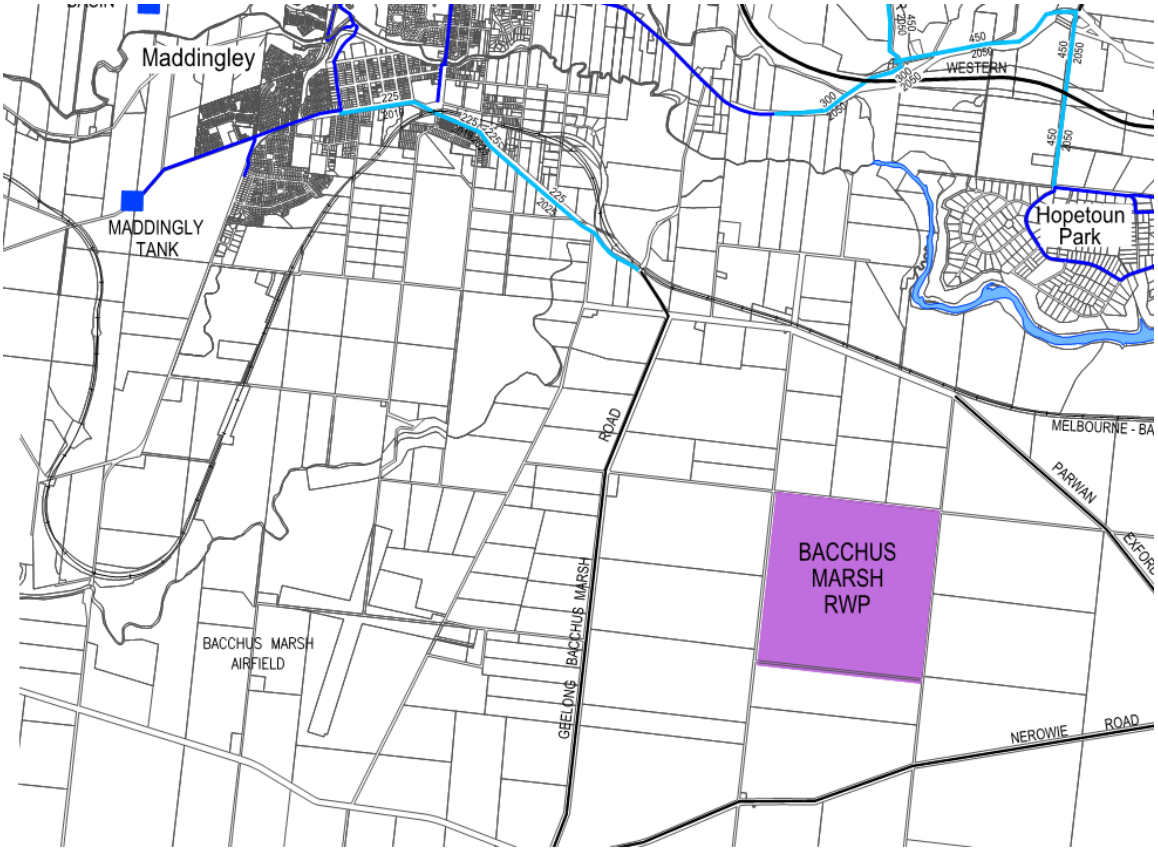

Figure 9: Bacchus Marsh/Melton Potable Water Servicing Strategy (*Source: Western Water, June 2018*)

It is noted that the future Parwan and Merrimu precincts are not considered in the current WW strategy, and no allowance has been made for their growth.

4.2.3 INTERIM SERVICING ARRANGEMENTS

Western Water provided servicing advice at a workshop held at their offices on 2 December 2019. WW confirmed that the existing 100mm and 80mm dia. water mains in the Parwan precincts did not have any capacity to service additional development.

Advice received from WW indicated that the sizing of the new water main in Geelong-Bacchus Marsh Road has been increased in size. WW noted that the new water main will be a 300mm dia. size, with the central portion of the water main currently in construction. See **Figure 10** below, the central light blue section of 300mm dia. water main will be constructed by WW between Fisken St and Griffith St, to be completed by 2020.

It is noted that the remaining sections of 300mm dia. water main to the east and west in Geelong-Bacchus Marsh Rd and Griffith St respectively are noted by WW to be completed in 2025; and are currently part of the WW capital works program.

Advice received from WW indicates that there will also be upgrade works of the water Pump Station in the centre of Bacchus Marsh township as part of these 'Stage 2' works. This will upgrade the capacity of the local water main network from 70 L/s to 160L/s in 2025.

As noted by WW, there will effectively be a surplus interim supply of 90 L/s in the Bacchus Marsh system, which will be delivered to Woolpack Road by 2025. It was highlighted by WW that this will be the immediate surplus supply available to the Bacchus Marsh vicinity. Noting that Maddingley will be progressing forward with additional development, future development in Maddingley or Bacchus Marsh township may proportionally decrease this interim supply available for the Parwan precincts.

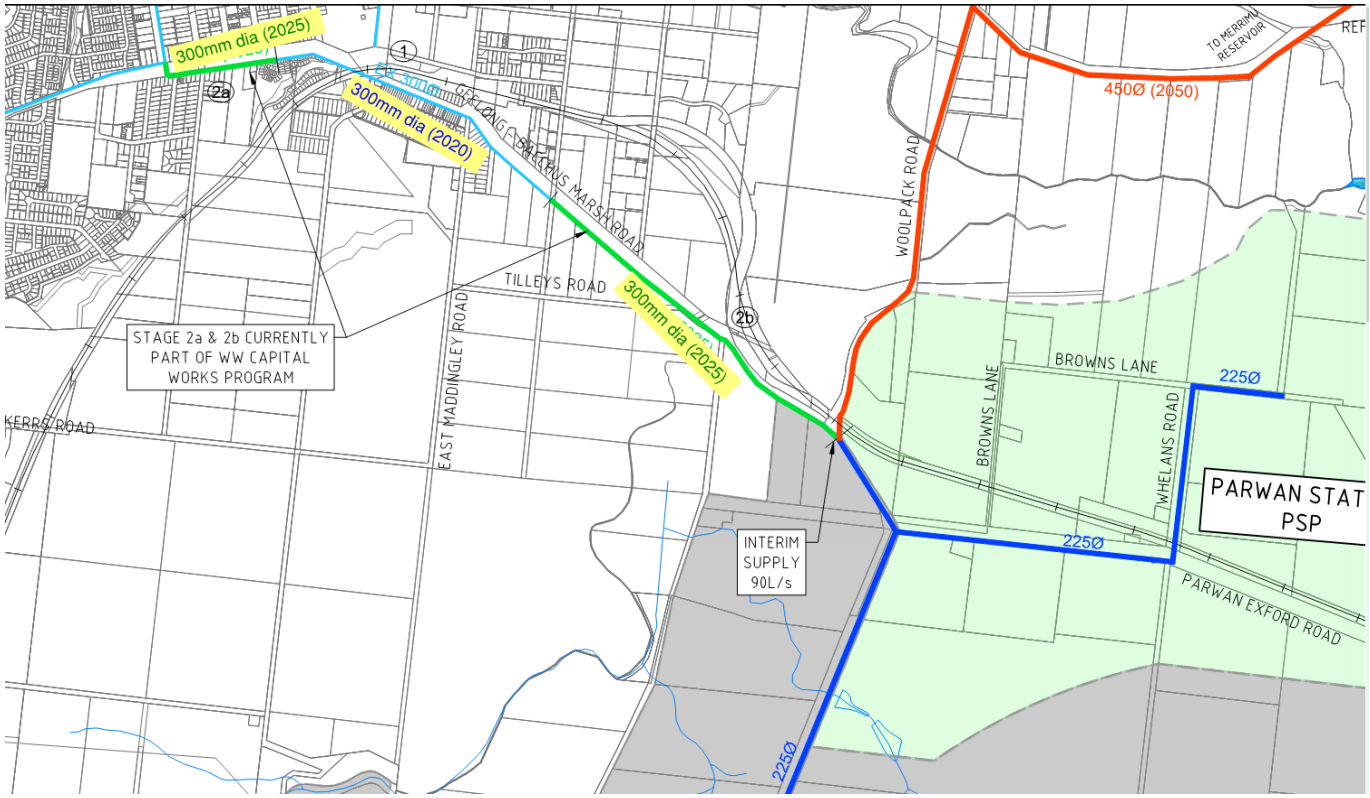

Figure 10: Parwan Potable Water Servicing Strategy (*Source: Reeds Consulting*)

It is expected that by the time the Parwan Station PSP is gazetted, developments proceed, and houses connect to the reticulation system; that 1,000 lots would have already been delivered by the anticipated growth in Bacchus Marsh and Maddingley. As such, there will be reduced interim potable water supply available to Parwan at the time of development.

It is noted that a proposed abattoir and protein recovery facility is proposed in the south of the PEP and a planning permit has been granted from Moorabool Council for the protein recovery facility (PRF). The potable water supply requirement for the PRF would be in the vicinity of 5 L/s, however the future abattoir will require a peak flow of 69 L/s. As such, reduced potable water supply will be available to the Parwan Station PSP at the time of development.

To service the Parwan Station PSP, new water infrastructure will be required to be extended from the proposed 300mm dia. main noted above (Stage 2b). Noting that there is no formal WW servicing strategy for the Parwan areas yet; based on discussions with WW, it is anticipated that Parwan Station will require a 225mm dia. water main.

To service the PEP, new water infrastructure will be required to be extended from the proposed 300mm dia. main noted above (Stage 2b). It is anticipated that a 225mm dia. water main will be extended along Geelong-Bacchus Marsh Road. The Potable Water servicing plan in **Annexure 3** has nominally shown the shared asset size of 225mm dia. ending just south of the Aerodrome Road. Future sizing and loadings of the system are currently unknown due to the unspecified future uses of the precinct and the wide variety in typical supply requirements from different use industrial developments. Further investigation is required by WW into the upgrade works required for the future loadings of the Parwan, Maddingley and Merrimu precincts

4.2.4 ULTIMATE SERVICING ARRANGEMENTS

Western Water has confirmed that for the next Essential Services Commission pricing period of 2023 – 2028 that the Parwan and Merrimu precincts will be accommodated into the future servicing plans.

WW has indicated that once the additional 90 L/s interim water supply is depleted, there is limited ability for additional capacity from the Bacchus Marsh network.

As such, once the water supply capacity in Bacchus Marsh is exhausted, any further development in Parwan or Hopetoun Park or Merrimu will trigger the construction of a major pipeline from the Merrimu Water Filtration Plan (WFP) down Flanagans Drive. The Merrimu WFP is ~40m higher than the Parwan region, as such there would be sufficient head to cater for the supply of the precincts.

According to the WW's current servicing strategy (2018), this water main is proposed to be a 450mm dia. water main; and is nominated to be constructed in 2050.

However, following discussion with WW, this timing will be reviewed and staged in a logical sequence, and due to potential demand from Parwan, Hopetoun Park and Merrimu, this water main will need to be a minimum 600mm dia. size.

In order to provide additional supply to the Parwan precincts, this 600mm dia. water main will need to extend 11.8km from the intersection of Woolpack Road and Geelong-Bacchus Marsh Road, cross the Werribee River, cross the Western Freeway, and continue north to the Merrimu WFP. See **Figure 11** below for the regional plan of this major pipeline.

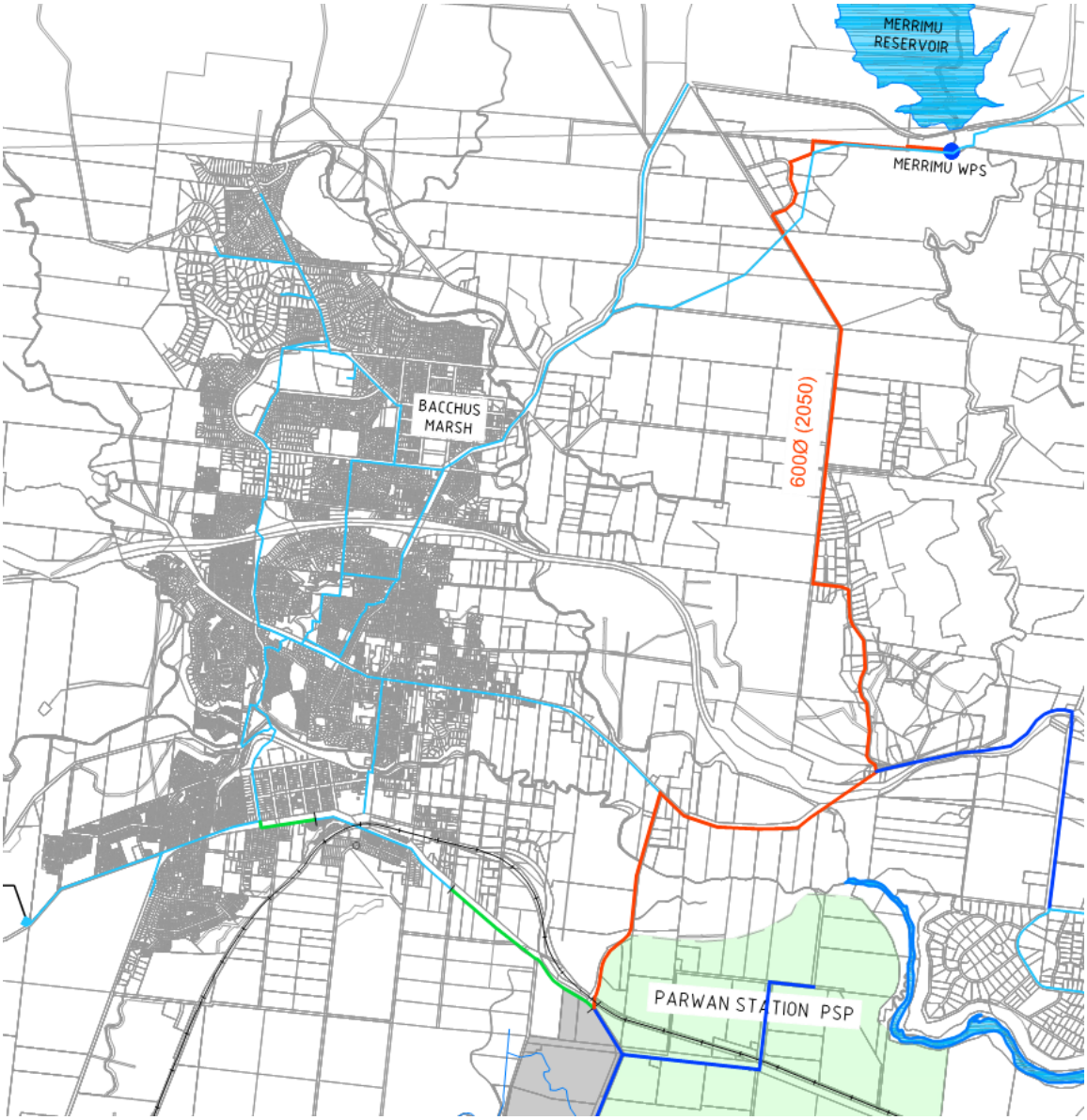

Figure 11: Parwan Station Potable Water Servicing Strategy (*Source: Reeds Consulting*)

Western Water has advised that the capacity of Merrimu WFP is 15,000 lots. Noting that the current number of lots being supplied is ~7,000, there is currently capacity in the WFP for interim development of the Parwan and Merrimu precincts.

However, it is anticipated that by 2033 there will be in excess of 15,000 households in the Bacchus Marsh region. WW has advised that a new supply from the Melbourne Water system is likely to be required at this point. This will require new infrastructure to be constructed between the Merrimu WFP and existing Melbourne potable water infrastructure in Melton.

As WW originally noted the 450mm dia. water main from Merrimu WFP to be long-term infrastructure (2050 delivery date), there is limited detailed information available for the pipeline and the proposed alignment is not confirmed. Further investigation is required by WW into the specific works required and to provide firm cost estimates.

The delivery timing for the water mains is developer-driven, by being dependent upon development to trigger & construct down-stream headworks. Bring-forward construction costs may apply if development is required to construct the down-stream water mains in their entirety prior to the WW nominated delivery timelines.

The Parwan precincts will typically require the construction of normal developer designed and constructed 150mm-100mm diameter water reticulation mains within each development to service the proposed lots plus payment of New Customer Contributions. All works are to be constructed in accordance with the Water Standards Association of Australia - Water Supply Code of Australia WSA 03-2011-3.1 Melbourne Retailer's Edition Version 2.

4.2.5 EXPECTED FUNDING ARRANGEMENTS

Current Western Water policy, under WW's New Customer Contributions Guidelines as approved by the Essential Services Commission, is to fund water main that are typically 225mm diameter and larger, and generally permanent fixtures such as water tanks. This infrastructure is partly funded through New Customer Contributions paid by greenfield developers, typically on a per lot basis for residential. New Customers Contributions, which are standardised within growth areas across the WW region, also partly fund new headworks assets, including treatment upgrades, required to service new growth. Developers fund potable water infrastructure smaller than 225mm diameter. WW also do not provide any reimbursement or funding for temporary or interim assets.

Based on discussion with WW, Reeds have prepared a conceptual costing for the significant interim and ultimate infrastructure required to service the Parwan precincts. The interim costings noted below are works required upfront to provide immediate supply and can be viewed more as a 'Stage 1' of ultimate infrastructure to be delivered. Further investigation is required by WW into the specific upgrade works required for the provision of water services to the areas, including treatment plant upgrades, to provide firm cost estimates and funding arrangements.

Table 2 – Potable Water Estimate Costing Table

Item	Rates Used	Interim Costing	Ultimate Costing
Water Pump Station		Stage 2b= $ 1,500,000 (*ballpark only*)	*TBC – modelling to be completed by WW*
Water Main	225mm = $600 /m 300mm = $700 / m 600mm = $1,000 / m	Stage 2a (0.6km) = $ 450,000 Stage 2b (2.1km) = $ 1,700,000 Parwan Station PSP (2.8km) = $ 1,700,000 PEP (~4.5km) = $ 2,700,000	Flanagan Drive 600mm dia. main (11.8km length) = $ 13,000,000
TOTAL		**$ 6,550,00**	**$ 13,000,000**

Reeds note that the 300mm dia. water mains (Stage 2a & 2b) and 225mm dia. mains in Geelong-Bacchus Marsh Road and Parwan-Exford Roads will need to be constructed immediately to facilitate any further development of Parwan. WW only have funding available for 2025 for these mains, therefore if these water mains are brought forward there will be an incremental costs payable by the developer delivering these water mains.

Where a specific area or facility contributes to significant upgrades of Western Water's infrastructure, WW may require a specific infrastructure charge for that area or facility, to avoid burdening the wider customer base. The PEP, or specific customers within that precinct, may trigger a specific infrastructure charge.

4.3 RECYCLED WATER

Western Water (WW) is the Recycled Water supply Authority for the Parwan Precincts and surrounding area.

4.3.1 EXISTING SERVICES

According to the Dial Before You Dig (DBYD) information received from Western Water, there does not appear to be any existing authority Class A recycled water infrastructure in the vicinity of the Parwan Region.

It is noted that the Bacchus Marsh Recycled Water Plant (RWP) currently produces Class C recycled water, which is not suitable for residential use. WW has indicated that a number of local businesses in the area currently use this Class C recycled water.

4.3.2 ULTIMATE SERVICING ARRANGEMENTS

Western Water provided servicing advice at a workshop held on 2 December 2019.

Advice received from WW indicated that if an upgrade of the Bacchus Marsh RWP goes ahead, it will cost an additional ~$10 million to install specific facilities to produce Class A recycled water. If this facility is installed, then recycled water mains could proceed from the treatment plant to provide supply to Parwan. See **Figure 12** below.

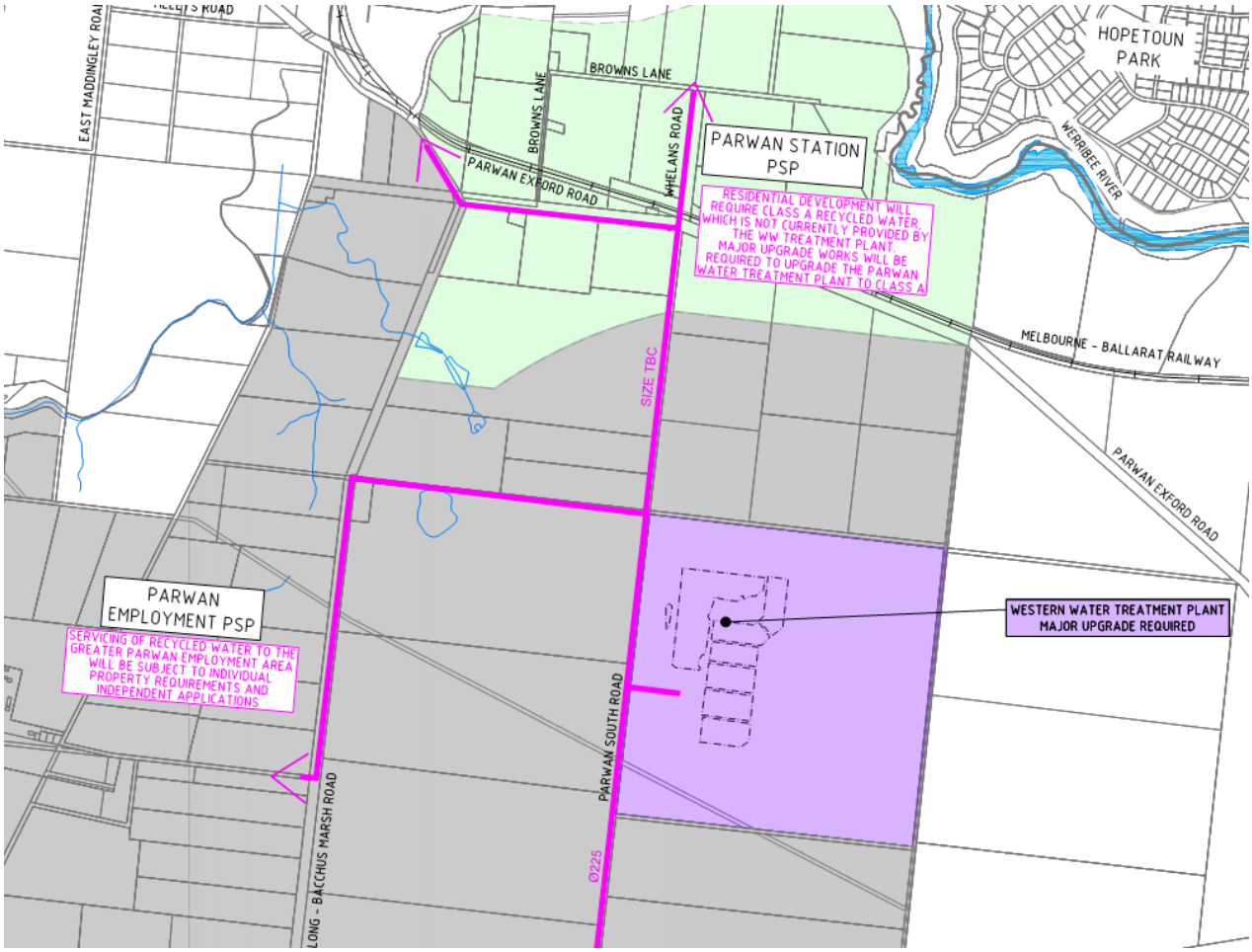

Figure 12: Parwan Station Recycled Water Servicing Strategy (*Source: Reeds Consulting*)

Further investigation is required by WW into the specific works required for pipeline sizes, to determine if supply will be extended to service the greater Bacchus Marsh region and to provide firm cost estimates.

If the precinct construction precedes timing for recycled water infrastructure in the area, future development may be required to construct temporary potable cross connections to charge the recycled main reticulation. This cross connection would be removed when recycled water reticulation is brought to the subject site by WW in the future.

If recycled water is mandated by WW, development will typically require the construction of normal developer funded 100mm -150mm diameter water reticulation mains within each site to service the proposed lots. Payment of New Customer Contributions will be required for each lot prior to compliance of individual internal stages.

All works are to be constructed in accordance with the Water Standards Association of Australia - Water Supply Code of Australia WSA 03-2011-3.1 Melbourne Retailer's Edition Version 2.

WW wish to note that they are no longer building Class A recycled water infrastructure in the residential growth areas of Melton and Sunbury. Indications suggest that there would be sufficient demand for Class C recycled water within the Balliang area that may limit an available supply for Class A recycled water.

WW may review the need for a Class A plant if there is sufficient demand from local industries, rather than residential areas, by having a positive impact on the supply into the area by substituting potable water supply with recycled water.

4.3.3 EXPECTED FUNDING ARRANGEMENTS

Western Water no longer mandates the need for a Class A recycled water network for new developments. As it is not mandated, the ESC guidelines for funding of the infrastructure are not applicable. This places the delivery and funding of a Class A recycled water network, as well as the required recycled water plant upgrades on any prospective land owners that request recycled water supply.

Based on discussion with WW, Reeds have prepared a conceptual costing for the interim and ultimate recycled water infrastructure required to service the Parwan precincts. The interim costings noted below are works required upfront to provide immediate supply and can be viewed more as a 'Stage 1' of ultimate infrastructure to be delivered. Further investigation is required by Western Water into the specific staged upgrade works required for the treatment plant, and to provide firm cost estimates, if recycled water is mandated by WW in future.

Table 3 – Recycled Water Estimate Costing Table

Item	Rates Used	Interim Costing	Ultimate Costing
Bacchus Marsh RWP Upgrade	$10 million to provide Class A	$ 10,000,000	*TBC – modelling to be completed by WW*
Water Main	225mm = $600 /m 300mm = $700 /m	Parwan Station PSP (~3.5km length) = $ 2,300,000 PEP (~4.1km length) = $ 2,500,000	Parwan Station PSP = (~2.5km) = $ 1,500,000 PEP = TBC – *dependent upon future developments and land uses*
TOTAL		**$ 14,800,00**	**$ 2,500,000**

4.4 ELECTRICAL RETICULATION

Powercor is the electrical authority responsible for supply to the Parwan Precincts and surrounding area.

4.4.1 EXISTING SERVICES

According to the Dial Before You Dig (DBYD) information received from Powercor, there is existing High Voltage (HV) infrastructure in the vicinity of the Parwan Region.

Advice received from Powercor confirms that the closest regional zone substation is the Bacchus Marsh Zone Substation (BMH) on Kerrs Road. See **Figure 13** below for an excerpt from the Powercor Project Assessment report for the Bacchus Marsh & Melton areas from 2016. The Parwan precincts are located within the BMH nominated zone substation coverage area.

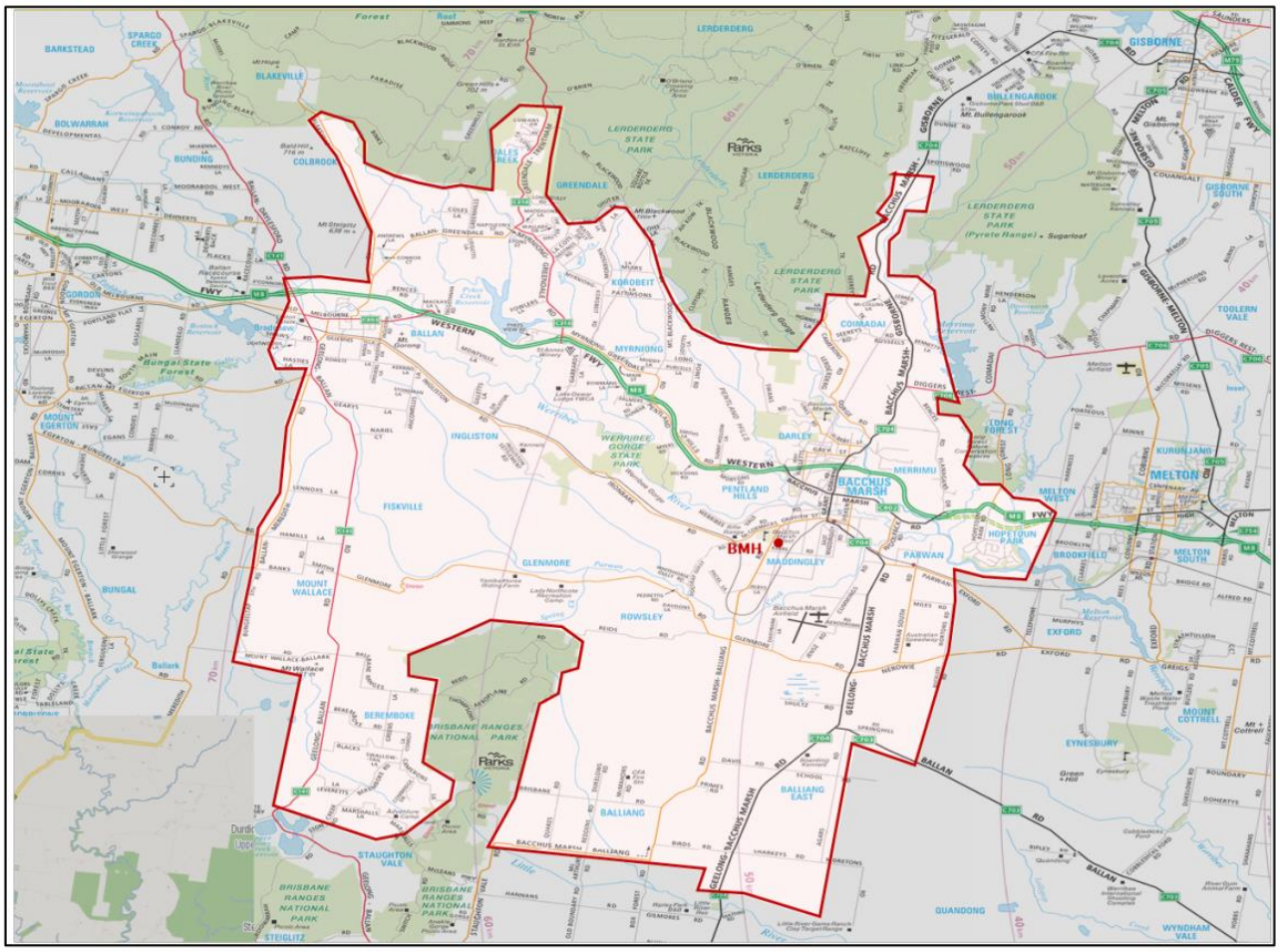

Figure 13: Parwan Electrical Servicing Strategy (*Source: Powercor 2016*)

Quoting the Powercor project assessment report (2016) for the Bacchus Marsh zone sub:

"BMH is currently supplied by a 66kV sub-transmission line from the Brooklyn terminal station (BLTS) with backup supply via a 66kV sub-transmission line from the Ballarat terminal station (BATS) via an auto changeover scheme at BMH. The zone substation is a banked station consisting of two 10/13.5 MVA 66/22kV transformer supplying two 22kV buses with four distribution feeders. The zone sub experiences both summer evening and winter hot load peaks."

4.4.2 INTERIM SERVICING ARRANGEMENTS

Powercor provided servicing advice at a workshop held at their offices on 27 November 2019.

See **Figure 14** below for a plan of the Parwan precincts and the existing HV network 22kV in orange, and the 66kV sub-transmission network in thick red.

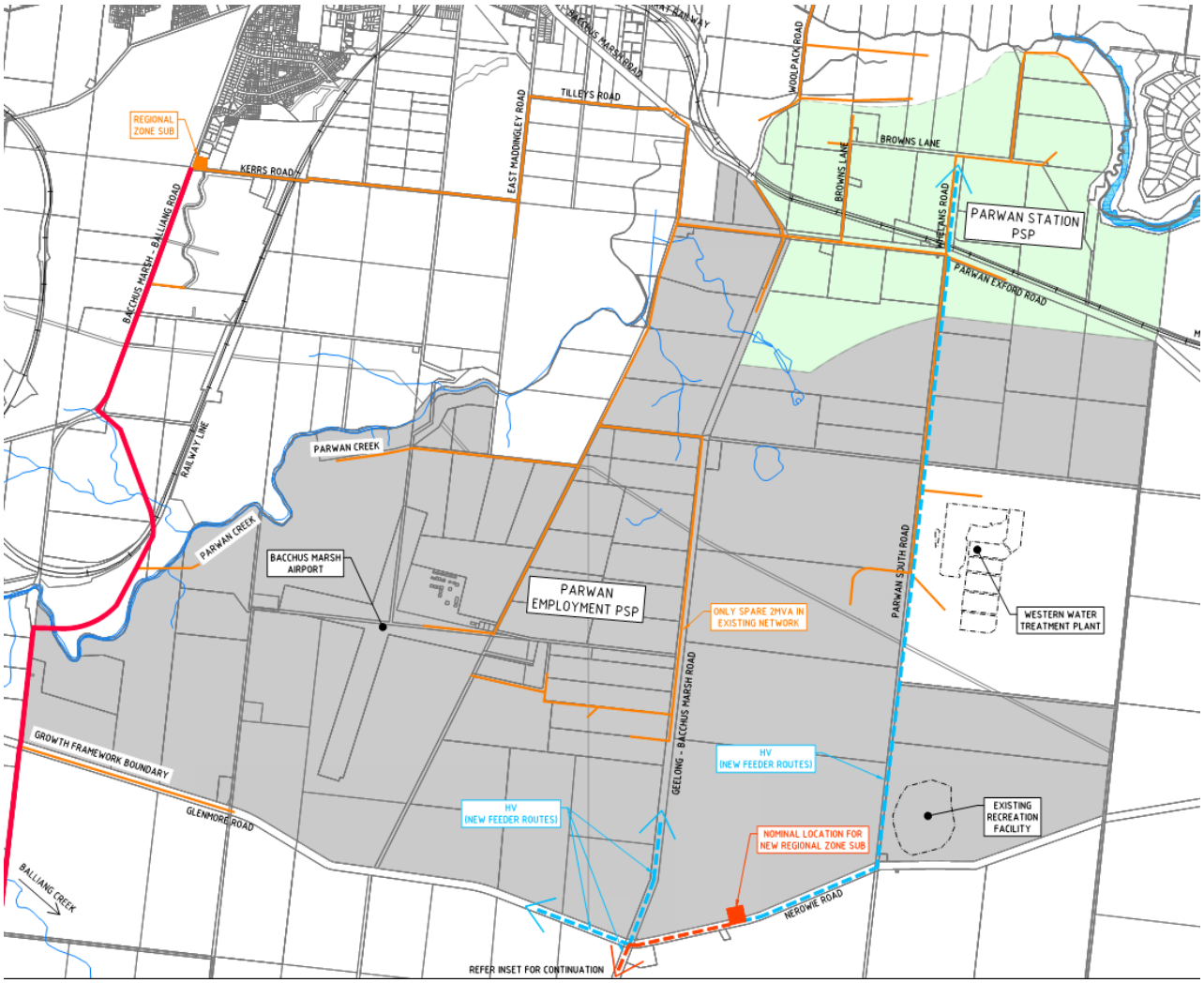

Figure 14: Parwan Electrical Servicing Strategy (*Source: Reeds Consulting*)

Powercor has advised that there is only 2 MVA capacity remaining in the current HV 22kV feeders in Parwan. Specifically, the existing overhead lines only have capacity in Geelong-Bacchus Marsh Road up to the Aerodrome Road, with minimal supply available south of Aerodrome Road.

It is noted that this is the existing condition of the network, even after upgrade works to the Melton (MLN) zone sub were completed in 2018 which offloaded 5 MVA of load from the BMH zone sub.
The existing zone substation (BMH) in Kerrs Road does not have sufficient existing capacity to provide any additional supply over the 2 MVA noted above. A possible interim option nominated by Powercor is to upgrade the existing BMH by installing another bus node and transformer within the existing kiosk substation reserve. As per similar upgrades completed in Melton recently as per Powercor Project Assessment report (2016), Reeds estimate the cost of this additional bus node and transformer to be in the region of $5 million, and new overhead feeders will also be required to be installed from Kerrs Road into Parwan at additional cost.

4.4.3 ULTIMATE SERVICING ARRANGEMENTS

Powercor has provided advice regarding the ultimate servicing of the Parwan precinct with electrical supply.

Powercor preliminary advice indicates that when the ultimate capacity from the Bacchus Marsh zone sub is exhausted, a new zone substation will be required to service the Parwan areas. See **Figure 15** below which provides a schematic diagram for where the Parwan substation would likely be installed within the existing 66kV sub-transmission network.

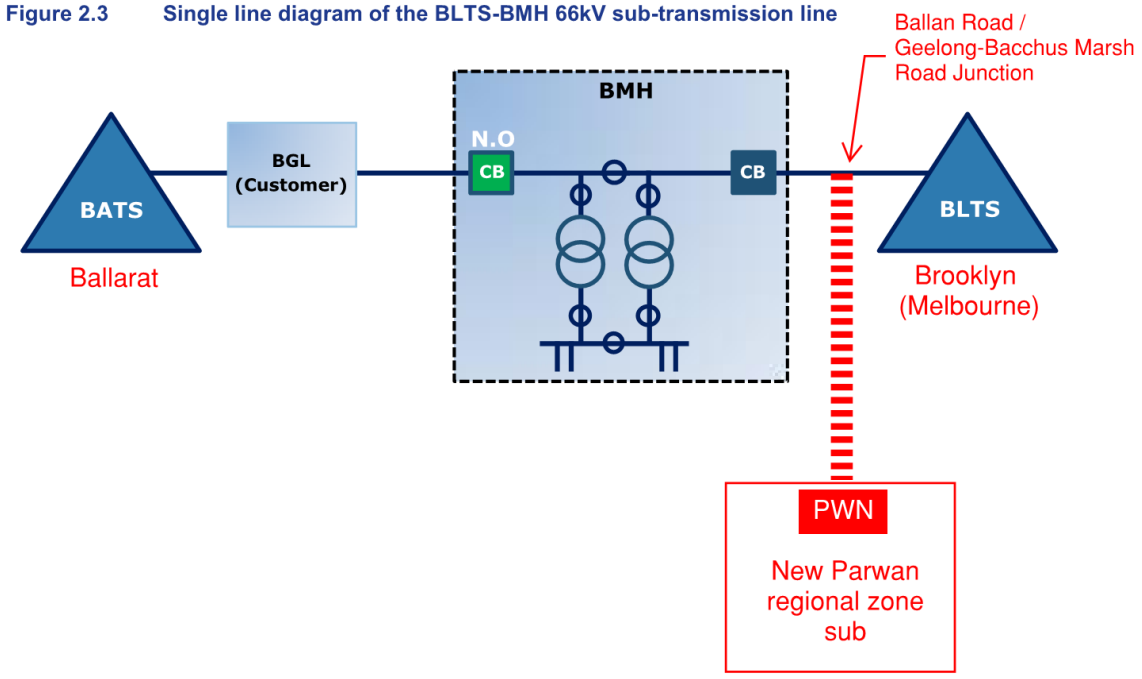

Figure 15: Parwan Electrical Servicing Strategy (*Source: Reeds Consulting*)

See **Figure 16** adjacent, it is anticipated that this new 66kV sub-transmission line would connect to the existing network at the Ballan Road / Geelong-Bacchus Marsh intersection; and continue 3.5km north along Geelong-Bacchus Marsh Road into Parwan.

The new Parwan zone substation would require a 100m x 100m reserve purchased by Powercor. As shown in **Figure 17** below, a nominal location for the zone substation has been shown to scale. This is not confirmed, and is subject to landowner agreement and further Powercor planning.

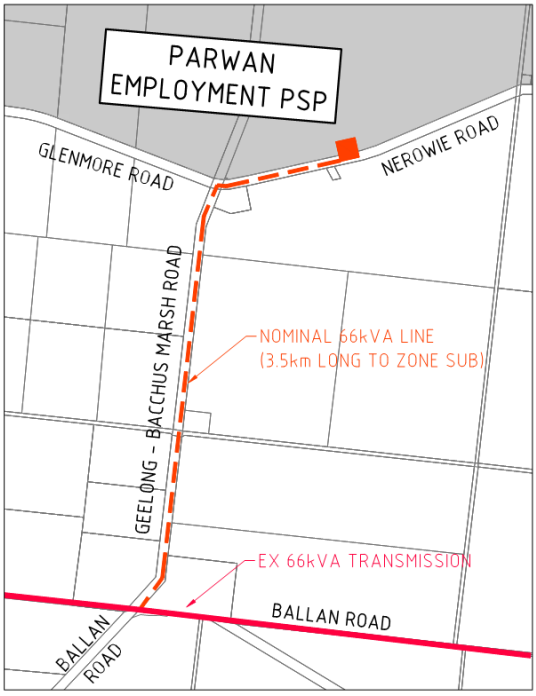

Figure 16: Parwan Electrical Servicing Strategy (*Source: Reeds Consulting*)

The proposed Parwan zone sub will be expandable, with up to four total bus upgrades possible to be installed after the initial construction. Due to the significant cost, the future upgrade of the zone sub will be staged to provide additional supply to the Parwan precincts as required.

The delivery timing for the zone substation is subject to a minimum 19-month program with a $100,000 up-front payment to Powercor for network design and specification. This program includes 5 months for preliminary design and issue of a firm offer; 2 months for detailed specification; and a minimum 12 months for construction. Powercor note that this timeline is preliminary only, and subject to availability of materials and electrical components in the international market. Based on the Powercor Project Assessment report (2016) and the Powercor Connection Policy, Reeds estimate the cost for the first stage of the zone substation will be in the vicinity of $10 million.

New 22kV feeders (shown in light blue in **Figure 17** below) would continue from the new Parwan regional zone sub and extend north, east and west as required to service new developments within the Parwan Precincts.

Powercor advise that the installation of the Parwan zone substation will assist system redundancy and re-distribution of loads from the BMH zone substation. As such, there will likely be opportunities to disseminate existing Parwan loads such as the RWP into the new Parwan sub, and provide supply to the Parwan Station precinct from an existing overhead HV network.

Powercor need to complete additional design and modelling to confirm the future network loads and likely feeder alignments for Parwan development.

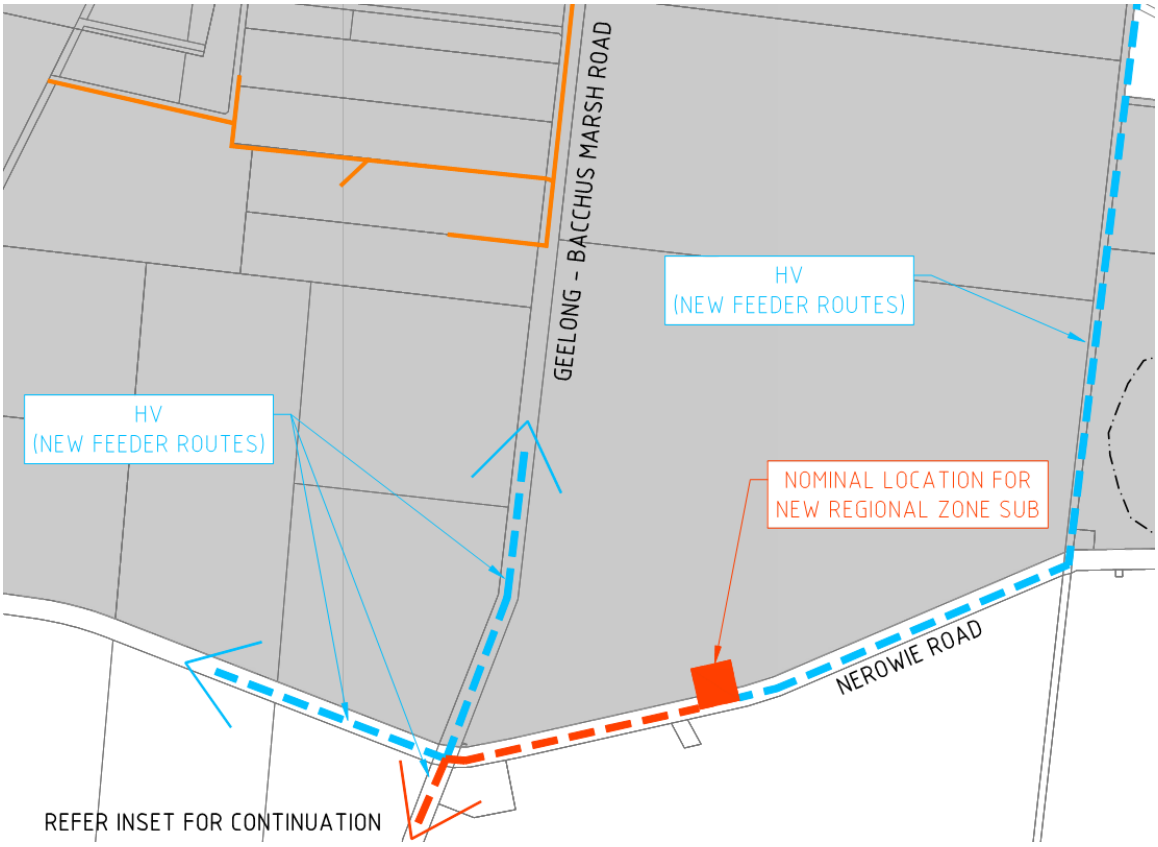

Figure 17: Parwan Electrical Servicing Strategy (*Source: Reeds Consulting*)

Underground power HV and LV cables and suitably located kiosk substation facilities will be master planned for each development within the precinct. The detailed design of electrical works, cabling, lighting and the final siting of kiosk substation/s will be undertaken on a stage by stage basis in accordance with the proposed network scope and general requirements of Powercor.

The installation of electricity conduits, service pits, trenching and backfill works will be carried out by each developer's civil contractor and the cabling and jointing will be undertaken by an approved electrical contractor under the project management and auditing requirements of the electrical company. Street lighting and in particular the type of pole and light fittings internal to the development will be subject to approval of Council and Powercor and externally, in the arterial road network, lighting will require the relevant road authority's approval.

4.4.4 EXPECTED FUNDING ARRANGEMENTS

Powercor's charges for connection services and their calculation is publicly available and on their website within the "Powercor Connection Policy". To provide initial supply to the Parwan areas, a 'negotiated connection service' will be required from Powercor.

Powercor's connection charge is calculated according to the following formula:

$$Connection\ charge = AS + CC + PS$$

where:

AS is the total charge payable for all applicable ancillary services

CC is the total capital contribution payable for all standard control connection services, which are calculated with reference to the cost-revenue-test set out below

PS is the total charge payable to account for any pioneer scheme applying to the assets to which the customer connects

Powercor typically provide HV Equalisation Rebates to customers through the above CC (Capital Contribution) item in their above formula. This rebate usually extends to the construction of shared HV infrastructure, including substation kiosks and HV transmission lines. Low Voltage works for each development, including all civil construction costs for public lighting and residential supply networks will typically be at the cost of each developer.

Based on discussion with Powercor and review of industry reports, Reeds have prepared a conceptual costing for the significant interim and ultimate branch infrastructure required to service the Parwan precincts. The interim costings noted below are works required upfront to provide immediate supply and can be viewed more as a 'Stage 1' of ultimate infrastructure to be delivered. Further investigation is required by Powercor into the specific staged upgrade works required, and to provide firm cost estimates.

Table 4 – Electrical Estimate Costing Table

Item	Rates Used	Interim Costing	Ultimate Costing
Parwan Zone Substation	$10 million for substation establishment $5 million for each bus upgrade	$ 10,000,000 *(does not include procurement of land area)*	All four bus upgrades: $20,000,000

HV feeders	66kV OH extension = $500 /m 22kV OH extension = $300 /m	Extension from Ballan Road (~3.5km) = $ 2,000,000 Parwan Station extension (~1.5km) = $500,000	*TBC – each additional HV feeder to be treated as an individual project, specific to development applications*
TOTAL		**$ 12,500,000**	**$ 20,000,000**

The upfront cost associated with funding the zone substation is not feasible for a single developer to deliver and carry. It is hopeful that dedicated State government funding can be provided to facilitate the initial capital works investment required to provide supply to initial development of the Parwan precincts. A pioneer scheme may also apply to the new Parwan zone substation as follows:

"*If a network extension ceases, within 7 years after its installation and energisation, to be dedicated to the exclusive use of the customer occupying the premises, the customer may be entitled to a partial refund of connection charges under our pioneer scheme.*"

This pioneer scheme charge noted above in the formula (PS) would be applicable to all future users after the first-in customer and would be passed through to the first-in customer as a refund. This should be considered by the State government in any grant proposals or infrastructure funding models to enable the economical progression of the Parwan precincts, as the PS could be a mechanism through which the State government could partially recoup its costs.

4.5 GAS RETICULATION

Ausnet Gas is the gas company responsible for gas supply to the Parwan precincts and the surrounding area.

4.5.1 EXISTING SERVICES

According to the Dial Before You Dig (DBYD) information received from APA Group, there is an existing high-pressure transmission gas main that bisects the PEP in an east-west alignment. See **Figure 18** below for an excerpt from the DBYD plan received from APA Group.

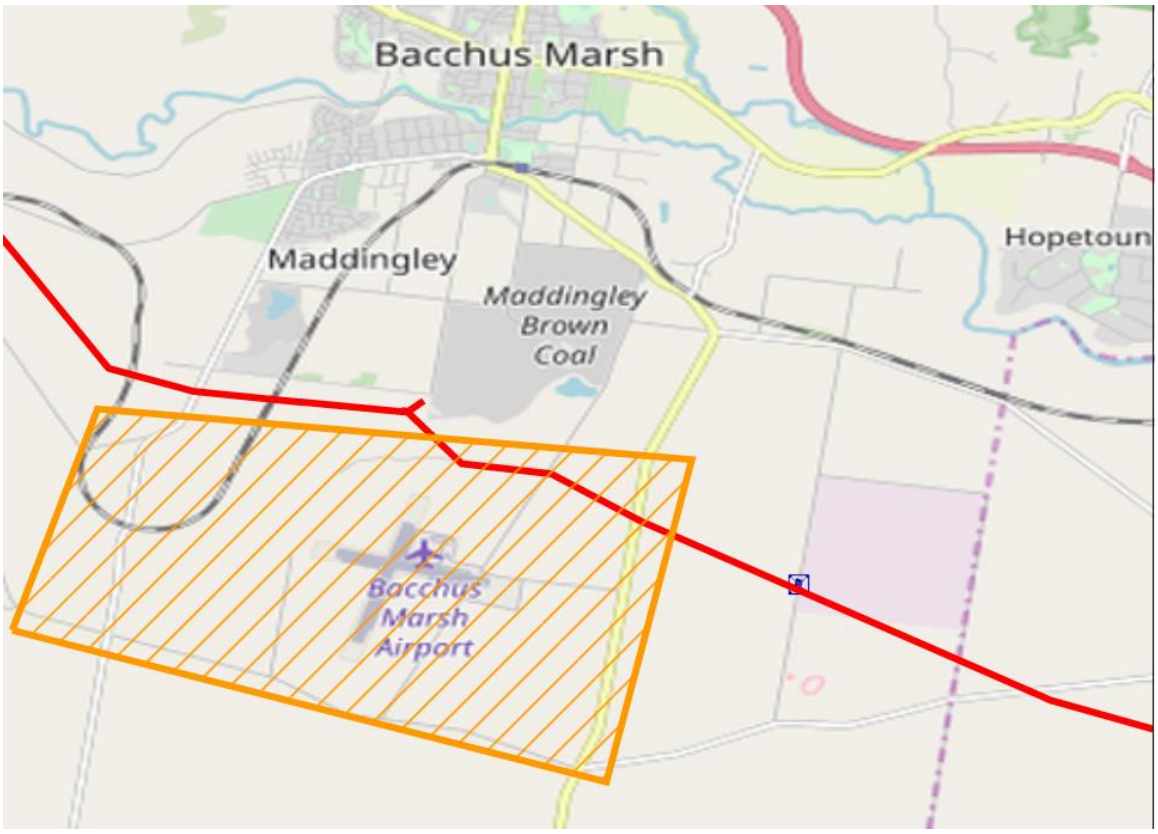

Figure 18: APA Group Asset Plan– Gas Transmission Main (*Source: DBYD*) N.T.S

APA Group has confirmed the specifications of the transmission gas main as noted below and provided additional information packages for pipeline safety see **Annexure 3**.

- Name: **Brooklyn-Ballan**
- Size: **200 mm diameter**
- Material/type: **API 5L Gr B**
- Pressure: **7390**
- Date of construction: **1972**
- Easement width: **20m**
- Buffer distance: **210m**

Ausnet Gas as the local authority do not have any existing gas reticulation gas present in Parwan with capacity to service future development. There is an existing City Gate gas interchange on the opposite side of Parwan Creek in Rowsley Station Road which provides gas supply to Bacchus Marsh.

4.5.2 ULTIMATE SERVICING ARRANGEMENTS

APA Group provided servicing advice at a workshop held at their offices on 26 November 2019. Ausnet Gas provided servicing advice at a workshop held at their offices on 3 December 2019.

Both APA Group and Ausnet Gas have confirmed that a new Citygate will need to be installed on the existing Brooklyn-Ballan transmission main to provide gas supply to both Parwan precincts. The cost of this Citygate is expected to be in the vicinity of $5.0 million, excluding the land acquisition required.

Preliminary advice indicates that the likely location for this Citygate will be south of the Western Water Bacchus Marsh RWP, east of Parwan South Road. See **Figure 19** below which provides an overall plan for where the Parwan Citygate would likely be installed, and the probable gas reticulation extensions through the Parwan precincts.

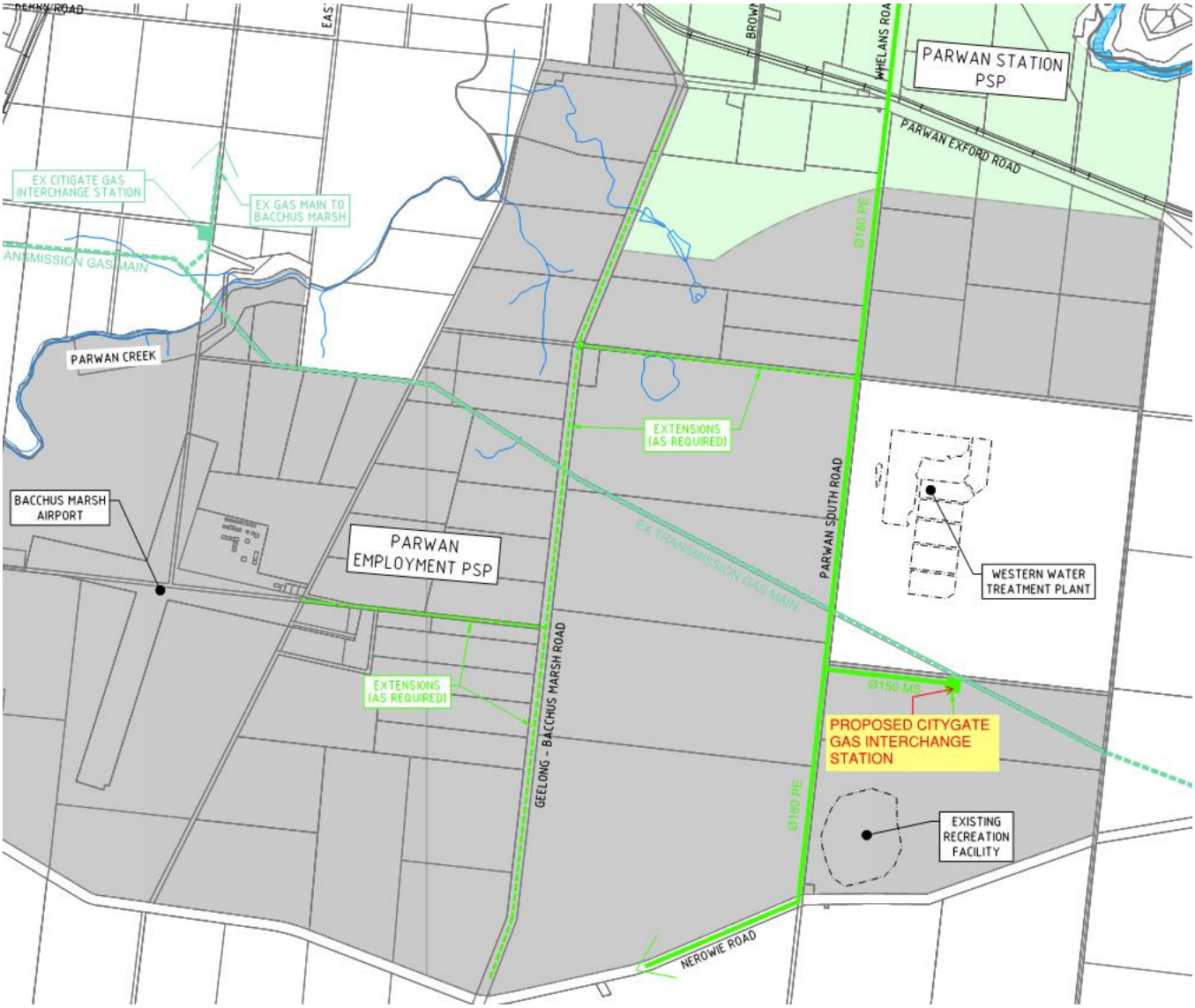

Figure 19: Parwan Gas Servicing Strategy (*Source: Reeds Consulting*) N.T.S

Ausnet will design the new city gate and include a risk assessment using a combined HAZID/QRA which will determine the risk contours for future urban development around the new city gate. The proponent will need to enter into a commercial agreement with Ausnet and APA Transmission to allow the risk assessment to take place. Ausnet and APA transmission will

attend the HAZID workshop. Advisors are required to conduct the combined HAZID/QRA using recent examples such as the Soldier Rd Clyde North, Hillcrest Christian College template.

APA Group have advised that prior to the PEP being progressed further, they will require a Safety Management Strategy (SMS) briefing to be completed with the VPA to inform if any specific safety or protective measures will need to be implemented. The cost of this SMS will be borne by the VPA; and requires the HAZID/QRA to have already taken place, as the QRA risk contours from the new City Gate are required to have the urban development comply with the risk contours.

APA Group have also provided additional advice regarding their transmission main noting that the capacity of the transmission system will need to be checked once the load forecasts to the new City Gate Station can be forecast. The requirements (and costs) for any additional pipeline augmentation (if required) would be determined at that stage.

Ausnet have advised that gas reticulation can be extended north through Parwan South Road to form the basis of gas supply for the Parwan Station Precinct. Gas reticulation will also be extended south as required to service the PEP.

4.5.3 EXPECTED FUNDING ARRANGEMENTS

Due to the significant costs associated with the Citygate station, it is anticipated that dedicated State government funding will be required to facilitate the initial capital works investment required to service interim development of the Parwan precincts.

Current Ausnet policy is to provide gas reticulation within residential development at no cost to the development. Generally, gas mains are constructed concurrently with the water supply works and the developer will be required to provide trenching and backfill requirements to the gas company's current requirements at their own cost.

Noting that the Parwan-South Road gas mains will be gas exclusive service trenches, and long extensions without direct tappings, it is expected that there will be marginal contributions required to be paid to Ausnet for gas reticulation in Parwan South Road to service the Parwan Station precinct, notwithstanding it being a residential precinct.

Current Ausnet policy regarding industrial sites is that they are not mandated to provide gas for industrial developments. This also applies to the expected use the PEP being agribusiness in nature. As such, all gas main extensions within the PEP will be subject to individual development supply requirements; and will be entirely at each development's own cost. Any and all gas extensions within the PEP will be developer-driven, with timing entirely depending upon individual development timing and supply requirements.

Further investigation is required by Ausnet Gas into the specific upgrade works required for the Parwan Precincts, and to provide firm cost estimates for the headworks required.

Reeds have prepared a conceptual costing for the significant interim infrastructure required to service the Parwan precincts. The interim costings noted below are works required upfront to provide immediate supply and can be viewed more as a 'Stage 1' of ultimate infrastructure to be delivered. Further investigation is required by authorities into the specific staged upgrade works required, and to provide firm cost estimates.

Table 5 – Gas Estimate Costing Table

Item	Rates Used	Interim Costing	Ultimate Costing
City Gate (includes 800m of gas conduit)	$5.0 million lump sum	$ 5,000,000 *(does not include procurement of land area)*	*TBC – requires further modelling by Ausnet & gas main extensions are dependent on future development applications*
TOTAL		**$ 5,000,000**	

4.6 TELECOMMUNICATIONS

Telstra, NBN and Optus are all relevant authorities for telecommunications supply in the Parwan precincts and wider Bacchus Marsh area.

4.6.1 EXISTING SERVICES

Telstra currently have assets located within the Parwan precinct.

NBN do not have any fixed line networks within the Parwan precincts, however they provide wireless & satellite service, as requested by individual customers in the area.

4.6.2 ULTIMATE SERVICING ARRANGEMENTS

NBN provided written servicing advice via email on 26 November 2019. Advice is as follows:

Proposed network upgrades

Currently there are no plans to install or upgrade any infrastructure within this precinct. NBN do not foresee any constraints or issues with future standard infrastructure installation. There are no plans to extend the network to the precinct area unless customer initiated.
Overall, NBN Co consider it highly unlikely that they will need to implement any new key infrastructure.

Noting the above, that there are no current plans to provide fixed-line NBN to Parwan, NBN has provided further advice on providing fixed-line service to the precincts:

Servicing the precinct area

Servicing of the Precinct would be planned on a case by case application basis and driven by customer-initiated demand. New infrastructure would be deployed utilising a mixture of existing Telstra, new NBN build also developer supplied & shared trenching arrangements. Any new build (multiple conduit) to this precinct is planned to connect via Geelong-Bacchus Marsh Rd at the western end of the Parwan Station Precinct. It is envisioned that new pit & pipe infrastructure is required within the entire precinct.
Any extension of the Fixed line footprint to Parwan precincts will connect to the NBN co-located FAN site in Main St, Bacchus Marsh.
Initial cable infrastructure planned to service this precinct would be of sufficient capacity to meet the supplied projected household growth out to the year 2031

NBN Co, as the responsible agency, will determine the requirements for initial and ultimate fibre optic-based telecommunication services to proposed development within the precincts. Application and registration requirements for the provision of telecommunication services to the proposed development will be made through NBN Co by each individual development within the precincts.

An approved NBN Co provider will typically design and install the infrastructure within each development on a staged basis and also install the extension of the network or backhaul to the development as required.

Other options for telecommunication fibre provision to the home are available from private providers, such as Opticomm. Further information and quotes on private fibre can be obtained upon request.

4.6.3 EXPECTED FUNDING ARRANGEMENTS

The cost of network extension, if applicable, is subject to various factors including the access, distance and capacity of an exchange. If the length of backhaul is typically over 1.0km, then there will be additional charges to be paid by the developer to bring NBN fixed-line optic fibre to their site.

As such, for both Parwan precincts, it is expected that the cost of backhaul and external pit & pipe headworks will be borne by the 'first-in' development.

NBN Co subdivision provisioning requirements will also apply, requiring each developer to install pits and conduits within the development to NBN Co standards in a co-ordinated manner with the other civil works, at their own cost.

A typical per dwelling contribution will be required to be paid for all development within the precincts, at the time of this report the contribution cost for a single dwelling unit (SDU) is $600/lot.

5 SUMMARY & CONCLUSION

This report has provided an engineering assessment of the key servicing requirements for the proposed Parwan Station PSP and PEP precincts.

Our investigation has reviewed the availability and requirements for all necessary infrastructure including potable water supply, recycled water supply, sewerage, utility services including electricity / lighting, telecommunications and gas and also provided an overview of proposed roadworks and earthworks requirements.

Key Constraints

Based on the investigation and analysis of the engineering servicing report, we note that there are no existing assets within Parwan with effective capacity to service immediate future development within the precincts. We conclude that the Parwan precincts will require significant planned upgrades and augmentation of existing services to meet the demands of both interim and ultimate development.

We have summarised below the major service trunk infrastructure required to provide an interim supply of services for the precincts.

- Sewerage — Bacchus Marsh RWP Upgrade, ~2.0km of rising main, sewer pump station in the Parwan Station PSP.
- Potable Water — Water Pump Station in Bacchus Marsh, ~2.7km of DN300 and ~4.5km of DN225 water main in Geelong-Bacchus Marsh Rd, ~2.8km of DN225 water main for the Parwan Station PSP.
- Recycled Water — **not currently mandated**. However, if required, a Bacchus Marsh RWP upgrade for Class A production, ~3.5km of DN300 for Parwan Station PSP and ~4.1km of DN300 for PEP.
- Electrical — New zone substation construction at Nerowie Rd, ~3.5km HV 66kVA extension from Ballan Rd through Geelong-Bacchus Marsh Rd, ~1.5km HV feeder into Parwan Station PSP.
- Gas — New Citygate construction and 800m of gas conduit to provide supply to Parwan-South Road.
- Telecommunications — Extensions as required by NBN.

Key Opportunities

It is noted that delivering the infrastructure outlined in this report will benefit not just the subject Parwan precincts, however the wider region of Bacchus Marsh. Three critical examples of this servicing synergy are outlined below.

First, the Bacchus Marsh RWP upgrade will provide additional sewer treatment capacity for greater Bacchus Marsh, Maddingley and likely Merrimu. Second, the ultimate 11.8km length DN600 water main to be brought from the Merrimu WFP down to Geelong-Bacchus Marsh Road will provide potable supply directly to the Merrimu precinct and Bacchus Marsh in addition to the Parwan precincts. Third, the construction of the new Parwan zone substation will alleviate the capacity issues within the existing Bacchus Marsh zone sub. This will enable continued growth within Bacchus Marsh and possibly the Merrimu and Hopetoun precincts.

It is concluded that constructing the above key infrastructure will enable both immediate development for the Parwan precincts and continued development of the greater Bacchus Marsh region.

Costing

Based on discussion with authorities, Reeds have prepared a conceptual costing for the significant interim and ultimate infrastructure required to service the Parwan precincts. The interim costings noted below are works required upfront to provide immediate supply and can be viewed more as a 'Stage 1' of ultimate infrastructure to be delivered. Further investigation is required by authorities into the specific staged upgrade works required, and to provide firm cost estimates of trunk infrastructure.

Table 6 – Summary Estimate Costing Table

Item	Interim Costing	Ultimate Costing
Sewer	$ 53,400,000	$ 64,500,000
Potable Water	$ 6,550,00	$ 13,000,000
Recycled Water	$ 14,800,00	$ 2,500,000
Electrical	$ 12,500,000*	$ 20,000,000
Gas	$ 5,000,000*	-
TOTAL	**$ 92,250,000**	**$ 100,000,000**

** does not include procurement of land*

Further Investigations

Due to the significant upfront costs associated with the construction of the interim infrastructure, it is recommended that options for dedicated State government funding are investigated to facilitate the initial capital works investments. It is noted that the above report is a result of discussions directly with all servicing authorities and each authority has expressly noted that further modelling and investigations are required to assess future servicing of the Parwan precincts.

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Disclaimer

The information contained within this report has been obtained from various servicing Authorities either verbally or in writing however, until such time as formal applications made and the applicable written conditions, statutory permits and all relevant approvals obtained it should only be used as a guide. Any party wishing to use the material contained within this report should make their own inquiries to satisfy themselves to the accuracy of the information.

ANNEXURE 1 – Western Water Sewer Servicing Strategy

ANNEXURE 2 - Western Water Potable Water Servicing Strategy

ANNEXURE 3 – APA Group Gas Pipeline - Information Package

ANNEXURE 4 – NBN Servicing Advice

ANNEXURE 5 – Reeds Utility Servicing Plans

ANNEXURE 6 – Meeting Minutes with Service Authorities

ANNEXURE 7 – Geelong-Bacchus Marsh Rd Typical Cross Section