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Engineering Servicing Report

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Longwarry Precinct Structure Plan

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1 Introduction

The purpose of this report is to further identify key infrastructure readiness, challenges, and potential funding arrangements to cater for Longwarry’s anticipated future growth.

Previous work has been undertaken to identify key future infrastructure requirements for the future growth of the Longwarry township. A summary of previous work undertaken, and investigation areas is shown in Appendix A.

Longwarry’s anticipated residential growth is estimated to be approximately 816 Lots over the next twenty years to 2041. This equates to approximately 40 lots per annum and does not include existing sites or projects already under development.

The map below shows the Longwarry township and surrounding area. Area D (approx. 94 Hectares) was nominated as the preferred expansion option to accommodate growth as identified in the Longwarry Structure Plan. The report will focus on what planning has been done to supply infrastructure to area D.

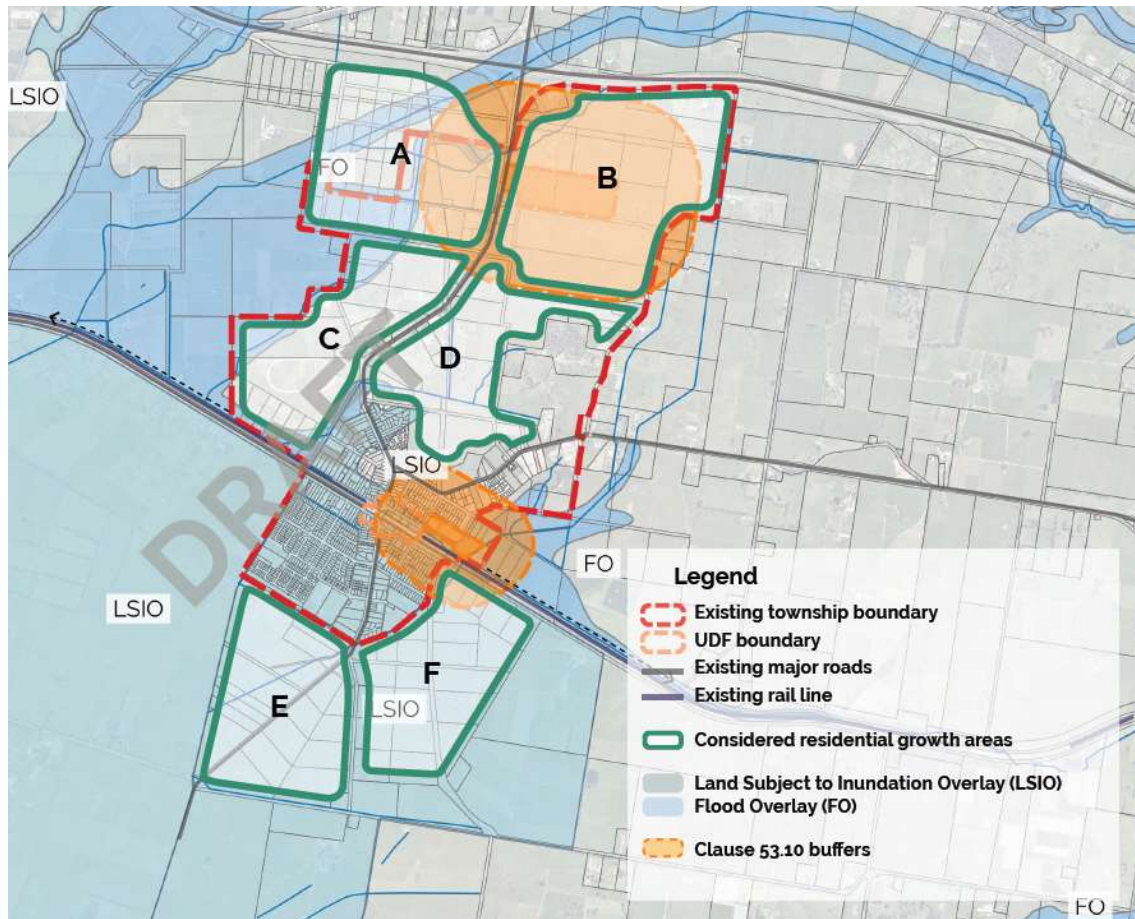


Figure 1 Longwarry Township and surrounds

The work undertaken was primarily focused on 3 key Service Authorities to better understand what infrastructure plans they may have in relation to the future residential growth in Longwarry.

The 3 Service Authorities contacted were;

- South East Water (Water and Sewer infrastructure)
- APA Group (Gas Infrastructure)
- Ausnet Services (Power Infrastructure)

Stormwater drainage or more specifically potential locations for Retarding Basins were also considered as part of this report.

Key outcomes and methodology

The desired key outcomes of this report were as follows.

To supplement previous studies to further define potential future residential infrastructure requirements and limitations for the township of Longwarry including;

- Proposed infrastructure concept plans
- Proposed timing and / or sequencing of infrastructure
- Known funding arrangements if any
- Constraints if any to providing infrastructure

An information request was compiled (refer Appendix B) and submitted via email to the 3 service authorities as noted above. The Service Authorities were followed for receipt of the information, to confirm their understanding of requirements and to check on progress of the information collection.

What new information that was available was provided by the Service Authorities and in some cases, they referred to the information provided in the previous study.

On the following pages are the details of what was provided to identify the infrastructure readiness of Service Authorities for the future growth of Longwarry.

Conclusion

The current study and focus of this report was based on 3 key Service Authorities and their infrastructure readiness for the anticipated residential growth of the Longwarry township.

Overwhelmingly, most of the Service Authorities contacted did not have concept plans for proposed infrastructure in the Longwarry area.

Service Authorities were also not generally able to dedicate time or resources to developing infrastructure plans without appropriately endorsed and refined land areas and details of potential lot layouts or at least conceptual layout plans to focus infrastructure planning and design resources on.

The Service Authorities also said they need considerable lead times to be able to schedule time and resources to developing infrastructure plans that include concept plans, preliminary designs and proposed costing estimates and timing.

The Service Authorities need to dedicate significant time and resources to design infrastructure for urban growth areas. Most of the Service Authorities said they struggle to keep up with demand for residential / commercial and other infrastructure requirements and therefore need carefully detailed and endorsed growth areas to focus their energy (time and resources) in an efficient manner.

What was also evident was that Service Authorities did not have a clear position as to what growth is forecast in Longwarry and what area or areas are the focus areas within Longwarry. Once Baw Baw Shire Council (BBSC) have adopted an area or areas for future growth, via the Longwarry Structure Plan or similar mechanism, it would be extremely beneficial for BBSC to socialise that with the Service Authorities. This may help enable Service Authorities to dedicate resources to ensuring adequate planning can be done in the short to long term to develop infrastructure readiness before demand potentially surpasses supply.

SEW and particularly water infrastructure planning appears to be in a good position with future growth for Longwarry understood at a township level and should area D be adopted as the future growth area reticulation mains could be upgraded within reasonable timeframes provided all SEW approvals are sought in a timely manner.

Sewer infrastructure will require extensive design, planning and project management to enable Sewer infrastructure to be designed and constructed prior to future growth / customer demand for servicing of future lots within area D. Stakeholders outside of SEW may not be aware of the long lead times generally required to design and construct Sewer infrastructure particularly in areas such as Longwarry.

Ausnet Services while they don't have a future infrastructure plan developed at this point in time, they continue to meet current demand as best they can and have adopted additional strategies such as implementing battery storages to continue to meet demand.

APA Group were not in a position to provide information due to current workloads. They did say that the current Gas supply is nearing capacity and significant planning would be required to cater for the future growth of Longwarry.

Although some Service Authorities were not in a position to provide detailed information with respect to future infrastructure, particularly for Area D they continue to meet current demand within Longwarry, even though dedicated growth areas have not been identified.

Essentially it is our view that should BBSC adopt Area D as the future growth area and communicate that with the Service Authorities at the earliest possible time, that Service Authorities should be able to keep up with the current and proposed growth of Longwarry. This would give Service Authorities certainty and enable them to dedicate time and resources to planning infrastructure for such growth.

2 Service Authorities

2.1 APA Group (Gas)

APA Group (APA) is the responsible authority for providing gas to the Longwarry township area. APA is experiencing high workloads at present and did not have any definitive future infrastructure plans nor were they in a position to provide any.

The current reticulation supply in Longwarry is nearing capacity with the current supply being to the south of the township. Significant augmentation of the supply mains would be required to provide enough capacity for the investigation area D.

For these works to be completed the works would need to be staged as development progresses. Areas south of the railway line could receive supply from the existing main to the south however areas to the north including area D would require a new supply main to be laid through the town to reach them.

Furthermore, the current gas supply from the south (City Gate) is close to capacity and would require upgrading to supply this size of development. Works on the City Gate would be required early as the investigation area becomes developed.

Subject to further investigation and density requirements it may be reasonable to build a new supply source to the north off the Longford to Dandenong pipeline to supply areas to the north of the railway line including area D. This would avoid duplicating the existing supply mains and upgrading existing regulators which otherwise would need to be upgraded early in the scheme of works.

In order to supply gas from the north it would require a approximately 1.3km gas trunk main to be constructed along Sand Rd Longwarry from just south of the Princes Hwy down to Area D. Smaller reticulation mains would then need to be constructed to service individual parcels of land and lots depending on final lot layouts of residential subdivisions.

Refer to figure 2 over the page which shows a potential Gas supply main alignment from the Longford to Dandenong pipeline to the north of Longwarry.

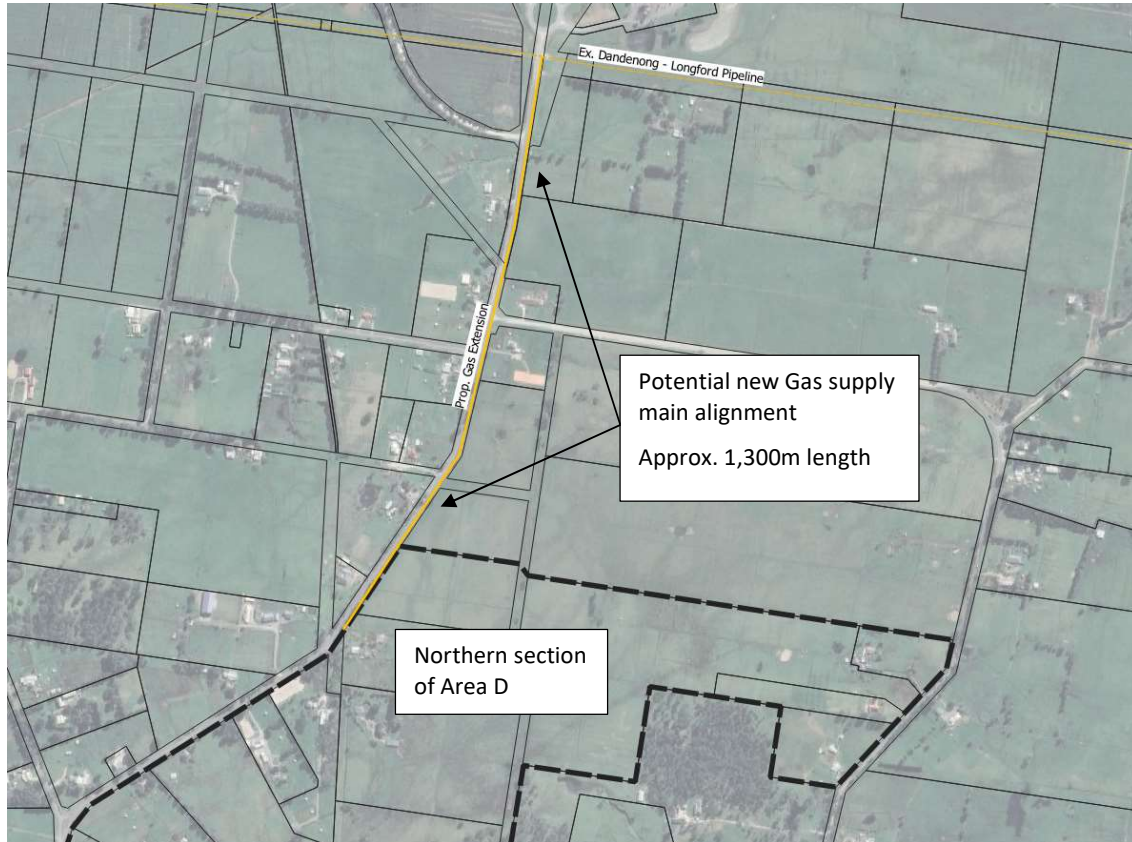


Figure 2 Potential Gas supply main alignment from the Longford to Dandenong pipeline

2.2 South East Water (Water & Sewer)

South East Water (SEW) is the responsible authority for sewer and water within Longwarry township area. The existing sewer and water network is part of the Railway Town network linking Nar Nar Goon, Tynong, Bunyip, and Longwarry.

2.2.1 South East Water (Water)

South East Water (SEW) has recently completed some master planning for the Railway Towns and assessed the required augmentations to the network to accommodate for growth within the Longwarry township.

Future growth in Longwarry will require and upgrade to the existing trunk main supply along Nar Nar Goon – Longwarry Rd just west of the Longwarry township. This will require replacing approximately 2.68 kilometres of the existing DN250 asbestos cement main with a new 375mm PVC main. Proposed timing for the upgrade of the Trunk main is scheduled for 2027-2028. The trunk main would be funded by SEW.

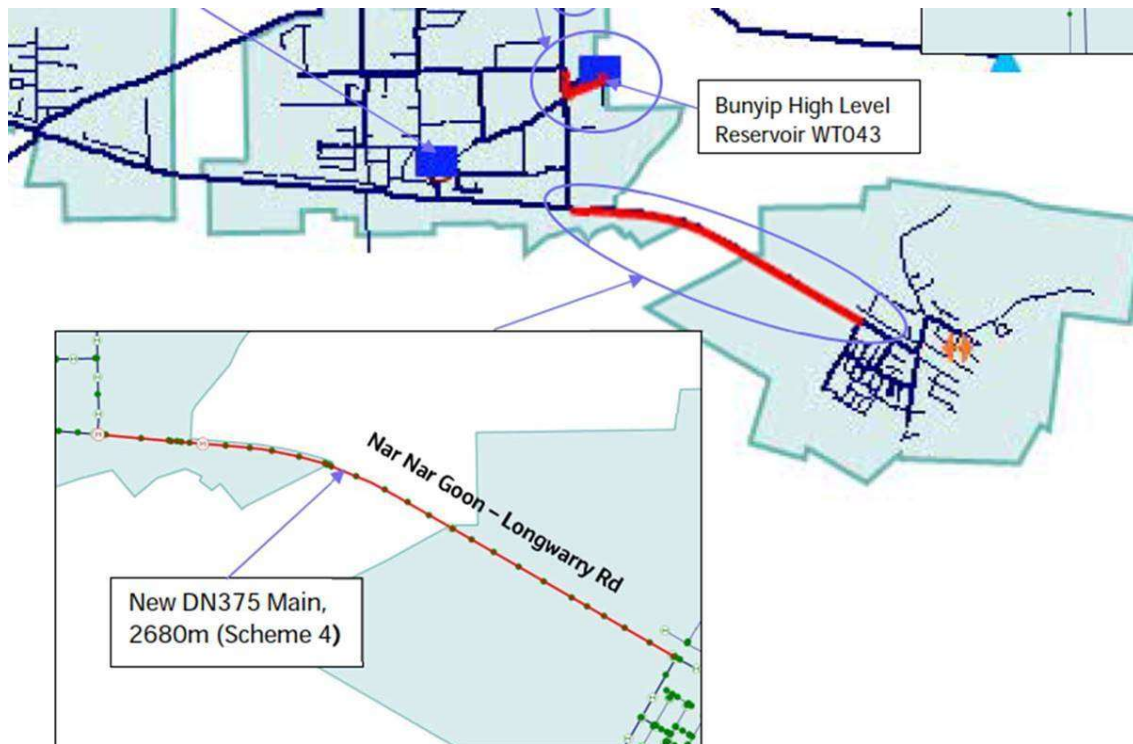


Figure 3 SEW proposed Longwarry trunk main upgrade location

Some reticulation mains within the existing township would also need to be upgraded to supply water to Area D for future growth.

The responsibility for building reticulation mains to service developments and subdivisions in general, would normally fall under the responsibility of the developer wanting to develop land within nominated areas. Normally, reticulation mains 225mm and greater are reimbursed by SEW. Reticulation mains built under 225mm are usually funded by the developer and gifted to SEW.

Figure 4 below shows the existing reticulation mains in blue and where they currently run to service properties with the northern section of the Longwarry township. A larger map is also shown at is shown in Appendix C.

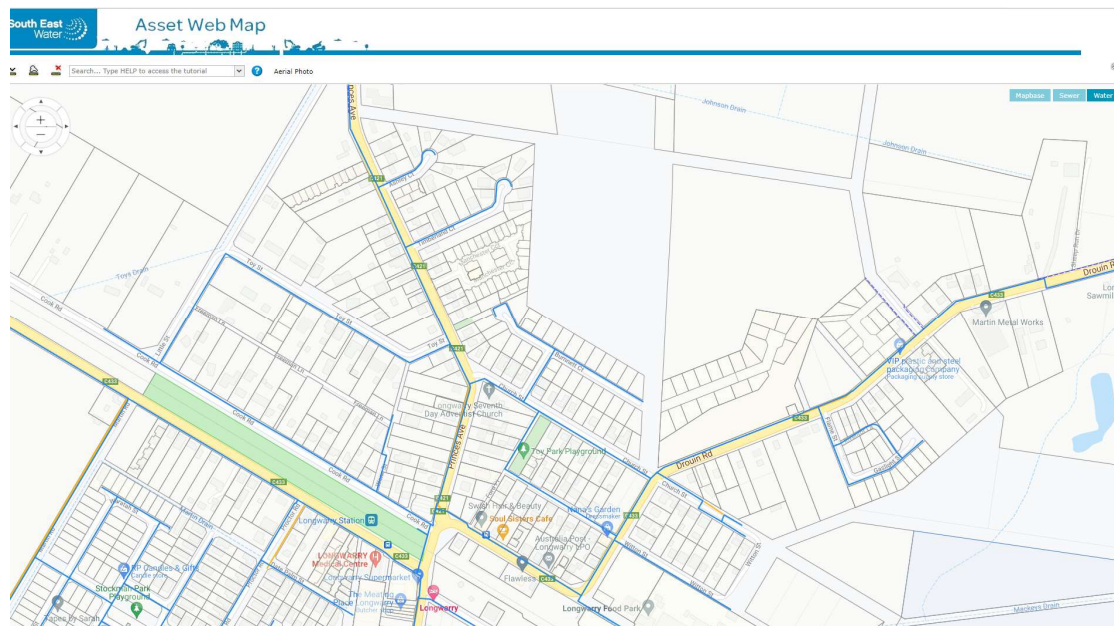


Figure 4 Existing Longwarry water reticulation mains – north of the town centre / railway line

Although detailed concept plans were not available, it is more than likely, based on the advice from SEW that a 225mm water main would be needed to supply Area D.

Currently a 225mm main makes its way from the trunk main through the township up the corner of Church St and Princes Ave. This would then require an additional section of main to be constructed to service area D. To the edge of area D would require approx. 340m of 225mm PVC main and 610m of 225mm main to extend to the middle of area D. Other smaller reticulation mains would be required to service area D depending on the lot layouts of the individual developments.

Please note, although SEW advised a 225mm main would be required to service area D they did not provide actual routes. We have provided a potential route shown in figure 5 over the page. These have not been endorsed by SEW.

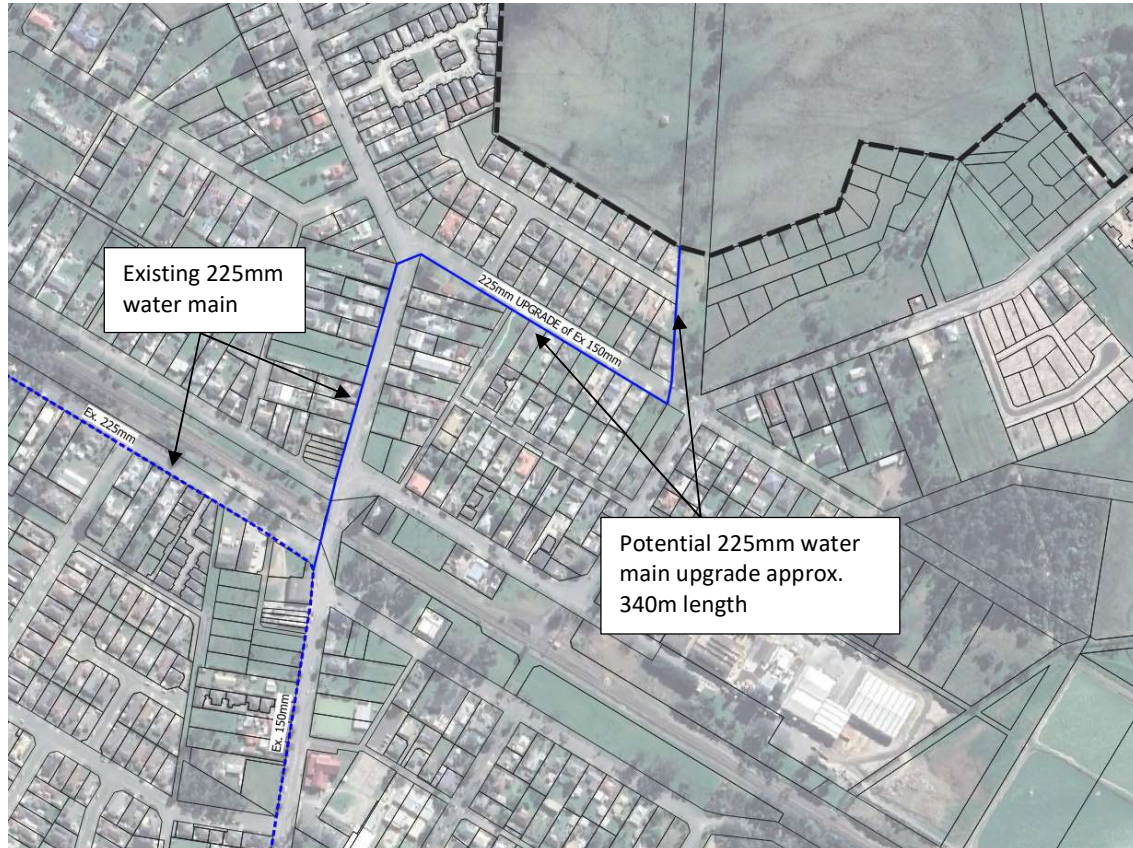


Figure 5 Potential upgrade and / or location of 225mm main to service area D

Conclusion

In summary, as far as future water supply infrastructure for the growth of Longwarry, SEW has made some progress as far as developing a master plan for Longwarry. To cater for future growth a trunk main upgrade is scheduled for 2027-2028.

Future growth area (area D) reticulation mains could be upgraded by SEW approved contractors within reasonable timeframes to service future demand / growth provided all SEW designs and related approvals are sought in a timely manner and appropriately funded to construct them.

2.2.2 South East Water (Sewer)

South East Water (SEW) has advised that existing smaller reticulation sewers close to area D have some limited capacity to service some of the lots in area D in the short term. However, the bulk of the area will need to be serviced via the existing 525mm Vic. Clay (Terra Cotta) gravity sewer which is approximately 800m away to the south of the railway line near Longwarry Train Station.

A map of the existing Longwarry sewer network reticulation mains highlighted as red lines is shown below. A larger map is also shown as is shown in Appendix D.

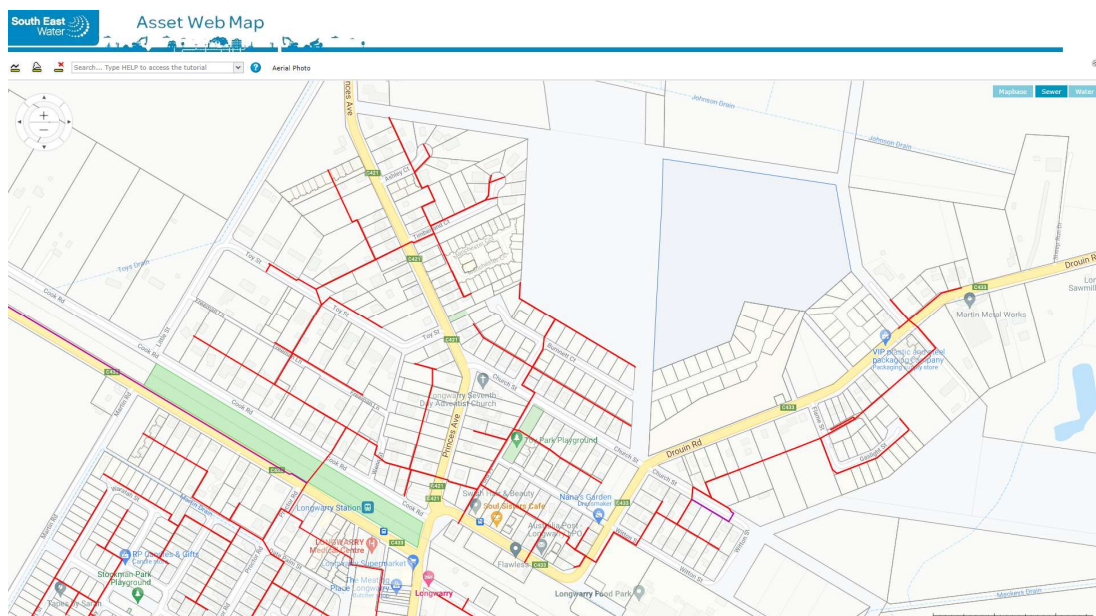


Figure 6 Existing Longwarry sewer reticulation line mains – north of the town centre / railway line

The existing 525mm gravity sewer has capacity for the proposed 816 lots. However, the 525mm Sewer is approximately 800m southwest from the southern end of area D and will require new infrastructure to be built to access it.

Future growth within Longwarry and surrounds will require upgrades to existing Sewer infrastructure and new infrastructure would need to be constructed to service the majority of area D.

Some of the upgrades that will be required to the existing Longwarry Sewer network are;

- Collet St pumping station pump capacity upgrade, and
- Potential rising main and detention storage upgrades.

These upgrades will be funded by SEW.

With respect to Sewer network requirements to locally service area D they will require the following design considerations;

- final surface levels and subdivisional lot layouts determined for area D, and
- potential other development(s) for areas A-F.

Once this information is provided to SEW, they can develop a future infrastructure plan for sewer to service area D as well as potentially other areas.

Some of the potential infrastructure required to service area D may include;

- Smaller reticulation sewer infrastructure to transport sewer to pump station(s),
- Pump station(s) to be used as detention storage and for pumping to gravity mains, and
- Minimum of approximately 800m of Rising main constructed up to a pump station at the southern section of area D to transfer sewer to 525mm gravity main. Should a Pump Station be located in the middle of area D rather than the southern section then a further 500m of rising main would need to be constructed.

Although not endorsed by SEW a potential route for Sewer rising main to transfer product from area D to the existing 525mm gravity is shown over the page.

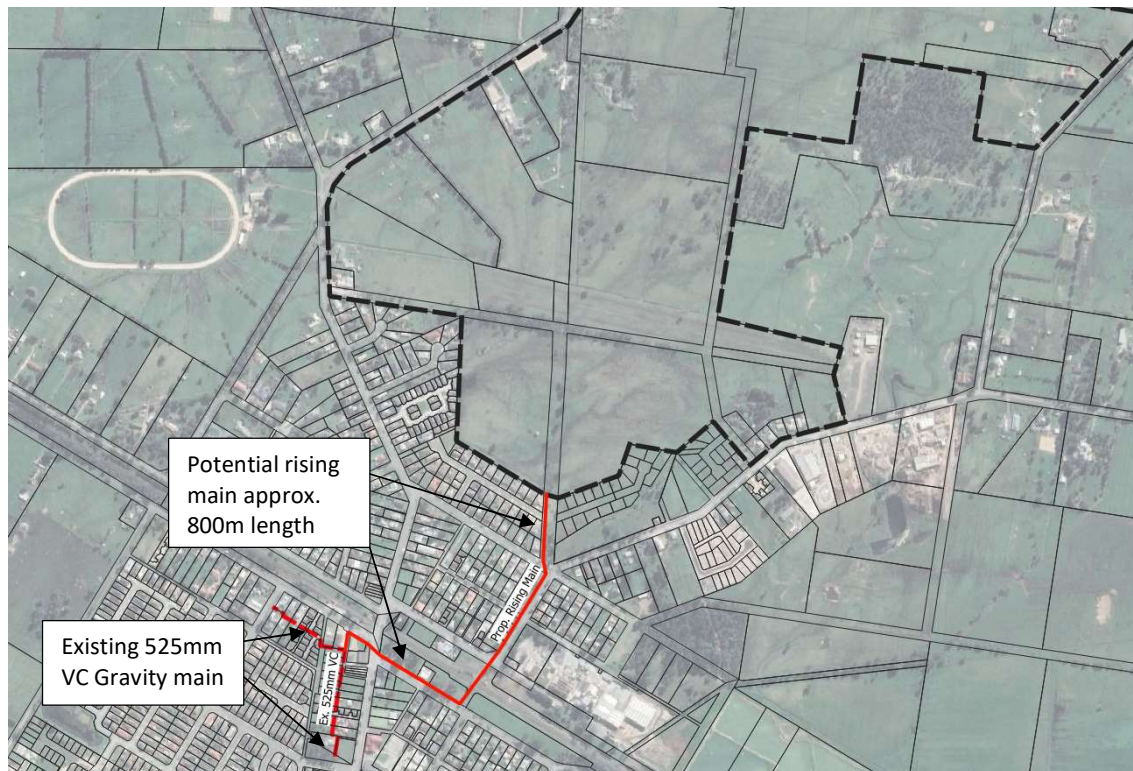


Figure 7 Approximate route for sewer rising main

Sewer infrastructure for area D described above would more than likely be funded by the developments within area D. If the pump station inlet is smaller than 300mm it is funded by the developer(s). If the pump station inlet is 300mm or larger it is funded by SEW.

Conclusion

While SEW did not have detailed plans for future Sewer infrastructure they did provide some limited information of a general nature. There is some limited capacity to service lots with sewer in area D currently. Potential future developments will need to be carefully sequenced to allow enough time for SEW to adequately design and construct Sewer infrastructure and have it operational prior to the development of individual parcels of land to service area D.

Sewer Infrastructure requirements to service area D will potentially include some or all of the following.

Trunk main / headworks requirements potentially funded by SEW;

- Collet St pumping station pump capacity upgrade, and
- Potential rising main and detention storage upgrades.

Smaller localised sewer infrastructure to supply area D potentially funded by developer(s) and depending on size requirements.

- Smaller reticulation sewer infrastructure to transport sewer to pump station(s) via rising mains,
- Pump station(s) to be used as detention storage and for pumping to gravity mains.

2.3 Ausnet Services (Power)

Ausnet services is the responsible authority for the supply of electricity within Longwarry.

Ausnet’s position as far future infrastructure planning and requirements has not changed since their reply in April 2021 for the previous study. We have therefore included the previous information provided in the prior report to highlight their current challenges.

The Longwarry area is supplied by 2 High Voltage feeders from Warragul. At present Ausnet Services has capacity issues with these lines during summer periods due to the organic load growth in the area. Ausnet Services has taken steps to mitigate this issue by installing a 5MW battery within Warragul to support summer peak loads.

Should further significant development take place, substantial system augmentations and extensive investments such as a new feeder from Warragul will be required to support such development. This would not be completely borne by developers; however funding of electrical infrastructure is extremely complex and governed by legislation. Ausnet will generally look at projects on a case-by-case basis, determine what works need to be done and what other benefit there may to future upstream customers. Depending on these assessments the developer may be eligible for various high voltage and other types of rebates.

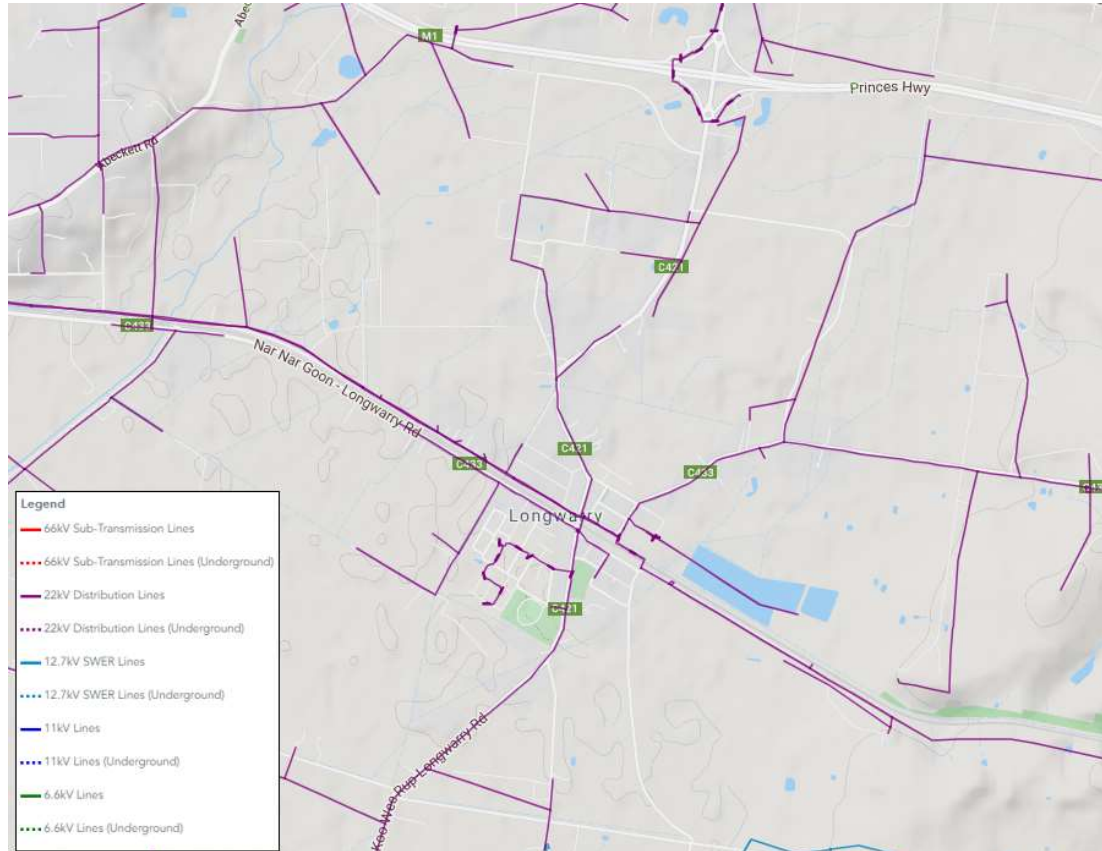


Figure 8 Ausnet Distribution Network

2.4 Stormwater Drainage

Previous work undertaken in 2010 by Water Technology as part of the Baw Baw Shire Council (BBSC) Longwarry Drainage Strategy identified a Retarding Basin (RB) for the southern portion of area D shown below as catchment 1. While no further work has been undertaken within area D we have estimated potential locations and approximate sizes for the remaining catchments 2 & 3 in the northern section of area D.

Refer to the diagram below showing the previous 2010 Longwarry Drainage Strategy study area (catchment 1) in southern section and the residual catchments 2 & 3 remaining in the northern section.

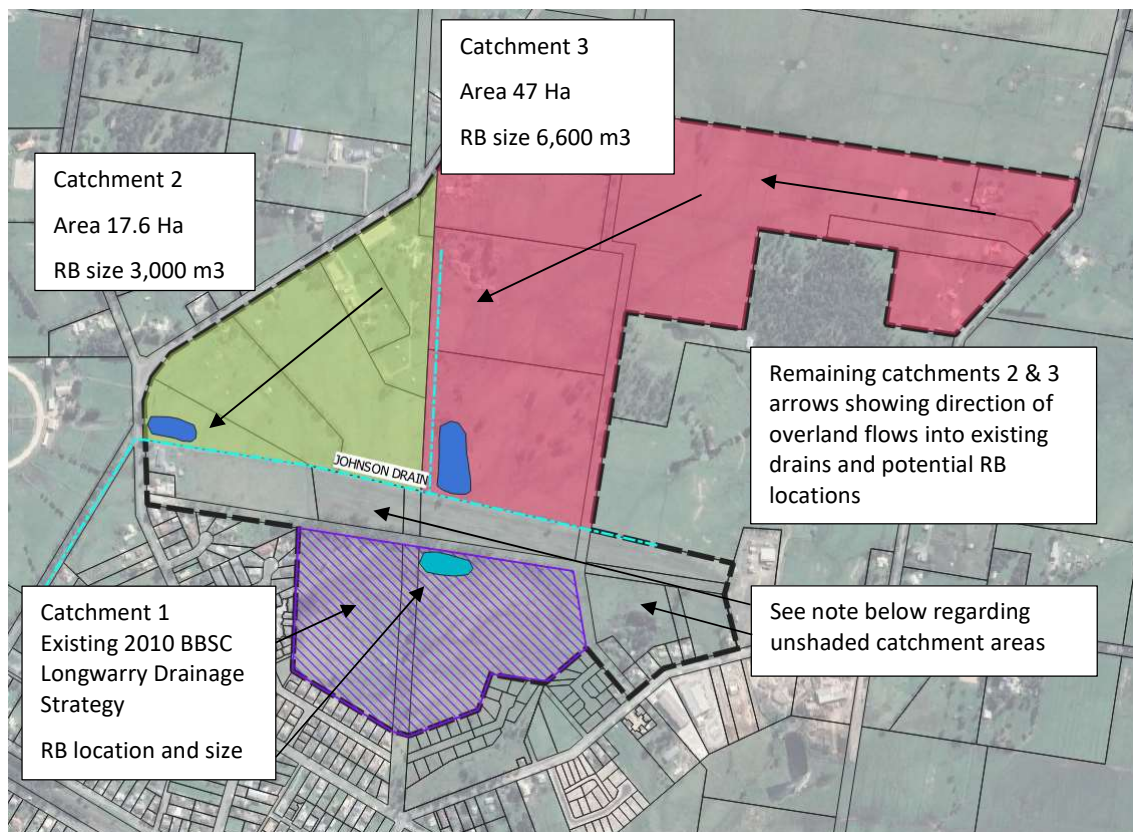


Figure 9 - Area D potential location and approx. sizing of Retarding Basins

Note: The unshaded catchment areas above sit on the wrong side of the existing drain to be picked by the large Retarding Basins within catchments 2 & 3. These smaller areas and

potentially smaller Retarding Basins could be considered as part of future developments or a revised stormwater strategy to re-assess catchment 1 along with the proposed area D Longwarry Precinct Structure Plan.

Shown below is the hydraulic modelling and the stormwater management model (EPA-SWMM) by Water Technology for the Baw Baw Shire Council – Longwarry Drainage Strategy completed in 2010. The model below in figure 10 shows catchment 1 in the top section of the diagram. These models are designed to help ensure that development flows at the outlets to these developments are reduced to below existing conditions. Essentially helping to reduce the potential for flooding when developments naturally reduce the ability of water to disperse naturally within the previous land, paddocks and low-lying areas.

Catchment 1 has an area of 14.4 Hectares. The proposed Retarding Basin size is 3,000m³.



Figure 10 – Longwarry – Hydraulic Modelling – Stormwater Management Model

Catchment 2 has an area of 17.6 Hectares, the land falls from the north east to the south west generally and the approximate retarding basin size estimated for this catchment is 3,000 m³.

Catchment 3 has an area of 47 Hectares, the land falls from the east to the west towards the existing drain and the approximate retarding basin size estimated for this catchment is 6,600 m³.

As far as funding requirements, construction of Retarding Basins for catchments over 60 Hectares are generally funded or reimbursed by Melbourne Water and they take responsibility of the asset after construction and maintenance periods have been completed. Construction of Retarding Basins under 60 Hectares, as is the case with the Retarding Basins described in this report, are normally funded by developers, and gifted to the responsible Authority, in this case Baw Baw Shire Council. In both these cases after construction and maintenance periods the assets are gifted to the responsible Authority for ongoing responsibility and maintenance.

Further investigation is required to validate the assumptions made for the size and location of the Retarding Basins for catchments 2 & 3 and the residual unshaded catchment areas. There has not been any stormwater modelling completed to verify the assumptions made above.

3 General

The information in this report has been obtained as a result of existing known processes and where possible, informal discussions with officers from the three relevant Service Authorities as mentioned previously. The information may differ at some future date when development conditions are officially requested. Taylor Miller Pty Ltd cannot accept any responsibility if any authority changes its requirements after the date of this report.

No responsibility or liability for any statements, opinions, information, or matters (expressed or implied) arising out of, contained in, or derived from or for any omissions from the report is accepted by Taylor Miller Pty Ltd or any of its employees, agents, or consultants.

Appendices

A. Previous work undertaken – Summary

The Longwarry Precinct Structure Plan will investigate the expansion of the current urban area of the Longwarry township for a range of residential, commercial, and industrial uses. As part of this work, Taylor Miller have been engaged to investigate the engineering serviceability of a range of areas. To assist with this task, areas surrounding the existing township have been grouped into six general investigation areas for growth as shown on the next page.

Zones 1, 2, 5 & 6 are located to the north of Longwarry and are currently zoned 'Farming Zone'. Zones 3 & 4 are located to the south of Longwarry and are currently zoned 'Farming Zone'.

An existing Land Subject to Inundation Overlay (LSIO) covers zone 1, 3 & 4 while a flood overlay encroaches into Zone 1, 2 & 5.

In recent years residential development within the township has occurred primarily to the south west where 100+ new dwellings have been provided during the latter stages of the Stockman Wood Development. Smaller developments have occurred to the north east with scattered infill development occurring throughout the township. Key servicing issues experienced during the progression of these developments have related to;

- Providing free draining drainage outfalls to developments,
- Minimising the loss of flood storage and providing suitable freeboards to lots, and
- Mitigating any increase to downstream flooding when connecting to existing underground drainage networks.

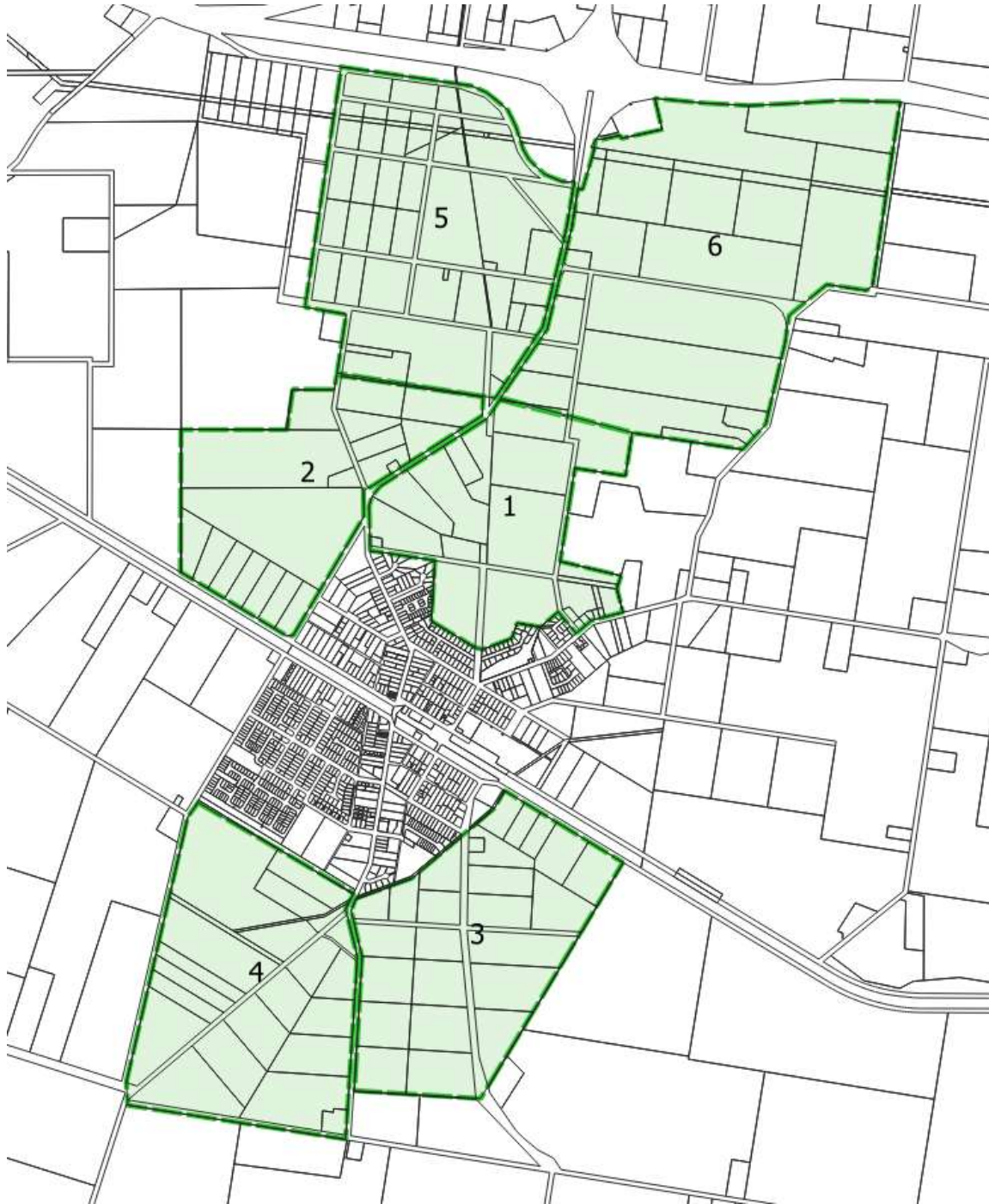


Figure 11 - Longwarry Precinct Structure Plan Investigation Areas

B. Information Request for Service Authorities

4th November 2021

Service Authority

Re: Request for information - Longwarry Structure Plan

Dear Sir / Madam

We have been engaged on behalf of Baw Baw Shire Council and Echelon Planning to assist in the development of the “**Longwarry Structure Plan**”. This study is to collect information from the various service utilities to determine key Infrastructure readiness and challenges etc. for the future growth of Longwarry anticipated to be approximately 816 lots over the next 20 years to 2041. This effectively translates to approximately 40 lots per annum and does not include existing sites already under development or scheduled for development outside of the study area but within the Longwarry township area.

We are seeking information regarding **Area D** to the northeast of the Longwarry township as shown in **Appendix A – Study areas**.

The specific types of information we are seeking to support Longwarry’s anticipated growth are.

- Current or proposed infrastructure concept plans including proposed sizes and locations etc.
- Proposed timing and or sequencing of infrastructure particularly if it relates to overall infrastructure or infrastructure potentially supplying Area D.
- Any identified constraints to providing the required infrastructure.
- Any cost estimates for the required Infrastructure.
- Identification of whether service authorities will fund infrastructure internally or require external funding. Potential funding sources if external.
- Any potential interdependencies for the required infrastructure.

We are happy to collate the information from different sources if need be due to time constraints.

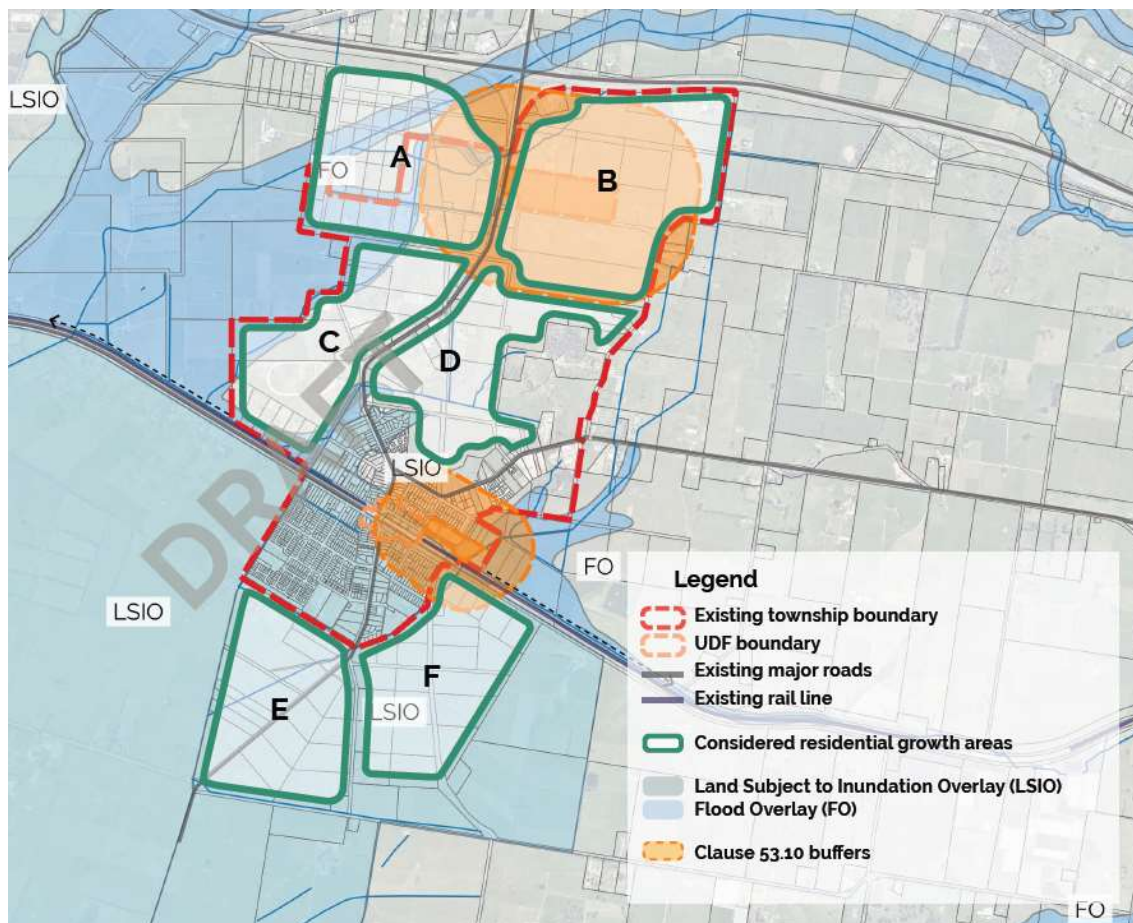
We are looking to get this information within approximately two weeks as we need to prepare and provide a draft report to Baw Baw Shire Council within approx. 3 weeks.

Should you have any questions or require any additional information please do not hesitate to contact me on 0411 677 841 or via email at damien@taylormiller.com.au .

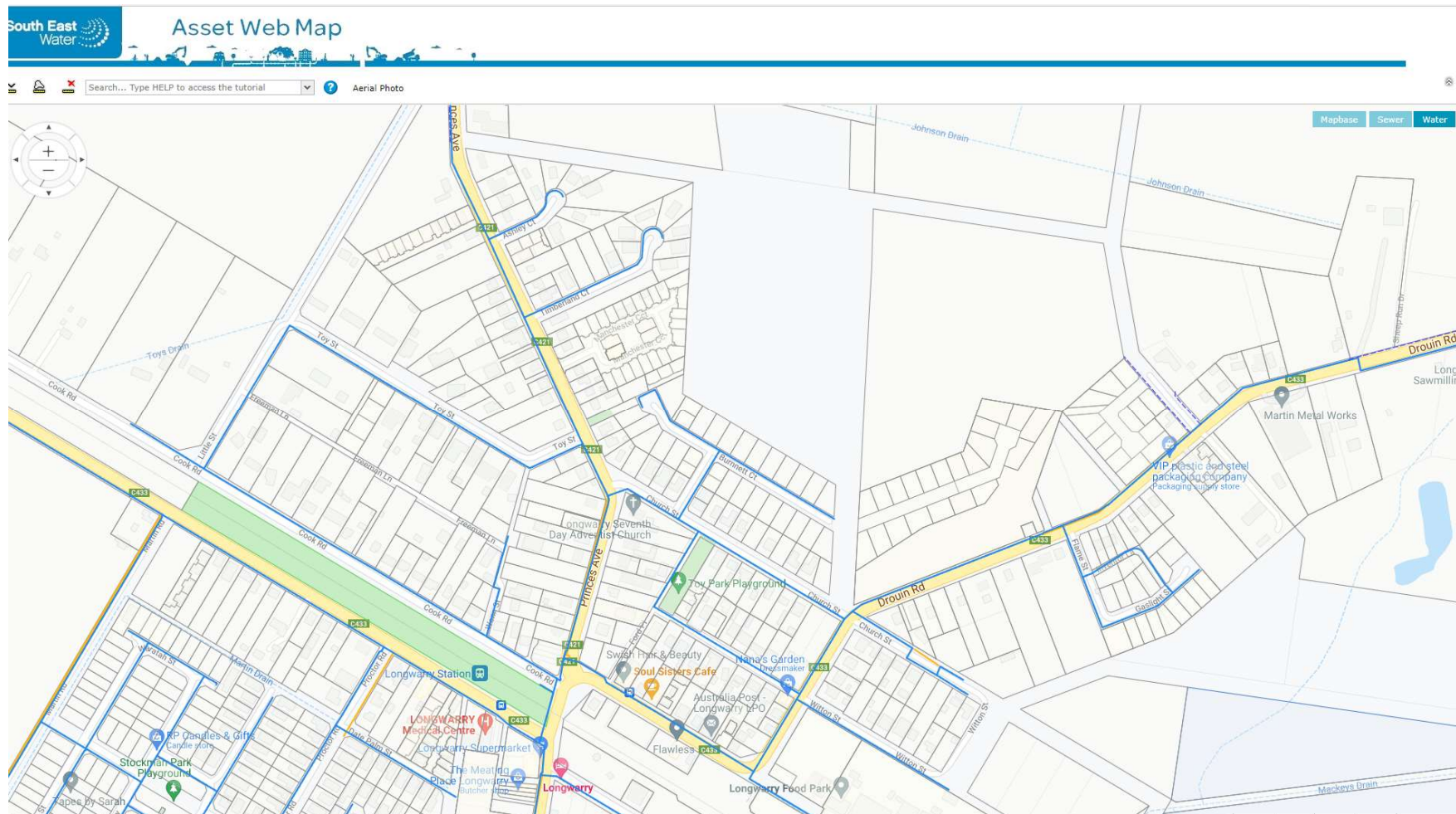
Regards,

Damien Clynes
Project Manager
Taylor Miller Pty Ltd
M: 0411 677 841
E: damien@taylormiller.com.au

Appendix A – Study areas



C. SEW existing water reticulation network (Blue lines)



D. SEW existing Sewer reticulation network (Red lines)

