Talbot Future Sewerage Scheme Business Case

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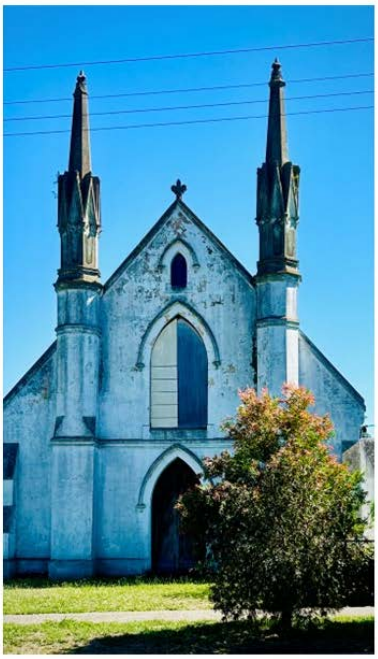


REGIONAL DEVELOPMENT VICTORIA
CENTRAL GOLDFIELDS SHIRE COUNCIL
CENTRAL HIGHLANDS WATER

Talbot Future Sewerage Scheme Business Case

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Executive summary

Background

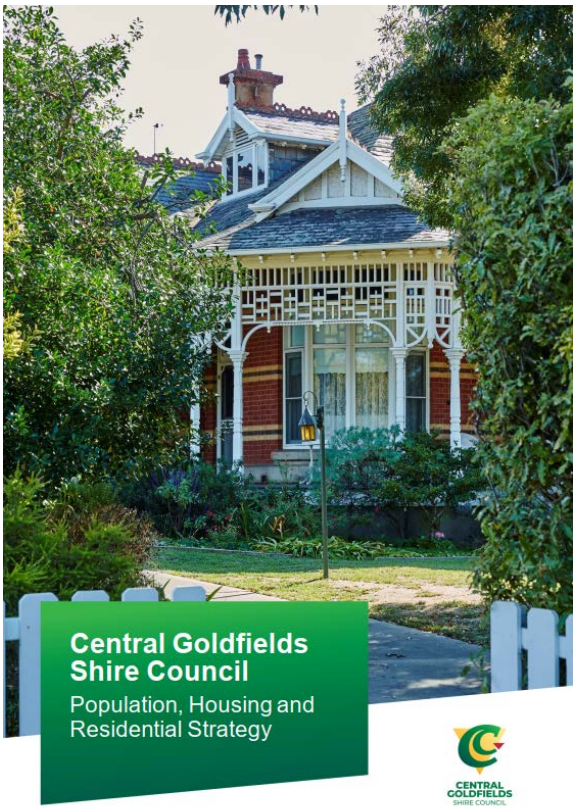
The small township of Talbot is located approximately 15 km south of Maryborough and 50 km from the larger regional city of Ballarat. It is connected to both larger centres by road and rail. Talbot's train station was upgraded around 2013 when the passenger service to Maryborough was reinstated.

The Central Goldfields Population, Housing and Residential Settlement Strategy 2020, (the Strategy) identified constraints on growth in Talbot, primarily due to limited capacity for additional housing development without the provision of a reticulated sewerage system. Land capacity constraints for on-site wastewater management are preventing the development of small township lots, and there are issues in managing existing septic tank systems to prevent adverse environmental outcomes. During peak times, such as the monthly Talbot Farmers Market that attracts a significant number of visitors, septic systems for public facilities are inadequate to meet the demand.

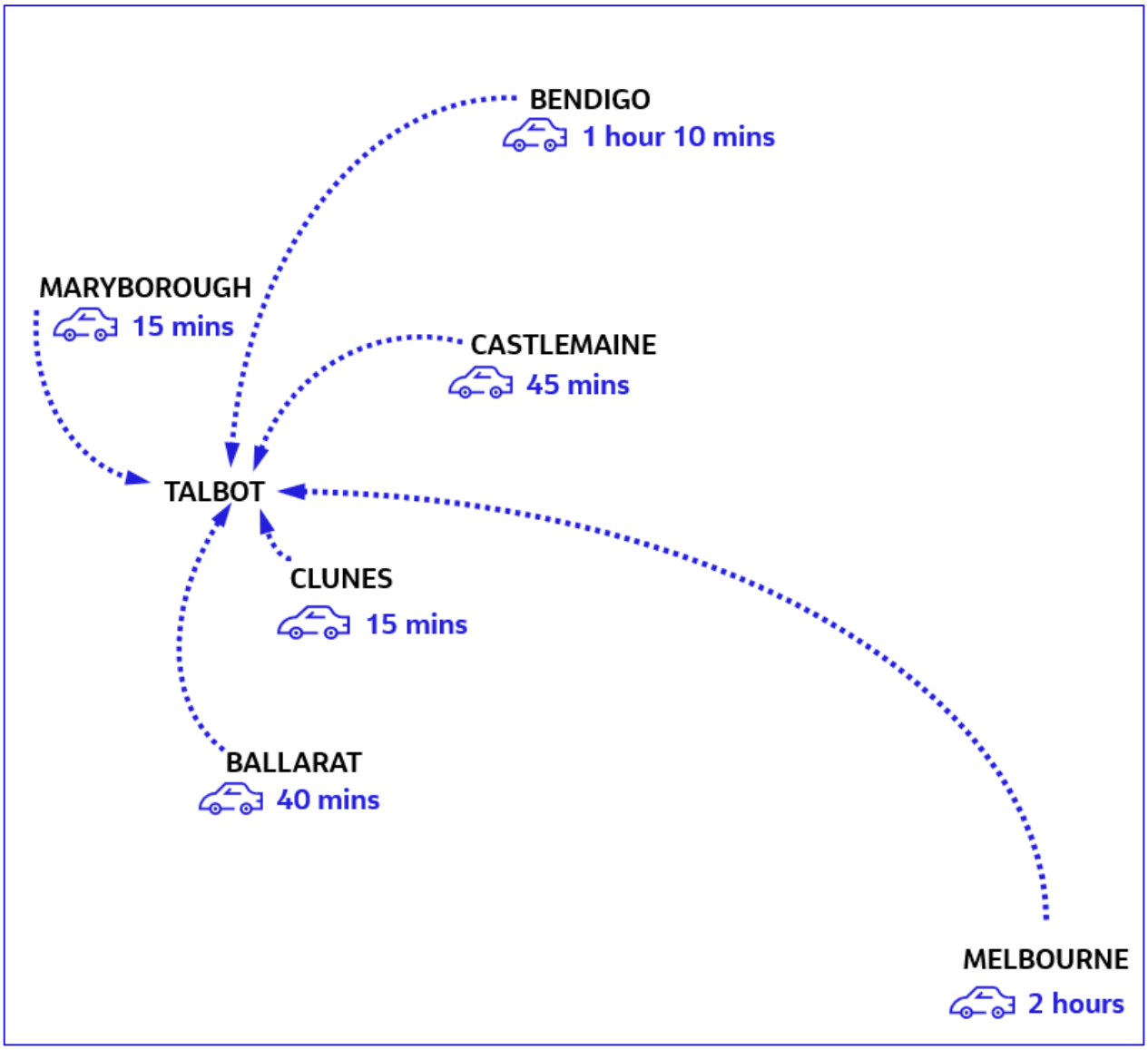
The Strategy notes that within the Central Goldfields Shire, "most of the recent population growth (70% or more) and housing development has been in Maryborough, Carisbrook and their environs". From 2009 to 2019, total dwelling approvals in the Central Goldfields Shire averaged 65 per year. Nearly 70% of these approvals were in Maryborough (the percentage would be significantly higher if it included approvals in Carisbrook and on rural residential lots close to Maryborough/ Carisbrook).'

Constraints on outward growth in Maryborough – largely due to the 'natural growth boundary' of forest surrounds – mean that the Strategy identifies the need to focus largely on infill development in Maryborough, while nearby towns will increasingly play a role in accommodating future growth.

Talbot and Dunolly have a key role in accommodating a proportion of future population growth, with both townships retaining significant heritage charm and lifestyle appeal at a village-sized scale. Dunolly is sewered and has growth capacity but is located slightly further from Maryborough (and Bendigo). Talbot's location has strategic advantages due to its proximity to Maryborough and Ballarat, with passenger train connections to both centres and on to Melbourne. This is illustrated ES 1-1 on the following page.



Talbot's location means that it is well placed to accommodate some of the 'Maryborough satellite' population growth as well as being attractive in its own right. Given the potential for the recent trend in population shift towards regional Victoria to be maintained in the mid- to long-term, townships like Talbot are likely to have increasing appeal for those seeking lifestyle and amenity at a village scale while maintaining connections to larger centres for work and social purposes. A moderate level of growth may also have advantages for existing residents by ensuring that community services (school, kindergarten, recreation and social facilities) remain viable and that a small day-to-day local retail offering will become more viable.



ES 1-1 Strategic location of Talbot

Government responsibility

The Talbot township does not currently have a reticulated sewerage system. Each landowner is responsible for managing and maintaining a septic tank arrangement. The Central Goldfields Shire Council (CGSC) is the responsible authority in management and approvals of individual waste management, such as septic tanks, new building construction and town services, excluding water, electricity, telecommunications and the highway on the Western edge of the town.

Central Highlands Water (CHW) is the regional Water Authority. The township of Talbot is within the service delivery regional boundary CHW. CHW already provides a reticulated potable water system to Talbot residents. Furthermore, CHW operates reticulated sewerage systems in neighbouring community centres of Clunes and Maryborough. If a reticulated sewerage system were to be constructed in Talbot, CHW would become the responsible authority for its construction, operation and service fee collection.

CGSC, in partnership with CHW, have investigated options for a sewerage scheme to service the community of Talbot. The sewerage scheme has been assessed in parallel with an associated structure plan for facilitating and managing township growth. This business case for the sewerage scheme has been developed for consideration by CHW and CGSC and to support further funding applications.

Problem definition

The five key problems underpinning the case for investment are summarised in Figure ES 1.

Without a reticulated sewerage system for the township of Talbot, growth opportunities cannot be realised due to the existing lot sizing within Talbot being too small to meet guidelines for the use of septic and blackwater systems, therefore preventing approval for dwellings and construction. This serves as a bottleneck for growth for the entire CGSC, because the other towns of Maryborough and Carisbrook have their constraints. Ultimately, the lack of population growth deprives the local council of greater resources to reinvest in the liveability of the local area.

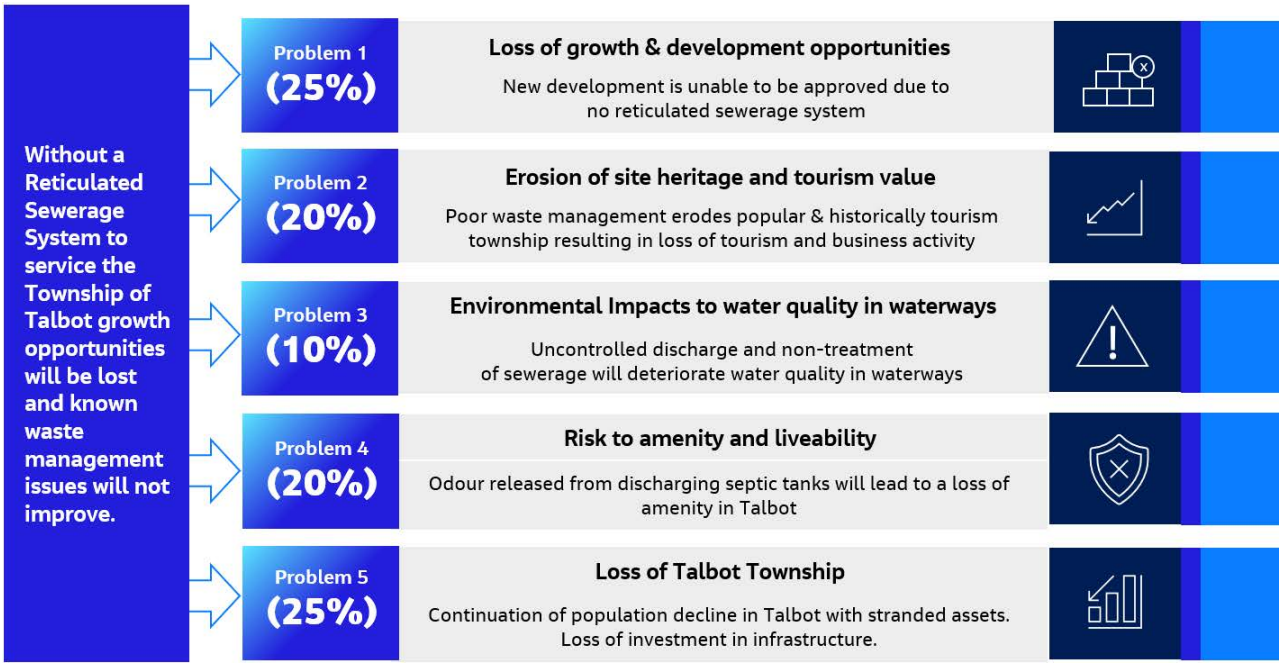


Figure ES 1: Project problems driving the need for investment

Talbot's heritage and tourism economy will also be impacted if residential waste is not appropriately managed. CGSC is aware of known spills of sewage during regionally significant events in Talbot, such as the monthly street market day. Without these activities, the historically and culturally tourist town will not be commercially viable. Ultimately, this will hinder regional investment and prevent CGSC from fulfilling its growth strategy.

Moreover, the discharge of non-treated residential waste may enter local waterways. While this risk has not been documented yet, it is a foreseeable risk that is increasingly likely to eventuate over time as existing septic tanks age and deteriorate. This may result in Environmental Protection Agency (EPA) involvement. The deterioration of private sewerage containment tanks is expected to lead to a rising risk of amenity and liveability impacts on the residents of Talbot.

Without the investment in a reticulated sewerage system within Talbot, there may be a continuation of population decline in Talbot, leading to underutilised state and local assets, as well as an increase in cross-subsidisation with CGSC and CHW to maintain services.

Without a Reticulated Sewerage System to service the Township of Talbot growth opportunities will be lost and known waste management issues will not improve.

Figure ES 2: Talbot Farmer's Market

Options considered

The business case considered two project options for the sewer network and three options for sewage treatment. These options would provide a sewerage system for around 140 existing properties (dwellings, commercial and public facilities) and establish the foundation for further extensions of the system to provide for developer led and funded growth over time:

- Project Sewer Network Option 2: Gravity Sewer**.** This option involves a gravity system that allows for residential waste to flow under gravity to a central sewer pump station for transfer to a Wastewater Treatment Plant (WWTP).
- Project Sewer Network Option 3: Pressure Sewer. This option involves each property having a sewer tank and pump to transfer the residential waste via pipelines to a central sewer pump station for transfer to a WWTP. The pipelines are generally smaller when compared to gravity networks, however, the pump and tank are landowner assets for replacement and operational power use.

It is noted that Option 1 is the Do Nothing base case option for this business case.

Based on an integrated options analysis, **Option 2 was identified as the preferred option for implementation.** It is expected to offer high value for money, be supported by key stakeholders and the community, and present lower risk for the Government.

Three sub-options were assessed for sewage treatment, including utilising existing WWTPs at Clunes or Maryborough and establishing a new local treatment plant at Talbot. The transfer of raw sewage from Talbot to either Maryborough or Clunes was determined to be not feasible for reasons documented in this business case and was not considered further. A local Talbot WWTP was identified as the only practical treatment option.

Transformative societal benefits of the project

The investment need of the project is clear, and the benefits have the potential to be transformative to Talbot and the CGSC. These benefits include catalysing investment and improving amenity.

Catalyse property development, investment and jobs

A new reticulated system has the real potential of catalysing a property development resurgence in Talbot. This projection is supported by SGS Economics and Planning's Talbot Housing and Commercial Technical Assessment (2022). It noted that a new reticulated sewerage system could potentially spur the development of roughly 15 dwellings annually between 2025 and 2051. Figure ES 3 below illustrates the differences in dwelling development between a Do Nothing Base Case (Option 1) and Option 2. The chart shows that by 2059, Talbot could have over 400 more dwellings with the new sewerage system compared to the base case.

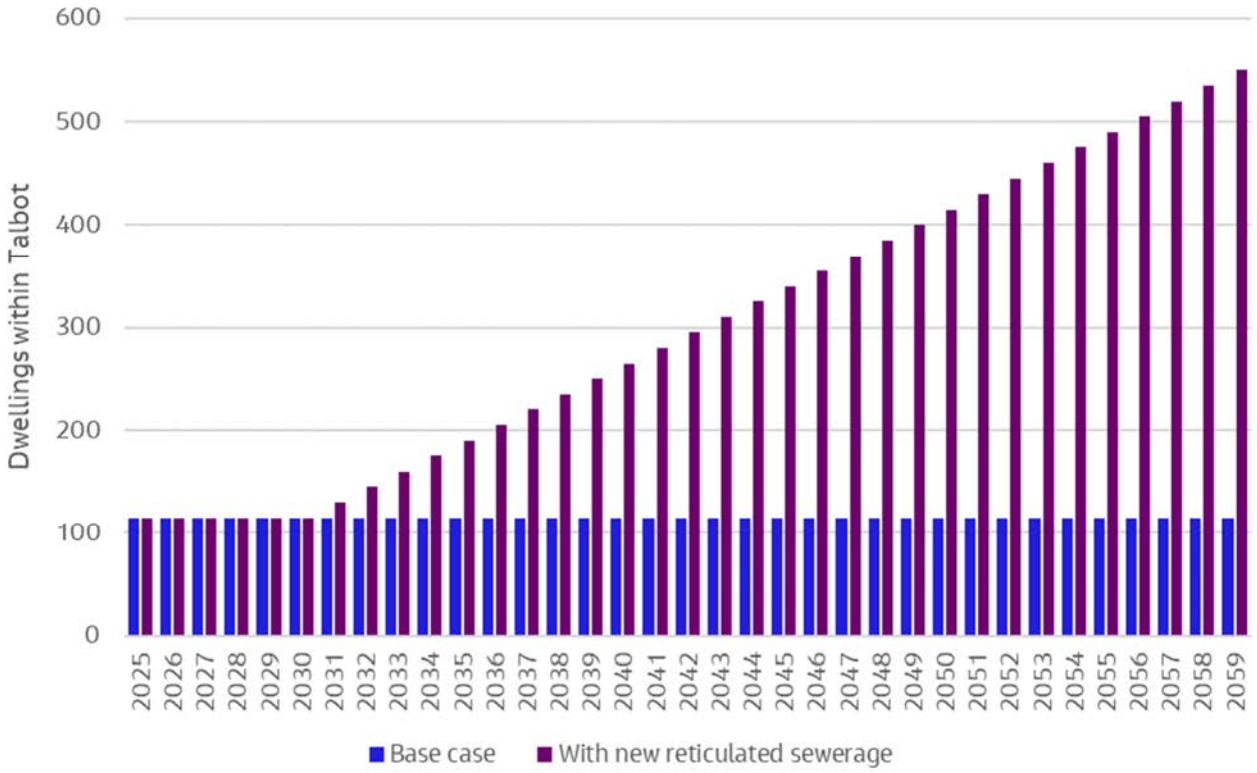


Figure ES 3: Accelerated dwelling development

The projected property development will provide more affordable housing options for Victorians, particularly young families. Estimates within this business case indicate that the project would trigger roughly $320m (2023 real dollars) of property development from 2030 to 2059 (Jacobs analysis, 2023). This will transform Talbot into a thriving Victorian township.

As noted within the SGS Economics report, such population growth would trigger additional investment opportunities into the community to provide goods and services. This includes the real potential of a new supermarket complex (600 – 900 sqm) within the next 20 years. Such a complex could be worth $2m in capital investment and could generate roughly $0.2m per annum in rental income. This, in turn, would provide additional job opportunities for the local community.

It is important to reinforce that this population growth will be more efficiently accommodated within Talbot when compared to the development of a new greenfield township. This is primarily due to the fact that Talbot already has the several enabling community assets. These include a new rail station, a primary school and a community pool. This means that the state government can simply invest in a sewerage system at Talbot to

accommodate regional population, without having to develop a greenfield township, which would also require a new reticulated sewerage system, rail connections, schools and much more.

Enhance amenity and local tourism

Talbot's reliance on septic tanks for sewerage poses an ever-present risk of odour blanketing the town. This undermines Talbot's image as a travel destination, liveability, and ultimately limits its growth potential.

Reticulated sewerage is critical to supporting the growth of the hospitality sector. An Urban Environmental study shows that improving sanitation is the "best investment for promoting tourism" (Elysia and Wihadanto, 2020). The study found that for each percentage increase in the population with access to improved sanitation facilities by 1%, it increases the number of tourist arrivals by 2.9%.

In addition, the Flemish - Department of Environment, Nature and Energy, 2009, found that households were willing to pay $212 per annum to reduce the risk of odour. These liveability enhancements will further support Talbot as a place to accommodate population growth.

Summary economic analysis results

A cost-benefit analysis (CBA) was undertaken to capture the solid economic value of the project**. Figure ES 5** below shows that the project has economic viability as it has a positive Net Present Value (NPV) of $1.1m over a 30 year period of operations.

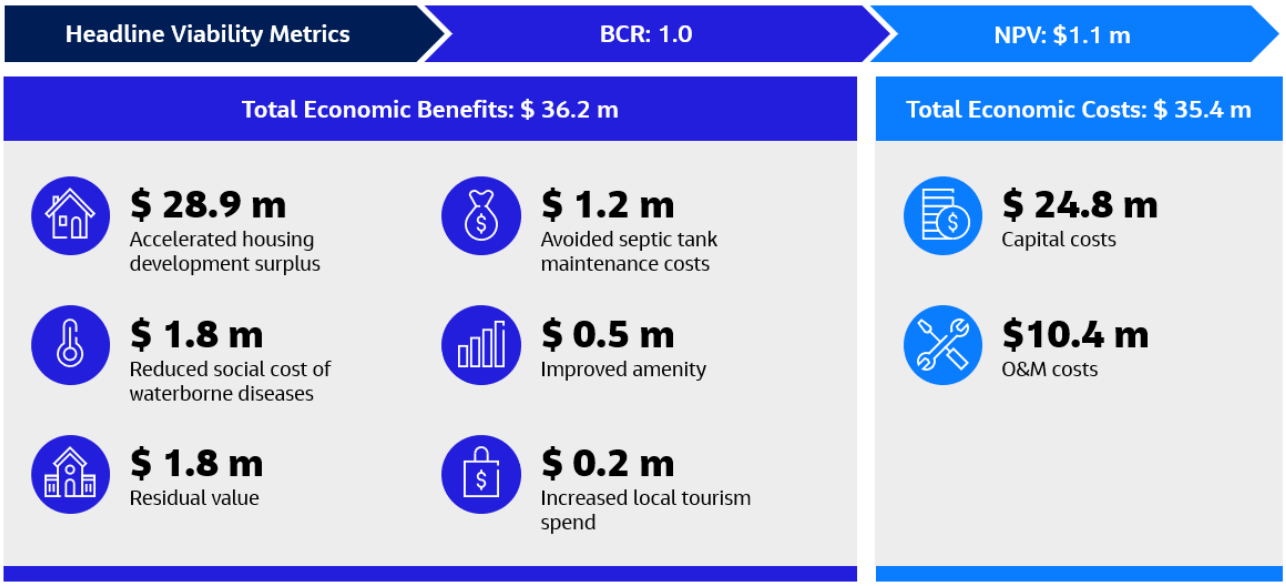


Figure ES 5 Summary CBA Results (P50 discounted costs and benefits using a 7% Discount rate, 30 years of operations)

It is noted:

- The CBA does not directly include the expected CHW sewerage tariff fee as these count as revenue for Central Highlands Water. The operational and maintenance (O&M) costs represent the economic cost to society of the new sewerage system.
- Capital costs include decommissioning of septic tanks.

Moreover, the CBA results shows that the majority of benefits stem from accelerated housing development. This benefit relates to the gross margin earned by property developers for building dwellings. Other sizeable economic benefits of the project relate to increased tourism spending, reduced social costs of waterborne diseases, improved amenity and avoided replacement and maintenance costs of the current septic tank system. This demonstrates that the project will deliver on its objectives, provide benefits to a broad cross-section of the community and is a positive use of state funds.

It is important to consider that a Benefit to Cost Ratio (BCR) around 1 for a sewerage/water infrastructure project servicing a regional township like Talbot is a strong indication of the project's worthiness. This is because it is typically difficult to generate enough benefits among a relatively smaller population base to outweigh the relatively large upfront capital costs.

Additionally, the existing residential costs for connection from the dwelling to the gravity sewer at the property boundary are included in the capital costs in the CBA. This is an estimated $1,050,000 additional costs for landowners to access the reticulated sewer system. The cost for new connections for future dwellings is part of future dwelling development costs and are not in the cost benefit analysis.

Table ES 1 below outlines likely costs to be faced by Talbot residents. The sewer tariff charges are financial costs faced by Talbot residents. These financial costs are included in the financial analysis but not the cost benefit analysis. This is because the tariff charges are transfers between customers and CHW.

Table ES 1: Resident Cost Summary

Resident Cost	Cost ($2024)
Sewer Connection Costs for Future Dwellings (140 existing dwellings included in Capital Costs)	$7,500 per connection
CHW Sewer Tariff Fee without Pension Discount (Included in Revenue Analysis)	$757.52 per connection per year
Septic Tank Decommissioning (Not included in Capital Costs)	$10,000 per septic tank
Replacement Septic Tank (Included in Benefit Analysis)	$25,000 per new tank

Funding request

This business case requests a capital investment of $36.1 million from the state government to deliver the project. The funding would provide for the establishment of a sewerage system in Talbot for approximately 140 properties (including dwellings, commercial and public facilities) with capacity to be expanded to cater for future growth. The funding does include the costs for existing individual property owners to connect to the sewerage system at the initial stage and decommissioning their septic tanks. Property owners will need to fund connection at later stages and or system extensions. The funding request is based on the P90 project capital cost shown in Table ES 2.

Table ES2: Summary Cost Estimate

Cost P-Level	Total Nominal Cost
Base Estimated Cost	$ 27.1 m
With Contingency P50	$ 31.6 m
With Contingency P90	$ 36.1 m

Identified growth zones within the Talbot reticulated gravity sewer system service area are to be undertaken at a developer's expense when development occurs. These sewer extensions have been considered in the scheme, and the initial stage system can accommodate these new developments. The estimated developer

costs are approximately $1,320,516, excluding house branch connections, which are separate development costs as part of land development for residential building.

Next steps

This project needs to communicate the business case to key stakeholder groups and potential funding agencies. Key actions to be undertaken in preparation for funding approval and project commencement include:

- **Targeted stakeholder engagement:** Confirming Talbot residents' interest and capacity to pay for capital connection costs and service fees.
- **Approvals and land purchase:** Assessing potential land for the Talbot WWTP and securing a potential option or purchase of the land.

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Acronyms and abbreviations

BCR	Benefit Cost Ratio
CBA	Cost Benefit Analysis
CGSC	Central Goldfields Shire Council
CHW	Central Highlands Water
CHMP	Cultural Heritage Management Plan
EPA	Environmental Protection Agency
NPV	Net Present Value
RDV	Regional Development Victoria

Limitations

This business case features the preferred options for the Talbot reticulated sewerage system. The report documents site specific options assessments and impact assessments and uses information available at the time of preparing this report.

The report focuses on project requirements, informed by input from CHW, CGSC, advice from other specialists and reports and documents previously submitted to CHW and CGSC.

The work to date has largely been based on desktop information. Key information regarding Talbot community survey and confirmation of project interest has not been undertaken at the time of this report. The output and scope may need to be amended as more factual information becomes available on the Talbot community interest in the proposed sewerage scheme.

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1. Introduction

1.1 Overview

Talbot is located in the southern part of Central Goldfields Shire Council local government area (LGA) in regional Victoria (Figure 1-1). The town has a pleasant town centre that reflects a rich heritage from the gold rush era and is in close proximity to the key regional towns of Maryborough (15 minute drive) and Ballarat (40 minute drive). The town is serviced by public transport, hosts a primary school and has a public pool enjoyed by its population of 271 residents (SGS Economics and Planning, 2022). Noting that some of the 271 population is in the area surrounding the Talbot township.

Despite this, the town's population growth has stalled. Although it offers opportunities to help meet future housing demand within the LGA, realising this opportunity is constrained by lack of sewerage infrastructure. With the proposed introduction of a sewerage system to Talbot, the potential for more significant growth and development will be unlocked.

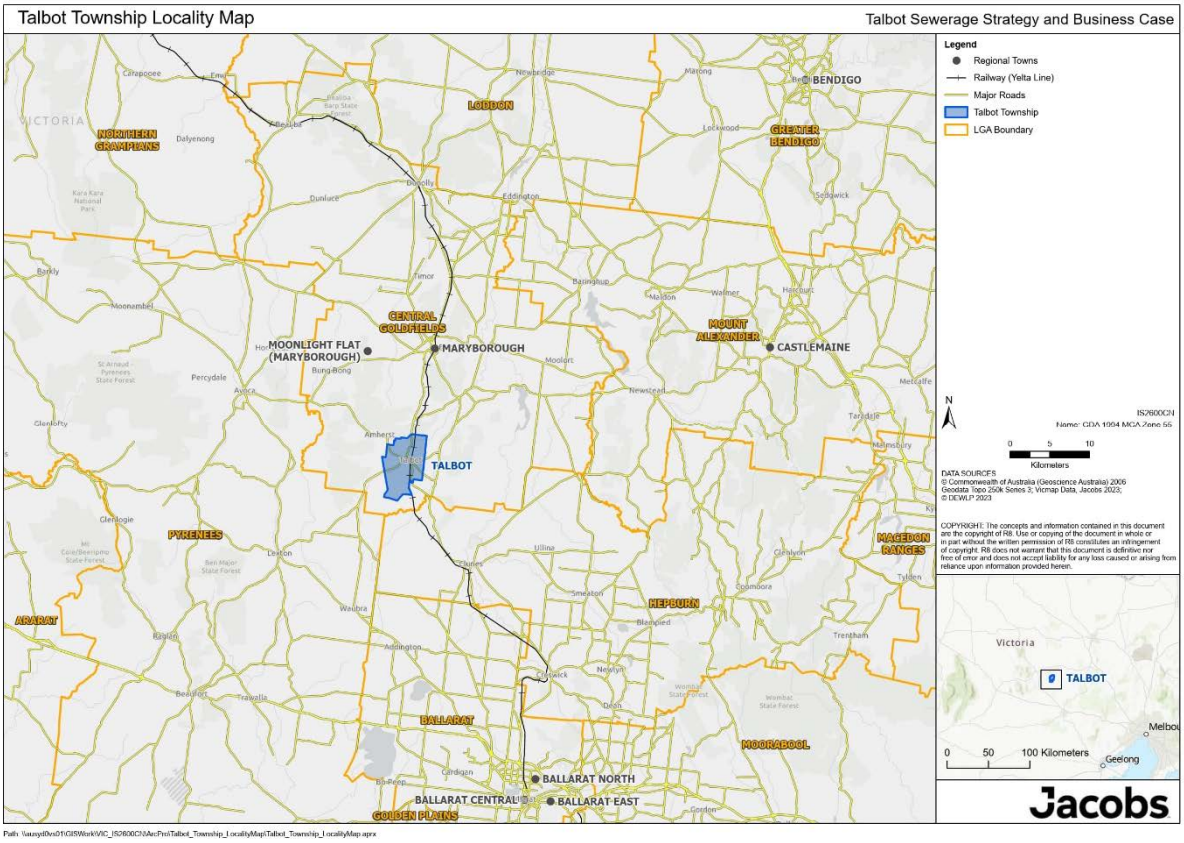

Figure 1-1: Locality map of Talbot

1.2 Housing demand in the Central Goldfields Shire

State Planning Policy requires councils to plan for a land supply that is sufficient to provide for at least 15 years of housing needs based on projected population growth, including direction on locations where growth should occur. This requirement is intended to apply on a council-wide and not a town/location-specific basis.

Consistent with this policy requirement, the Central Goldfields Shire Council ('Council') commissioned the Population, Housing and Residential Strategy (Central Goldfields Shire Council (CGSC), 2020).

The assessment found that:

- There is 18-25 years of zoned urban residential land supply in Central Goldfields Shire
- There is a mismatch between supply and demand geographically – Maryborough is where demand is concentrated (based on historical trends), but most of the capacity is in other townships
- It is estimated existing residential zoned lots will be exhausted in Maryborough by around 2032 based on recent development patterns
- Given the bushfire constraints in some areas of Maryborough and the diminishing supply of available broad hectare lots for development, this need for new residential lots within the shire is becoming increasingly acute (Figure 1-2)
- Talbot has significant potential, but its growth is severely constrained by the lack of sewerage.

Based on these findings, Council in partnership with Central Highlands Water (CHW) secured funding from Regional Development Victoria (RDV) to investigate the costs and benefits of the provision of sewerage infrastructure for Talbot. In tandem, Council developed the Talbot Structure Plan (CGSC, 2022) to guide potential development within the town.

In aggregate, these studies found that Talbot offers great appeal for home-buyers due its large lots, its proximity to Maryborough and Ballarat, and the local amenities (shops, primary school, sports clubs). The town also appeals to weekenders looking for a rural getaway from Melbourne. For these reasons, established homes are in demand but rarely come on the market. It is reasonable to expect that unlocking new land in Talbot will assist with meeting the housing development shortfalls within the shire. Collectively these studies supported the benefits of a sewerage scheme for Talbot township.

Figure 1-2: Maryborough, showing the green corridor constraining future housing growth due to bushfire risks

1.3 Purpose

The purpose of this business case is to present the investment case for sewerage infrastructure that will catalyse growth within Central Goldfields Shire. The business case seeks additional funding for a sustainable long-term solution to manage community waste in Talbot that balances environmental, social, cultural, economic, and legislative considerations.

1.4 Proposed infrastructure

The recommended solution involves a reticulated gravity sewer network to collect waste, which is then transferred to a central sewer pump station. From there, the waste is sent to a new local wastewater treatment plant (WWTP) via a rising main. The WWTP is proposed to be constructed to the east of the Talbot township. Key features of this project include:

- Approximately 9.2 km of gravity sewer pipelines ranging in diameter from 150 mm to 300 mm
- Approximately 86 sewer maintenance holes for connection of gravity sewer pipelines varying in depth from 1.2 m to 4.5 metres
- A submersible sewer pump station with approximately 68 kilolitres of wet weather storage transferring waste via a 2.9 km long rising main that incorporates railway under bore
- A new wastewater treatment plant for sewage treatment - proposed to be a lagoon-based system with on-site recycled water (Class C) reuse for adjacent irrigation.

1.5 Outline of this business case

This business case presents the case for funding and provides the following sections:

- Background (Section 2) provides overview of the Talbot township and background relevant to the problem to be addressed by the proposed solution
- Problem definition (Section 3) provides detail of the investment rationale, including a description of, and evidence for, the problems underpinning the investment rationale
- Case for change (Section 4) outlines the intended benefit from the project and the opportunities for additional value capture
- Response option development (Section 5) outlines the strategic interventions and responses considered, and the shortlisted responses that were considered in more detail
- Options assessment: sewage disposal(Section 6) provides an overview of the sites considered for the treatment plant, and the process used to identify the preferred site
- Identification of the preferred project option (Section 7) outlines the methodology used to identify the preferred project option
- Economic evaluation of the preferred option (Section 8) outlines the economic evaluation results of the preferred option.
- Deliverability of recommended solution(Section 9) provides detail on the scope, cost and timelines and commercial considerations of the preferred option
- Management (Section 10) provides detail on and management considerations (governance, stakeholder engagement, risk management, etc.)
- Delivery (Section 11) outlines the processes that need to be followed to deliver the project.

2. Background

2.1 History of Talbot

Prior to the arrival of Europeans, the district was home to the Dja Dja Wurrung Aboriginal people who referred to the region as Tuaggra. The first Europeans passed through the area in 1836, and the area commenced being settled by Europeans later that same decade. In the period since, Talbot has experienced fluctuations in population, as well as businesses that serviced those populations.

Today, the Talbot community has a population of 271 people in the 2021 Census with 288 dwellings (SGS Economics and Planning, 2022), of which 140 are within the proposed sewerage scheme service area. While gold mining has ceased, the monthly markets are a drawcard for the town, and the Railway station was reopened in 2013 for passengers (Figure 2-1).

Figure 2-1: Talbot railway station, closed in 1993 (left image) and reopened in 2013 (right image)

An important part of the area's history includes that of the Dja Dja Wurrung people, with evidence of their occupation and connection to Country continuing today. With a lack of permanent creeks in the region, Aboriginal people built rock wells to source fresh and clean water. Nearby Talbot is the Bull Gully Rock Wells (Figure 2-2), considered the best example of Aboriginal Rock Wells in Victoria. The wells consist of four holes dug into the base of a large sandstone rock, making a natural catchment for falling rain. Locals say the wells have never been known to dry up over the last 150 years, even during extended periods of drought.

Another piece of the Central Goldfields' Indigenous heritage can be found in the spectacular Aboriginal Birthing Tree, just out of Talbot. The 700-year-old giant river red gum has a circumference of over 15 metres and its hollowed out centre was used by the Dja Dja Wurrung clan as a safe place for women within the tribe to give birth. This tree is classified by the National Trust of Victoria.

Figure 2-2:Bull Gully Rock Wells, considered the best example in Victoria

An overview of the history of the town is provided in Figure 2-3.

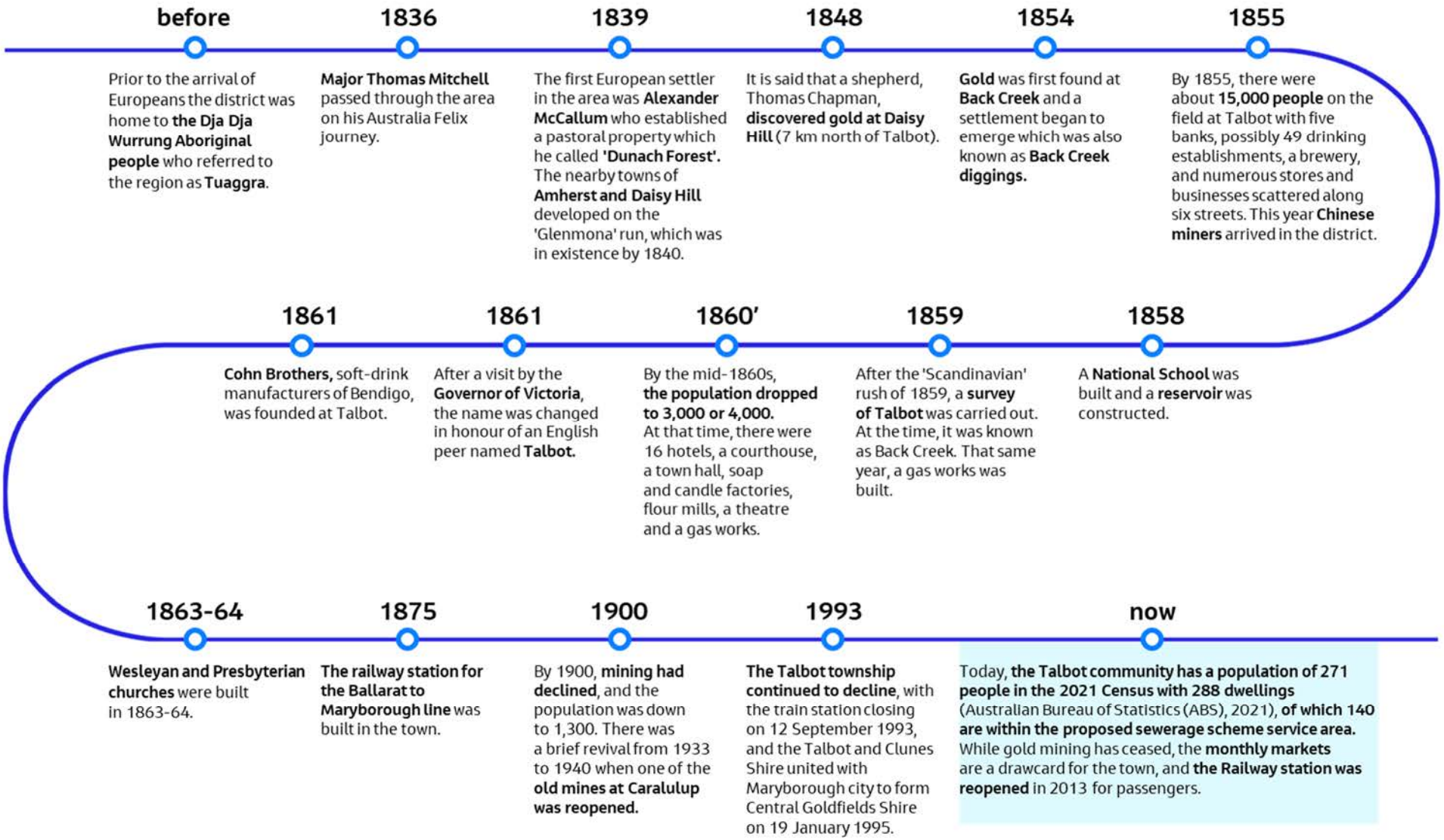

Figure 2-3:: Talbot historical timeline

2.2 Legacy of the gold rush era

The early prosperity following the discovery of gold is evident in the picturesque heritage buildings of the town (Figure 2-4), now occupied by a mix of homes and businesses. These buildings provide Talbot with high visual appeal attracting demand from buyers and weekend tourism (CGSC, 2022). A further legacy of the gold rush era is a large number of small allotments to accommodate anticipated residential development surrounding the central township area. These small allotments now pose a constraint to further growth in the township without a reticulated sewer system, as discussed further below.

Figure 2-4: Historic buildings in Talbot contribute to the town's visual appeal

The vibrancy of the Talbot township is enhanced by the number of short-stay tourism opportunities the area provides, serviced by existing hotel, bed and breakfast and farm stay accommodation options. Tourism opportunities in the area are promoted through the Talbot Arts and History Museum located in the former Primitive Methodist Church (opened 1870, centre image – front cover page) which, in itself, provides a visitor experience.

The regionally significant Talbot Farmer's Market Day plays a central role in Talbot's tourism value and profile. During those days, Talbot hosts an average of 80 stallholders and up to a total of 3,000 visitors each month. Visitors come from as far as Melbourne and inject tourism expenditure into the local economy. On such days, tourists and local residents typically spend on fresh produce, baked goods and wines.

The Talbot region also host significant natural features which offer a different tourism experience. The Talbot Observatory, located at the rear of the old Court House, provides opportunities to view the night sky. Mt Greenock Geological Reserve, located just outside Talbot, features an extinct volcano, a historic mine site, and an informative sign celebrating the life and accomplishments of Major Thomas Mitchell. This is an outstanding example of a volcano and lava flow associated with a deep lead and is one of the few large scoria cones on public land. The nearby Amherst Reef Geological Reserve (in Bung Bong - Lillicur State Forest) features the largest outcrop of pure quartz rock remaining in Victoria (as almost all quartz blow-outs were completely mined away during the goldrush period of the 1850s).

2.3 Town services

Talbot has a suite of basic services that positions it well for growth and contribute to its liveability. In addition to the train station, this includes existing assets such as a public swimming pool, post office, primary school (Figure 7), fire station, community garden and recreation reserves. Active commercial sites are scattered across central Talbot, generally concentrated around Camp Street, Ohara Street, and Prince Alfred Street. There are also a number of buildings that are not currently in use and have been converted to dwellings or remain vacant.

Hotels comprise the largest share of active commercial floorspace in Talbot across three sites, indicating a strong presence of short-term accommodation in the township. In addition to these, there are two Talbot homes listed on accommodation websites, for a total of six short-term accommodation sites in the area.

Figure 2-5: Talbot Primary School

Retail shops typically have limited operating hours, as do the cafés, opening as little as 1-2 days per week. Talbot Town Hall offers a mix of uses on different days, including a hairdresser. Similarly, Market Square Building has multiple functions, serving as a general practice clinic, a bookshop (Talbot Old & Rare Books) and other retail spaces. The post office doubles as a general store, functioning as the only servicer of day-to-day needs in the township. Two local markets also run in central Talbot once per month.

Supermarket shopping is conducted primarily in Maryborough, approximately a 15-minute drive from Talbot.

CHW has provided current potable water metering data showing the Talbot water supply system has 282 metered connections. Of these, 140 are within the Talbot township and 142 are outside the township. Households are the predominant type of connection, representing 82% of the total within the township and 70% in the area adjacent to it, Figure 2-6. Metered vacant land is the next most common type of connection in the area outside the Talbot township zone (20%)

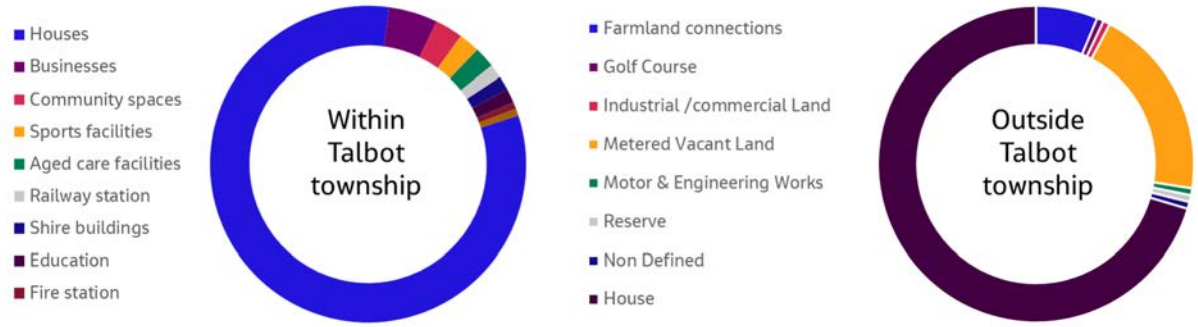

Figure 2-6: Metered connections in Talbot

Key features of the Talbot township are shown in Figure 2-7.

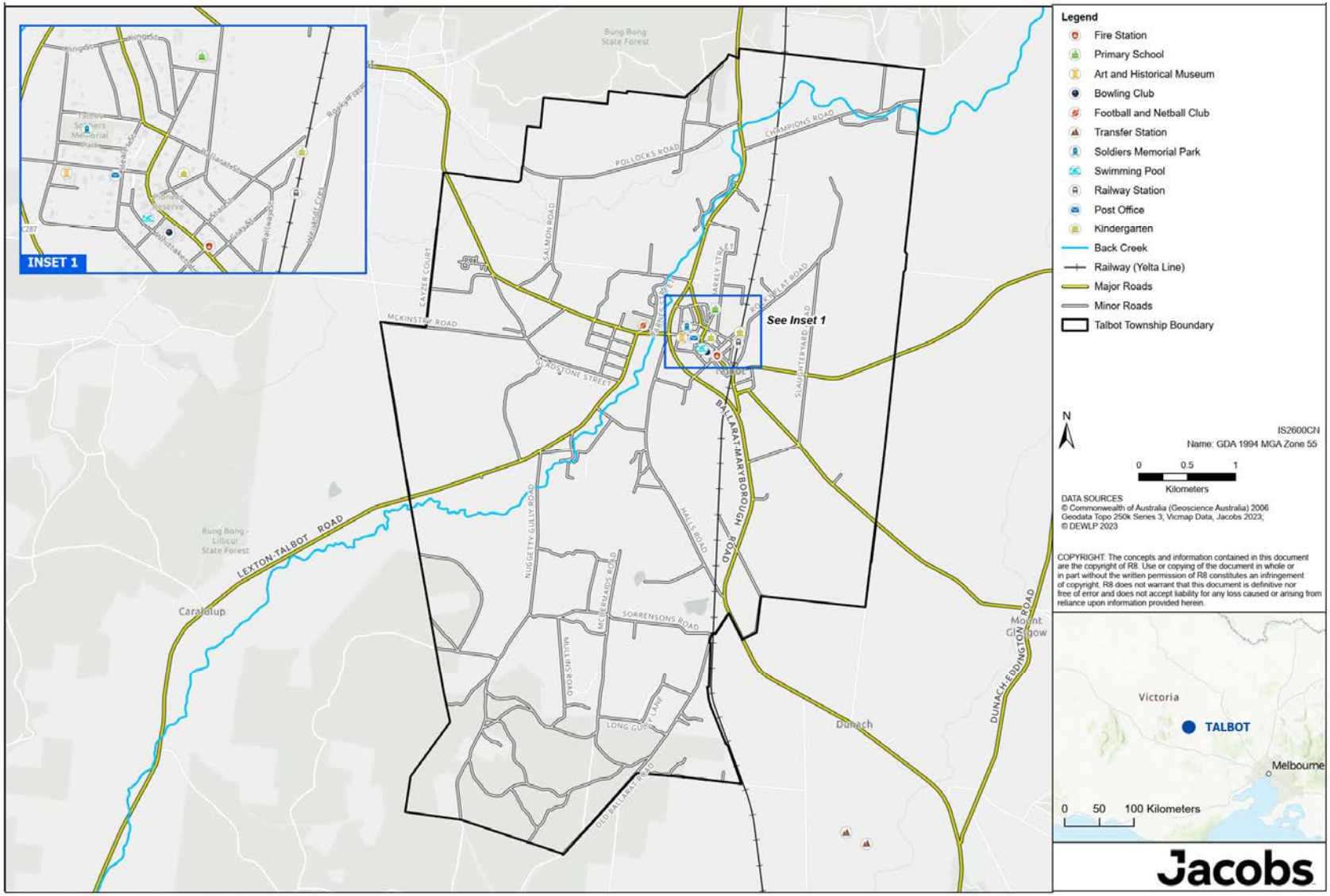

Figure 2-7: Map of Talbot township

2.4 Development opportunities and planning controls

Council has confirmed that dwellings within Talbot require a minimum of 4,000 m^2 of area to have on-site domestic wastewater treatment systems. Approval cannot be granted for new developments in Talbot unless the lot satisfies this minimum size, smaller lots are amalgamated or unless there is a reticulated sewerage system available for connection. Addressing this restriction releases the following potential:

- Talbot currently has approximately 15 useable residential lots that meet the minimum land size needed for septic systems, providing limited opportunity to accommodate future growth and housing demand in the Central Goldfields Shire.
- An estimated additional 100 lots (less than 4,000 m^2) could be available for housing development if a reticulated sewerage scheme was in place.

The main planning scheme zones in Talbot are the Farming Zone and the Rural Living Zone, which extends to the south of the township. The town centre is zoned Township Zone and includes small areas of Public Use Zone land to accommodate a memorial park, schools, and fire station.

Overlays also apply to the township, most notably an Erosion Management Overlay which requires a permit for development. Much of the land to the south and west of the town centre is also restricted by a Bushfire Management Overlay and Vegetation Protection Overlay. A Land Subject to Inundation Overlay also applies to land surrounding the creek and a Heritage Overlay applies to the town centre to protect the local character and history. Land to the east of the town centre is not subject to any planning overlays, indicating high suitability for development. Strategic rezoning of land within Talbot could open up additional land for housing beyond the 100 lots identified above. However, without a reticulated sewerage system, the driver for rezoning does not currently exist.

2.5 Current sewage management

The CGSC has the primary government responsibility for regulating septic systems for premises generating less than 5,000 litres per day, while the Environment Protection Authority (EPA) is responsible for wastewater volumes above 5,000 litres per day.

Properties not connected to a main sewerage line must have an approved on-site waste disposal system (septic tank system). Council's Environmental Health team must be contacted to obtain a permit to install a septic tank system. The Environmental Protection Authority (EPA) approves the type of on-site systems that may be installed in Victoria, via a 'certificate of approval system'. Council has a commitment to enforcing relevant septic tank legislation and, along with property owners, a responsibility to minimise the impact of septic tank systems on public and environmental health.

2.6 Why Talbot is Unsewered

The reasons for Talbot remaining unsewered are not clearly understood. The following aspects may have contributed to this essential infrastructure not being undertaken.

- Talbot is understood to have suffered from serve bushfires in the 1980's further reducing the town's population. At this time septic tank approvals were understood to be readily available, further reducing demand for reticulated sewer.
- The Shire of Talbot and Clunes separated into the Shire of Central Goldfields (Talbot) and Shire of Hepburn (Clunes) in 1995. Clunes had reticulated sewer constructed in 1998. It may be the previous Shire had planned to proceed with sewerage for Talbot, however separated before Talbot's works were undertaken.

Considering that Clunes was provided a reticulated sewerage system, it is now appropriate to invest in a sewerage system that will unlock dwelling and population growth in Talbot.

3. Problem definition

This section provides detail of the investment rationale including a description and evidence for the problems underpinning the investment rationale.

The Talbot township is currently seeing little residential building activity. Population growth is stalled and reflects a trend of ageing that surpasses that of the broader shire. While the town has limited access to local goods and services, it is readily accessible to Maryborough and well-service by the nearby major regional cities of Bendigo and Ballarat. With the proposed introduction of a sewerage system to Talbot, the potential for more significant growth and development in Talbot is unlocked.

The purpose of this business case is to present the reticulated sewerage systems assessment and seek additional funding for a sustainable long-term solution to manage community waste in Talbot that balances environmental, social, cultural, economic, and legislative considerations.

3.1 Project problems defining the need for investment

The five key problems underpinning the case for investment are summarised in Figure 3-1 and discussed in more detail below.

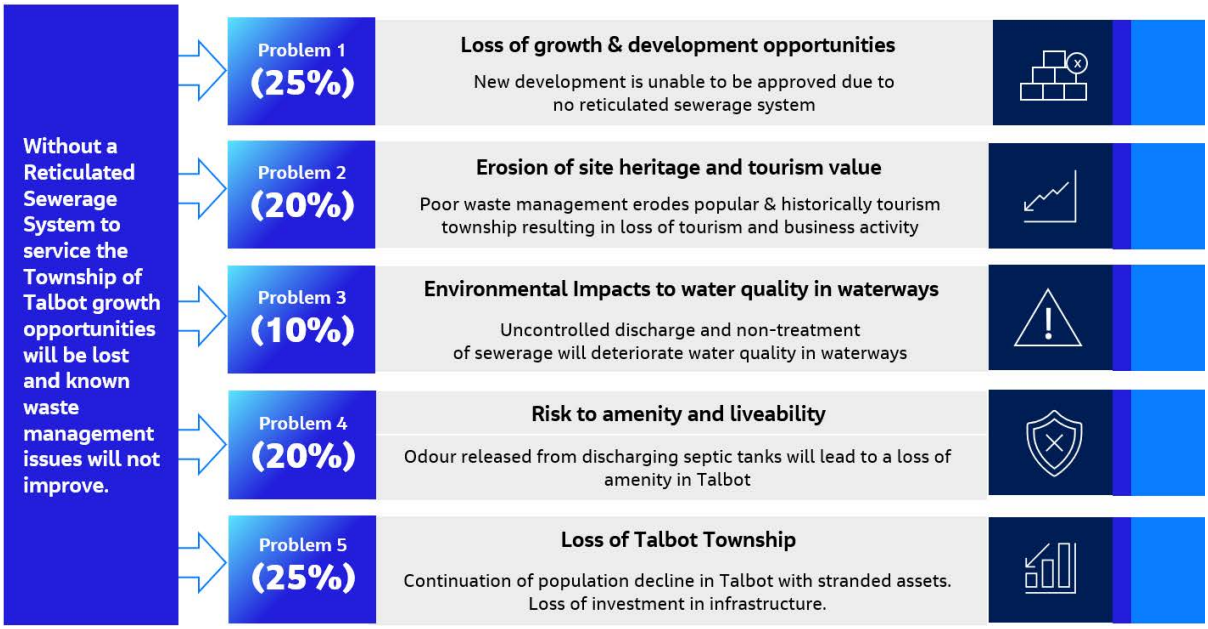

Figure 3-1: Project problems driving the need for investment

3.1.1 Problem 1: Loss of growth and development opportunities

Cause	Who is affected?	How are they affected?	Nature of the problem
CGSC is unable to support future growth for housing due to constraints in Maryborough and other surrounding towns having limited capacity for development. As a result, CGSC runs the risk of not meeting its 15-year growth plan.	CGSC State Government Talbot residents	New development is unable to be approved due to no reticulated sewerage system Limits growth of the town and availability for low cost house development Can be a barrier for new families to relocate and make Talbot home.	CGSC may be challenged to provide minimum residential land for growth requirements. Septic tanks require larger lot sizes which results in a relatively low dwelling yield of 4.7 dwellings per gross ha for the municipality Lack of housing diversity, which has now reached its growth land capacity Unable to develop new dwellings within township without significant land consolidation

3.1.2 Problem 2: Loss of heritage and tourism value

Cause	Who is affected?	How are they affected?	Nature of the problem
Poor wastewater management leads to poor reputation of Talbot tourism due to smell or unsightliness.	Tourism businesses (direct and indirect) Visitors / tourists Schools (education groups) Victorians	Less train travellers and not an effective use of the train station Heritage tourism would decline, impacting all tourism sector in the region, and ultimately reducing investments into the region.	Discourage travellers to further explore Talbot and spend more time within the township

3.1.3 Problem 3: Environmental impacts to water quality in waterways

Cause	Who is affected?	How are they affected?	Nature of the problem
Contaminated waste from overfilled septic system in contact with waterways	Local ecosystems Local waterway users Local residents Traditional Owners CGSC	Unsafe waterways Contaminated drainage systems in a high rainfall event	Environmental impact on waterway with pollution Impacts other users of the waterway Risk of high cost to clean up environmental impact Loss of reputation to Talbot

3.1.4 Problem 4: Risk to amenity and liveability

Cause	Who is affected?	How are they affected?	Nature of the problem
Contaminated waste from overfilled septic system in contact with waterways	Recreational users (locals and visitors) Local residents Business owners (tourism) CGSC	Odour Unsafe waterways	Heath risk to wider community. Loss of amenity with poor smell. Impact on liveability and business within the Talbot township

3.1.5 Problem 5: Loss of Talbot township

Cause	Who is affected?	How are they affected?	Nature of the problem
Lack of investment in reticulated sewer leads to continuation of population decline and stranded assets and investment in infrastructure	Local residents Business owners (tourism) CGSC Central Highlands Water Other Asset Owners – V/Line, CFA, Primary School	Reduced services Increase in cross subsidies from wider area Reduce revenue to cover service delivery	Declining population of Talbot is expected to reduce revenue from community and increase the cost of service delivery to the community, at the expense of the wider area

For example:

- Release of odour may detract from the amenity benefits from outdoor recreational activities such as bike riding, walking, etc.
- Prolonged exposure to odours can cause negative effects such as emotional stress, anxiety, and discomfort (Invernizzi et al., 2016)
- Loss of value for nearby properties
- Loss of commercial value for nearby businesses
- Loss of tourism revenue if the amenity issues impact Talbot's image or directly impact some of its tourism sites.

3.2 Evidence of the problem

The following table summarises the evidence provided for each of the problem statements.

Problem	Evidence
Problem 1: Loss of growth and development opportunities	CGSC has confirmed that dwellings within Talbot require a minimum of 4,000 m^2 of area to have on-site domestic wastewater treatment systems. CGSC cannot approve new developments in Talbot unless the lot has a minimum area of 4,000 m^2 or unless there is a reticulated sewerage system available for connection.

Problem 2: Erosion of townships heritage and tourism value	The CGSC community engagement has confirmed cases of sewage overflow during farmer market days, where existing septic tanks were unable to contain waste. This poorly reflects on Talbot as a tourism destination.
Problem 3: Environmental impact to water quality in waterways	No direct evidence has been provided to demonstrate the environmental impact on local waterways due to the possible risk of septic tank overflow.
Problem 4: Risk to amenity and liveability	CGSC has community input that development opportunities are being lost due to not having a reticulated sewerage system. This is preventing further town commercial development and impacting liveability improvements.
Problem 5: Loss of Talbot township	CGSC Population, Housing & Residential Strategy 2020 documents lack of growth in Talbot compared to all other areas of CGSC. No growth and inability to develop new residential or commercial developments.

3.3 Land development and approvals

Talbot offers an attractive investment proposition for homebuyers due its large lots and its proximity to Maryborough and Ballarat and the local amenities (shops, primary school, sports clubs). The town also appeals to weekenders looking for a rural getaway from Melbourne. The train line is appealing to potential buyers; however, trains are infrequent, so it is not as critical to the town's appeal as the driveable distance to regional centres.

Furthermore, Talbot has substantial areas of vacant land that can accommodate additional residential dwellings (Figure 3-2). In the Strategy, Talbot is shown to have unrealised potential for development relative to the available lots. Figure 3-2 below shows that Talbot has a relatively low number of occupied plots compared to the number of vacant plots. This indicates that there is real potential for further development. This is critical as Talbot has all the necessary infrastructure (e.g., a school, a train station, a community pool etc.) to support further population growth, except for a reticulated sewerage system.

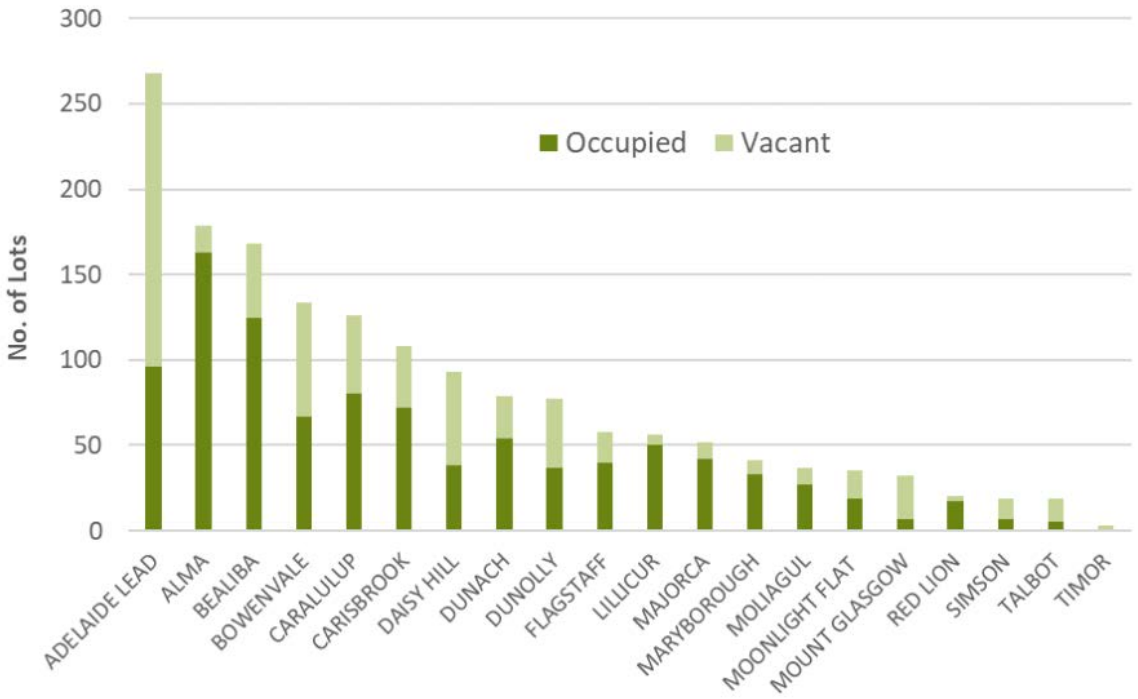

Figure 3-2: Stock of rural residential allotments

The lack of sewerage and clarity surrounding the timeline of potential works is off putting to potential homebuyers. Landowners could be currently holding on to their land in hopes that the sewerage will be installed. Without sewerage, the small vacant lots need to be bundled together in order to meet lot size requirements for a septic tank. Established homes are in demand but rarely come on the market. The town has significant potential, but its growth is severely constrained by the lack of sewerage. All other services are available including, but not limited to, sealed roads, potable reticulated water supply, storm water drainage, swimming pool, primary school, numerous sporting facilities, halls, churches and other community facilities. The train station with daily services is in place, resulting in a community ready for growth with the missing service of reticulated sewerage holding it back.

3.4 Loss in value of heritage and cultural tourism to Talbot's economy

The heritage building stock of Talbot is perhaps its defining feature. It contributes to the sense of township identity and also to the economic potential of the settlement. Visitor attraction can diversify the local and regional economy.

3.5 Ageing population

The median age in Talbot rose by 6 years between 2016 and 2021, as indicated inTable 3-1. This is in line with the general ageing of the population – that is, a larger share of older people in general – but is particularly pronounced in Talbot where the lack of new development means there is no influx of younger households. Failure to provide opportunities for growth will have significant impacts on the township. However, new or younger demographics sectors may also have different needs or priorities than those which have been catered for to date. Facilitating growth in the township will be important to unlock the potential for new families to move to the township, thereby supporting the local primary school, sporting reserve, etc.

Table 3-1: Median age summary by Town

Town	Median age in 2016	Median age in 2021	Change
Maryborough	50	51	+1 year
Carisbrook	44	46	+1 year
Dunolly	57	59	+1 year
Talbot	55	61	+6 year
Central Goldfields	50	52	+2 year

(SGS Economics and Planning, 2022)

Seeking to attract new families will mean the plan for the township needs to look not only at the needs of existing residents but also at the potential future demographic when considering priority actions.

3.6 Central Highland Water's future planning

3.6.1 Timing considerations

The need for a reticulated sewerage system in Talbot was identified over 10 years ago in the 2012 Residential Settlement Strategy. Even then, this strategy noted that "…the absence of reticulated sewerage poses a significant limitation to the future growth of the Town". The urgency of the need has only grown since then due to expected future population growth that needs to be accommodated in the broader shire.

Without the reticulated sewerage system, Council will not be able to meet planning policy responsibilities (particularly in relation to bushfire and vegetation management) due to the constraints of major towns within the shire – exhaustion of suitable land available within Maryborough and limited capacity of the smaller township of Dunolly to incorporate further growth.

3.6.2 Consideration of the broader context

The broader needs and opportunities that exist in parallel to the reticulated sewerage scheme for Talbot, are detailed below.

COVID-19 Impact and Recovery

The pandemic spurred preference shifts towards more space, houses and regional locations, resulting in lower household sizes and therefore increased rates of household formation and dwelling demand. In addition, since the pandemic, housing affordability has become a central cost pressure for households.

The towns in Central Goldfields experienced a decline in average household size due to the reasons mentioned above, and they are below the average household size of 2.4 for regional Victoria. Dunolly and Talbot have the highest median age in Central Goldfields, and this is reflected in the household size in these towns. People in retirement age will be the norm going forward, and household size may continue to fall in the long term if development remains stagnant.

The amenity of the outdoor recreation spaces has also become increasingly important during this period, with more of people's free time spent outdoors and in public spaces. The importance of

activities that improve mental wellbeing by allowing people to reconnect with each other will likely become increasingly important to the community.

Furthermore, housing prices and rentals remains lower in regional towns such as Talbot, relative to metropolitan areas. This presents an opportunity for the government to increase the supply of more affordable housing alternatives for investment/leasing to relieve cost pressures.

Commercial and Industrial Land Supply

There are no industrial land stocks in the township of Talbot and no evidence of unmet industrial land demand. The Planning Scheme Review (2020) recommends further investigation into the extent of the town centre in Talbot but finds no issues with the Township Zone in terms of accommodating a mix of commercial and residential uses.

3.7 Problem Dependencies and Interfaces

Key interdependencies and interfaces that are relevant to the problem include the following:

- Maryborough, the nearest town to Talbot, is poised for further population growth. Given the bushfire constraints in some areas of Maryborough and the diminishing supply of available broad hectare lots for development, this need is becoming increasingly acute. In addition, the Central Goldfields Shire Council Planning Scheme Review (2020) has identified the need to review some of the existing planning controls in Talbot, including the Township Zone, the Significant Landscape Overlay 2 (SLO2), and the Erosion Management Overlay (EMO).
- The purchase of land for the Wastewater Treatment Plant is a critical step in the implementation of the reticulated sewer network. This will be required to ensure the final design and costings of the works. Risks associated with land purchase need to be resolved in the early stages to allow for long-lead procurement, such as power supply, EPA approvals and land use changes among others.
- The connection costs for existing residents may be a high financial burden to residents on fixed incomes such as aged pensions. Consideration for hardship grants need to be considered in scheme to avoid undue stress being placed on residents. Median personal weekly incomes for Talbot are $457 (SGS Economics and Planning, 2022).

3.8 Uncertainty around the Problem

There are a number of key uncertainties associated with the problem that will impact the proposed solution. These include:

- **Community buy-in.** Existing residents have established septic tanks that are a low-cost sewer arrangement. The estimate cost of emptying a septic tank is $450 - $600 per tank. This may be undertaken every 3 – 5 years. Resulting in an estimated annual cost of $200 per property. The new gravity sewer scheme is expected to have an annual service charge from CHW of $757.52 per year. Water and sewerage concession for eligible concession card holders is 50% of the bill to a yearly maximum of $354.10, resulting in a net annual bill for sewerage of $580.47, assuming the existing water bills have the savings already applied. This does not include upfront connection fees. This increase in annual fees may reduce community support for the gravity sewerage scheme as it may have limited immediate benefits to existing residents. It is worthwhile testing the community's appetite for the proposed sewer scheme with the expected costs to confirm alignment.
- **Existing Septic Tank Condition –** The condition of existing septic tanks is not clearly understood. It is estimated that there are approximately 140 tanks within Talbot based on the number of water meters. This may vary with some locations such as the football club having more than one tank. The replacement cost of a residential septic tank is estimated to be approximately $25,000 with an estimated operational life of 40 years. The Talbot community would be expected to have an increased interest in a reticulated scheme when the replacement of a septic tank is due. Consideration should be given to the age and condition of septic tanks as part of the community

survey to assess the understanding of existing septic tanks, as these assets are likely to be approaching end of life.

- **Legacy septic tanks need consideration regarding whether they will be removed or left in a safe state at their current location**. The disconnection of sewers from the tanks will occur to link to new sewers within the road reserve. However, the tanks will likely need to be emptied and removed from the site or potentially penetrated to allow drainage and filled with sand to prevent a hazardous confined space in backyards. These costs have not been included within the cost estimate or this business case. Nevertheless, it is essential to determine the agreed-upon state in which legacy septic tanks will be left.

4. Case for change

4.1 Benefits to be delivered

Resolving the problems identified in the investment logic map (ILM, Appendix A) will deliver a range of environmental, amenity, tourism, and planning benefits as summarised in **Table 4-1** and discussed in more detail below. The benefits management plan is provided in Appendix B.

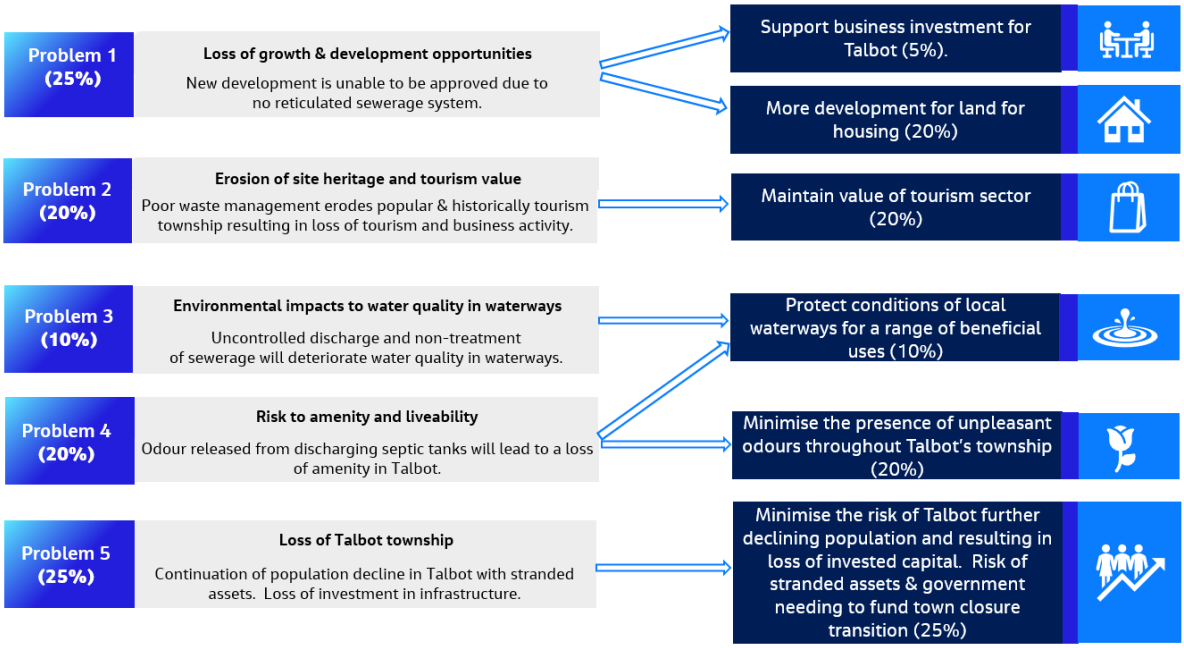

Figure 4-1: Project benefits

There is strong local support for sewerage upgrades. Talbot Futures, a civic non-government organisation, undertook a survey of 12% of the local community (Talbot Futures, 2022). The survey found that a clear majority of the respondents were in favour of sewerage upgrades, with only two respondents objecting. It is noted however that further engagement to reassess the community's commitment is required when the community has been informed about the costs they will incur associated with annual sewerage tariffs, capital contributions and connection.

4.1.1 More land suited to development for housing

Talbot has a great existing framework for growth, which requires the reticulated sewerage network to unlock. The subdivision and titles are ready for sale however are unable to be used for more housing developments until the reticulated sewer network comes into operation.

The sewerage system would catalyse growth in housing developments in Talbot and would spur private sector investment in the township to deliver services to the growing population. This projection is evidenced within in the SGS Economics and Planning's Talbot Housing and Commercial Technical Assessment (2022). It noted that a new reticulated sewerage system could trigger the development of up to 15 dwellings per annum, between 2025 and 2051, under the 'Big Melbourne' population scenario. The report noted that this is the likely population growth scenario for Talbot if a new sewerage system is put in place.

Figure 4-2 below illustrates the differences in dwelling development between a Do Nothing Base Case and what may be possible with a reticulated sewerage network for Talbot. The chart shows that by 2059, Talbot could have over 400 more dwellings with the new sewerage system compared to the base case.

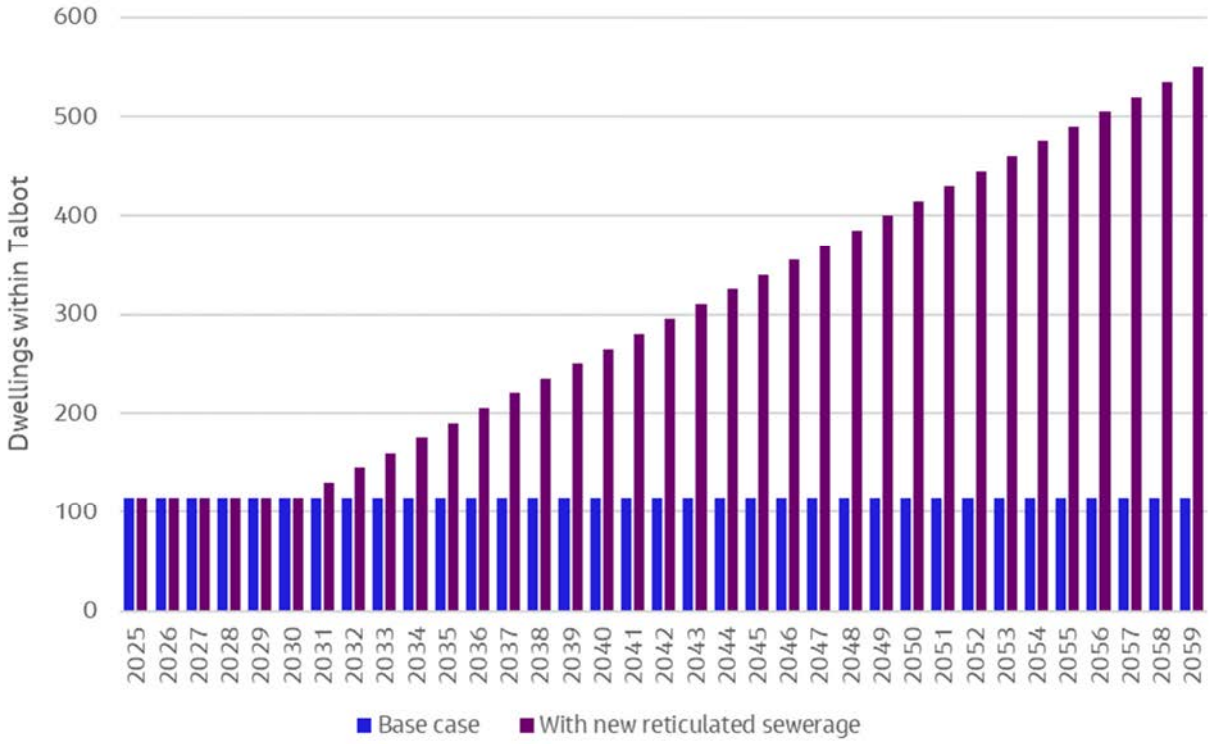

Figure 4-2: Accelerated property development

The projected property development will provide more affordable housing options for Victorians, particularly young families. Estimates within this business case indicate that the project would trigger roughly $320 million (2023 real dollars) of property development, from 2030 to 2059. This will transform Talbot into a thriving Victorian township.

The potential revenue discussed is real and significant. The SGS Economics and Planning Housing and Commercial Technical Assessment report noted that in October 2022, Central Goldfields Shire has been attracting interested buyers – particularly new homebuyers and investors seeking affordable housing investments. The report noted that buyers are looking for larger house plots with proximity to Ballarat, Bendigo and Melbourne. There is also strong interest within the rental market, with some properties receiving up 30 applications.

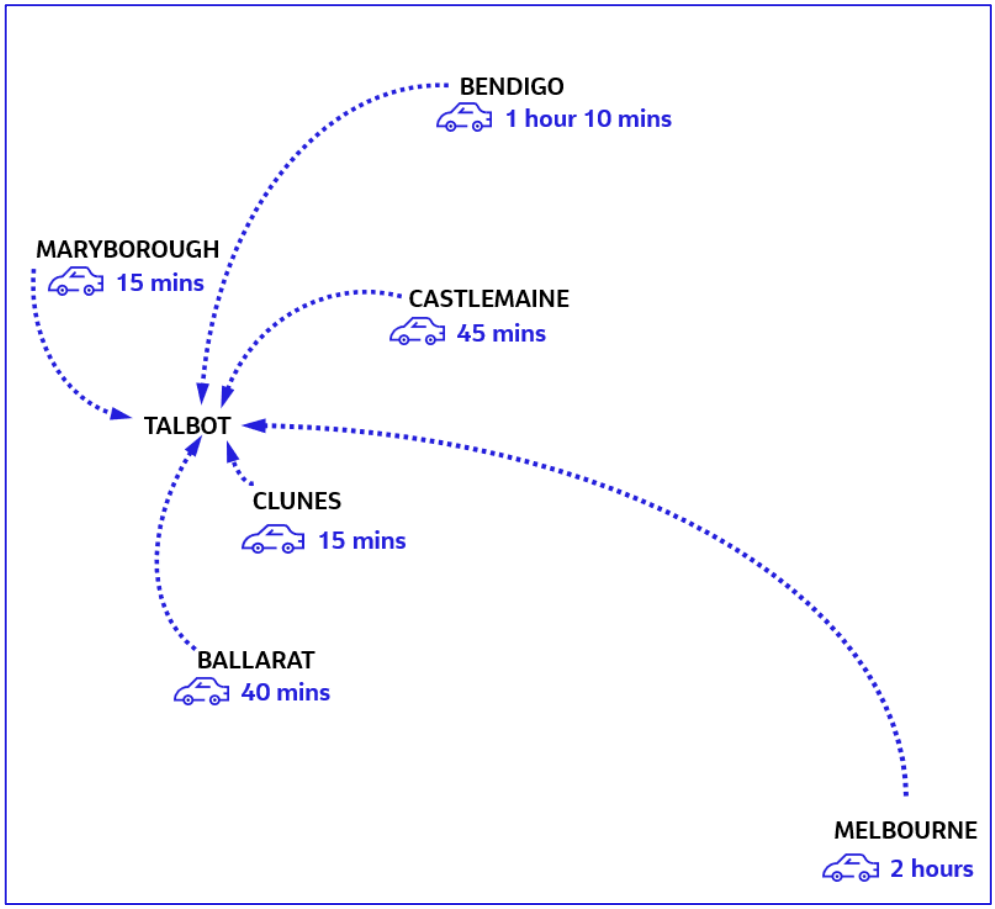

Figure 4-3 Strategic location of Talbot

This points to strong potential for Talbot for the following reasons:

- Talbot offers large affordable plots for property investment.
- Talbot is accessible to Ballarat, Bendigo and Melbourne.
- There are existing local amenities and social services.

Further population growth would generate increased private sector investment to provide additional services to the growing local community within Talbot. This would establish a virtuous cycle of housing investment, population growth and private sector investment in services.

The potential virtuous cycle is evident in examples of comparable Victorian towns - Harcourt, Clunes, and Creswick - with reticulated sewerage systems, limited goods and services, but close proximity to nearby serviced towns. Table 4-1 shows that Harcourt, Clunes, and Creswick have experienced fast dwelling growth. These higher dwelling growth rates demonstrate the ongoing missed opportunity within Talbot, which has grown by less than 1% per year in the same time period.

Table 4-1 Recent dwellings growth for comparable towns (SGS Economics and Planning, 2022)

Town	Clunes	Harcourt	Creswick	Talbot
Total dwellings in 2021	1,025	468	1,373	288
Additional dwellings per year from 2016-2021	24	15	20	<1
Average annual growth rate of dwellings from 2016 -2021	2.4%	3.5 %	1.6%	<1%

Efficient accommodation of regional population growth

Talbot is blessed with a suite of infrastructure assets that offer critical services to the local community; however, it lacks the critical reticulated sewer system. This means the government has the opportunity to direct population growth in an area that does require additional government expenditure on infrastructure. This is particularly pertinent in regional areas where infrastructure construction costs can he higher than in metropolitan areas.

4.1.2 Increased business investment

As noted within the SGS Economics report, such population growth would trigger additional investment opportunities into the community to provide goods and services for this growing town. This includes the real potential of a new supermarket complex (600 – 900 sqm) within the next 20 years. Such a complex could be worth $2 million in capital investment and could generate roughly $0.2 million per annum in rental income. This, in turn, would provide additional job opportunities for the local community.

Table 4-2 below outlines the average annual and total indicative revenue that could be generated for CHW, CGSC and the state government from the increased investment in property over a 30 year period (see Section 8.1.2 for a breakdown of underlying assumptions). This revenue includes CPI increase of sewerage charges. This revenue could be reinvested into the local community for further development.

Table 4-2: Indicative estimates of financial income (includes escalation of prices/tariffs)

Revenue source	Average annual revenue	Total revenue
CHW sewer charges	$ 0.8 million**	$ 25.3 million
CGSC rate	$ 1.9 million	$ 56.1 million
VIC stamp duty	$ 0.8 million	$ 23.4 million
GST	$ 1.5 million	$ 45.5 million
Total	**$ 5.0 million**	**$ 150.3 million**

*** The $0.8 million CHW sewer charges is the average annual revenue for the period to 2030 to 2059. This cost includes 3% indexation to charges in addition to forecast increased dwelling numbers*. At the commencement of any sewerage scheme the income from sewerage charges paid by customers would likely be far less than the cost to operate the sewerage system, based on the current generic system wide charges currently approved.

Figure 4-4 below illustrates the annual revenue, by source for the operations period. The annual increase in revenue reflects the increase in the number of dwellings and the annual CPI indexation of charges and rates.

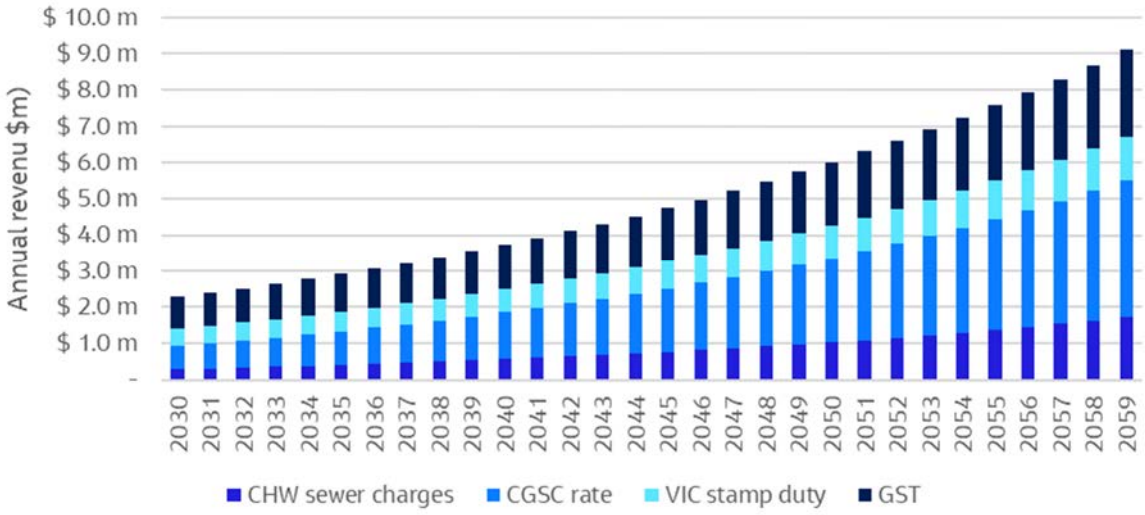

Figure 4-4 Potential annual revenue

4.1.3 Maximise value of Talbot's tourism sector

Talbot's reliance on septic tanks limits the growth of hospitality operations. A reticulated sewerage system is critical to supporting the expansion of the hospitality sector. An Urban Environmental study suggests that improving sanitation is the 'best investment for promoting tourism' (Elysia and Wihadanto, 2020). The study found that for each percentage increase in the population with access to improved sanitation facilities, the number of tourist arrivals increased by 2.9%.

Tourism is a very important industry and employer in regional Victoria. Tourism Victoria includes Talbot as part of the Goldfields region for tourism. This region includes Ballarat, Castlemaine, Dunolly, Heathcote, Maldon, Maryborough and Talbot and is promoted as a destination that provides rewarding cultural experiences, based in history and expanded through arts and complemented by food and wine. The majority of visitors are domestic travellers, such as day travellers from Melbourne who can make a stop enroute to Daylesford, Bendigo or Mildura.

Key visitation features includes the following:

- Talbot Farmer's Market Day currently attracts approximately 2,000 visitors each month. Assuming each visitor spends $45 on average (Daylesford Macedon Life, 2022), this translates to about $120,000 of tourist market revenue per month. This is equivalent to roughly $1.1 million per year.
- The CGSC area hosts 225,500 visitors annually and they spend roughly $35.1 million in the local areas (CGSC, 2020). A sizeable proportion of this visitation and tourism spend is connected to Talbot's reputation is a primary food, wine and agribusiness destination within the CGSC area (CGSC,2020)

These visitors come from as far as Melbourne and inject tourism expenditure into the local economy.

Figure 4-5: Quality produce offered at Talbot Farmers Market

4.1.4 Protect condition of local waterways for a range of beneficial users

Preventing uncontrolled discharge of sewage into the affected environment aims to prevent contamination of waterways. This effort will benefit the environmental health of the waterways, benefiting both active and passive recreation for visitors.

4.1.5 Minimise the presence of unpleasant odours in Talbot Township

Preventing the spread of sewage odour throughout Talbot will protect and enhance the town's amenities for residents and visitors and will directly and indirectly benefit the wellbeing of the community. One of the stated benefits within the Talbot Futures Survey was that sewerage upgrades were needed to prevent unpleasant septic smells that permeate the town.

Example benefits include:

- Higher property prices for properties that would otherwise be affected by the odour
- Increased amenity and well-being for residents that would otherwise be impacted by the odour
- Increased recreation value for those undertaking passive and active recreation by the affected waterways
- Reduced deterrence for visitation (tourists and residents) to attractions in Talbot.

4.1.6 Leveraging existing assets and investment

Table 4-3 outlines key assets in Talbot, including their social function and indicative replacement cost value. The total replacement value of these assets is over $20 million, which is close to the cost of a reticulated sewerage system. The implications of this are that investing in the Talbot reticulated sewerage system costs at least half the total capital cost of supporting regional population in a new greenfield regional area within Victoria. This represents a significant capital cost saving that can be reinvested towards other state priorities.

Table 4-3 Key infrastructure assets in Talbot

Asset	Social function	Indicative replacement value ($2023)
Railway station	Talbot railway station is located on the Mildura line in Victoria. It is the successor station to the old heritage Talbot station that was built in 1875, closed in 1993 and then reopened in 2023. The new Talbot Station features a new platform, shelter, car park, bus and taxi bay, and a bus stop on Railway Street. It is critical infrastructure that allows local Talbot residents access to travel to Mildura and Melbourne.	~$22 million (Victorian government state budget)
Talbot primary school	Originally built in 1869, Talbot Primary School is one of Victoria's oldest public schools. It is an important education provider for new families that require education providers for their young children.	~$10 million (Victorian government state budget)
Talbot outdoor pool	The Talbot Outdoor Swimming Pool is a community pool open between December-March each year. It is popular location for recreation and exercise.	~$0.1 million
Total		**~$22.1 million**

4.2 Importance of benefits to government

Stakeholders from relevant agencies are involved in an advisory group and are increasingly engaged in the issue. Relevant government policies, strategies and commitments that align with the project are summarised in Table 4-4.

Table 4-4: Government policies, strategies and commitments aligned to the Project

Agency	Policy/strategy document	Alignment to the project
Department of Energy, Environment, and Climate Action (DEECA)	**Water for Victoria, Water Plan** Water for Victoria is the Victorian Government's long-term strategic plan for management of Victoria's water resources to support a healthy environment, a prosperous economy and thriving communities.	The project will support the following action(s) of plan: Action 4.1 : Supporting regional development and change. This project will spur housing development and investment in support services.
Department of Jobs, Precincts and Regions (DJPR)	**Visitor Economy Recovery and Reform Plan** The Plan provides a framework for industry and the Victorian Government to work together to restore and grow the tourism sector. It considers the combined effects of the 2019-20 bushfires and the 2020 COVID-19 pandemic and pathways for recovery.	The first key theme of the Regional Tourism Review which formed part of the Plan was 'strengthening our tourism offering'. Stakeholders identified that authentic local offerings, hidden gems, history and heritage and Aboriginal experiences should be further developed.

Agency	Policy/strategy document	Alignment to the project
State of Victoria	**Plan Melbourne 2017-2050** This is the principal state-level strategic document that guides growth and development of the metropolitan area. It emphasises the importance of regional Victoria to support housing and economic growth, enhance social and economic participation, and support healthy communities. According to the policy, growth in rural townships should be in keeping with the character of those places and balanced with the protection of productive land, economic resources, and biodiversity assets.	The project will support further development of Talbot, in keeping with its character.
Victoria's Housing State – The Decade ahead | 2024 - 2023	This is government's statement of intent for focusing policy and investment that will increase the supply and availability of affordable housing for all Victorians. The documents also identifies actions that will the development and release of affordable housing.	This project is directly aligned to this policy as it will unlock a major barrier to housing development in Talbot. By funding the construction of the reticulated sewerage system, the government will lift the last barrier to further dwelling development in Talbot.
Central Goldfield Shire	**Population, Housing and Residential Strategy (2020)** This ensures Central Goldfields has adequate residential land and supply to meet anticipated housing needs to 2036. It is based on a 2019 Residential Land Supply and Demand Assessment prepared by Spatial Economics	The project directly addresses the recommendation made in this strategy for the development of a sewerage system in order to facilitate more housing development and catalyse investment into the council.
	Loddon Mallee South Regional Growth Plan (2014) The Loddon Mallee South Regional Growth Plan is the strategic regional land use plan for the Loddon Mallee South region comprising the following local government areas: Central Goldfields Shire; the City of Greater Bendigo; Loddon Shire; Macedon Ranges Shire; and Mount Alexander Shire.	
	Industrial Land Supply & Demand Assessment (2021) This addresses the adequacy of industrial land supply and the appropriateness of current Council planning for future industrial land supply.	

5. Response option development

5.1 Method and criteria

CGSC and CHW have undertaken a number of studies, considering strategic interventions and responses to address the identified problems. The approach included two key stages:

- Stage 1 – Identification of strategic responses that could be implemented in response to the service need, including definition of the base case scenario.
- Stage 2 – Developing the project options based on the preferred strategic responses.

An overview of the key steps in this process is summarised in Figure 5-1.

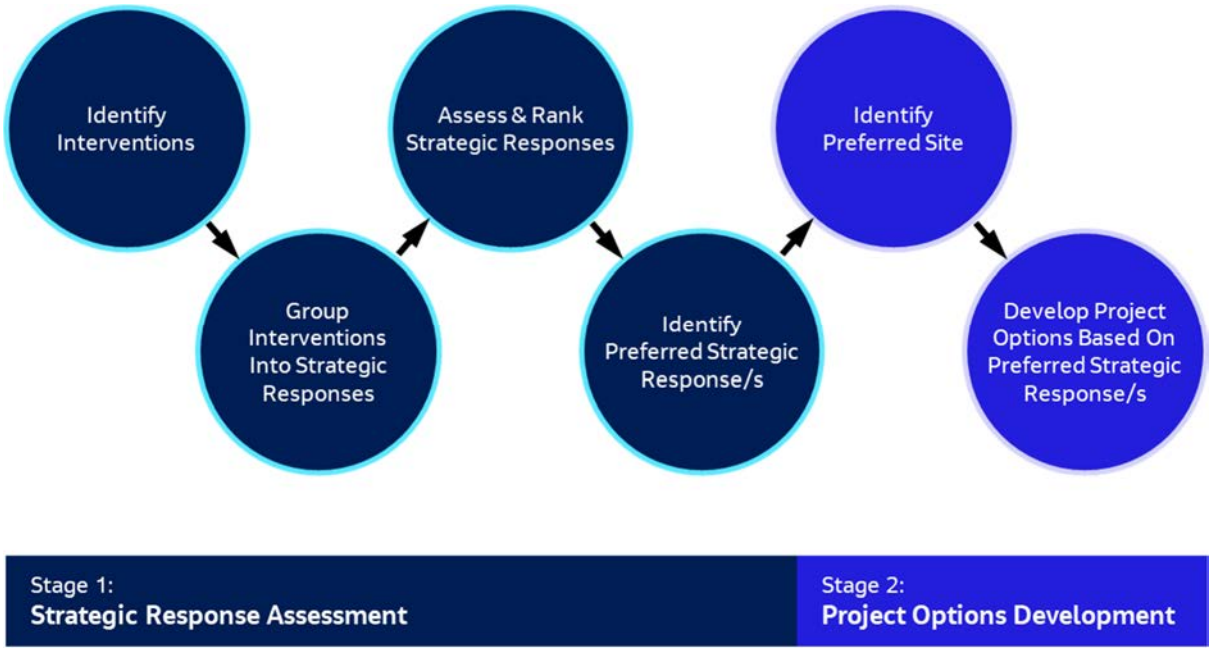

Figure 5-1: Strategic options assessment process

The outcomes of this approach are detailed in the following sections.

5.2 Strategic interventions and response options

The core strategic interventions identified include the following:

- Introduce a reticulated sewer network within Talbot.
- Transfer the sewage existing wastewater treatment plan (WWTP) outside of Talbot.
- Transfer the sewage to a new WWTP at or near Talbot.

Response options that align with the strategic interventions are summarised in Figure 5-2 below, along with a preliminary assessment on their ability to address the project needs.

Base Case	No new infrastructure, sewerage continues to be managed using onsite septic systems for individual households.		Option 1
Collection of sewerage	Gravity Reticulation Sewer Network	A reticulated sewerage scheme is built in the Talbot township that operates by gravity	Option 2
	Pressure Sewerage System	A reticulated sewerage scheme is built in the Talbot township that operates by pressurised pump(s)	Option 3
Wastewater treatment and effluent disposal	Disposal to an existing WWTP	Rising main to Maryborough WWTP	Option M
		Rising main to Clunes WWTP	Option C
	Disposal to a new WWTP	Construction of a new WWTP at Talbot.	Option T

Figure 5-2: Response options

5.3 The base case

The base case is the 'without investment' or Do Nothing scenario. Under this scenario, Talbot's viability as a town will deteriorate. Key elements of the base case include the following:

- Continuing the use of septic tanks and larger lot sizes for houses
- The condition and suitability of existing septic tanks are uncertain
- No further commercial and new housing development within Talbot
- Uncontrolled release of sewage to the environment during high visitor days, such as the Farmer's Market leading to loss of tourism
- The release of 'sewerage' odour across the town
- A reduction of tourism attraction to Talbot, leading to the closure of existing business
- CGSC fails to provide residential growth opportunities, and growth is constrained due to limitation in Maryborough and Dunolly.

6. Options assessment: sewage disposal

6.1 Options assessment

This section provides an overview of assessment of options to dispose and treat sewerage collected through a new reticulated sewerage scheme (Options M, C and T).

The assessment process is summarised in Table 6-1 and further discussed in the following sections.

Table 6-1. Options assessment process for sewerage disposal

Stage 1: Site identification	• Identify potential sites through desktop analysis and undertake further discussions with CHW and Council • Finalise list of potential sites
Stage 2: Eligibility shortlisting	• Complete a rapid eligibility assessment based on whether existing WWTPs could take the Talbot waste flow to either Maryborough or Clunes • Assess the transfer pipeline costs and operations to either Clunes or Maryborough • Develop a new local Talbot WWTP option for comparison with existing plant options in Clunes or Maryborough. The Talbot WWTP considered sufficient space for treatment and on-site irrigation. • All options considered impact on ecology, cultural heritage, European heritage, capital and operational costs, and the capacity for the WWTP to accommodate Talbot's sewage.
Stage 3: Preliminary assessment workshop	• In a workshop with key stakeholders, discuss and document the advantages and disadvantages of each site
Stage 4: Final shortlisting	• Agree on a preferred site for higher level of infrastructure assessment of a local new Talbot WWTP

6.2 Site identification

Potential sites considered for the disposal of sewerage collected from Talbot include:

- Existing WWTPs at Maryborough (Option M) and Clunes (Option C).
- A local Talbot WWTP, located outside the main township area, with adjacent land available for irrigation to pasture (Option T).

Collected sewerage would need to be piped to each of the locations. A potential alignment was identified and is shown in Figure 6-1, with the following colour coding:

- Maryborough – Green.
- Clunes – Purple.
- Talbot - Yellow.

For the purposes of this assessment, farming land 2-3 km to the east of the township was considered to be the preferred location for the new local treatment plant, winter storage and effluent irrigation area. The exact location of this site would need to be determined as part of future work on the project during early design and planning phase. If population growth and new housing and industrial developments take place, this option would be most beneficial in the long term.

Figure 6-1: Sewerage scheme options plan

6.3 Eligibility assessment

A rapid desk top assessment of the three options under consideration was conducted, with the results of this assessment summarised in Table 6-2.

Table 6-2. Rapid assessment of sewerage disposal options for Talbot

Assessment criteria	Option M: Rising main to Maryborough WWTP	Option C: Rising main to Clunes WWTP	Option T: New WWTP at Talbot
Works required	The rising main to Maryborough WWTP would be approximately 20.5 km.	The rising main to Clunes WWTP would be approximately 22.5 km. Due to the length of rising main and difference in elevation, an intermediate pump station would be required.	The rising main is expected to be approximately 3 km, and requires a new WWTP.
Estimated capital cost	$14.42 million	$20.57 million (This is the most expensive option due to the longer pipeline and additional pump station)	2.9km Rising Main $901k
Estimated operating cost **Assumed 3% of CAPEX**	$432.6k / Yr.	$611.1k / Yr.	$27.03k / Yr.
Capacity constraints	Poses unacceptable load pressures on existing WWTP	Poses unacceptable load pressures on existing WWTP	New plant can be designed to accommodate future growth
Operational considerations	There is risk of odour and corrosion within the existing network arising from long transit times and distances	There is risk of odour and corrosion within the existing network arising from long transit times and distances	Short rising main and low operational risk.
Feasibility	This option is not considered feasible and not supported by CHW.	This option is not considered feasible and not supported by CHW.	This option is considered feasible and is supported by CHW.
Aboriginal and European heritage considerations	Impacts likely to be high to very high (at least 20 ha of disturbance), with significant constraints to avoiding impacts to remnant vegetation	Impacts likely to be high to very high (at least 22.5 ha of disturbance), with constraints to avoiding impacts to remnant vegetation	Lowest impact option (estimated 5 ha of impact), predominantly converted farmland

Environmental considerations	Significant impact area (as above)	Significant impact area (as above)	Least impact option
Approvals	Likely to be complex and increase project duration and costs	Likely to be complex and increase project duration and costs	Least complex and least impact on project duration and costs
Community support	Further consultation is required with the Talbot community to determine preference for sewage disposal options. Local disposal potentially poses the lowest risk of community opposition and economic impact, due to the smaller works footprint. However, this did not apply in Newstead where the community wanted sewage pumped to another town as they did not want a local to lose some of their land.		

6.4 Assessment workshop

A preliminary assessment workshop to consider the findings of the eligibility assessment was held with representatives from Jacobs, CHW and CGSC.

The key outcomes of this workshop was that the preferred site for the proposed WWTP be the local new Talbot site (Option T), for the following key reasons:

- It has the lowest impact option for ecology, cultural heritage and European heritage
- It is the lowest-cost option, with a new WWTP being less expensive than long transfer pipelines to either Maryborough or Clunes
- The local new Talbot WWTP provides a fit-for-purpose treatment process that can be designed to suit Talbot's needs
- Pipeline transfer lengths and time were identified as treatment risks to Maryborough and Clunes, as receiving aged sewage could create high odour emissions and impact WWTP treatment capacity
- The site is closer to Talbot (the pumping location) than the other options, requiring less pipeline length. Longer pipelines can be more expensive, leading to more complex planning approval processes and potential delays.

6.5 Preliminary option shortlisting

Based on this finding, the remaining options which progressed for further assessment were:

- Option 1: Base Case
- Option 2: Gravity sewerage network with a new local Talbot WWTP
- Option 3: Pressurised sewerage network with a new local Talbot WWTP.

7. Identification of the preferred project option

A multi-criteria analysis was used to identify the preferred project option in consultation with Jacobs, CHW and the CGSC. Stakeholders – including local Talbot residents - have been involved in ongoing consultation throughout the Council's structure planning process.

7.1 Project options considered

The key components of the two options are summarised in Table 7-1.

Table 7-1: Summary of options

Key feature	Option 2: Gravity sewerage network with new local Talbot WWTP	Option 3: Pressure sewerage network with new local Talbot WWTP
Complexity	The gravity system does not have operational components for residents. Sewage exits the property boundary via gravity and does not involve any moving parts.	A pressure system requires a holding tank, a grinder pump and a connecting pipeline to discharge sewage from the dwelling. System requires high level of partnership between customer and CHW systems.
Additional Costs	CHW pricing is fixed with no variation risk to customers within pricing period.	The power cost of the grinder pump is paid by the residents.
Customer Risk	Low risk of supply impacts as system is maintained by CHW.	The operation and maintenance of the grinder pump are the responsibility of the landowners.
Feasibility	CHW operates many gravity sewer networks and is well understood and support by existing supply chain and contractors.	Pressure sewer systems are less common and create potential confusion with Talbot's system being significantly different to surrounding systems.

7.2 Stakeholder input to the preferred option assessment

Most stakeholders are impacted by both options similarly; however, the pressure sewer options have high upfront costs and more operational responsibility for residents. The CHW sewer service fee charges are expected to be the same for either option. CHW has a strong preference to a gravity sewer system to align with existing operational knowledge, experience and business practice. A pressure sewer is not preferred by CHW, as it creates additional interface risk with network operations with residents owning and operating individual residential grinder pumps.

Key stakeholder input to the assessment includes:

- **Local Residents** would have a preference for the gravity system as it less operational responsibilities than the gravity system.
- **Central Goldfields Shire Council** has a primary interest in accommodating future growth in Talbot township and is interested in local environment, tourism and jobs.
- **Central Highlands Water** has strong preference to gravity system to align with general business practice.

Further rationale for these stakeholder views were captured through the multi-criteria analysis and summarised below.

7.3 Alignment with business operations

Table 7-2 summarises how the two project options align with CHW's business operations.

Table 7-2: Alignment with CHW business operations

Alignment	Option 2: Gravity sewerage network with new local Talbot WWTP	Option 3: Pressure sewerage network with new local Talbot WWTP
Consistency with CHW business operations	Delivers the intended benefits and aligns with CHW normal business practice and is consistent with regional sewerage management practices.	Delivers the intended benefits; however, it is not within CHW's normal business scope and is not the preferred technology for CHW as it is inconsistent with regional sewer management. This could potentially create issues with integrating it into the regional development of Talbot.
Ongoing costs and operations		Has a higher cost to residents in connection and great operational and maintenance responsibility for CHW.
Net zero emissions targets	Gravity system has less overall pumping and expected to use less electricity (scope 2 Emissions). The scope 1 emissions of methane and nitrous oxide are the same for both options.	The pressure system has higher overall pumping and expected to use more electricity (scope 2 Emissions). The scope 1 emissions of methane and nitrous oxide are the same for both options.

7.4 Risk comparison

The relative risk of each project option was assessed. Only risks that help differentiate between options were considered. Project risks were identified and assessed based on the consequence if it occurred and the likelihood of the occurrence (high, medium or low). The results are shown Table 7-3.

Table 7-3: Risk comparison of project options

Project Risk	Option 2: Gravity sewerage network with new local Talbot WWTP	Option 3: Pressure sewerage network with new local Talbot WWTP
Community opposition due to capital cost of connection	Low	Medium
Community opposition due to operational cost of service with residents	Low	Medium
Cost increases relative to estimate	Low	Medium

Under the base case scenario the problem statements are not addressed, notably:

- The odour and contaminated waste issues would continue posing a risk to water quality in waterways which can impact the environment, water users as well as amenity.
- Housing shortfalls within the shire may be realised due to a lack of housing lots suited to development.

7.5 Capital costs

Table 7-4 below outlines the real capital costs of each option. Included in the capital costs estimates are:

- $1.87 million WWTP establishment and land purchase
- $360k Provisional Allowance Easement and Legals

Table 7-4: Real capital costs by project option, ($2023)

Cost classification	Option 1	Option 2	Option 3
Total base real costs	$0	$25.7m	$24.7m
With Contingency P50	$0	$30.2m	$29.0m
With Contingency P90	$0	$34.7m	$33.3m

7.6 Social benefits

Table 7-5 summarises the distribution of social benefits between the two project options.

Table 7-5: Social benefits overview

Social value	Option 2: Gravity sewerage network with new local Talbot WWTP	Option 3: Pressure sewerage network with new local Talbot WWTP
Amenity improvements (odour removal)	✓	✓
Heritage value	✓	✓
Education benefits	✓	✓
Employment access/ well-being	✓	✓

Social benefits relevant to Option 2 will also be realised under Option 3. These include:

- Amenity improvements – relative to the base case, both options will treat sewage.
- Both options could eliminate existing odour released from septic tank.

The avoid community cost of $25,000 per tank replacement is significant. It is not clear when existing Talbot septic tanks are in need of replacement. This expense would avoid residents approximately $25,000 per dwelling, totalling $3.5 million in avoided capital costs to the Talbot residents, if a reticulated sewerage system were to be installed before the septic tanks need replacement.

7.7 Environmental impacts

The environmental benefits are the same for both options and include:

- Maintaining the existing ecosystem condition. Managing sewage waste and septic waste, targeting the discharge location, will ensure that adverse impacts on local water quality and ecosystem health will be adequately mitigated. Both options will comply with EPA requirements.

7.8 Economic impacts

Table 7-6 summarises the distribution of economic benefits between the two project options. It shows that both options will have a similar increase in tourism and have flow on economic impacts to the broader regional economy.

Table 7-6: Economic impacts overview

Economic value	Option 2: Gravity sewerage setwork with sew local Talbot WWTP	Option 3: Pressure sewerage network with new local Talbot WWTP
Local tourism impacts	✓	✓
Flow on economic impacts to other industries	✓	✓

7.9 Project implementation

Table 7-7 summarises the estimated project delivery timeframes for the two project options.

Table 7-7: Indicative project delivery timeframes

Phase	Option 2: Gravity sewerage setwork with sew local Talbot WWTP	Option 3: Pressure sewerage network with new local Talbot WWTP
Detail Design (Range)	2-3 years	2-3 years
Procurement (Range)	1-2 years	1-2 years
Construction (Range)	2-3 years	2-3 years
Commissioning Connection	1-2 years	1-2 years

7.10 Value creation opportunities

Table 7-8 summarises potential value add opportunities associated with the two project options.

Table 7-8: Potential value add or co-investment opportunities

Opportunity	Option 2: Gravity sewerage network with new local Talbot WWTP	Option 3: Pressure sewerage network with new local Talbot WWTP
Reuse of treated water from the local Talbot WWTP	Recycled water from the WWTP may be used by existing farmers in the area. This may reduce land purchase requirements if a longer-term irrigation agreement could be reached. If feasible, this could provide co-design and co-investment opportunities.	Recycled water from the WWTP may be used by existing farmers in the area. This may reduce land purchase requirements if a longer-term irrigation agreement could be reached. If feasible, this could provide co-design and co-investment opportunities.

7.11 Septic tank renewal discussion

Consideration was given to the renewal of existing septic tanks within Talbot township. This option was determined to be not feasible.

The renewal of existing septic tanks would not allow future growth of new developments, as existing septic tanks within Talbot are generally understood to not comply with minimum lot sizes of 4,000 m^2. Existing septic tanks are understood to be grandfathered assets and would not comply with current CGSC regulations.

Consultation within the CGSC did not find a list of existing septic tanks within Talbot that are known to be noncompliant. Furthermore, no information has been provided through the development of this

business case to indicate that existing Talbot residents need or want additional funding to maintain or renew existing septic tanks for individual landowners.

This option was not investigated further due to the previously listed considerations.

7.12 Interdependencies

Key interdependencies and interfaces that are relevant to the problem include the following:

- The purchase land for the new Talbot WWTP is critical to provide certainty on delivery timeframes and obtaining necessary EPA approvals for a licence facility. The project would benefit from the early purchase of land to give certainty on key project decisions and cost estimates, which are reflective of assumptions of where the WWTP will be located.
- The existing septic tanks may become a point of issue for the community in terms of how the tanks are managed and the cost burden.
- Talbot residents' capacity to pay for connection and increased operational costs needs to be confirmed to ensure wide community support. Consideration may need to be given to loans and/or grants for connections.
- Talbot Futures Structure Plan – Draft Discussion Paper released in December 2022 includes a breakdown of issues and opportunities within the Talbot township for future growth.

These interfaces will be accommodated through the design, funding, governance structure and project plan.

Table 7-9: Evaluation of response options

	Option 1: Base Case	Option 2: Gravity sewer network with new local Talbot WWTP (F)	Option 3: Pressure sewer network with new local Talbot WWTP (F)
Benefits			
Benefit 1: Supports business and housing growth opportunities in Talbot (25%)	0%	90%	70%
Benefit 2: Improves sewerage waste management and minimises unpleasant odours throughout Talbot (20%)	0%	100%	100%
Benefit 3: Minimises the risk of sewage spill to environment and maintains clean waterways (10%)	0%	80%	80%
Benefit 4: Improves liveability and confidence to invest in Talbot in the long term (20%)	0%	80%	80%
Benefit 5: Prevents the decline of Talbot and unlocks growth opportunities (25%)	0%	50%	50%
Cost			
Capital total estimated investment (TEI)	NA	~25.7 million	~ 24.7 million
Net incremental output costs (annual)	NA	~0.7 million per annum	~0.7 million per annum

	Option 1: Base Case	Option 2: Gravity sewer network with new local Talbot WWTP (F)	Option 3: Pressure sewer network with new local Talbot WWTP (F)
Time			
Detail Design (Range) Procurement (Range) Construction (Range) Commissioning Connection Phase (Range)	NA NA NA NA	Options cannot be differentiated on the basis of delivery timeframes	
Risks (likelihood / consequence)			
Risk 1	Will not improve Talbot conditions **(H)**	Opposition from local community for increase in service costs **(M)**	Opposition from local community for increase in service costs **(M)**
Risk 2	Unable to grow or develop Talbot **(H)**	Opposition from local community for connection capital costs **(M)**	Opposition from local community for connection capital costs **(H)**
Dis-benefits			
Dis-benefit 1	Poor sewerage management, severely impacting visitor economy	Local WWTP uses local farmland, reducing farming area	Local WWTP uses local farmland, reducing farming area
Dis-benefit 2	Reduced heritage value	Talbot has high impacts during construction phase impacting business and residents	Talbot has high impacts during construction phase impacting business and residents
Ranking			
Ranking	3	1	2

7.13 Integrated analysis and options ranking

Table 7-10 summarises the results from the options assessment.

Table 7-10: Integrated analysis

	Project Option 2: Gravity Sewerage Network with New Local Talbot WWTP	Project Option 3: Pressure Sewerage Network with New Local Talbot WWTP
Stakeholder preferences	CHW preferred system	Not preferred by CHW
Social impacts	Low	Medium
Environmental impacts	Low	Low
NPV	Most likely > 0	Most likely >0
Risk comparison	Low – Medium	Low – Medium

8. Economic evaluation of the preferred option

The purpose of the economic evaluation is to assess whether the project provides value for money from the perspective of society, considering a range of social, environmental, economic and cultural impacts.

Cost benefit analysis (CBA) is the traditional approach to evaluating the viability of project options, as it provides decision-makers with a strong basis for comparing alternatives based on monetary costs and benefits. The CBA was conducted on the preferred Option 2. It covers a construction period from 2024 to 2029 and 30 years of operations from 2030 to 2059. The CBA was conducted in accordance with Department of Treasury and Finance guidelines.

Benefits

The key economic monetised benefits of introducing a reticulated sewerage system in Talbot include the following:

- **Accelerated housing development benefits.** It is anticipated that the implementation of the reticulated sewerage system will lead to an increase in housing development. This will result in an increase in housing sector development gross margin and productivity generated. The gross margin included is 25% of the Regional Victorian median house price of $568,000 (Dept. of Transport and Planning, 2022).
- **Reduced social cost of waterborne diseases.** This is related to the reduced risk of local residents obtaining waterborne diseases from improving the sanitation system. The NSW Trade and Investment CBA Toolkit suggests that residents are willing to pay $315 per person per annum to improve the sewerage system in order to reduce the risk of waterborne diseases.
- **Increased local tourism spend.** This benefit stems from the fact that an improved sewerage system will increase the profile of Talbot. This will result in an increase in the number of tourist visitors.
- **Increased amenity and reduced odour benefits.** This relates to reduced risk of odour from providing an improved sewerage system. This results in an improved amenity benefit for each future resident for Talbot. This benefit relies on a willingness to pay value of $212 per household to reduce the risk of odour (Flemish Department of Environment, Nature and Energy, 2009).
- **Avoided septic rank replacement costs.** This is a cost saving related to households avoiding septic tank replacement costs. The replacement cost is estimated to be $25,000 per dwelling. While the condition of existing Talbot septic tanks is not known it has been assumed that replacement is expected within 10 years.
- **Avoided cost of septic system maintenance.** This benefit is related to reduced costs faced by household to maintain septic tanks. The annual avoided cost per household is $395 per annum (NSW SAFE AND SECURE WATER PROGRAM Cost Benefit Analysis Guiding Principles, 2018)
- **Residual value.** This is the remaining asset life that will benefit the community after the appraisal period of the CBA.

Costs

Table 8-1 below outlines the real capital costs from the cost estimate included in the CBA. The P50 capital cost is used in the core CBA.

Table 8-1: Cost estimate real capital costs by project option

Cost classification	Option 2 ($m)
With Contingency P50	$ 29.4 million
With Contingency P90	$ 33.4 million

In addition to the capital costs outlined in Table 8-2, the CBA also includes an allowance of $1.4 million for the decommissioning of septics at existing dwellings. This is calculated using the CHW assumption of $10,000 per decommissioned septic tank system per dwelling for 140 properties.

The CBA also accounts for the operating and maintenance costs of the new sewerage system. The annual operating and maintenance costs are estimated to be 3% of the project capital cost. This equates to $0.8 million per annum for P50 capital costs.

CBA summary results

Table 8-3 below shows that the project returns are a positive net present value (NPV) of $1.1m and a benefit cost ratio (BCR) of 1.0. This demonstrates that the project is economically viable and is a positive investment for the community.

The single dominant benefit comes from the accelerated housing development. The second largest benefit is avoided pump-out sewerage system costs.

Table 8-3: Core CBA results

Benefits/costs	Option 2 ($m)
Costs	
Capital costs	$ 24.8 million
Operating costs	$ 10.4 million
Total costs	**$ 35.2 million**
Benefits*	
Accelerated housing development benefits	$ 28.9 million
Increased tourism spend	$ 0.2 million
Amenity improvements (odour, water taste)	$ 0.5 million
Avoided social cost of water borne diseases	$ 1.8 million
Avoided cost of septic tank replacements	$ 1.8 million
Avoided cost of septic system maintenance	$ 1.2 million
Residual value	$ 1.8 million
Total benefits	**$ 36.2 million**
Viability metrics	
NPV	$ 1.1 million
BCR	1.0

** The benefits analysis does not include the expected CHW sewerage tariff fee. The operational costs are included in the economic costs.*

Sensitivity tests

Sensitivity tests are undertaken to assess the robustness of the economic viability of a project by changing several key assumptions. Table 8-4 indicates that the project's viability varies between 0.8 to 1.5 under different assumptions. This shows that the BCR has a relatively high lower limit BCR, and more upside if assumptions are more favourable.

Table 8-4: CBA sensitivity tests

Sensitivity tests	BCR
4% Discount rate*	1.5
10% Discount rate*	0.8

Sensitivity tests	BCR
20% Higher capex	0.9
20% Lower capex cost	1.2
20% Higher benefits	1.2
20% Lower benefits	0.8

8.1 Financial analysis

A financial analysis of the project was undertaken to assess the costs and revenue potential of the project. The analysis looked at the entire suite of revenue that could be earned by the revenue public sector entities. The analysis was conducted using the following assumptions:

- Assessment period: 3 years of construction plus a 30-year operations period
- P50 nominal capital cost
- CPI of 3.5%.

8.1.1 Operating and maintenance costs

Operating costs are estimated at 3% of the capital cost for the project, which amounts to approximately $0.8 million per year averaged over 30 years. The operating costs initially would far exceed the initial income from tariffs (less than $0.2 million per year) if based on the current charges and 140 connections. The operational costs have the added benefit of being revised in future CHW pricing periods with the Essential Service Commission (ESC) to be adjusted over time. As CHW has a uniform pricing model across its region, the over or under estimation of the operational costs will be corrected over time through customer tariff pricing. The initial 3% measure has been tested with CHW and reflects the expected operational costs of similar-sized towns and systems, such as the neighbouring township of Clunes.

8.1.2 Potential revenue

Table 8-5 shows the potential revenue that could be generated by the project over 30 years. These results include a 3.5% CPI indexation for revenue. As discussed earlier in the business case, the project has the potential to generate the following revenue streams:

- CHW Sewer Charges from users ($750 per year per property).
- Property revenue from accelerated housing development:
  - Council property rates ($0.002934 per $ of property value)
  - Stamp duty from housing purchases ($2,870 plus 6% per dollar over $130,000), assuming every house is sold once in a 30-year period
  - GST revenue from housing sales (10% of housing sales).

Table 8-5: Potential revenue summary results

Revenue	Nominal results
CHW sewer charges	$ 25.3 million
CGSC rate	$ 56.1 million
VIC stamp duty	$ 23.4 million
GST	$ 45.5 million
Total revenue	**$ 150.3 million**

8.2 Uncertainties

Key uncertainties impact the success of the project, and the proposed management of these uncertainties is summarised in the following Table 8-6.

Table 8-6: Identification and management of uncertainties

Uncertainty	Description	Management approach
Purchase of Talbot WWTP	The Talbot WWTP needs to be secured to provide certainty to project design, costs and delivery. The remaining elements of the project are to be constructed in road reserve and public lands. The land for the WWTP is critical to project progress.	Negotiations with the local landowners should be undertaken to confirm the viability of the local Talbot WWTP. Land purchase or options on land should be negotiated by CHW and CGSC to progress the project.
Confirmation of Talbot community support with expected contribution costs	The connection costs and service fees need to be confirmed with Talbot residents to ensure that the project is within the community's capacity to afford.	Once community capacity to pay is confirmed, additional measures could be explored to provide low-cost loans or grants to residents to support the sewer scheme. This may require a revision of the business case.
Talbot Community Support for the sewerage Scheme	Risk with community not connecting existing houses to the system (willingness of people to connect), CHW reputation and legal issues of forced connections. CGSC risk with potential need to for removal or commissioning of the existing septic systems.	Further community engagement is essential to ensure the project aligns with community needs and support.
Forecasted Growth	The operational costs for the Talbot reticulated sewer systems need to be supported by forecasted growth in new dwellings for increased revenue. Growth is the underpinning aspects to this business case.	Consideration should be given to market the new land for development in Talbot. Potential discussions with regional land developer could be undertaken to encourage new dwellings.

9. Deliverability of recommended solution

9.1 Detail of recommended solution

The recommended solution involves a reticulated gravity sewer network to collect waste and transport it to a central sewer pump station for transfer via a rising main to a new local wastewater treatment plant constructed to the east of the Talbot township. Key features of this project include:

- Approximately 9.2 km of gravity sewer pipelines ranging in diameter from 150 mm to 300 mm
- A submersible sewer pump station with approximately 68 kilolitres of wet weather storage transferring waste via a 2.9 km long rising main that incorporates railway under bores
- A new wastewater treatment plant for sewage treatment - proposed to be a lagoon-based system with on-site recycled water for irrigation.

9.2 Delivering additional social and cultural value

As part of the detailed design, an allowance will be allocated to explore and support opportunities to leverage the investment to deliver additional community benefits. The nature of this work is not known yet, but the implementation will be based on co-designing opportunities with the community and incorporating the time to do this in the proposed project plan.

Co-design is a way of empowering those who can benefit from the initiative to provide input on the opportunities that can generate social and cultural value.

Examples of opportunities to be explored include:

- Re-use of disposal for farming
- Education initiatives on water use with community groups.

9.3 Scalability of the project solution

The recommended solution is based on requirements to ensure the safe disposal of existing township sewage. If additional houses are being built, the sewerage network can be expanded by a developer to facilitate future growth to the extent outlined in the CGSC structure plan. The extension works would be funded by private developers and are not included in this business case. It is noted that the system has additional capacity factored in to avoid developers having to replace proposed sewerage networks. The selected sites allow for an expansion of the sewerage network service area should that be required in the future.

9.4 Planning, environment, heritage and culture considerations

Desktop assessments of planning, environment, heritage and cultural considerations and required approvals have been completed by Jacobs as part of the concept design (Jacobs, 2023).

The new local Talbot WWTP was preferred in the assessments due to its small impact footprint and the available information when compared to other options. The Talbot township has several listed heritage sites that will need to be avoided, should the sewerage scheme proceed.

A Cultural Heritage Management Plan is likely required as the proposed works constitute a high-impact activity because the construction would result in significant ground disturbance in an area of cultural sensitivity.

9.5 Commercial and financial

The current market conditions have greatly impacted contractors' capacity and capability to deliver infrastructure projects. This has exacerbated a market that was already stretched due to the large number of competing projects to be delivered, leading organisations to be more strategic in choosing which projects to bid for. This highlights the importance of testing the market as part of the procurement process before committing to a delivery approach.

Market conditions will determine the ultimate procurement model based on market feedback and a corresponding Expression of Interest (EOI) process. This is captured in the procurement approach and delivery schedule.

The procurement options outlined here are procurement models that would be suitable for consideration in the delivery of the project, but subject to the process outlined below.

9.6 CHW procurement approach

CHW has significant experience managing backlog sewer schemes, including design, construction and operating contracts for large and complex projects. CHW's approach involves:

- **A market scan** – testing of market conditions, identifying potential contractors and their ability and capacity to deliver the requirements of the project. This will help test the proposed timelines, and the approach for the Expressions of Interest (EOI) stage.
- **Delivery Model** - CHW will need to confirm the preferred delivery model for procurement to best suit CHW and the project objectives in the market conditions at the time.
- **Expressions of interest** – used to confirm market interest prior to tendering. It is used to shortlist suitable Contractors. This stage will not determine the preferred procurement model and will allow the market to determine the most efficient way to deliver the project. It is important to understand whether certain market conditions may become a barrier to achieving some of the project objectives.
- **Single stage tender process** – this will generally only go to contractor shortlisted at the EOI stage but could include more contractors if deemed appropriate. Again, this stage will be outcome focused, and therefore not be prescriptive about the preferred delivery model.

9.7 Potential procurement models

The procurement strategy needs to consider the options that have potential to account for the project characteristics and that meet the intended project outcomes. This includes not just the economic and environmental objectives, but also covers the social and cultural aspects and longer term legacy benefits desired.

In particular, the level of involvement of CHW in the facility is another consideration in the procurement model for the ongoing operations and maintenance post-commissioning. The ongoing constrained market for contractors should also be considered in order to ensure that the procurement model will appeal to the market in its approach and attract competitive bidding. Organisational capability to both procure and manage any selected procurement model is also critical to ensuring the project is delivered successfully. Separation of the project into the WWTP as one package and the sewer network and pump station being a second package for procurement is a possible consideration.

Based on these aspects, the potential procurement models considered for the project are:

- Construct-only contract
- Design and construct
- Design, Build Operate and Maintain

- Early contractor involvement (ECI)
- Managing contractor (MC)

Based on the estimated capital expenditure and ongoing operational expenditure, a public private partnership model has not been considered due to its insufficient size to attract private finance.

Table 9-1 outlines each of these procurement models and their characteristics.

Table 9-1: Procurement Models

Procurement method	Description
Construct only	▪ The project is designed to a construction-ready state by the Principal's Designer, allowing the engagement of a contractor to undertake the construction on a fixed-price basis. This model requires the procuring agency to have a well-defined scope and strong design management, procurement and contract management capability.
Design and construct	▪ The contractor develops a detailed design based on the client's concept design and is engaged on a fixed-time and cost basis. This is suited to situations where the project can be adequately scoped, and the risks can be identified and priced, with the design risk being able to be passed through to the Design and Construct (D&C) contractor.
Design, Build Operate and Maintain	▪ This model extends the design and construct scope to include the maintenance for the asset once it is complete. By including the operations and maintenance scope, the contractor may be commercially driven to consider the whole-of-life costs in its design and allows for the consideration of higher-cost construction options that deliver net savings over the long term.
ECI	▪ ECI is a 'relationship' procurement method that involves contractors in the preliminary design process to assist in the designing and planning of the project in a collaborative manner based on the client's brief. ▪ Similar to a design and construct delivery model, the key difference is that ECI utilises the contractor's specialist knowledge earlier in the project planning and design process. This is then followed by either a fixed price Design and Construct contract or another form of collaborative contract such as those with a target cost.
MC	▪ This model involves a single appointed party responsible for the project delivery similar to a D&C contract, but with its main role being the project management, with a requirement normally to subcontract out all its design and construction obligations. The Principal retains a large degree of control over the engagement of these subcontractors. The MC would be commonly paid using a combination of a fixed price for the management services with a reimbursable component for the subcontracted portions.

Table 9-2: Procurement Model Considerations

Procurement option / objective	Construct only	Design, construct and maintain	Design and construct (D&C)	Early contractor involvement	Managing contractor (MC)
Risk allocation and management	Interface risk between the design and construction may result in a less-than-optimal outcome.	Single point of responsibility to manage both the delivery and post-delivery risk.	Integration of the design and construction risk to the contractor, while minimising interface risk.	Reduces the risk of misalignment between the scope and the available budget, particularly during the early stage planning.	The MC is incentivised to achieve early completion despite the time delay risk being ultimately borne by the principal. Its early stage involvement covering both the design and construction ensure interface risk is minimised.
Whole-of-life costs	It is less likely to achieve whole of life savings given the design may not fully consider the construction and maintenance aspects as strongly.	The wrapping of both the D&C as well as the maintenance by the one provider is likely to result in greater whole-of-life benefits due to the alignment of both the principal and the contractor. The duration of the maintenance contract may also influence the extent of these savings.	May not capture whole-of-life benefits if the design is focused on reducing the capital expenditure component of the project.	Principal's input allows the consideration of lifecycle asset risk in the design process while achieving good understanding of the impact of design changes on the overall costs.	Similar to a D&C contract, this model may not capture whole-of-life benefits if the design is focused on reducing the capital expenditure component of the project. The greater involvement of the Principal under an MC model however can ensure that the ongoing operational costs are an area of focus.
Market interest	This model may attract sufficient competitive bidding particularly if the design scope and risk is reduced with	Given the longer-term nature of the operational phase, this would be less attractive to CHW and certain	There would be reduced market interest for this model. The size of the project may not attract the Tier 1 contractors	It would be expected that the market would have interest to be involved given their ability to influence the risk profile of	It would be expected that the market would have interest to be involved given their ability to influence the risk profile of

Procurement option / objective	Construct only	Design, construct and maintain	Design and construct (D&C)	Early contractor involvement	Managing contractor (MC)
	construct only approach.	providers that the operational costs are low.	and Tier 2 are unlikely to have the capacity to manage the complex approvals and design process with land purchase.	the project at this early stage.	the project at an early stage.
Timing to deliver project	This would entail a longer procurement period due to being split between the design and construction tenders.	Timing of the project appears sufficient. It would not be expected to impact the delivery timeline by including the maintenance scope, although there may be an additional time allowance required during the procurement phase.	The timing of the project appears sufficient to be delivered under a D&C model.	The timing will depend on the time spent during the ECI phase but it would be expected to deliver efficiencies due to its non-sequential approach and consideration of risks in the early stages of the project planning.	This procurement model allows earlier involvement and may be able to deliver greater time efficiencies as a result.
Organisational capability	There would be capability to manage this style of contract but may require personnel with the interface experience to minimise issues arising between the design and construction aspects.	Given the common use of the D&C model, there would be expected to be strong capability in managing this style of contract. The maintenance scope would require resourcing capability that may not already exist.	Given the common use of the D&C model, there would be expected to be strong capability in managing this style of contract.	Principal and its designer will need to be able to work collaboratively for this style of contract as will the selected ECI contractor.	The MC model will require the Principal's team to be experienced and able to work collaboratively at a greater level compared to a D&C contract.

9.8 Risk assessment and management

The risk management framework adopted aligns with Australian Standard (AS) ISO 31000:2018 and include:

- Establishment of risk assessment criteria for the project
- Risk identification involving relevant stakeholders
- Establishment of a risk register
- Development / identification and implementation of strategies to mitigate identified risks
- Regular monitoring and review processes.

The key risks relate to cost estimates, operational arrangements and uncertainty of whether the projected population takes place as predicted.

Some of the key risks associated with this project and approaches to risk mitigation are outlined in Table 9-3.

Table 9-3: Project risks and proposed management

Risk	Risk rating (pre mitigation)	Mitigation strategy	Risk rating (post mitigation)
Capex and opex costs are based on preliminary estimates (class 5). Final costs could be above approved budget	Significant	Appropriate contingency has been allocated (P50 and P90 estimates have been provided) The concept design has identified levers for optimising cost estimate and budget management Project management team and procurement approach to manage budget risk	Medium
New housing and land developments do not take place as predicted	High	Introduce tourism and industry initiatives to Talbot. Attract first home buyers	Medium
Residents oppose proposed wastewater treatment plant at Talbot	Significant	Develop a communication and engagement strategy and ensure that all stakeholders are consulted during the design and construction phase	Medium

9.9 Detailed costing

Detailed costing is provided in Table 9-4. The full cost plan is provided in Appendix C. This business case requests a capital investment of $36.1 million from the state government to deliver the project. The funding request is based on the P90 project capital cost.

Table 9-4: Nominal capital costs (including contingency and escalation) for Option 2 ($2023)

Cost classification	($ million)
Project Costs	
Total project base estimate	$ 27.1 million
With Contingency P50	$ 31.6 million
With Contingency P90	$ 36.1 million

9.10 Funding sources

It is proposed that the project is fully funded by the Regional Development Victoria (RDV), a partnership between the Australian state and territory governments. Alternative funding sources, including contribution from Central Goldfields Shire Council are considered, given that they are beneficiaries from the proposal. CHW may be directed to contribute to the project; however, advance notification is required for inclusion in the relevant pricing plan. CHW further noted that CHW cannot recover costs from its customer base for growth related projects, according to recent advice from the Essential Services Commission (ESC). This may limit CHW capacity to contribute as Talbot sewerage scheme is to provide future growth area for the CGSC.

When looking at co-design opportunities and other social and cultural value enhancement opportunities, the project team will provide support to identify additional (i.e., non-government) funding sources to leverage government investment.

9.11 Staffing impacts

CHW estimated staffing impacts are to be two full-time operational staff for CHW. One would be involved with the WWTP. The second would provide operational management for the sewer network and associated pump station. Initially, this may be higher for commissioning and addressing faults. Over time, this may reduce as the system becomes better known and managed.

10. Management

10.1 Governance and project management strategy

Project governance and control are critical to a project's ultimate success. If the project receives grant funding, CHW will be the lead delivery agency responsible for project delivery and ongoing operations.

10.2 Stakeholder engagement and communications plan

A communications and stakeholder engagement management plan will be developed in the next stage of planning (once the preferred option is determined and funding is approved and all relevant agencies are committed). CHW and CGSC will be the lead agencies to develop and manage stakeholder engagement and a communications plan. It is noted that Talbot is an existing customer of CHW with potable water services in operation. CGSC is the local government for Talbot.

The communications strategy will:

- Identify key stakeholders and their interests by expanding on the information contained and appropriate channels / frequency for communicating with them.
- Identify timing, type and frequency of communication with each stakeholder group throughout project planning, procurement, delivery and through to commissioning.
- Identify specific actions to proactively manage stakeholder concerns and expectations. This is particularly important through the planning stage to avoid delays.
- Manage stakeholder and community expectations for project outcomes by communicating progress and updates throughout project delivery.
- Establish and implement a marketing plan for co-design opportunities.
- Monitor local and wider press coverage regarding the project, from design through to post-commissioning and operations.

10.3 Stakeholder mapping

Table 10-1 provides a summary of key project stakeholders.

Table 10-1: Stakeholder summary

Stakeholder	Relationship	Consultation to date	Synergies/benefits from the project	Interest
Victorian Government				
Minister for Water	Head of project governance	Low	Deliver on government commitments	Reputation and commitments
Local members of parliament	Key influencers on Ministerial decision	Low	Deliver on government commitments Satisfied local stakeholders	Reputation and commitments
Government agencies				
DEECA – Planning	Regulatory role	Low	None	Project approvals
EPA	Regulator of discharges	Low		Regulate wastewater treatment and disposal management

Stakeholder	Relationship	Consultation to date	Synergies/benefits from the project	Interest
RDV – Regional Development Victoria	Regional development	High	Enhanced regional development	Grant funding agency. Opportunities for tourism and industry development
Water and environment management agencies				
Central Highlands Water	Responsible for delivering urban water and sewerage services Operate an interim management approach	High	Current operator for potable water supply to Talbot	Ongoing operational responsibilities Asset owner and relationship with customers
North Central Catchment Management Authority	Social, economic and environmental outcomes of the surface waters around Bendigo Regulatory role	Low	Improving waterways will support core objectives	
Local government and community				
Central Goldfields Shire Council	Interest in local environment, tourism and jobs	High	Improved amenity Maintained and enhanced tourism Support growth and housing strategy	Interest in community impacts and opportunities for co-development Opportunities for development. Assistance with stakeholder engagement.
Dja Dja Wurrung	Traditional owners	Low	Goal of healthy land and waterways that meets the need of their people.	Supportive of option which will protect waterway health and take a holistic view of healing land following mining impacts Interested in co-location opportunities (e.g. water reuse on-site).
Local community in surrounding towns	Interest in jobs and environmental amenity	Low	Improved environment and amenity, more jobs through enhanced tourism	Medium interest / low impact / low influence Interested in finding new affordable housing nearby to Maryborough
Talbot residents	Potentially impacted by design	High	May benefit from rehabilitation of site if brought forward	Interested in amenity, noise and traffic disruption during construction and operation

11. Delivery

11.1 Change management

There are no significant changes in organisational process required to effectively deliver this project and to realise the intended benefits. The governance structure, including the Project Control Board and the advisory groups, is already established and effective within CHW.

The operation and maintenance of the treatment plant will be under CHW management.

11.2 Timelines and milestones

The proposed project schedule is summarised in Figure 11-1. This is an indicative program only, with a more detailed program to be developed as part of the reference design phase. Key assumptions underpinning the schedule include:

- Site investigations will not commence prior to funding approval.

It is noted that this project can be staged with an initial step of land purchase of the wastewater treatment area and undertaking detail design. This reduces project risks, allowing for a further funding application in two steps.

11.3 Readiness and next steps

This project needs to communicate the business case to key stakeholders and potential funding agencies. Key actions to be undertaken in preparation for funding approval and project commencement include:

- Confirming the interest and financial capacity of Talbot residents to pay for capital connection costs and service fees
- Confirming the condition of Talbot septic tanks and associated environmental risks
- Assessing potential land for the Talbot WWTP and securing a potential option for purchase of the land.

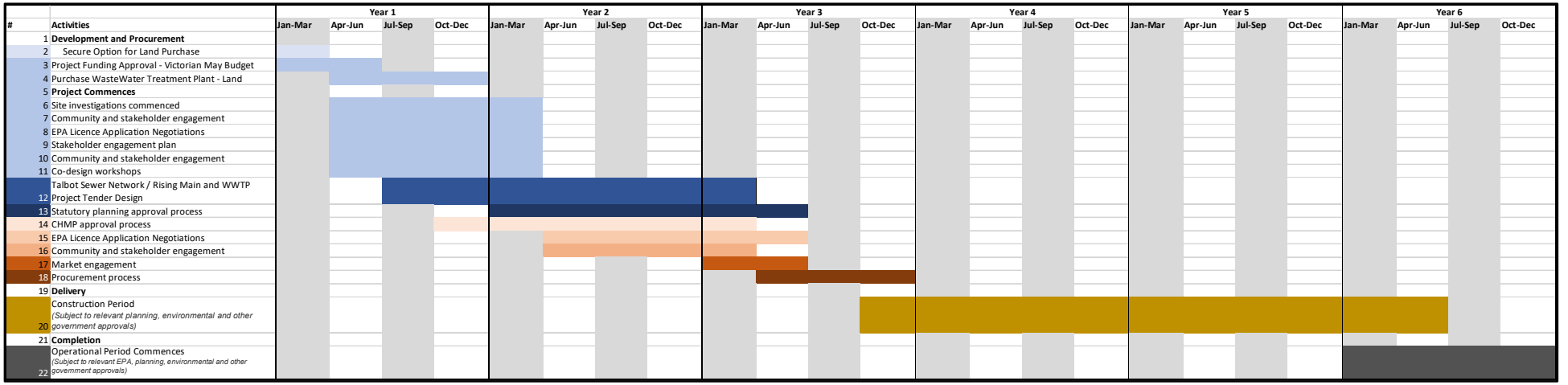

Figure 11-1: Project schedule (Guidance Only for determining potential project duration)

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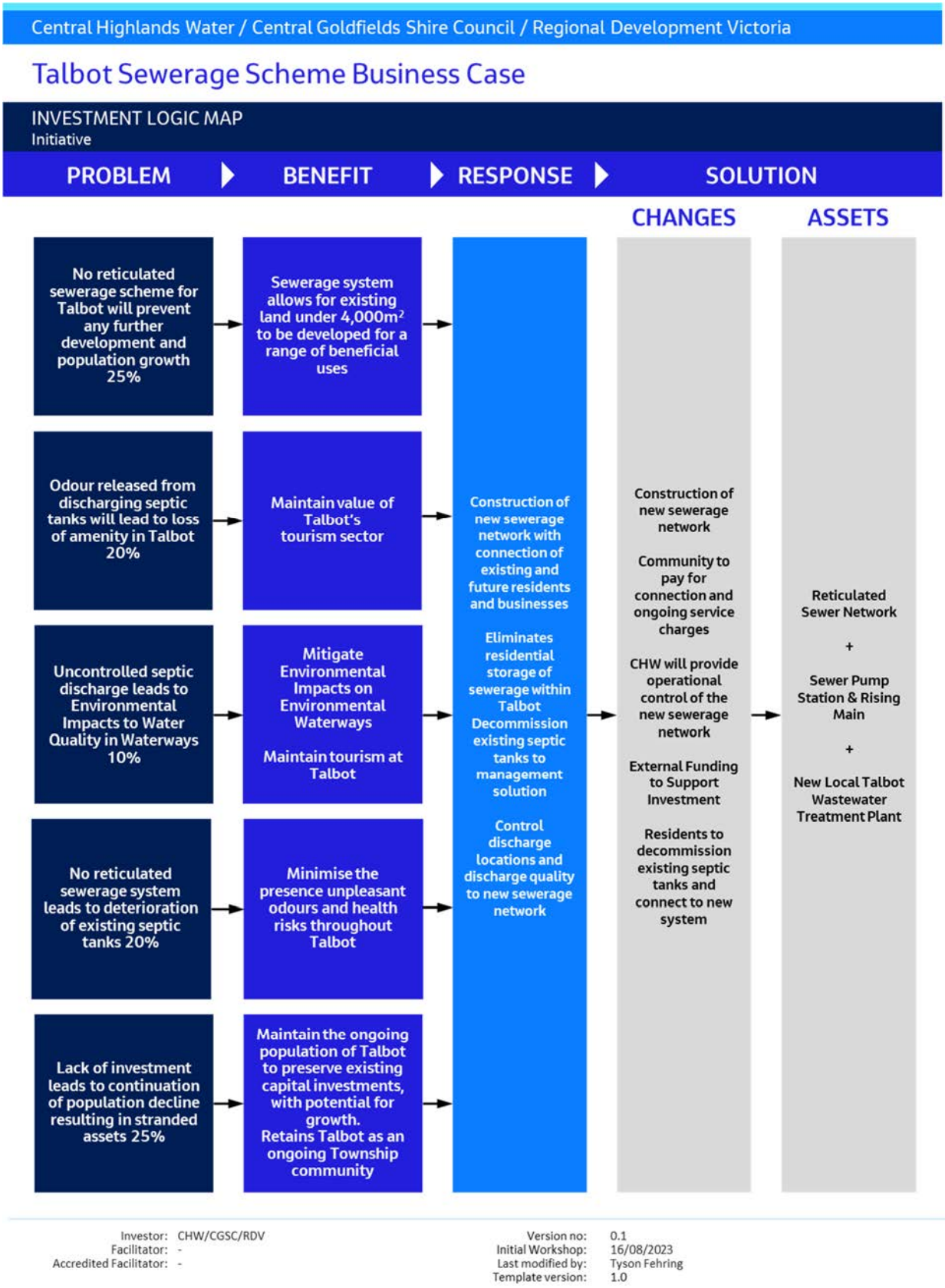
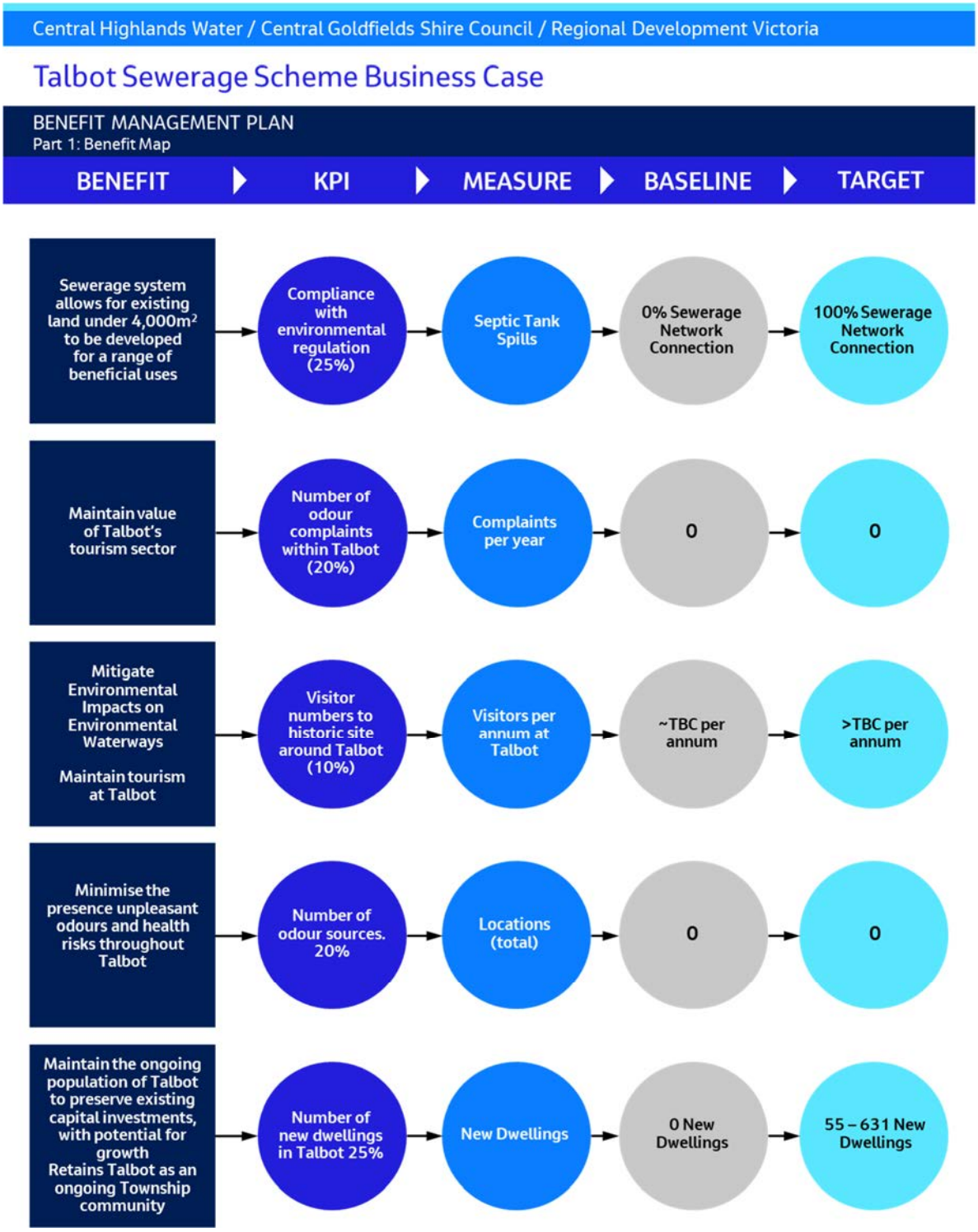
Appendix A. Investment logic map



Appendix B. Benefits management plan



Appendix C. Cost plan

Regional Development Victoria
Talbot Sewerage Scheme

Talbot, Victoria
Estimate of Cost: Feasibility

Document No: IS2600CN-0000-ME-EST-0001
Revision 0
June 2023

Prepared by Simon Baum
Cost Estimate Reviewed by Ihab Nickolla
Engineering and Construction Methods Reviewed by Bruce Lade
Approved by Tyson Fehring

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Regional Development Victoria
Talbot Sewerage Scheme
Talbot, Victoria

Estimate of Cost: Feasibility

June 2023

Document No: IS2600CN-0000-ME-EST-0001 — **Prepared by Simon Baum**

Revision 0 — **Cost Estimate Reviewed by Ihab Nickolla**

Engineering and Construction Methods Reviewed by Bruce Lade

Key Notes

Background

Regional Development Victoria, and Central Highlands Water (CHW) are investigating the feasibility of the implementation of a new Sewerage Scheme for the Township of Talbot in Regional Victoria. Currently the treatment and disposal of sewage in the township is by the use of septic tank and ground infiltration systems.

The Concept Design that this estimate is based on is described in the Jacobs design reports.

This estimate includes the following scope:

The key scope and scheme description is as follows;

1 New Gravity Sewer Network for Talbot, plus SPS and Rising Main to new local WWTP

1b Option for New Pressure Sewer Network in Talbot

2 New local Wastewater Treatment Plant on new site - land purchase required

3 Option for Rising Main to existing WWTP at Clunes or Maryborough

Estimate of Cost

Note: This estimate is based on the proposed scheme layout and service area as defined in the design reports. The alignment and depth of sewers, and the extent of sewers will vary in response to community consultation, site investigations and detailed design.

Key Rate Build-Up

Talbot Sewerage Scheme Cost Estimate Summary - Gravity Sewer Network			Incl Indirect Costs
Sewer Reticulation		5,817,369	10,801,830
Pump Station and Rising Main		1,951,000	3,622,663
WWTP		6,062,500	11,256,994
Contractor Costs		4,474,261	
Project Indirect Costs	86%	7,376,356	
TOTAL ESTIMATED COST		**25,681,487**	**25,681,487**
With Contingency P50	Guide P50	30,180,000	**30,180,000**
With Contingency P90	Guide P90	34,670,000	**34,670,000**

Talbot Sewerage Scheme Cost Estimate Summary - Pressure Sewer Network		
Sewer Reticulation		6,010,247
Pump Station and Rising Main		1,008,000
WWTP		6,062,500
Contractor Costs		4,249,224
Project Indirect Costs	89%	7,332,948
TOTAL		**24,662,920**
With Contingency	Guide P50	28,980,000
	Guide P90	33,290,000

Cost Estimate Commences here;

Descriptions	Qty	Unit	Rate	Total	Total	Notes
Site Establishment and Mobilisation					**150,000**	
Site Establishment and Mobilisation - Sewer Reticulation - Rising Main & Pump Station - WWTP	1	Item	150,000	150,000		
Gravity Sewer Reticulation	9,230	LM	336		**3,098,569**	
Indicative rate			$ 1.92	$/mm/m		
Pavement surface removals	2,000	m2	65	130,000		
Excavation	17,500	m3	55	962,500		
Sand bedding	2,800	m3	140	392,000		
150 PVC Sewer Pipe, Supply and Installation	6,720	LM	80	537,600		
225 PVC Sewer Pipe, Supply and Installation	2,210	LM	120	265,200		
300 PVC Sewer Pipe, Supply and Installation	300	LM	150	45,000		
Backfilling	14,250	m3	55	783,750		
Disposal of excess material	3,100	m3	75	232,500		
Temporary Fencing - based on 5 hours to establish a 30m works zone	20,000	LM	26	514,286		
Trench Shields - hire/purchase	1	Item	25,000	25,000		
DEVELOPER FUNDED FUTURE WORK - Deduction from above - Prorata deduction	(3,300)	LM	400	(1,320,516)		
Council Roads Reinstatement allowances - improvements to existing roads - allowance of 500x5m and 1250m x 2m - basic quality regional town roads	5,000	m2	125	625,000		
Reduction	(750)	m2	125	(93,750)		
House Branch Connections					**2,025,000**	
Branch Connections to existing occupied property boundaries	150	No	3,500	525,000		
Branch Connections to properties (future connections)	150	No	2,500	375,000		
Additional Cost for 150 full connections	150	No	7,500	1,125,000		
Sewer Maintenance Holes (MHs)					**543,800**	
Sewer MH, 800-1200 Depth	6	No	2,800	16,800		
Sewer MH, 1250-1800 Depth	19	No	3,500	66,500		
Sewer MH, 1900-2500 Depth	26	No	5,500	143,000		
Sewer MH, 2600-3400 Depth	24	No	7,500	180,000		
Sewer MH, 3500-4500 Depth	11	No	12,500	137,500		
On-property Pump Station and Storage					-	
Not applicable to Gravity Sewer						
Decommissioning of Septic Tanks		Excluded				
Gravity Sewer Network Pump Station & Rising Main					**1,951,000**	
Rising Main to Local WWTP East of Talbot						

Descriptions	Qty	Unit	Rate	Total	Total	Notes
Site Establishment and Mobilisation					**150,000**	
Site Establishment and Mobilisation - Sewer Reticulation - Rising Main & Pump Station - WWTP	1	Item	150,000	150,000		
OPTION FOR PRESSURE SEWER						
Pressure Sewer Reticulation	9,698	LM	225		**2,185,247**	
Indicative rate			$ 1.29	$/mm/m		
Pavement surface removals	2,000	m2	65	130,000		Assume open trench construction - may be trenchless for small bore pipe - assume similar cost
Excavation	8,146	m3	75	610,974		
Sand bedding	1,697	m3	140	237,601		
32 & 40 HDPE Pipe, Supply and Installation (0.4kg/m)	7,191	LM	25	179,775		
50 & 63 HDPE Pipe, Supply and Installation (.7 and 1.1kg/m)	1,061	LM	35	37,135		
110 HDPE Pipe, Supply and Installation (3.2kg/m)	659	LM	60	39,540		
125 HDPE Pipe, Supply and Installation (4.15kg/m)	88	LM	80	7,040		
160 HDPE Pipe, Supply and Installation (6.78kg/m)	519	LM	90	46,710		
180 HDPE Pipe, Supply and Installation (8.58kg/m)	180	LM	110	19,800		
Backfilling	6,449	m3	75	483,688		
Disposals of excess material	1,697	m3	75	127,286		
Temporary Fencing - based on 5 hours to establish a 30m works zone	20,000	LM	26	514,286		
Trench Shields - hire/purchase	1	Item	10,000	10,000		
DEVELOPER FUNDED FUTURE WORK - Deduction from above - Prorata deduction	(3,300)	LM	239	(789,837)		
Council Roads Reinstatement allowances - improvements to existing roads - allowance of 500x5m and 1250m x 2m - basic quality regional town roads	5,000	m2	125	625,000		
Reduction	(750)	m2	125	(93,750)		
House Branch Connections					**1,050,000**	
DN40 Branch Connections to existing occupied property boundaries	300	No	2,500	750,000		
DN40 Branch Connections to properties (future connections)	150	No	2,000	300,000		
Additional Cost for 150 full connections	-	No	7,500	-		
Sewer Maintenance Holes (MHs)						
None for pressure sewer network						
						-
On-property Pump Station and Storage					**2,625,000**	
On-property pump station and storage on existing occupied properties	350	Item	7,500	2,625,000		
Decommissioning of Septic Tanks		Excluded				
Rising Main to Local WWTP East of Talbot					**1,008,000**	
Rising Main - 200 dia HDPE, PN16 - 162.5mm ID, 10.57kg/m - $50/m supply only	1,200	LM	290	348,000		

Regional Development Victoria
Talbot Sewerage Scheme
Talbot, Victoria

Estimate of Cost: Feasibility

June 2023

Document No: IS2600CN-0000-ME-EST-0001 — Prepared by Simon Baum

Revision 0 — Cost Estimate Reviewed by Ihab Nickolla

Engineering and Construction Methods Reviewed by Bruce Lade

Descriptions	Qty	Unit	Rate	Total	Total
Rising Main - 200 dia HDPE, PN16 - 162.5mm ID,	2,900	LM	290	841,000	
Sleeved Section under Railway Line	40	LM	1,500	60,000	
Rising Main to Maryborough					
Rising Main - 200 dia HDPE, PN16					
- 154mm ID, 12.68kg/m - $60/m supply only	20,500	LM			6,355,000
Extra Over for bored sections	3,000	LM			390,000
Additional Pump Station Costs, Break Tanks					1,500,000
Air Valves & Dosing					1,000,000
Contractor's Indirect Costs					2,773,500
Engineering, etc					2,403,700
Additional Cost to go to Maryborough					14,422,200
Rising Main to Clunes					
Rising Main - 200 dia DICL, PN35	22,000	LM	400		8,800,000
Extra Over for bored sections	3,000	LM	130		390,000
Additional Pump Station Costs, Break Tanks					
- Dual Lift Pump Station					3,000,000
Air Valves & Dosing					1,000,000
Contractor's Indirect Costs					3,957,000
Engineering, etc					3,429,400
Additional Cost to go to Clunes					20,576,400
Gravity Sewer Network Pump Station					
Submersible Sewage Pump Station (SPS) as GRP package unit incl. pumps, wet well, valving, pipework, electrics, control	1	Item	250,000	250,000	
68kL Emergency Storage - example shown is Aquatec arrangement - allowance of $350k for Storage arrangement, based on current project with Hunter Water	68	KL	5,147	350,000	
3-phase Power Supply to site point of supply	1	Item	100,000	100,000	
SPS Switchboard, MCC, Control System, SCADA and telemetry	1	Item	150,000	150,000	
On Site Back-Up Power Generator with acoustic dampening - for power outage periods - auto changeover - kVA load TBA	1	Item	200,000	200,000	
Wastewater Treatment Plant (WWTP)					6,062,500
Plant					
Inlet Flow meter	1	Item	20,000	20,000	
Inlet Works and Screening - step screens	1	Item	250,000	250,000	
Lagoon inter-connection pipework	1	Item	250,000	250,000	
Treatment Lagoons - aerated primary, maturation and winter storage (similar to Beaufort). Treatment lagoons 2.0 m depth, 9 month winter storage 3.0 m depth; 700 freeboard - balanced earthworks construction, underdrainage system with clay and HDPE liners (similar to Ballan Winter Storage)	50,000	m2	70	3,500,000	
Aerators in Lagoons	4	No	45,000	180,000	
Irrigation Pump Station (outdoor/"bush shelter")	1	Item	150,000	150,000	
Irrigation System - 1 x Central Pivot	1	Set	750,000	750,000	
Treatment Plant and Irrigation Consumer Mains cable, Switchboard and Control System including SCADA and telemetry	1	Item	200,000	200,000	
Site perimeter fencing	2,000	LM	125	250,000	
Admin Building, and toilet	1	Item	100,000	100,000	
Site Roads	500	LM	275	137,500	
3-phase Power Supply to site point of supply	1	Item	250,000	250,000	
Water supply - tank and pressure pump	1	Item	25,000	25,000	
Services Relocations & Services Protections					250,000
Allowance for Services Relocations & **Protections** - additional allowance - or general slowed productivities in order to avoid existing services	1	Item	250,000	250,000	
Contractor's Costs					4,224,261
Contractor's Costs - Prelims 8%, Overheads & Profit 12%, Construction Management 15%, etc	30%	of	14,080,869	4,224,261	
TOTALS				18,305,130	18,305,130
Indirect Project Costs					7,376,356
Geotechnical Investigations - Guide - 2%, for extensive Geotech works	2.0%	of	18,305,130	**366,103**	
Engineering & Design - anticipated benchmark is 8%- 10% for full project - However this is a more simple irrigation project	10.0%	of	18,305,130	**1,830,513**	
Central Highlands Water Costs, Superintendent Costs - Project Management, and Procurement - allowance	6.0%	of	18,305,130	**1,098,308**	
Environmental & CH Related Costs - Additional Flora & Fauna, and Cultural Heritage Cost Allowances	3.0%	of	18,305,130	**549,154**	

Note: Rising Sewer Options to Maryborough and Clunes deemed too expensive.

Options are not viable, due to price.

Guide cost of $15M for Maryborough Rising Main.

Guide cost of $20M for Clunes Rising Main.

Talbot Gravity Sewer SPS typical arrangement (Aquatech GRP PS and storage)

Figure 3-2 - SPS General Arrangement (Aquatec example) – Not To Scale

Pump Station

Not Required

Wastewater Treatment Plant (WWTP) — 6,062,500 — **6,062,500**

Wastewater Treatment Plant (WWTP)

Services Relocations & Services Protections — 250,000 — **250,000**

Contractor's Costs — **3,999,224**

Contractor's Costs - Prelims 8%, Overheads & Profit 12%, Construction Management 15%, etc	30%	of	13,330,747	3,999,224	
TOTALS				**17,329,972**	**17,329,972**
Indirect Project Costs					**7,332,948**
Geotechnical Investigations - Guide - 2%, for extensive Geotech works	2.0%	of	17,329,972	**346,599**	Cheaper for shallower sewer option
Engineering & Design - anticipated benchmark is 8%- 10% for full project - However this is a more simple irrigation project	10.5%	of	17,329,972	**1,819,647**	Similar cost for both options
Central Highlands Water Costs, Superintendent Costs - Project Management, and Procurement - allowance	6.3%	of	17,329,972	**1,091,788**	Similar cost for both options
Environmental & CH Related Costs - Additional Flora & Fauna, and Cultural Heritage Cost Allowances	3.15%	of	17,329,972	**545,894**	Similar cost for both options

Regional Development Victoria

Talbot Sewerage Scheme

Talbot, Victoria

Estimate of Cost: Feasibility

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Descriptions	Qty	Unit	Rate	Total	Total
Additional Approvals - Environmental Approvals - Council Approvals - Stakeholder Management - Community Consultations	3.0%	of	18,305,130	**549,154**	
EPA Submissions and Approvals				**750,000**	
Land Acquisition for WWTP - required land parcels off approx 37 Hectares, 2 properties, based current land for sale at approx $300k for 20 acres, say $300k per 8 hectares say $37,500/hectare, plus 35% for acquisition costs.	37	Ha	50,625	**1,873,125**	
Easements & Legals - Provisional Allowance	12,000	LM	30	**360,000**	
Note: Sunk Costs are excluded from this Capital Cost Estimate.					
TOTAL ESTIMATED COST	750	Properties served		34,242	**25,681,487**
TOTAL with a nominal Contingency			35%		**34,670,007**
Potential P10 Cost			Deterministic	Optimistic	**23,110,000**
Potential P50 Cost			Deterministic	Most Likely	**30,180,000**
Potential P90 Cost			Deterministic	Pessimistic	**34,670,000**

Descriptions	Qty	Unit	Rate	Total	Total	
Additional Approvals - Environmental Approvals - Council Approvals - Stakeholder Management - Community Consultations	3.15%	of	17,329,972	**545,894**		Similar cost for both options
EPA Submissions and Approvals				**750,000**		
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Easements & Legals - Provisional Allowance	12,000	LM	30	**360,000**		
Note: Sunk Costs are excluded from this Capital Cost Estimate.						
TOTAL ESTIMATED COST	750	Properties served		32,884	**24,662,920**	
TOTAL with a nominal Contingency			35%			**33,294,941**
Potential P10 Cost			Deterministic	Optimistic		**22,200,000**
Potential P50 Cost			Deterministic	Most Likely		**28,980,000**
Potential P90 Cost			Deterministic	Pessimistic		**33,290,000**

Contingency & Risk Guidelines

The estimate is a Class 4 Pre-feasibility estimate with a nominal contingency allowed of 35%.

The project is considered medium risk due to the current unknown complexity of working adjacent to existing roads and services. In addition, ground conditions are currently partially unknown, in terms of both geotechnical complexity, existing services and extent of contaminated material to be encountered and managed. The combination of these factors, in

Guide Contingency Requirements

Estimate Class	Guide End Use	Engineering Maturity	Low Risk Project Accuracy Range	Medium Risk Project Accuracy Range	High Risk Project Accuracy Range
Class 5	Concept Estimate / Pre-Concept / Screening	1%-3%	**-20% / +30%**	**-30% / +50%**	**-50% / +100%**
Class 4	Pre-Feasibility / Feasibility / or Final Screening / Pre-Funding	2%-15%	**-15% / +20%**	**-20% / +35%**	**-30% / +50%**
Class 3	Funding Approval / Project Funding	10%-40%	**-10% / +15%**	**-15% / +22%**	**-20% / +30%**
Class 2	Project Control Estimate, with tendered pricing from market	30%-75%	**-5% / +10%**	**-10% / +15%**	**-15% / +20%**
Class 1	Tender Estimate, Plus Detailed (known) Indirect Costs	65%-100%	**-3% / +7%**	**-5% / +10%**	**-10% / +15%**

Examples of Project Risk Levels:

Low Risk Wind Farm Expansion - Stage 2, within 12 months of Stage 1, with known out turn costs, and known key supply costs.

Mid Risk In ground pipelines, treatment plants, process plants similar to recently completed plants.

High Risk High Complexity, partially unknown ground condition, a lot of in ground works, tunnels, remote working.

NOTES PERTAINING THE SCOPE ,RATES AND PRICES

Exclusions

Rates prices and total estimated cost are exclusive of GST

Excessive disposal costs due to an unforeseen requirement to dispose o excess excavated material more than 5 km from eth township of Talbot or to any contaminated waste facility.

It is assumed that the pipeline alignments are generally in undisturbed ground and that no significant ground contamination has occurred. No investigation of the history of land use and potential contamination has been undertaken at this stage. Therefore only a nominal allowance for collection and disposal of contaminated soils or excavated material is included in this estimate.

This estimate was current in June 2023 and includes no allowance for subsequent cost increases due to inflation in cost of labour and materials, limited resources in the market, foreign exchange risks or other causes for cost escalation.

Assumptions

The above are only a cost guide, based on the opinion of an experienced estimator.

Productivity rates are discussed in detail in the estimate build-up. Note, production rates can vary, depending on ground conditions. Some of the production rate risk is absorbed into the contingency allowances.

There is potentially some "up side" opportunity, if the contractors believe they can achieve higher productivities than those detailed in the estimates.

Disclaimers

1. The order of costs provided by Jacobs is made on the basis of Jacobs' experience and qualifications and will represent our judgment as an experienced and qualified consultant, familiar with the relevant industry. Therefore, Jacobs cannot and does not guarantee that our order of cost will be accurate to current market conditions as provided by a tendering contractor.
2. It is important to understand that the rates and prices used in the estimate item details prepared for the project are indicative only. They may vary between Tenderers / Contractors for various reasons including their assessment of the; scale of project, specific material selections, anticipated material price increases, anticipated labour hours and potential cost increases as well as general market conditions.
3. Escalation / Time Lapse / Time Delays / Scope Growth / Market Factors / Site Constraints, and many other factors can contribute towards the above costs changing over time. It is recommended to perform estimate updates, and estimate refreshment, at various key milestones throughout the project life cycle. The above costs can become superseded or obsolete, once additional information is discovered during the design process, during tendering, and during construction.
4. Limitation: This document has been prepared on behalf of, and for the exclusive use of Jacobs' client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this document by any third party.
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