

Gas Network

Network Planning Report – Ballan PUBLIC

Friday, 10 June 2022

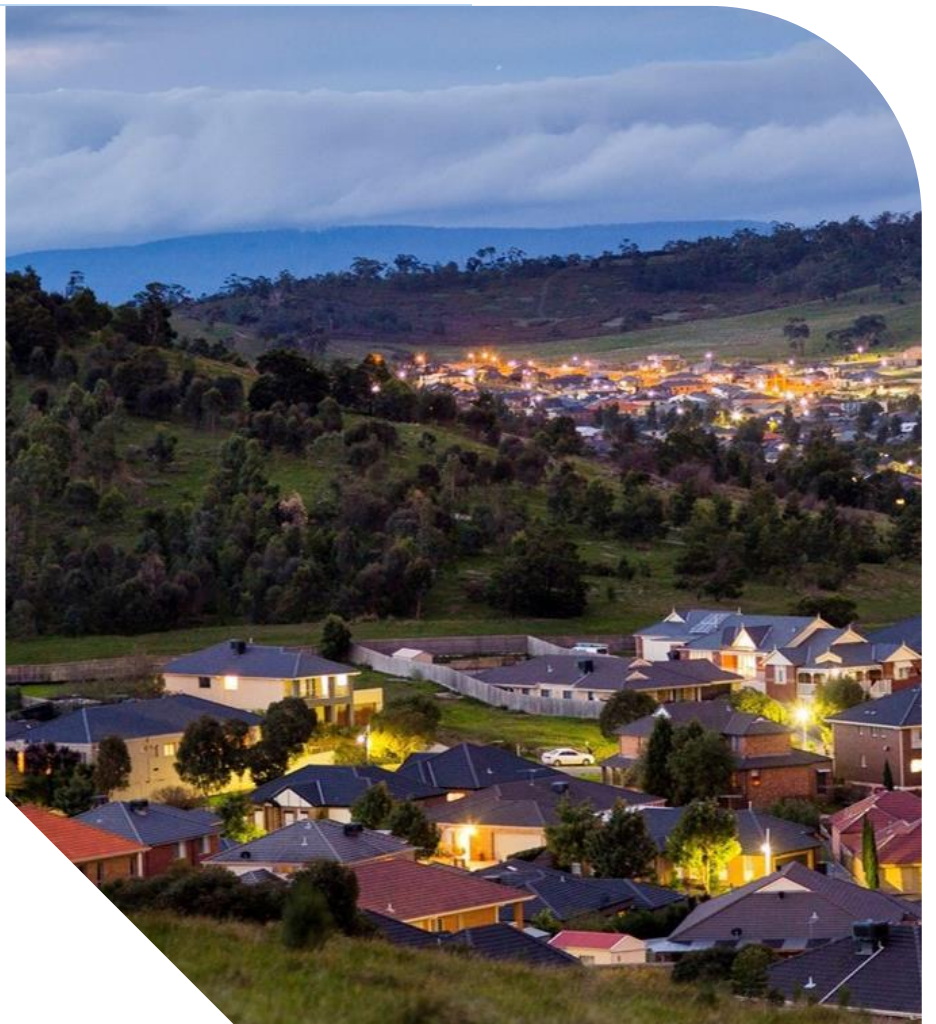
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Executive Summary

The Ballan network will be unable to support projected gas consumption growth and would require a network reinforcement by FY2023/24 to increase network capacity required in affected Northern fringe region and maintain adequate minimum network pressure in the area.

Recommendation - FY23/24

- Construct approximately [C.I.C] of 200mm steel pipeline outlet of Ballan City Gate

1. Network Overview

The Ballan network is one of AusNet Services' smaller regional town networks. It is solely supplied by a single supply source city gate namely Ballan City Gate.

The Ballan town has historically seen limited residential growth in its current Northern growth corridor. However, in the recent years, Ballan saw a step change in both residential and commercial growth with the various ongoing and proposed new residential estates and commercial precinct developments, resulting in increasing low network pressure events.

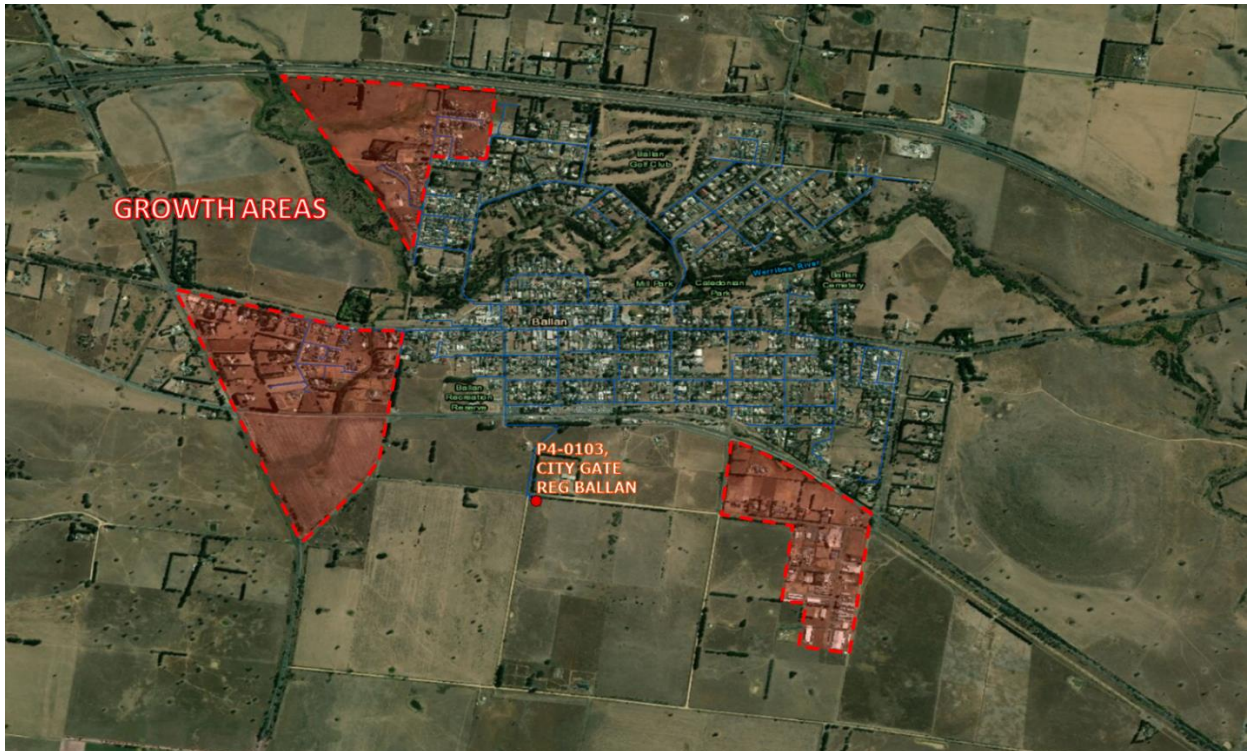


Figure 1: Ballan gas distribution network overview

2. Network Performance

Due to the continued growth in Ballan's north growth corridor and capacity limitations in current network design with undersized critical supply pipes outlet of Ballan city gate, network pressures at Ballan have been experiencing increasing low network pressures events, dropping below gas distribution code of 140kPa minimum. Low pressures can lead to poor appliance performance or customer outages. The chart below details the instances of low network pressure events experienced in the Ballan network in recent years as of August 2020.

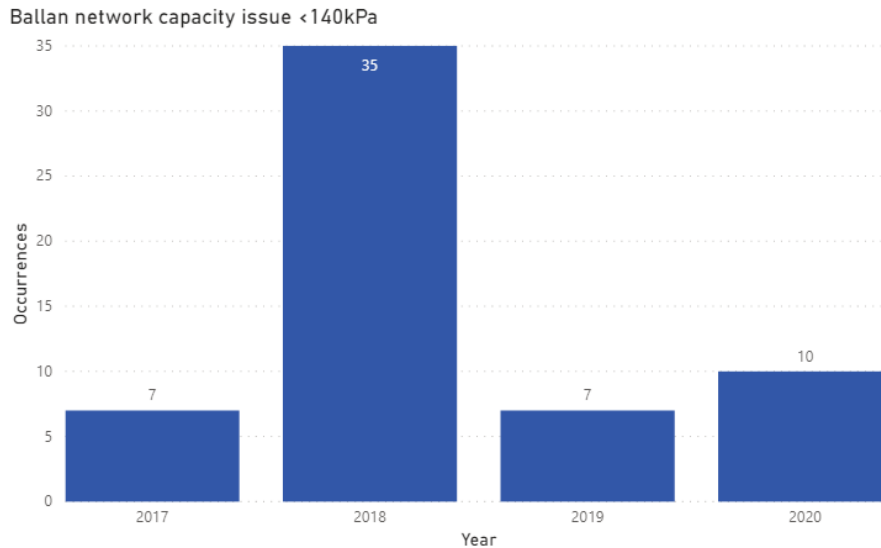


Figure 2: Ballan Network Performance Issues

Figure 2 above shows the reduction in instances when the network capacity experienced shortfall in 2019. This is due the non-expenditure initiative completed of raising Ballan's City Gate outlet pressure from 450kPa to 480kPa. Although this has improved capacity in the Ballan's network, in winter 2020 we have seen increasing number of breaches of gas distribution code of 140kPa minimum, affecting the Ballan's network supply.

The chart below details the instances of low network pressure instances experienced in the Ballan network in recent years as of August 2020.

Bottom 20 lowest Ballan fringe pressure

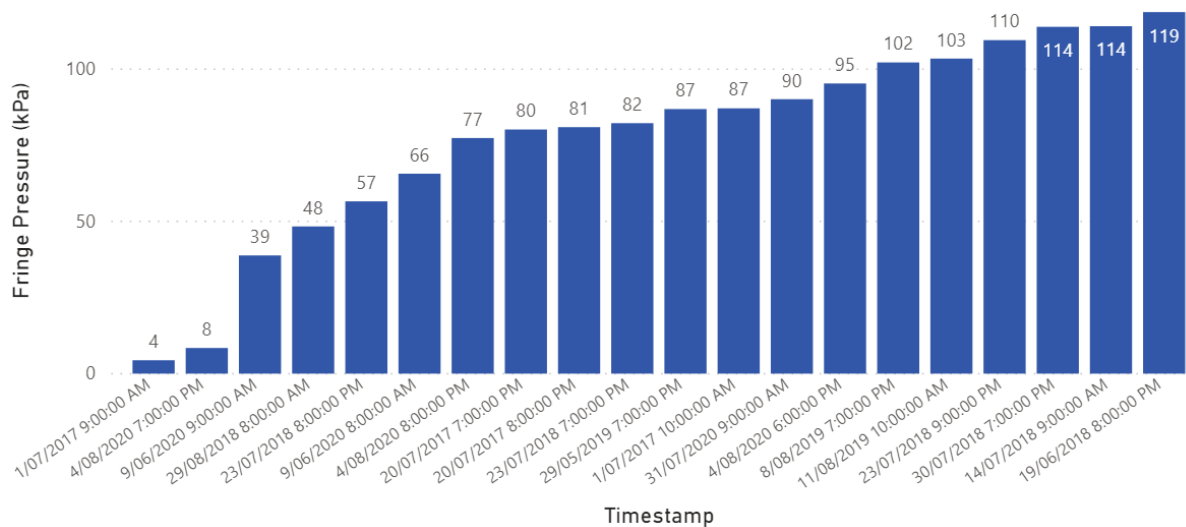


Figure 3: Ballan lowest fringe pressure instances

The capacity constraints in the Bellarine networks are driven by:

- Undersized outlet supply outlet supply pipe and valve from Ballan City Gate
- Undersized reticulation supply mains of 50mm steel from Ballan City Gate

3. Network Modelling

Network model for the Ballan High Pressure network is matched with latest analysis of the network using SCADA monitoring, fringe pressures in 2020.

The matched model illustrates the affected areas at the Northern section fringes as shown below.



Figure 4: Ballan matched model - winter 2020

Growth Forecasts rates provided by Finance Data Analytics team in AusNet Services' Finance department for the Ballan area as shown in table below.

Table 1: Ballan Growth Rate Forecast

Postcode	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
3342	1.01%	0.55%	0.96%	0.91%	0.91%	0.91%

Modelling the growth forecast rates above, the forecast minimum network pressures and estimated number of customer impact for the regulatory period can be obtained and detailed below:

Table 2: Ballan forecasted minimum pressure and customer impact

Ballan	2021/22	2022/23	2023/24
Minimum pressure (kPa)	146	135	Reinforcement required
Customer impact (no.)	0	300	-

4. Recommendations

4.1. Options considered

Several options were considered to increase the Ballan network capacity, which include

Table 3: Options Description Summary

OPTION	DESCRIPTION SUMMARY
1	No Capital Expenditure
2	Ballan City Gate outlet pipe reinforcement
3	Gillespies Lane and Old Geelong Road reinforcement

4.2. Option 1 – Do Nothing / No Capital expenditure

The Ballan distribution network is supplied solely from the Ballan city gate. During peak conditions, the regulators at the city gate can be raised further from 470kPa to 500kPa to push more gas through to the fringes of the network.

The consequence of accepting this option is that any pressure at or above the 500kPa threshold accelerates the wear of the regulator components. It is therefore not recommended from a safety and engineering standard perspective to operate the regulator at or above 500kPa for an extended period of time.

This option is not acceptable based on safety and engineering concerns.

4.2.1. Cost Estimations

Raise Ballan City Gate outlet pressure to 500kPa

- The cost of the non-capital expenditure option is to accept safety risk from regulator failures due to the acceleration of deterioration of the regulator components.

Total capital expenditure = \$0

4.2.2. Capacity

The benefits of the non-capital expenditure option are the deferred capital expenditure.

4.3. Option 2 – Ballan City Gate outlet pipe reinforcement

Due to the current restriction in flow capacity caused by the existing 50mm steel outlet pipe from the Ballan City Gate supply source. Increasing this 50mm steel outlet pipe size with 200mm steel pipe by approximately [C.I.C] would remove the current flow restrictions and significantly increase flow capacity to supply the Ballan town.

The outlet pipe looping reinforcement would boost capacity up to the Northern fringes of the work to address current capacity shortfall and provide long term security of supply to the network.

Network Reinforcement work comprises of:

1. Construct approximately [C.I.C] of 200mm S11 steel out of Ballan City Gate along Denholms Rd and tie-in to existing 50mm steel mains on Denholms Rd.
2. Replace Ballan City Gate's current 50mm outlet valve and regulators to full size 150mm valve.

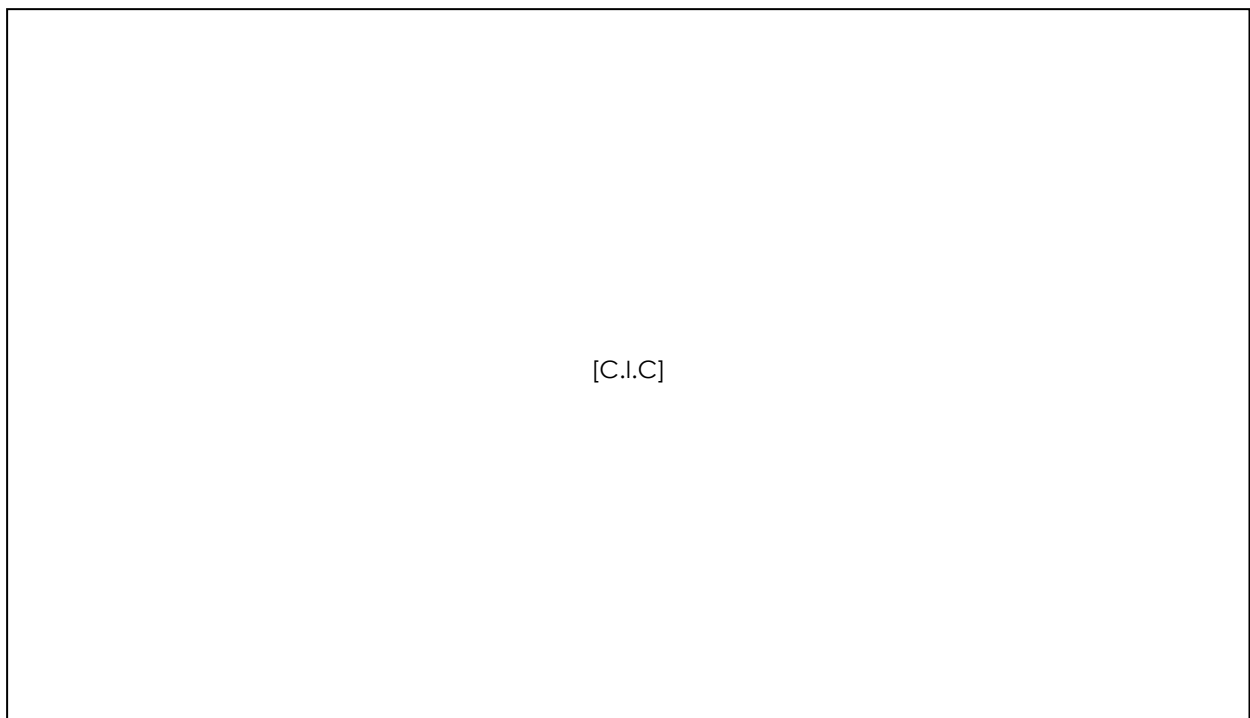


Figure 5: Ballan reinforcement - Option 2

4.3.1. Cost Estimations

[C.I.C]

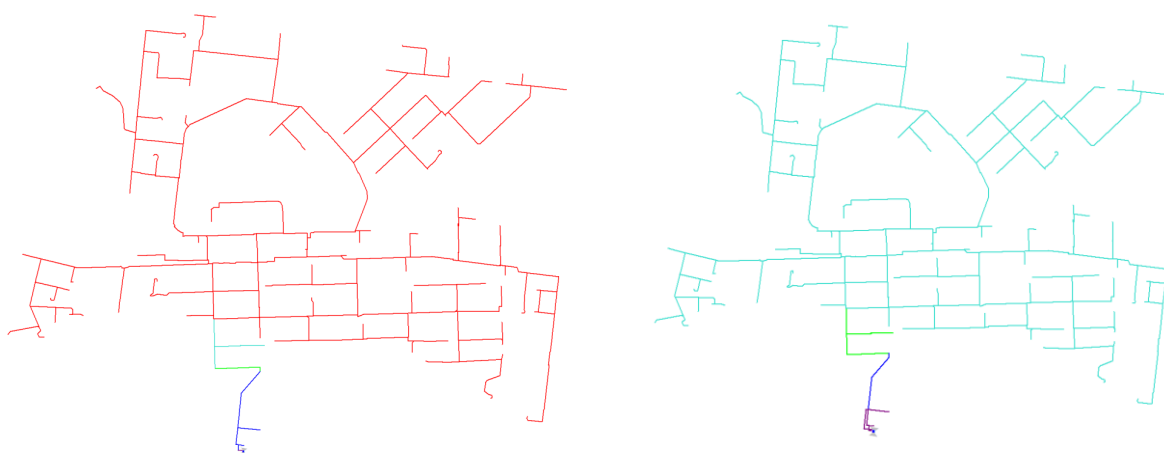
4.3.2. Capacity

Table 4: Option 2 - Ballan Identified Network Reinforcement

2023/24 Forecast Minimum Pressure	Affected Customers	REINFORCEMENT SUMMARY	Post Reinforcement Minimum Pressure
88kPa	700	[C.I.C] of 200mm S11	180kPa

Table 5: Ballan Forecast Minimum Network Pressures

Postcode	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
3342	88kPa	180kPa	176kPa	174kPa	170kPa	168kPa



2023 Before Facility Installation

2023 After Facility Installation

Figure 6: Ballan before and after augmentation

4.4. Option 3 – Gillespies Lane and Old Geelong Road Reinforcement

Capacity in the Northern Region can be significantly increased by connecting the current supply source at Ballan City Gate to the impacted areas with large diameter backbone mains of 180mm in size. This proposed reinforcement would direct all unrestricted flow to the Ballan and significantly increase delivery pressure to the entire Ballan network.

Network Reinforcement work comprises of:

1. Construct approximately [C.I.C] of 185mm polyethylene along Gillespies Ln from outlet of Ballan City Gate and tie-in to the existing 50mm poly main at Old Geelong Rd.

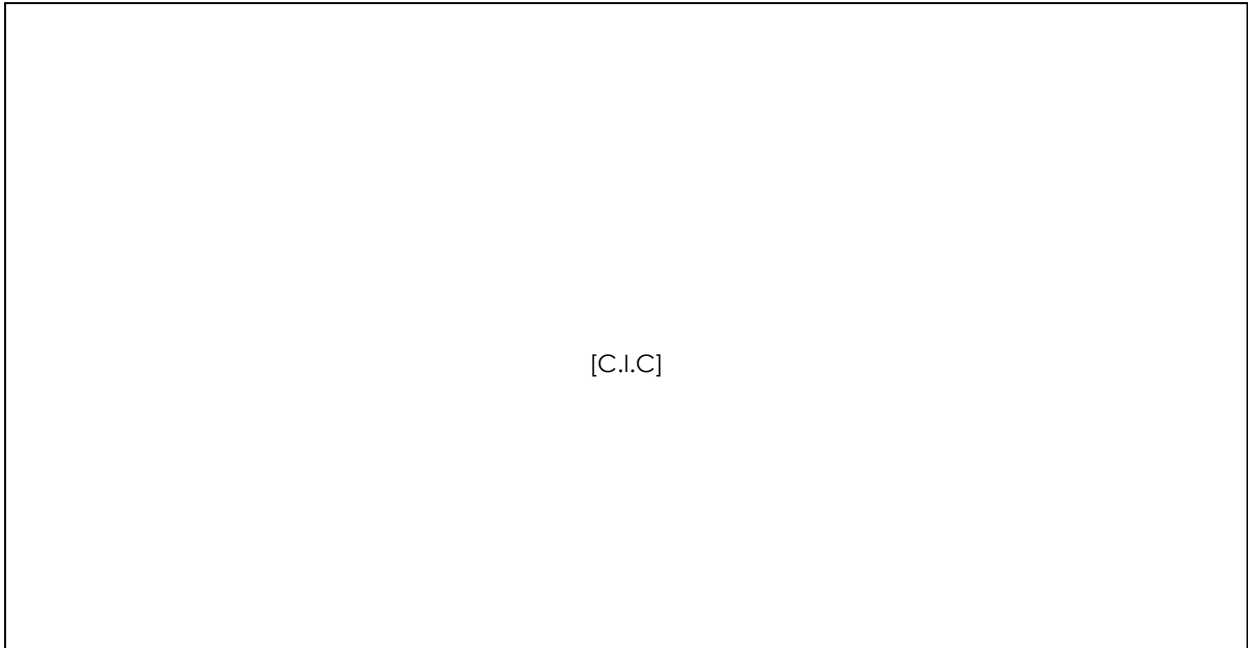


Figure 7: Ballan Reinforcement - Option 3

4.4.1. Cost and benefit analysis

[C.I.C]

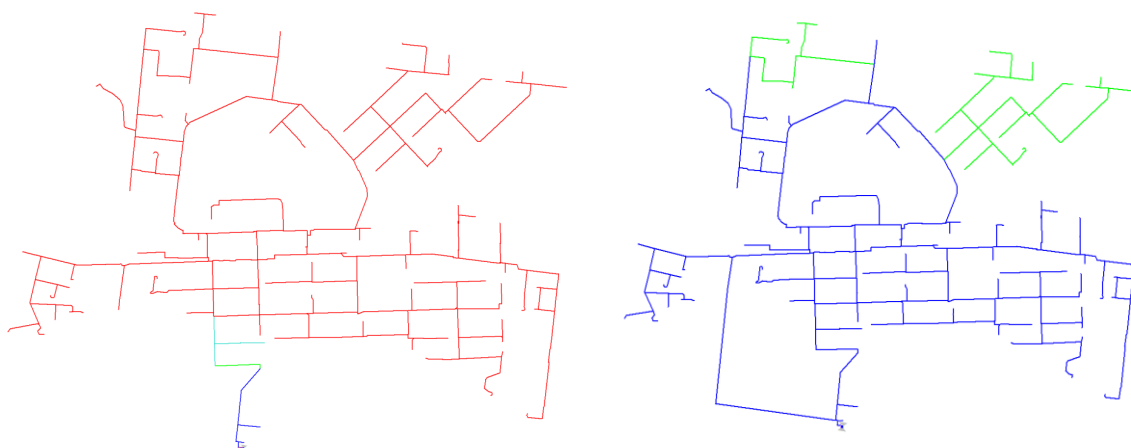
4.4.2. Capacity

Table 6: Option 3 - Ballan Identified Network Reinforcement

2023/24 Forecast Minimum Pressure	Affected Customers	REINFORCEMENT SUMMARY	Post Reinforcement Minimum Pressure
88kPa	700	[C.I.C] of 125mm P10	350kPa

Table 7: Ballan Forecast Minimum Network Pressures

Postcode	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
3342	88kPa	350kPa	348kPa	347kPa	345kPa	342kPa



2023/24 Before Augmentation

2023/24 After Augmentation

Figure 8: Ballan before and after augmentation

4.5. Benefit Assessment

The preferred solution is Option 2 which involves the construction of a [C.I.C] of 200mm Steel pipeline in total along Denholms Rd required to be in service by FY2023/24. This augmentation is considered the most cost-effective solution to augment the capacity of the Ballan network.

Table 8: Options Assessment Summary

OPTION	BENEFITS	COSTS (\$2020)
Option 1	Nil.	Continue accepting Ballan capacity shortfall and further network pressure deterioration and compromised safety and reliability of existing network.
Option 2	Preferred solution – addressing current capacity shortfall and long-term security of supply capacity solution in the growing Ballan network	[C.I.C]
Option 3	Addressing current capacity shortfall and long-term capacity solution. However, it is rejected due to with the doubling in CAPEX expenditure requirement compared to Option 2.	[C.I.C]

5. Capital expenditure summary

Table 9: Capital Expenditure Summary

	2023-24	2024-25	2025-26	2026-27	2027-28	2024-28 TOTAL
			[C.I.C]			

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