

A Holistic Approach to Water Quality: Managing Trihalomethanes in the Network

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INTRODUCTION

Logan Water distributes 65 ML/d through its water network with multiple secondary chlorination systems. It is primarily sourced from the Upper Brisbane River catchment, which may contribute to elevated Trihalomethane (THM) levels that are close to the Australian Drinking Water Guideline health limit. An extensive study was conducted on minimising THMs (a disinfected by-product with potential adverse health effects) to improve drinking water quality for the community.

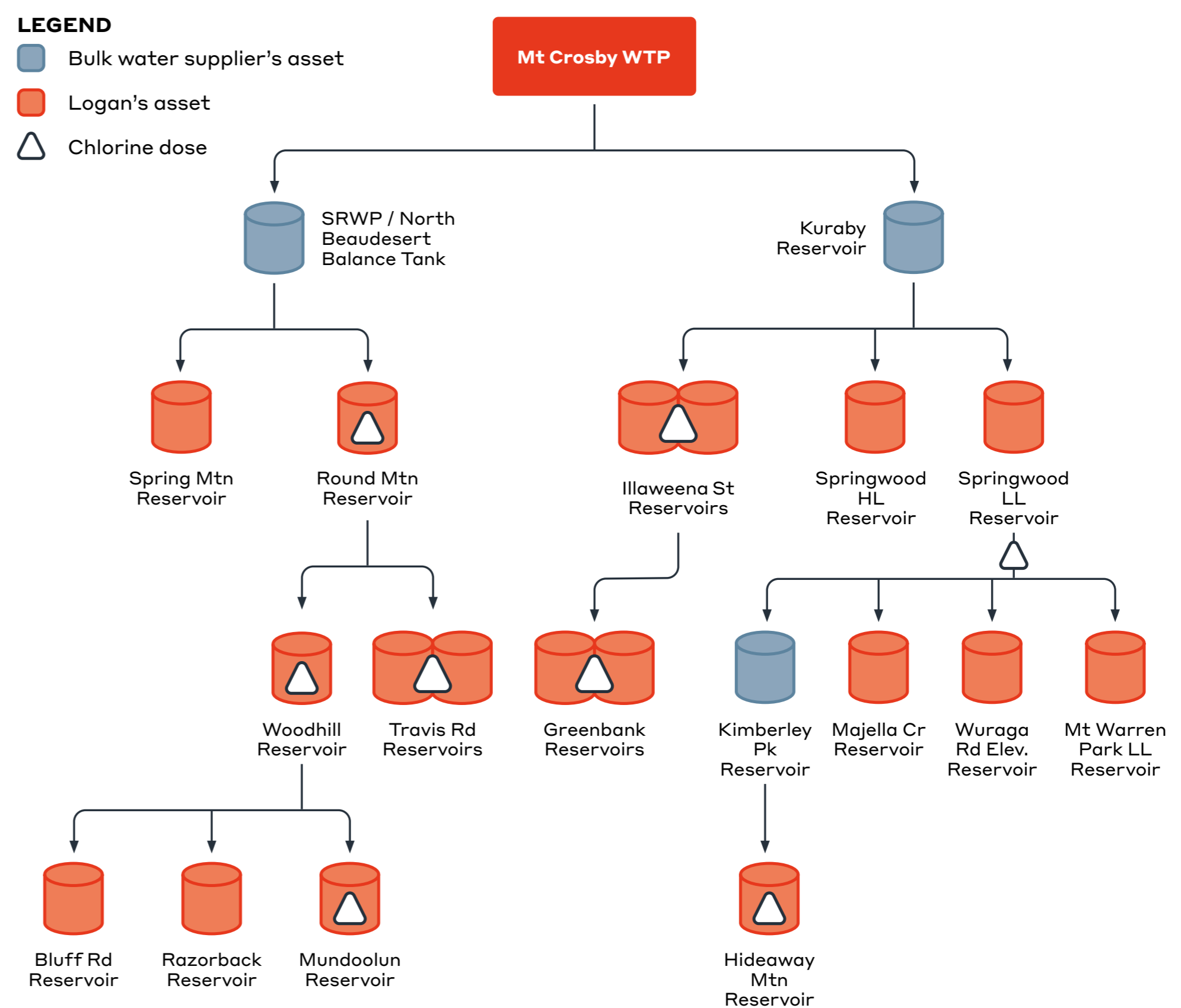


FIGURE: schematic of Logan Water's distribution network

APPROACH

Literature review & knowledge sharing:

- Review of THM formation & interrelationship factors
- Comparison of national & global standards of THM limits
- Engaging other water utilities to understand their THM management

System assessment:

- Benchmarking current performance
- Review of current management strategies
- Regression modeling analysis applied on 3 years of historic water quality data and THM speciation

Optioneering & recommendations:

- Developed 20 candidate options for THM management
- Shortlist to 7 opportunities for Logan Water
- Assessment of feasibility, costs, THM reduction potential and benefits
- Implementation Strategy developed specific for Logan Water



OUTCOMES

A set of best practice, balanced solutions were developed including various approaches to THM management:

- Managing THM formation precursors** (GAC adsorption for natural organic matter removal; chlorine residual optimisation study; re-chloramination facilities)
- Managing THM formation extent** (optimise reservoir level management; reduce reservoir residence time; reducing pH with carbon dioxide dosing)
- Managing THM levels after formation** (aeration and ventilation system improvements)

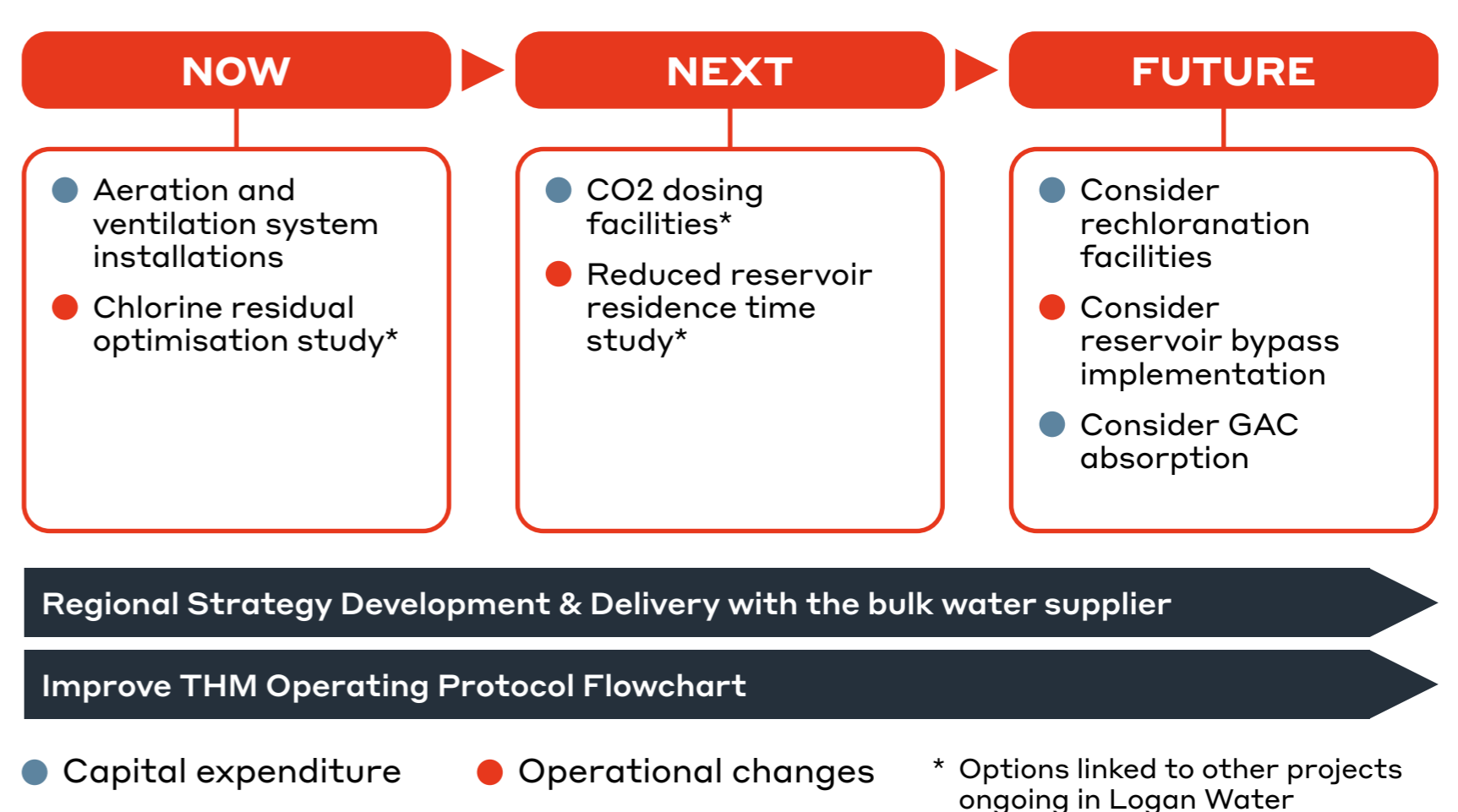


FIGURE: Implementation strategy for Logan Water



CONCLUSION

Logan Water are taking a proactive approach in response to changing catchment conditions, evolving legislative requirements and climate change, even though Logan Water are not exceeding the current ADWG health limits. Each water utility system is complex and unique, and a holistic approach is required. Effective THM management will aid in the protection of health and wellbeing of the community, provide best value to the customer across the supply chain and drive positive regulatory and reputational outcomes.