BUSINESS CONTINUITY PLANNING: FROM RESPONSE TO PREPAREDNESS ON CRITICAL SEWER MAINS

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Abstract

This paper discusses North East Water's strategic transition from an emergency response model to a proactive emergency preparedness framework concerning critical sewer mains. Recognising the importance of identifying essential infrastructure and potential vulnerabilities, the organisation is committed to future-proofing its services. A cornerstone of this initiative is the enhancement of in-house response capabilities through targeted investments in equipment and upskilling our operational teams. This is particularly crucial as a regional water authority with limited access to contractor services.

Following a comprehensive risk assessment of the largest diameter and most critical sewer main in North East Water's sewer reticulation network, the organisation has developed a methodical, risk-based approach to ensure the capacity for bypassing this main in the event of damage or failure. Historically reliant on contractors from Melbourne for bypass operations, the organisation has now procured its own equipment to effectively manage high flows during both emergency and planned situations.

Led by our operators, specialised contingency plans for critical segments of the sewer main have been developed to enable immediate response in case of failure. Successful trials conducted by our operators during peak flow periods demonstrate the effectiveness of the bypass system and showcase the capability of our teams to manage such an event. Ongoing refinement of these plans includes additional future bypassing exercises aimed at training, improving methods, and facilitating critical maintenance activities, such as inspections and repairs.

This ongoing effort demonstrates the evolution of the role our operators and how business continuity planning transitions the business from merely responding to emergencies towards a robust preparedness strategy, effectively addressing infrastructure challenges and system demands.

Introduction

North East Water (NEW) manages approximately 1,200km of sewer mains across 20,000m2 in North East Victoria. Increasing population and development, particularly in and around Wodonga, are creating significant pressure on sewer reticulation networks. This pressure is compounded by competing capital priorities across the organisation and the varying age and condition of existing infrastructure. At the same time, changes in community behaviour - notably the increased use of disposable wipes and other non-flushable materials - are contributing to rising debris loads and unplanned maintenance events.

In this context, NEW has adopted a business continuity planning (BCP) approach to shift from a reactive emergency response model towards proactive operational preparedness. This report outlines NEW's BCP approach for the Wodonga Sewer Transfer Main, detailing the methodology, capability uplift, trial execution, key learnings, and future steps to enhance service resilience for one of the organisation's most critical sewer assets.

Background

In recent years, North East Victoria has experienced sustained population growth, driving increased demand on water and sewer infrastructure. Wodonga, the organisation's largest and fastest-growing township, now supports a population of 44,849, consisting of residential, commercial, and industrial customers. This rapid growth has increased inflow volumes and elevated the operational risk profile of key assets within the sewerage system.

Wodonga's Sewer Transfer Main is a 600 to 900 mm predominately Reinforced concrete pipeline with small sections of MSCL extending approximately 5.7km. It transfers sewer from the entire Wodonga catchment as well as neighbouring towns of Kiewa and Tangambalanga to the West Wodonga Wastewater Treatment Plant. Recent condition assessments identified emerging vulnerabilities that, if left unaddressed, may cause service interruptions or system failure.

The pipeline's alignment presents significant access and operational challenges, as it crosses major arterial roads, passes through the rail corridor, and traverses large commercial properties. These factors make emergency access complex and time-consuming. They also constrain the ability to perform routine maintenance or execute sustained bypass operations without careful planning and coordination.

Due to competing capital demands across NEW's asset portfolio, full replacement or rehabilitation of the Wodonga transfer main is not scheduled in Water Plan 5. As detailed in this

report, the organisation is undertaking robust operational planning, enhanced monitoring, and improved emergency preparedness to mitigate risk and maintain service reliability.

Business Continuity Plan

Defining the Problem

The BCP process identified several interconnected challenges. The condition of the main and the scale of flows it transfers mean that even a short disruption presents significant environmental and operational risk. Peak flows, particularly during rain events, further complicate bypass operations due to the high volumes involved. The alignment of the main, which crosses heavily trafficked roads, commercial land, and the rail corridor, adds complexity and potential delays to any emergency response.

NEW is not equipped to repair a main of this diameter and historically has had to rely on Melbourne-based contractors to manage its flows during a failure. As a result, mobilisation time could range from 12 to 24 hours. With average flows of 160 Lt/s or 14 MEG per day, a delay of this scale carried unacceptable consequences. Through the planning process it was identified that our methods of monitoring, managing flows, and enacting a bypass until repairs could be undertaken needed to be addressed.

Figure 1: Evidence of concrete degradation in a section of main

Standing up an OMT

To ensure a coordinated and proactive response to the risks associated with the transfer main, NEW established a formal Operations Management Team (OMT). The OMT was created to coordinate cross-business planning efforts for a situation that, while not an emergency, had the potential to escalate into one without intervention. The team was responsible for overseeing planning activities, ensuring alignment with emergency management principles, and supporting any emergency procurement required - such as the acquisition of high-flow bypass equipment.

The OMT brought together subject matter experts from across the business, incident management specialists, and trained operational staff. This blend of skills ensured that the BCP

development process considered operational practicality, safety, asset condition, and environmental obligations. The OMT then commenced development of the BCP in accordance with NEW's risk management framework.

Developing the BCP

As part of the development process, NEW undertook a detailed assessment of its ability to respond to an incident on the Wodonga main. This assessment revealed several opportunities to strengthen capability. Operations were not equipped to manage a high-volume sewer spill or execute a sustained bypass on a main of this size. Consequently, NEW invested in specialised bypass pumps, fittings, and associated equipment, and delivered comprehensive training to upskill operators in advanced bypass techniques for both planned maintenance and emergency response.

NEW also developed a flow control plan to guide operational adjustments during an incident, such as pump station modifications, temporary diversions, and designated discharge locations. This plan clearly defines the actions required to minimise the impact of a break or blockage at any point along the main.

To increase precision in planning, the transfer main was divided into manhole-to-manhole segments. Each segment was assessed for bypass feasibility, environmental sensitivity, access constraints, and operational risk. For each section, NEW developed a detailed bypass plan outlining access points, pump requirements, hose and valve setups, communication needs, key risks, and stakeholder coordination. These plans were distilled into concise one-page operational manuals for immediate reference during an incident, ensuring staff have access to critical information under pressure.

In addition, NEW installed sewer monitors at strategic locations along the main to track flow conditions during wet weather, detect anomalies early, and provide real-time alerts for potential blockages, breaks, or failures.

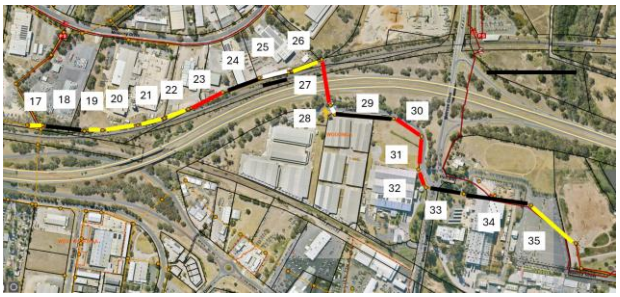

Figure 2: Example of sectional breakdown for zone 1 of the main

Testing the BCP

After completing the BCP, NEW conducted a live bypass trial on a controlled section of pipeline within the treatment plant boundary. This section spanned approximately 150 metres and provided a safe, internally managed environment for testing. The trial was scheduled to coincide with peak morning flow periods of 260lt/s to ensure the bypass system was tested under realistic conditions.

The trial aimed to assess mobilisation time, noise impacts, bypass stability, pump performance, and the ability to manage debris. It also provided an important opportunity for staff from Wodonga and neighbouring operational areas to gain hands-on experience with the bypass equipment.

During the trial, the team collected data on flow control, pump output, rag management, noise levels, and the practicality of the bypass methodology. While the initial intent was to use a single pump, a second unit was added just prior to the trial, and this redundancy proved essential. Ragging was a recurring challenge, but with practice, operators reduced pump unblocking times from around 20 minutes to only three minutes.

Figures 3 -6: Bypass trial in operation and rag built up in pump

Key Learnings

The trial demonstrated that live testing is critical for validating theoretical plans. The operational team identified several opportunities for improvement, including refinements to fittings, plant layout, and equipment configuration. Rag management emerged as a significant challenge, but the rapid improvement in clearing times highlighted the value of hands-on practice. Redundancy

proved critical, with the second pump ensuring continuous bypass capability during periods when the primary pump required maintenance or underperformed.

The trial also highlighted that small spills are difficult to avoid during high-flow bypass operations, reinforcing the need for on-site spill management. Defined hose and pump setups for each section of the main were found to be essential, as was the maintenance of easements to ensure access. Conducting the trial within NEW property provided full control and created a safe, calm environment for operators to gain proficiency. Monitoring manhole surcharging was important, and future trials will integrate data from newly installed monitoring systems.

Findings and Next Steps

The trial confirmed the feasibility of the BCP and demonstrated that NEW's operational teams and equipment can effectively manage a bypass event involving the Wodonga transfer main. Operators maintained control of flows for the majority of the trial, and the contingency pump arrangement ensured the bypass was sustained despite early challenges. Importantly, the BCP has reduced expected response times from previous contractor-dependent timeframes of 12–24 hours to approximately 4-6 hours, significantly reducing the environmental and operational consequences of a potential failure. In some scenarios, when combined with the flow management plan, this capability could nearly eliminate spill volumes from the time an incident is detected.

The trial also provided operators with valuable experience and confidence in managing high-volume bypass operations. NEW plans to conduct another trial in the coming months that will involve bypassing two consecutive sections, providing a more realistic simulation of a likely emergency. Following this, a similar trial will be conducted in Wangaratta on a comparable main to expand regional capability and consistency.

Conclusion

NEW's BCP work on the Wodonga Sewer Transfer Main represents a significant shift towards proactive preparedness. By building internal bypass capability, developing targeted operational plans, strengthening monitoring, and validating methods through live trials, NEW has improved network resilience and reduced environmental and service risks. This work enhances operational confidence and provides a template for applying BCP principles to other critical assets across the service region.