Water Corporation: Management of Water Pipes

Report 1 – February 2014

Background

The Water Corporation supplies over 357 billion litres of drinking water to 992 170 properties across Western Australia. A sustainable water supply relies on how effectively water is transported through over 34 000 kilometres of water pipes worth $11.72 billion.

This performance audit informs Parliament about whether Water Corporation's management of bursts, leaks and water loss from its water supply pipes contribute to sustainable water supply.

Audit Conclusion

Water Corporation's network of water supply pipes has generally performed well to date. Although performance is variable in different parts of the state, the overall rate of leaks and bursts has been low. The Water Corporation has maintained the water pipe network by replacing pipes as they fail. Consequently, the cost of replacing water pipes has also been low, $9 million in 2009-10. The water pipe network is ageing and as a result, pipe replacement costs will rise significantly to an estimated $41.5 million per year from 2013-14 to 2018-19, with further increases from 2020.

To allow it to better manage the network as it ages, the Water Corporation has recently adopted a risk based approach to replacing pipes, targeting the ones most likely to fail. Replacing all pipes only when they fail would risk under investment and increasing levels of pipe failures. Alternatively, replacing all pipes when they reach the end of their standard economic life regardless of their condition or performance could result in over investment. Under a risk based approach, the estimated cost of pipe replacement over the next 10 years is $318 million compared to $421.5 million based purely on the standard economic life of pipes.

A risk based approach to pipe replacement is sensible, but the Water Corporation will need to ensure it is robust. The approach relies on accurate and complete asset, condition and performance information. Currently, there are gaps in the Water Corporation's information that need to be addressed to ensure pipe replacement decisions are fully informed.

Water loss is a risk for the Water Corporation because it affects the sustainability of supply, reduces revenue, and can diminish its credibility as an advocate of water saving amongst its customers. Water loss in 2012-13 was around 10 billion litres above the Water Corporation's benchmark for minimum loss, and included seven to eight billion litres of undetected leakage from pipes. The Water Corporation has a leak detection program which has prevented 3.4 billion litres of leakage in the last three years. However, it is not considering undetected leakage in prioritising pipe replacement. This is a gap in replacement planning, and resolving it would strengthen efforts to reduce water loss.

Key Findings

- The overall rate of leaks and bursts on Water Corporation's water pipes has been within its previous licence requirements and low compared with other similar states. Until November 2013 the Water Corporation's licence required that the overall rate of leaks and bursts be below 20 per 100 kilometres of water pipe annually. The Water Corporation has met this target since 2008 and since 2010 the rate has been below 18 per 100 kilometres. This rate is low compared with similar sized water utilities in other states. The highest rate among similar utilities was 40 per 100 kilometres in 2011-12.
- The rate of leaks and bursts is worse in country regions than in the metropolitan area. Country regions have had an annual leak and burst rate of 21 per 100 kilometres since 2010 compared to fewer than 13 in the metropolitan area. This gap between country regions and the metropolitan area is expected to continue for at least the next 20 years.

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- The amount of water lost through the Water Corporation's supply system is high compared to similar sized water utilities in other states. In 2011-12, Western Australia lost about 90 litres of water per service connection per day, compared with similar sized utilities which ranged from 50 to 96 litres per service connection per day. Water loss in the supply system affects the sustainability of supply, reduces revenue, and can undermine broader water saving initiatives. In 2012-13, the Water Corporation estimated that about 43 billion litres (12 per cent) of water was lost across the supply system. This includes 13 billion litres that was not physically lost, but was unbilled usage. Almost 30 billion litres (eight per cent), however, was real water loss.
- While water loss cannot be eliminated from any supply system, it can be minimised. Current levels are just over 10 billion litres a year higher than the Water Corporation's benchmark for minimum loss of 19 billion litres. The Water Corporation considers the 10 billion litres to be recoverable, and about seven to eight billion litres of this is undetected leakage from pipes.
- The Water Corporation is pursuing initiatives, such as its leak detection program to reduce water loss. In the three years from 2010-11 to 2012-13, the leak detection program prevented 3.4 billion litres of leakage. Pipe replacement can also help to reduce undetected leakage but it is not included as a factor in Water Corporation's pipe replacement planning and investment. This lessens the effectiveness of efforts to reduce water loss.
- The overall low level of leaks and bursts in the network has meant that the costs of pipe replacement have also been low as pipes were replaced only when they failed. In 2009-10, the Water Corporation spent $9 million on pipe replacement. However, the pipe network is ageing and this will increase the cost of replacement. Between 2009-10 and 2012-13 an average of $17.25 million a year was invested but this will increase to $41.5 million a year on average between 2013-14 and 2018-19.
- To better manage the increasing cost of pipe replacement, the Water Corporation is replacing pipes based on the risk of failure rather than replacing them only when they fail. Continuing the 'run to fail' approach for all pipes with an ageing network would risk under investment and increase failures. Replacing pipes based purely on standard economic life would risk over investing by replacing pipes regardless of their condition.
- The Water Corporation estimates that using the standard economic life approach pipe replacement would cost $421.5 million between 2010 and 2019, $103 million more than their risk based approach. Between 2020 and 2049 the economic life approach would also see replacement costs climb to a total of $3.4 billion or an average of $107 million per year. This would involve replacing about 16 000 kilometres of pipe, or 47 per cent of the total pipe network.
- The risk based approach to pipe replacement relies on accurate and accessible information to identify pipes with the highest likelihood and consequence of failure. However, there are gaps in some of the information needed to ensure fully informed decisions. The age of some older pipes cannot be easily verified and information about where leaks and bursts have occurred and what caused them is not being effectively gathered. Also, connectivity between the different IT systems that hold age, condition and performance information is poor, making access and use of the information difficult.