Acute Water Shortage Risk Reduction

Update to Taumata Arowai

June 2024

Wellington Water

Our water, our future.

Wellington Water - update to Taumata Arowai schedule

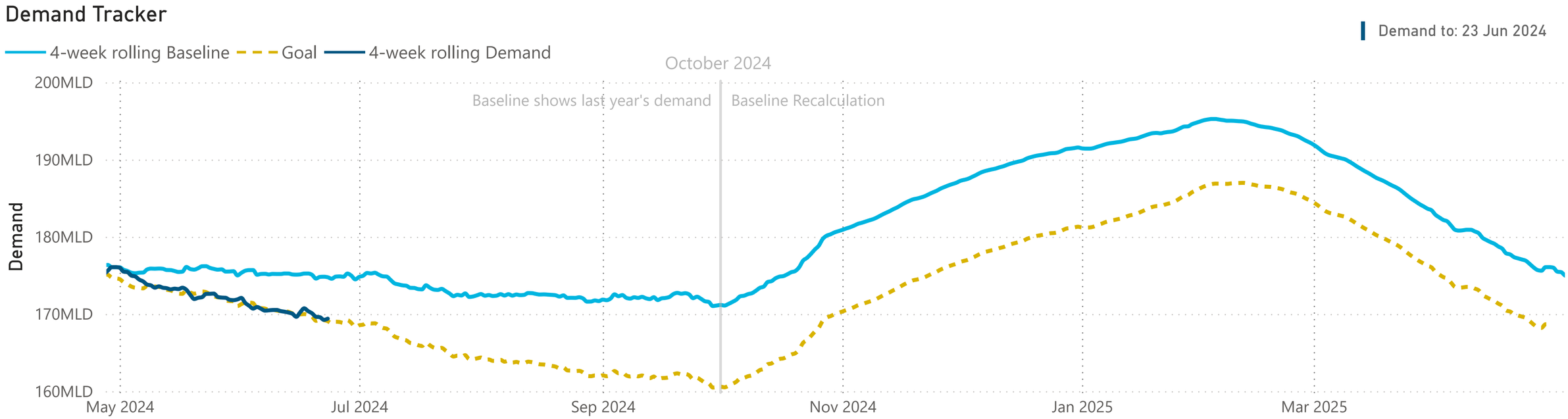
Records	Category	Breakdown	Frequency	Starting	Ending	Information required	Notes	Jun-24 Commentary
Supply and demand modelling review	Risk of acute water shortage	N/A	One-off	-	31-May-24	Summary of findings of the independent review of the Karaka model, including any recommended adjustments to the model for the 24/25 summer. Description of impact of any modelling changes on the calculated 'Likelihood of demand shortfall and restrictions in 2024/25' curves in Item 2.	Joint letter from WWL and owner councils of 15.03.24 states '… we will carry out an independent review of the model to ensure its accuracy and share the findings with Taumata Arowai'.	Report completed in May 2024 report (item 8)
Supply and demand summer risk updates	Risk of acute water shortage	Regional	Weekly	1-Oct-24	30-Apr-25	Acute water supply and demand programme report. Water watch dashboard. Governance summer risk dashboard. Production capacity dashboard. Reservoir level weekly view.	The same reporting is requested during the 24/25 risk period as the 23/24 summer, with inclusion of the updated Karaka model.	Start reporting October 2024
Water loss reduction dashboard	Network water loss reduction	Regional AND individual TA	Monthly	31-May-24	30-Apr-25	Dashboards at regional and TA level of actual MLD savings, with the addition of staged monthly MLD savings milestones / targets.	As per Item 6. Include exception commentary where relevant.	Refer to Demand Tracker further in report
Pressure monitoring progress	Network water loss reduction	Regional AND individual TA	Monthly	31-May-24	30-Apr-25	Tracking (MLD savings) and commentary from pressure monitoring and management interventions.		As per item "4a Pressure Management" further in report
Capital renewals progress	Network water loss reduction	Regional AND individual TA	Monthly	31-May-24	30-Apr-25	Tracking (MLD savings) and commentary from capital renewals programme.		As per item "4b Capital Renewals" further in report
Industry capacity assessment	Network water loss reduction	Regional AND individual TA (if possible)	One-off	-	31-May-24	A copy of the report on industry capacity.	As per item 7	As agreed with Taumata Arowai Welington Water to provide delivery plans with July 2024 monthly report.
Te Mārua Dissolved Air Flotation (DAF) project progress	Increased supply	N/A	Monthly	10-May-24	Project Completion	Target dates and commentary for key project milestones, including equipment arrival, plant construction completion targets and progress relative to commissioning targets.	As per Item 10. More detailed target dates for project milestones should be included as part of the first report. Include exception commentary where relevant.	As per item 10 further in report
Resource consent variation progress	Increased supply	N/A	Every second month	10-May-24	Decision on variation application	Provide any target dates for submission of resource consent variation application(s) and progress updates.	As per item 11	In accordance with discussion with Taumata Arowai Wellington Water intends to cease reporting from July 2024. (item 11)

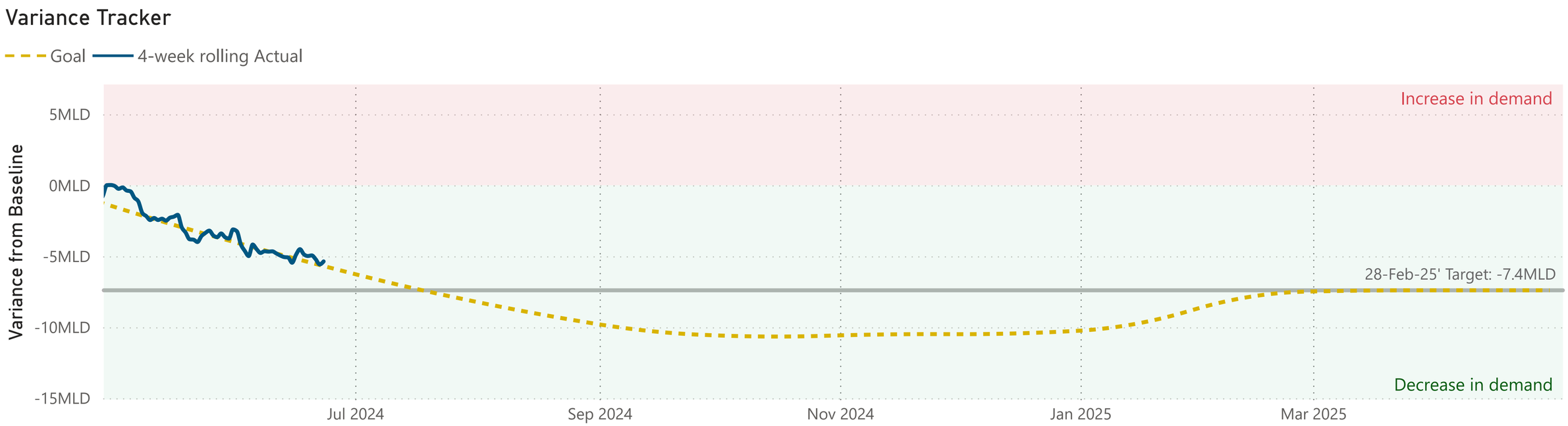
Acute Water Shortage Risk - Demand Reduction Monitoring

How is demand tracking?

Metropolitan view

These graphs measure demand as an indication of our progress towards achieving the 7.4 million litres per day (MLD) demand reduction needed to reduce the risk of an acute water shortage/water restriction Level 4 for the Wellington Metropolitan Region (Wellington City, Porirua, Lower Hutt and Upper Hutt). This target does not reduce the risk of water restriction level 3.
The 7.4MLD demand reduction by February 2025 has been agreed upon by Taumata Arowai, Wellington Water and our council owners as a realistic goal.
'Demand' refers to water that is used by customers and water loss (ie. leaks). Wellington Water and our council owners are working to reduce demand through water loss reduction and increasing customer water conservation. Work is also being done to increase daily supply at Te Mārua Water Treatment Plant. We don't anticipate that the work at Te Mārua will be completed in time to reduce the risk for summer 2024/25.
In order to reduce the risk, councils have increased their funding to find and fix more leaks. We are also looking at other operational activities to manage the network and reduce water loss e.g. pressure management.
We expect our data to improve over time, and provide us with a more robust understanding of the efficacy of our demand reduction activities and analysis. We expect these graphs to show short-term fluctuations in actual demand, with the overall trend aligning with the goal.





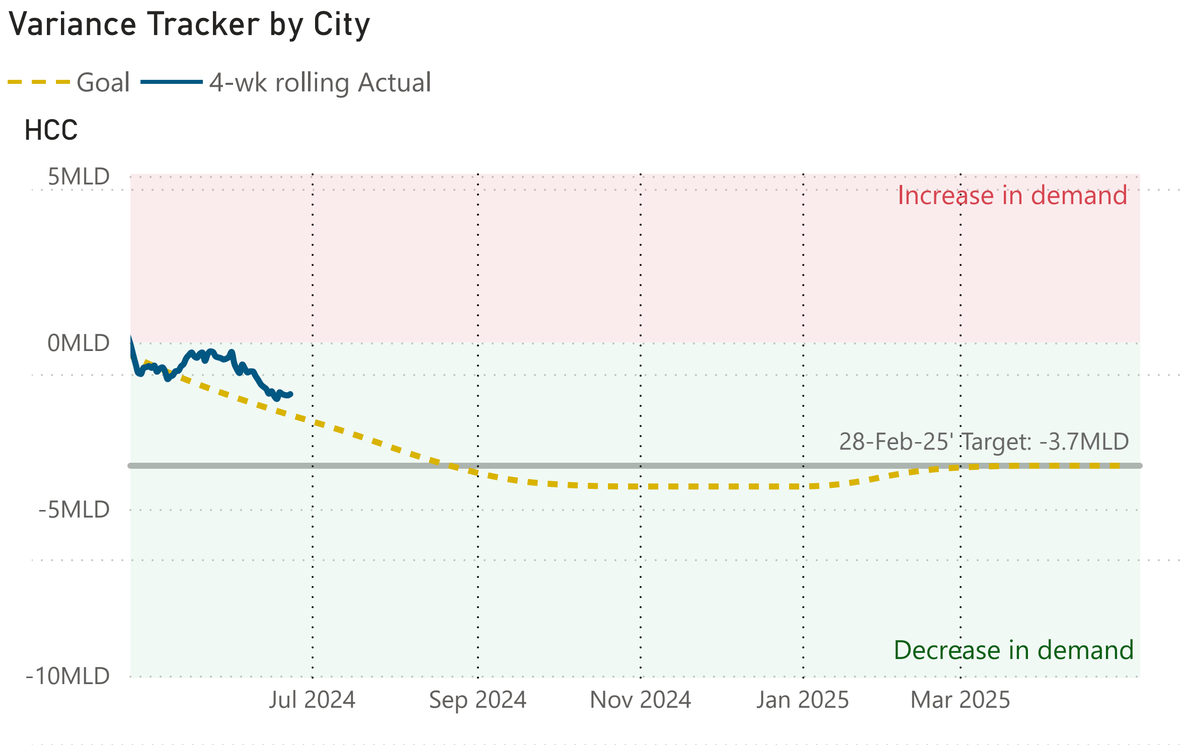
A range of water loss reduction activities continue across the region, enabling overall demand to remain in line with the goal set for the metropolitan region. The yellow dotted line indicates the goal pathway for demand reduction, while the blue line shows the actual demand. As water demand traditionally increases during summer, to achieve the goal of a 7.4MLD reduction in summer demand we need to exceed that demand reduction during winter. This is built into the graphs above, where demand dips beneath the target and then rises as we enter summer.

Acute Water Shortage Risk - Demand Reduction Monitoring

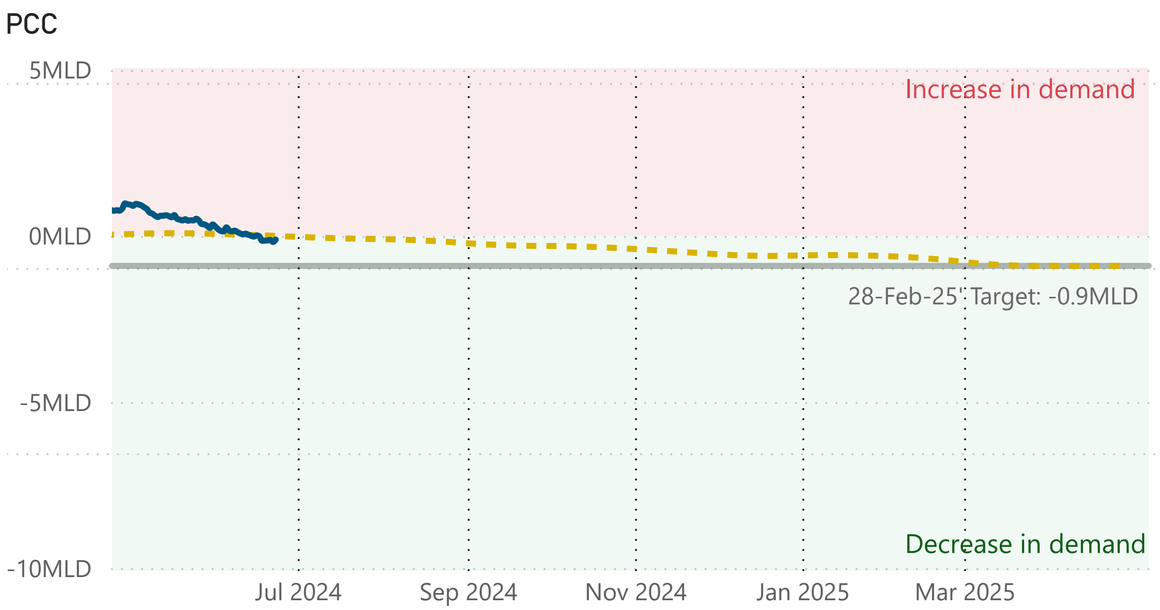
How is demand tracking?

Council by council

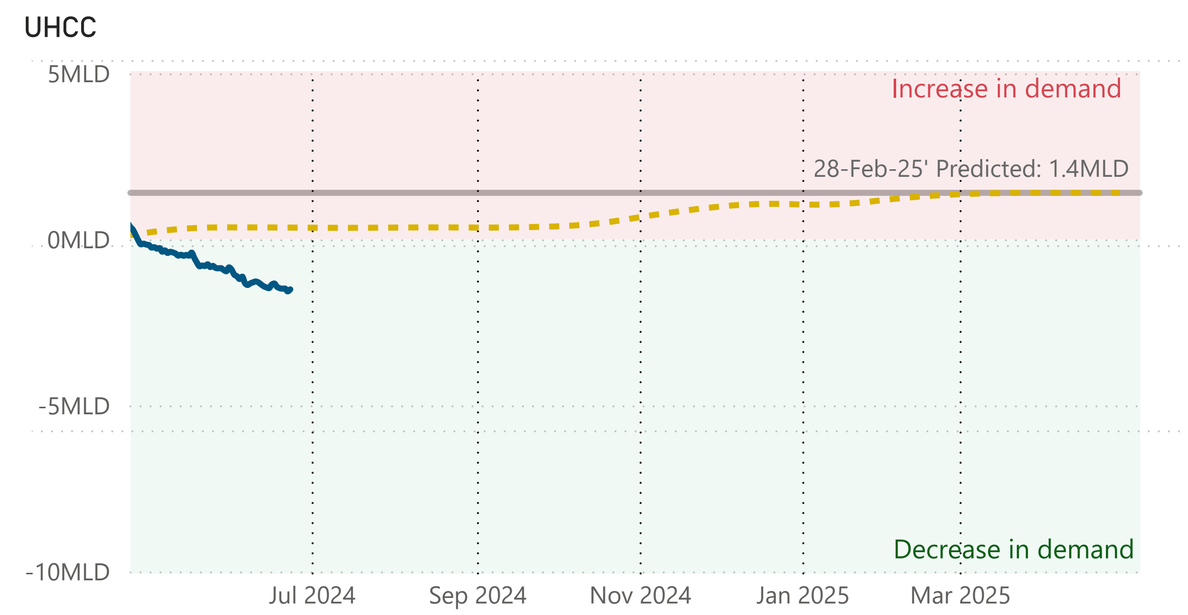
The graphs below track demand reduction, council by council. This is influenced by each council's investment in water loss reduction, activities like pressure management and network calming, and customer use. The yellow dotted line indicates the goal pathway for demand reduction, while the blue line shows the actual demand.



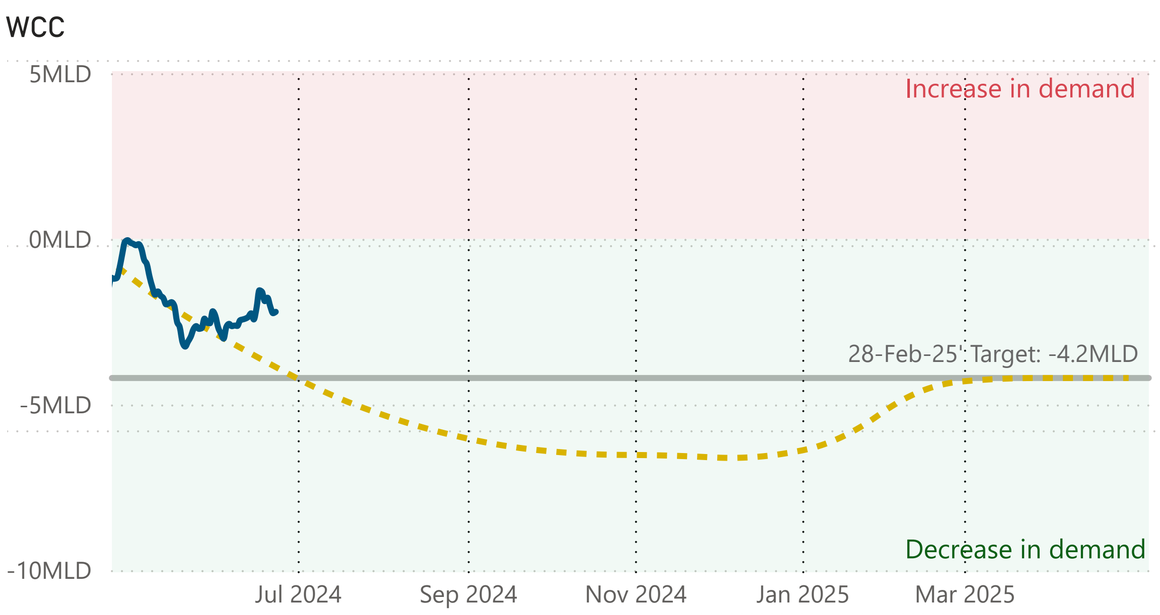
As anticipated, demand has gradually drawn closer to the goal. We are continuing a high level of water loss reduction activities, and expect this trend to continue.



We are encouraged by demand reducing to meet goal levels. We continue to work to reduce water loss to ensure that this is sustained.



Encouragingly, demand has continued to decrease at a better than forecast rate. We are continuing to work to reduce water loss to ensure that this is sustained.



We have seen an unexpected slowdown in demand reduction above what was forecast. While we are investigating the cause, we expect demand to gradually draw closer to the goal as water loss reduction activities accelerate.

4a. Pressure Management

Wellington Water have a pressure management programme which is contingent on funding. Once funding is confirmed by Council LTP budgets, Wellington Water will outline what zones will be constructed for pressure monitoring and management.

Commissioned zones (3) – post implementation outcomes under review

- Brooklyn
- Johnsonville
- Melrose

In progress zones (2) – commissioning scheduled by December 2024

- Wellington Road and Wise Street - constructed but not commissioned
- Hine and Main Road – Tender discussions underway

Future zones (15)

Zones to be investigated and planned implementation within next 7 - 8 years including:

- Hutt City Council (6)
- Upper Hutt City Council (4)
- Porirua City Council (3)
- Wellington City Council (2)

Savings theoretical, between 0.05 and 0.3 MLD per zone

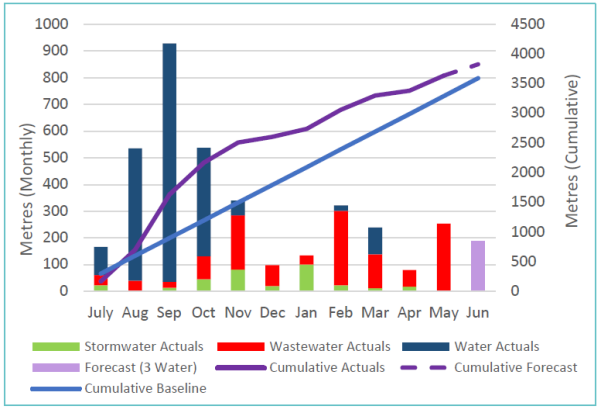
Reduction Activities

4b. Capital Renewals

Metres of Pipe Renewed or Replaced - FY23/24

*Information as of May 31st 2024

Major Projects & Programme Delivery



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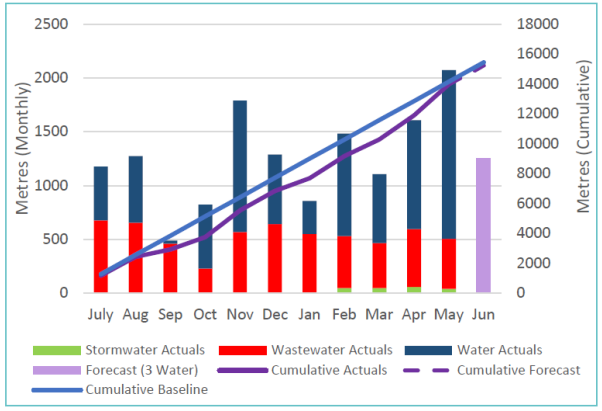

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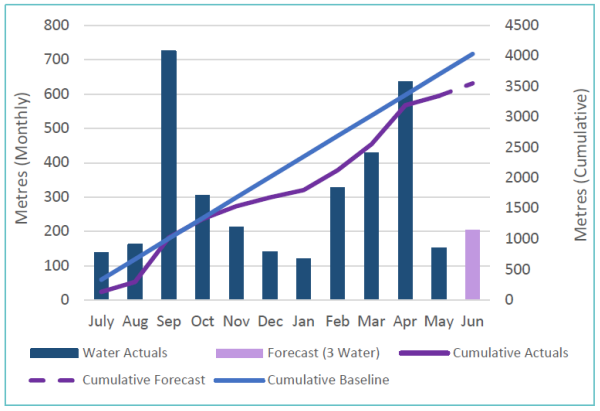

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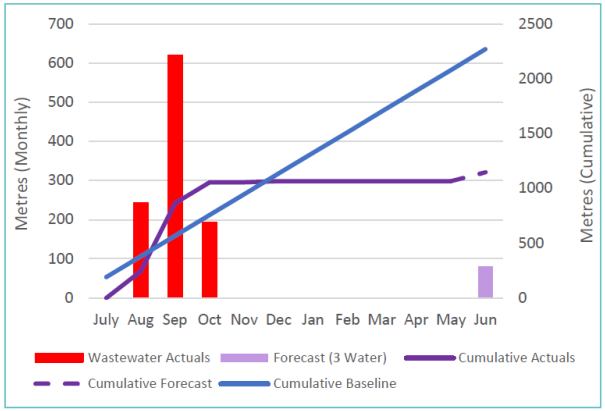

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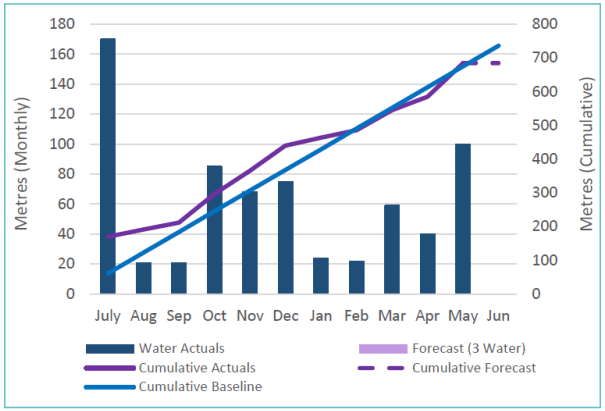

GWRC

Note - The current information on metres only includes planned renewals as per the councils LTP

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8. Supply and Demand Modelling Review

Taumata Arowai Requirement

- Summary of findings of the independent review of the Karaka model, including any recommended adjustments to the model for the 24/25 summer.
- Description of impact of any modelling changes on the calculated 'Likelihood of demand shortfall and restrictions in 2024/25' curves in Item 2.

Independent review of the Karaka model High level findings^:

- The Sustainable Yield Model (SYM) and Karaka Model processes, analysis, and reporting supports the strategic and operational risk management for the Wellington metropolitan water supply, including the risk context over the 2023/24 summer.
- The use of stochastic data, informed by a seasonal streamflow outlook, represents good practice, and is more sophisticated than current approaches typically adopted for cities of similar size to Wellington.
- There are however a range of opportunities to improve the SYM and its application, and the Karaka model.
- The majority of recommendations are assessed as having a relatively low impact on planning outcomes, but will help to improve the defensibility of Wellington Water's modelling, largely through greater transparency around model inputs and assumptions

Key recommendation relating to adjustments to the model for the 24/25 summer are:

- Data fit recommendation (1-15) will be included in the model update for November 2024. The observation is that the demand model may be under-estimating peak demands. If this is confirmed and the NIWA model is adjusted then the modelled likelihood of demand shortfall and restrictions in 2024/25 would increase.

Another recommendation of note that has the potential for modelling changes is the model input recommendation (1-7). This recommendation has the potential to increase or decrease the modelled likelihood of demand shortfall and restrictions in 2024/25. The observation requires a review of the historic climate records and modelling approach used by NIWA. This is being assessed as it requires a significant investment and will not be incorporated until the next substantive model update.

^ A fuller summary of the findings from HARC and recommendations are attached for reference.

Supply Activities

10. Key milestones and risks for Te Mārua DAF Project

Key Scope and Milestones	MLD Benefit	Target Date (April 2024)	Current Program Date (at June 2024)	Risks/Opportunities	Comments
DAF Tank Concrete Structures		August 2024	On Track	Water network supply issues can impact and delay shutdowns or commissioning, or 3rd party impacts (i.e. Regional Park activities, supply of materials).	
DAF Train 1 Mechanical & Electrical, and 2 of 6 filters renewed		October 2024	November 2024	Complex commissioning in multiple areas of plant. Tying into existing plant while supplying water to the network carries higher risks to project delivery. Early commissioning planning, and lessons learned from previous packages help to decrease the residual risks	Change to the programme date now allows for critical path delivery risk.
DAF Train 1 Commissioned	20MLD	November 2024	January 2025	Tying to older existing control systems and integration delays. Change to the programme date now allows for critical path delivery risk. e.g. Weather delays	Change to the programme date now allows for critical path delivery risk.
DAF Train 2/3 Commissioned	40MLD	May 2025	June 2025	Opportunity and risk around next summer water supply, works could come earlier or later depending on how dry summer is. Current program allows for predicted raw water availability for commissioning.	
Renewal of 6/6 Filters		End of 2025	On Track	Very dry next summer, delays re-start of renewals	

11. Resource consent variation

Wellington Water do not believe that a change to the existing consent conditions to allow for a greater take of water would be granted. Wellington Water do not therefore propose to pursue changes to these consents.

This is because additional water takes outside of the emergency works provisions referred to in the update would be prohibited activities. Wellington Water cannot apply for consents to undertake prohibited activities.

While there is a legal technicality that would allow for a 'change to consent condition' application, Wellington Water do not believe that it would be successful while rules prohibiting the activity are operational.

However, we will continue to build our understanding of the ecological impact of taking more water than allowed in the consents. This will allow us to tailor our operational response if/when required in an emergency situation.

Ecological Studies

Wainuiomata and Orongorongo catchments

- First round of ecological studies complete. Potential second round weather dependent.

Hutt River

- Ecological studies completed as part of normal consented environmental monitoring. No definitive conclusions to report at this stage.