Review of Central Coast Council water prices – response to IPART's draft report and decisions

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Date of approval:	14 April 2022
Reference No:	D15126316
Review date:	13 April 2022

13/04/2022

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Tables and Figures

This document adopts the naming conventions used by IPART in their draft report and associated papers on the maximum prices Central Coast Council can charge its customers for the water, wastewater and other services provided by it as a Water Supply Authority:

- 'CCC Water' is used when referring to Central Coast Council's functions as a Water Supply Authority under the Water Management Act 2000
- 'Council' is used when referring to Central Coast Council's local government functions under the Local Government Act 1993

The one exception to the use of IPART's naming convention is the below:

- 'Council' is used when referencing stormwater drainage services as this function is performed under Council's Infrastructure Services Directorate (this is different to the naming convention used by IPART).

1 Executive summary

This executive summary highlights the main discussion points in relation to IPART's draft report:

- improving performance
- demand for water services
- draft prices and bill impacts
- how the revenue level is set
- operational and capital costs
- trade waste and other prices
- funding stormwater services.

1.1 Improving performance

IPART notes in its draft report that it expects CCC Water to substantially improve performance and become more accountable for both delivery and spending.

CCC Water agrees that an improvement to both accountability and transparency to the community is required. CCC Water intends to publish on its website the following information in addition to producing an annual performance report.

- Supply services and performance standards
  - overview of water quality
  - drinking water management system
  - water sampling and results
  - drinking water quality improvements
  - water non conformances
  - water continuity including planned and unplanned outages
  - sewer overflows
  - sewer non conformances
  - water pressure
- Water conservation
  - yield
  - production
  - consumption
  - asset management strategies and plans
  - expenditure review
  - compliance with Customer Charter
  - community engagement and complaint resolution and handling

CCC Water welcomes IPART's proposed review of its performance in 2024 in relation to adopting better management and governance arrangements.

CCC Water acknowledges recommendations made by IPART's consultants and will work towards finalising and improving the following areas:

- asset management systems, processes and strategies
- the relationship between investment and customer outcomes
- further developing CCC Water's cost estimation framework
- the implementation of an endorsed customer charter with measurable outcomes and reporting.

CCC Water also acknowledges that some output measures have not been met:

- water quality complaints
- frequency of unplanned outages
- sewer overflows
- sewer odours
- non-compliance with Environmental Protection Licences (EPLs).

The additional operational and capital allowance requested by CCC Water will be channelled into addressing these issues with better mains cleaning and flushing, mains renewals programs, understanding of stormwater infiltration and system capacity, odour and corrosion projects and performing studies to improve performance at the Sewerage Treatment Plants (STP).

CCC Water will also conduct forums and surveys with the community to understand which performance measures they deem important.

1.2 Demand for water services

CCC Water notes the strong alignment between its submission to IPART and IPART's draft determination regarding demand for water services. Due to this alignment CCC Water's response on demand is kept to a high level in relation to:

- demand forecasts – accepting the rationale for lower water sales across the 2022 determination
- forecast customer growth at 1% each year
- alignment of the sewer discharge factors between the former Councils for non-residential customers
- application of the Demand Volatility Allowance where the difference exceeded 5%
- no drought prices for the 2022 determination
- acceptance of IPART's recommendation to report on climate change risk in the 2026 determination.

1.3 Draft prices and bill impacts

IPART have set draft prices with reference to the reduced revenue requirement as well as implementing the increase incrementally. This means that the average typical bills would increase by 19% in the first year of 2022 and then gradually increase by about 4% plus inflation each year thereafter.

CCC Water proposed to increase the price in the first year of the determination and then only by indexation thereafter. It was felt that this would benefit the community by keeping prices consistent over the 4-year period and avoiding large changes to prices in the 2026 determination.

CCC Water welcomes IPART's decision to align the sewer service charge between the former Gosford and Wyong Councils and to set the water usage charge at $2.27 per kL and the sewerage usage charge to $0.94 per kL.

The net revenue requirement (NRR) once determined can be lumpy throughout the 4 years, as it is dependent on the expenditure that is estimated throughout the determination period. IPART smooth this revenue and determine the revenue received each year of the determination based on Net Present Value (NPV).

The result is that the revenue received by CCC Water for Water and Sewer will vary year by year, increasing gradually so the highest revenue is received in years 3 and 4.

The current economic climate has changed since the CCC Water proposal was lodged in September 2021. This is anticipated to have impacts in securing both resourcing and procurement (materials and services). CCC Water proposes to defer some of the operational expenditure for water and sewer in years 1 and 2 to years 3 and 4 based on resourcing and procurement challenges. An additional benefit from deferring some of the operational expenditure for water and sewer is improved cash flow, ensuring that the water fund has sufficient unrestricted cash to deliver services.

It is not the intention of CCC Water to benefit from the deferred expenditure as per the overriding principles in relation to the Efficiency Carryover Mechanism (ECM). Gaining efficiencies regardless of when they occur is a key objective over next the determination period.

CCC Water is required to report financial performance in accordance with the Office of Local Government (OLG) Code of Accounting Practice and Financial Reporting, which includes non-regulatory expenditure (borrowing costs and depreciation) which is treated differently in the IPART building blocks.

Based on the current draft determination in both the water and sewer funds there is an operating deficit in years 1 and 2 due to the smoothing of price changes over the determination period. By deferring operational expenditure into years 3 and 4 it is forecast that the water and sewer funds will see an improvement to the operating profit and loss in each year of the 4-year determination. Both the improved cash flow and profit and loss will show improved financial performance for the

water and sewer funds – please refer to the Statement of performance measures by fund in the OLG Code of Accounting Practice and Financial Reporting.

It should be noted that both the regulated income and operational expenditure for the drainage fund is constant over the draft 4-year determination. Based on the reporting requirements under the OLG Code of Accounting Practice and Financial Reporting, the drainage fund will continue to have operating deficits over the 4-year determination and the negative unrestricted cash balances will continue to increase.

Council has proposed to simplify how it charges for stormwater drainage by funding all related activities via the single stormwater drainage charge. These activities include managing and maintaining the infrastructure that collects rainwater from roads, parks and private land. It also includes improving the quality of stormwater discharged into our waterways and undertaking flood planning and mitigation.

Council does not agree with IPART's interpretation that flood planning, stormwater quality and urban channel management are 'environmental management activities' as they are intrinsically related to and physically integrated as part of the stormwater drainage network – they are stormwater management activities, precedented by inclusion in former Council IPART determinations and should not be considered new or innovative for Central Coast ratepayers.

Council does not agree with IPART's decision to exclude the costs associated with flood planning, stormwater quality and urban channel management – as they are all core stormwater drainage management functions within the scope of Water Authority operation, and all are precedented as being funded by the stormwater drainage charge in former Council IPART determinations. Council has also demonstrated there is very strong community support for these services.

1.4 How the revenue level is set

IPART use the Building Block Model (BBM) to determine the revenue that is required over a regulatory period. The BBM is used by IPART for all public utilities such as electricity, gas, water and sewerage.

IPART reviewed the operational and capital expenditure put forward by CCC Water as well as additional allowances for depreciation, working capital and tax. The sum of these individual components determines the revenue that can be collected via service charges and usage charges.

There is a difference of approximately $60M (7%) less revenue from what CCC Water proposed compared to IPART's draft proposal i.e.:

- CCC Water proposed $870M
- IPART proposed $809M

Revenue is based on many different variables, but the major influences are those related to operational and capital expenditure.

CCC Water has requested higher operational expenditure related to additional revenue for the Sewerage Treatment Plants (STPs) which is deemed necessary, prudent and efficient. If the change in operational expenditure is accepted, then the overall revenue will increase and change the elements of the notional revenue requirement.

CCC Water analysed the Weighted Average Cost of Capital (WACC) and accepts IPART's WACC of 2.9%. The 3.31% WACC used for CCC Water's return on assets in the proposal was determined in June 2021 and there have been changes in the market since. In addition, CCC Water accepts IPART's calculation of the closing and opening Regulated Asset Base (RAB).

The disaggregation of the RAB proposed by CCC Water returned a lower regulatory depreciation allowance than that proposed by IPART. CCC Water accepts the regulatory depreciation determined by IPART.

The tax allowance proposed by IPART is lower than that proposed by CCC Water, this is attributed to higher revenue required as well as higher operational expenditure. If either of these inputs alter, then the tax allowance will also change. CCC Water accepts IPART's tax allowance calculation.

Financial sustainability is measured by IPART using three ratios[1], these ratios determine if CCC Water will have sufficient revenue to deliver the costs of providing water, sewerage and stormwater drainage services. These tests are:

- interest coverage
- funds from operations (FFO) by debt
- debt gearing.

The above ratios are dependent on the debt and interest for CCC Water as well as the revenue, tax and changes in working capital. CCC Water have passed the three ratios based on the information used in IPART's modelling.

However, there is an additional loan of $50M, $10M in year 1 and $40M in year 2 of the determination period, to fund the inclusion of the Mardi Water Treatment Plant capital expenditure which increases the debt, interest and principal loan repayments. The financial impact in year 1 is forecasted to increase interest expense by $0.5M and principal repayments of $0.3M. Financial impact in year 2 is forecasted to increase interest expense by $2.5M and principal repayments of $1.5M. CCC Water requests that the ratios be recalculated using the new loan and interest figures. These are detailed in section 8.4.1 "*Impacts to CCC Water financial sustainability*".

[1] The OLG have different ratio's Debt Service cover ratio, Building and Infrastructure Renewals ratio, Debt Asset Maintenance ratio, Infrastructure Backlog ratio. These ratios are different to those done by IPART and not included in CCC Waters responses as not part of the IPART modelling and finance-ability tests.

1.5 Operational and Capital costs

1.5.1 Capital expenditure review

CCC Water accepts IPART's decision to reduce sewer capital costs by $0.58M for the Charmhaven Wastewater Treatment Plant project, consistent with the revised cost profile.

CCC Water does not agree with IPART's decision to reduce water capital costs by $6.8M for the Mardi Water Treatment Plant project.

CCC Water maintains that the treatment plant project is prudent and works completed to date were needed and have been undertaken in line with the most efficient option available.

CCC Water asks that IPART revise its proposal for efficient capital water costs to ensure it has enough allowance in water to undertake essential projects including the Mardi Water Treatment Plant.

CCC Water suggests IPART could revise its proposed allowance for water to $100.1M and this increase could be offset by reducing the sewer allowance, resulting in a negligible impact to overall affordability for the customer. CCC Water would also ask that IPART revise its annual phasing of the allowance to better align with what CCC Water believes it needs to deliver.

Table 1 Proposed allowance for water

$M	2022-23	2023-24	2024-25	2025-26	Total
IPART draft water	8.9	21.6	18.1	27.7	**76.3**
CCC Water proposed	17.0	51.9	15.1	16.1	**100.1**

CCC Water's program for sewer capital expenditure is comprised of a variety of large, complex, high-risk projects, annual renewal programs and smaller less complex projects. CCC Water believes as it starts to mature, implementing productivity and efficiency improvements recommended by IPART and the consultants, there will be further opportunities to reduce delivery costs and re-evaluate options to find savings within the sewer program. CCC Water feels the offset method is reasonable and will enable CCC Water to complete all high-risk and critical works on both water and sewer assets and further develop capacity to implement efficiency initiatives.

Table 2 Proposed allowance for sewer

$M	2022-23	2023-24	2024-25	2025-26	Total
IPART draft sewer	31.7	40.6	64.3	51.7	**188.3**
CCC Water proposed	31.7	30.5	55.0	47.3	**164.5**

Table 3 Total proposed allowance

$M	2022-23	2023-24	2024-25	2025-26	Total
IPART draft total	40.6	62.2	82.4	79.4	**264.6**

$M	2022-23	2023-24	2024-25	2025-26	Total
CCC Water proposed	48.8	82.4	70.1	63.4	**264.6**

CCC Water will work over the 2022 determination period to:

1. deliver its capital projects at lower costs
2. investigate options into better capital planning and project management
3. investigate productivity and efficiency improvements
4. develop asset management plans and strategies.

IPART have advised that they have established an overall amount of efficient capital costs, with reference to Mott MacDonald's findings. However, they have not approved specific programs or projects for CCC Water to undertake. IPART expects CCC Water to manage its own spending priorities ensuring it has provided value for money to customers.

Based on IPART's recommendation, CCC Water has undertaken a further program risk analysis with the financial constraint level set in line with IPART's draft decision for efficient capital expenditure of $297.4M. CCC Water then undertook the same analysis at fund level with water set at $76.3M and sewer $188.3M.

During the 2019 determination period, CCC Water has faced some delivery challenges. CCC Water has been required to conduct further reprioritisation and reprofiling of several of its projects and programs throughout the 2019 determination period. Major causes for project and program reprofiling have been:

- business risk and asset criticality
- efficiency opportunities (packaging works)
- resourcing and requirement for specialised expertise
- grant and funding approvals
- November 2019 – January 2020, bushfires impacting access to Mangrove Water Catchment, pump station and dam
- March 2020 – ongoing, COVID-19 and contractor travel restrictions
- October 2020 – ongoing, corporate financial and resource constraints
- March 2021 – ongoing, major flooding and increased wet weather events (La Niña)
- increase in reactive and emergency renewals.

1.5.2 Operational expenditure review

The operational expenditure review supports the prudency of CCC Water's proposal except for the $4.7M double counting of water resilience expenditure. The efficiency assessment by the consultant relied solely on benchmarking. CCC Water's proposed operational expenditure sits within the consultant's range.

CCC Water's operational expenditure is higher than the mid-point proposed by IPART's consultants because there is substantial investment required to return the organisation to a steady operating state and transition from reactive to proactive maintenance regime. The justification for this investment is explained in detail in the pricing submission and technical papers.

CCC Water views the use of a second benchmark of a 2013-14 roll-forward to support the consultant's recommendation as relying on a base year which is not representative of the current organisation and an escalation rate of approximately 1.5% per year, which is far lower than other similar organisations such as Hunter Water have experienced during the same period. It should also be noted that in 2013-14 the former Councils were not amalgamated, and the structure of the water and sewer teams and operating models were different to the current structure and operating model. Whilst the former Councils worked together to deliver water services under the Joint Water Authority there was nothing similar in place for sewer.

The revised CCC Water proposal for total operational expenditure (water, sewerage and stormwater) is shown in the table below.

Table 4 - Revised proposed total for operational expenditure

$M	2022-23	2023-24	2024-25	2025-26	Total
CCC original proposal	126	130	135	132	**524**
Consultant recommended	117	118	118	118	**473**
CCC Revised proposal	125	129	133	131	**520**

Note: numbers may not add due to rounding

Council strongly disagrees with IPART's direction to the consultant to exclude stormwater drainage expenditure considered to be outside the historic scope of the Stormwater Drainage Charge from their review. These services have been approved by IPART as being within the scope of the Stormwater Drainage Charge for former Gosford Council prior to amalgamation and should therefore be considered as being within the historic scope of the Stormwater Drainage Charge.

The excluded related stormwater drainage services are all precedented by inclusion in former Council IPART determinations and are therefore be considered within the historic scope of the Stormwater Drainage Charge. These services were excluded from the current pricing period as they were being partially funded by an alternate funding source (a $25 per property annual charge for stormwater management services referred to as a stormwater levy in accordance with s496A of the *Local Government Act 1993*) which has since ceased and was last levied in 2016-17.

Council recommends the associated stormwater drainage step and fund changes are assessed in full by IPART and be considered for inclusion in finalising the draft determination.

Step changes

IPART's consultants reviewed CCC Water's base operational expenditure and the 'step changes' business cases. The process was largely a recategorization of expenditure from being a 'step change' associated with a new regulatory requirement to being part of base operational expenditure.

All expenditure was deemed 'prudent' in that the consultant did not indicate that any of the expenditure was not in the interest of customers.

At this stage, the consultants did not propose any reductions/efficiencies for CCC Water's base operational expenditure.

1.6 Trade waste and other prices

CCC Water notes the alignment between its submission to IPART and IPART's draft report regarding Trade Waste prices.

Trade waste prices are levied on commercial and industrial customers for sewerage in which the concentrations of pollutants exceed domestic equivalent. CCC Water proposed increases to annual and licence related liquid trade waste fees, as well as volume or concentration-based trade waste and mass-based trade waste prices.

1.6.1 Mass-based trade waste prices

CCC Water is seeking to include 4 additional pollutants to the mass-based trade waste (*Table 2.3: IPART's draft decision on list of substances subject to excess mass-based charges*), which were not included in the CCC Water's proposal. These are contained in the Environment Protection Licences for CCC Water's sewage treatment systems.

CCC Water proposes to include:

- mercury (with a charge of $2,600/kg)
- selenium ($55/kg)
- polychlorinated biphenyls ($1,600/kg)
- pesticides ($770/kg).

As CCC Water requires a mechanism for cost recovery from dischargers if any of these substances is detected in the discharges. These charges are not expected to generate any notable revenue as they are seldom detected in CCC Water's sewage streams. CCC Water requests IPART consider these additional charges.

1.6.2 Miscellaneous prices

Miscellaneous and ancillary prices are one-off prices levied for services such as disconnections and connections, accessing documentation and testing. IPART's consultants conducted a review of CCC Water's proposed prices for the ten most revenue-intensive miscellaneous charges. The review was to examine whether the price proposal by CCC Water reflected the efficient costs incurred in providing the services and accord with benchmark prices charged by similar utilities. IPART have sought to apply the same principles to the remaining miscellaneous prices that were not examined by the consultants.

4 out of 10 most revenue-intensive charges reduced

Table 3.3 in IPART's *Draft Technical Paper – Trade Waste and other prices* does not consider the true cost to CCC Water of providing the services.

CCC Water requests to further understand the methodology used by IPART when calculating the miscellaneous fees and charges to effectively review the charges proposed. Reference is made to 15a being similar to 15b, but they are very different charges in CCC Water's proposal.

Additionally, CCC Water refutes that it did not provide sufficient evidence to Frontier to justify the price rises proposed for charges 2b, 12b, 15b and 21a. CCC Water provided evidence on two occasions, the most recent being February 2022. Frontier did not seek further clarification of the basis for these proposed prices, nor provide any justification for rejecting the evidence provided in their draft report of 25 February 2022.

The proposed charge for 12b Standpipe hire – annual fees (65mm) is accepted, based on calculation using the revised water supply service charge (20mm) of $182.37 (Table 2 of Draft Determination).

1.7 Funding stormwater services

The Central Coast currently has the lowest water bill charges in NSW. This is partially due to IPART reducing Council's revenue in the 2019 price determination, which resulted in a significant reduction in the current stormwater drainage charge. Council supports IPART's decision to increase stormwater drainage revenue as part of this determination as it will help us meet mandatory legislative standards and sustainably manage our stormwater drainage network as infrastructure begins to age and the region continues to grow.

Council proposed to reintroduce flood planning, stormwater quality and urban channel management into this IPART determination and fund associated services using the stormwater drainage charge. At the time of the last determination, these services were funded by a $25 per year stormwater levy under the Local Government Act. This levy was stopped in 2016-17 and Council proposed to simplify stormwater drainage management by consolidating all functions under the one charge.

Council disagrees with IPARTs decision to exclude the costs associated with these services from the draft determination for the following reasons:

- the excluded stormwater drainage management functions are core / integral to management of the stormwater drainage network
- the functions are all precedented as being within the scope of Water Authority operations – as evidenced by IPART's approval of former Gosford Council determinations
- the functions were funded by the stormwater drainage charge in former Gosford Council
- there is strong community support for ongoing and increased investment in these services
- their inclusion will ensure continued provision of related services, mitigating the need for service level reductions – thereby supporting prudent planning in relation to flood events and emergency responses, limiting pollution export into our waterways and strategically managing flood risk across the local government area
- their inclusion will streamline and support Council's transition to stormwater drainage services fully funded by local government rates, a drainage Special Rate Variation or equivalent – simplifying future consultation and reducing community confusion in relation to the scope of Council's stormwater drainage operations.

In line with the above, Council has submitted a moderated proposal for funding these services as part of this response. The proposal is in alignment with IPART's broader determination principles as it excludes the step changes related to these services and would recognise IPART's role in establishing / regulating these functions, ensure ongoing service delivery and support Council as we transition to funding the services via local government rates.

Council fully supports IPART's decision to apply a 4-year price determination for stormwater drainage from 1 July 2022 to 30 June 2026 and agrees that it would be more efficient and appropriate to fund all stormwater drainage services through local government rates from the end of the next determination period.

As acknowledged by IPART this change would require an increase in local government rates – generally equivalent to the drop-in charges levied under the Water Management Act – to make sure Council has enough money to continue to fund its stormwater drainage activities.

2 Introduction

CCC Water has addressed each of IPART's draft decisions throughout this response. The below table lists IPART's draft decisions and provides a reference of where each item has been addressed in this response.

Table 5 - IPART draft decision with CCC Water comment and reference

IPART draft decision	CCC Water comment and reference
Prices and bill impacts	
Our draft decision is to phase-in an increase to prices so that typical residential household bills would: – increase initially by 19% in the first year of the determination in 2022-23– then, increase by 4% and inflation from 2023-24 to 2025-26. If we were to set prices to increase only in the first year of the determination period in 2022-23, typical household bills would increase by 25% in 2022-23 and then by inflation only each year after that. We want to know what you think about how we introduce the price increase.	CCC Water propose that the prices increase in year 1 and remain stable increasing by CPI only for the remainder of the determination period. This would allow prices to remain steady enabling better budgeting for the community. This was also raised by Public Interest Advocacy Centre (PIAC) in the community consultation held with IPART, they estimate a flat increase would be 25% increase in year 1 instead of 19%. Further information is provided in the *Draft prices and bill impacts* section of this document.
To set maximum water prices for CCC Water as shown in Table 1 in our *Draft Information Paper – Draft prices and bill impacts*, including to set the maximum water usage price at $2.27 per kilolitre in real terms over the 4-year determination period from 2022-23 to 2025-26.	CCC Water agrees with the proposed water usage charge being set to $2.27 per KL. This is in line with estimated Long Run Marginal Cost (LRMC) for water. CCC Water also endorses the sewerage usage charge set at $0.94 per KL. The service charges are based on the revenue requirements and if this increases then this may impact the service charges. Further information is provided in the *Operational and capital costs* section of this document.
To set maximum wastewater prices for CCC Water as shown in Table 2 and Table 3 in our *Draft Information Paper – Draft prices and bill impacts*, including to set the maximum wastewater usage price at $0.94 per kilolitre	CCC Water agrees with IPART's decision to set the sewerage usage charge at $0.94

IPART draft decision	CCC Water comment and reference
in real terms over the 4-year determination period from 2022-23 to 2025-26.	
To align wastewater prices so that customers in the former Gosford Local Government Area pay the same as equivalent customers in the former Wyong Local Government Area.	This aligns with CCC Water's proposal where the community expressed support for the alignment of the sewerage service charge. CCC Water agrees with IPART's draft decision.
To set maximum stormwater prices for CCC Water as shown in Table 4 in our *Draft Information Paper – Draft prices and bill impacts*, for the 2022 determination period from 2022-23 to 2025-26.	Council acknowledges IPART's draft stormwater prices. However, challenges the removal of the additional expenditure required for flood planning, stormwater quality and urban channel. If included would increase the stormwater prices. More information can be located in *Funding Stormwater Services* section of this document.
To gradually increase water and wastewater prices over the 2022 determination period by: setting prices in 2022-23 half-way between what the price would be if the total price increase over the period was applied in one go in that year and what the price would be if the total increase was spread evenly across all 4 years of the determination period, increasing prices from 2023-24 by spreading the rest of the total price increase across the remaining three years.	CCC Water propose that the prices increase in year one and remain stable increasing by CPI only for the remainder of the determination period. This was also raised by Public Interest Advocacy Centre (PIAC) in the community consultation held with IPART, they estimate a flat increase would be a 25% increase in year 1 instead of 19%. Further information is provided in the *Draft prices and bill impacts* section of this document.
Operational and capital costs	
To set CCC Water's operational expenditure allowance at $477.7M over 4 years as shown in Table 2 in our *Draft Information Paper – Operational and capital costs*.	CCC Water understands IPART's approach to setting the operational allowance and reducing it by approximately $47M. CCC Water has responded to this reduction accordingly and challenges the 9% reduction. The reduction in operational expenditure is related to a reduction

IPART draft decision	CCC Water comment and reference
	in sewerage and stormwater operational expenditure. Further information is provided in the *Operational and capital costs* section of this document.
To set the efficient level of past capital expenditure since 2018-19 to be included in the Regulatory Asset Base as set out in Table 3 in our *Draft Information Paper – Operational and capital costs*.	Expenditure for 2021-22 for Mardi Water Treatment Plant is prudent and efficient and should be included in the RAB. CCC Water challenges IPARTs decision to reduce the capital allowance for this project. Further information is provided in the *Operational and Capital costs* section of this document (discussed under heading *2019 capital costs*).
To set CCC Water's efficient level of capital expenditure to be included in the Regulatory Asset Base for the 2022 determination period at $297.4M, as shown in Table 4 in our Draft *Information Paper – Operational and capital costs*.	Accept draft decision to set CCC Water's capital costs at $297.4M. However, CCC Water challenges the targeted reduction in proposed water expenditure and ask that IPART increase water expenditure with an offset in sewer expenditure. Further information is provided in the *Operational and Capital costs* and *How IPART sets the revenue level* sections of this document.
Funding of stormwater services	
To not accept CCC Water's proposal to transfer $15.4M in stormwater costs currently funded through local government rates to CCC Water.	Council acknowledges IPART's response in relation to the transfer of $15.4M in stormwater costs. However, challenges this decision. Further information is provided in the *Funding Stormwater services* section of this document.

IPART draft decision	CCC Water comment and reference
To include in the draft determination that the stormwater drainage service charge would be set to $0 in the event that the 2022 determination was to apply beyond 30 June 2026.	Council agrees with IPART's decision to set the stormwater drainage charge to $0 from 1 July 2026 onwards. This was resolved by Council at the Ordinary Council Meeting held on 9 November 2021. Further information is provided in the *Funding Stormwater services* section of this document.
Setting CCC Water's revenue level	
To adopt a 4-year determination period from 1 July 2022 to 30 June 2026.	CCC Water endorses IPART's decision to have a 4-year determination period. Further information is provided in the *How IPART set the revenue level* section of this document.
To set maximum prices for CCC Water's water services in each year of the 2022 determination period (a price cap).	CCC Water agrees with IPART's price cap where IPART sets the maximum price that CCC Water can charge. Further information is provided in the *How IPART set the revenue level* section of this document.
To set the notional revenue requirement at $809M over the 2022 determination period as shown in Table 3.1 in our *Draft Technical Paper – How we set the revenue level*.	CCC Water proposed a total notional revenue requirement of $870M. IPART's draft response has a notional revenue requirement of $809M. The determination of the revenue is determined by several inputs with the majority being both the operational and capital allowance. Further information is provided in the *How IPART set the revenue level* section of this document.

IPART draft decision	CCC Water comment and reference
To calculate the return on assets using: an opening regulatory asset base of $1,461M for 2022-23, and the regulatory asset base for each year as shown in Table 3.2 in our Draft Technical Paper – *How we set the revenue level CCC Water's reported historical asset disposals for the 2019 determination period* as shown in Table 3.4 in our Draft Technical Paper – *How we set the revenue level CCC Water's forecast asset disposals for the 2022 determination period* as shown in Table 3.2 in our *Draft Technical Paper – How we set the revenue level* a real post-tax weighted average cost of capital of 2.9% to calculate the return on CCC Water's assets a sampling date of 31 December 2021 for market observations a true-up for differences between the forecast and actual cost of debt over the 2022 determination period in the 2026 Determination.	IPART's response to the setting of the Regulatory base, return on assets, WACC and the end of period true up is largely supported by CCC Water, further detail can be located in the "*How IPART sets the revenue level*" section of this document. CCC Water largely accepts IPART's decision on the RAB, tax allowance, true -up, working capital and regulatory depreciation.
For the purpose of calculating CCC Water's allowance for return of assets, to calculate regulatory depreciation using a straight-line method set the asset lives for existing and new assets as shown in Table 3.8 and Table 3.9 in our *Draft Technical Paper – How we set the revenue level*.	CCC Water's accepts IPART's regulatory depreciation allowance and the disaggregation of the RAB. Further information is provided in the *How IPART sets the revenue level* section of this document.
To set CCC Water's allowance for return of assets at $152M over the 2022 determination period as shown in Table 3.7 in our *Draft Technical Paper – How we set the revenue level*.	CCC Water accepts IPART's return of assets at calculation based on the new asset categories and the methodology used by IPART (WAUL weighted by depreciation). Further information is provided in the *How IPART sets the revenue level* section of this document.

IPART draft decision	CCC Water comment and reference
To set the working capital allowance for the 2022 determination period as shown in Table 3.10 in our *Draft Technical Paper – How we set the revenue level*.	CCC Water accepts IPART's calculation of working capital. It closely aligns to what was proposed by CCC Water. Further information is provided in the *How IPART sets the revenue level* section of this document.
To calculate the tax allowance using a tax rate of 30% – IPART's standard methodology.	CCC Water accepts IPART's calculation of the tax allowance. Further information is provided in the *How IPART sets the revenue requirement* section of this document.
To adopt the regulatory tax allowance as shown in Table 3.13 in our *Draft Technical Paper – How we set the revenue level*.	CCC Water accepts IPART's calculation of the Tax Allowance. Further information is provided in the *How IPART sets the revenue requirement* section of this document.
To set an allowance for pensioner rebates for the 2022 determination period as shown in Table 3.15 in our *Draft Technical Paper – How we set the revenue level*.	CCC Water accepts IPART's calculation of the allowance for pensioner rebates. Further information is provided in the *How IPART sets the revenue requirement* section of this document.
To deduct non-regulated revenue from CCC Water's notional revenue requirement (NRR) for the 2022 determination period as shown in Table 3.16 in our *Draft Technical Paper – How we set the revenue level*.	CCC Water accepts IPART's calculation of non-regulated income.
To set prices to recover the total NRR over 4 years, in present value terms.	CCC Water agrees that IPART recover the NRR over 4 years using present value terms.
Demand for water services	
To set water, wastewater and stormwater prices using the forecast customer numbers in Table 2.1, Table 2.2 and Table 2.3, as set out in our *Draft Technical Paper – Demand for water services,* in line with CCC Water's proposal.	CCC Water note the strong alignment between its submission to IPART and IPART's draft determination. Further information is provided in the *Demand for water services* section of this document.

IPART draft decision	CCC Water comment and reference
To set water prices using the water sales forecasts in Table 2.5, as set out in our *Draft Technical Paper – Demand for water services,* in line with CCC Water's proposal.	CCC Water note the strong alignment between its submission to IPART and IPART's draft determination. Further information is provided in the *Demand for water services* section of this document.
For setting developer charges, to maintain the equivalent tenement value per customer at 150 kilolitres (kL).	CCC Water accepts the decision by IPART to set the developer charges to the equivalent tenement value at 150 Kilolitres (kL).
For setting wastewater prices, to maintain the wastewater deemed discharge allowance for: standalone residential properties at 125 kilolitres (kL) multiple and mixed multiple premises at 80 kL non-residential properties within mixed multiple premises at 125 kL.	CCC Water agrees with the sewerage deemed discharge allowance.
For setting wastewater prices, to maintain the 75% discharge factor for all residential properties and unmetered properties.	CCC Water agrees to maintain the 75% discharge factor for residential properties.
To set wastewater prices for non-residential customers using the discharge factors and resulting billable discharge volumes in Table 2.6, as set out in our *Draft Technical Paper – Demand for water services*, in line with CCC Water's proposal to align wastewater charges for customers in the former Gosford local government area with those in the former Wyong Local Government Area.	CCC Water agrees to align the sewerage discharge factors between the former Gosford and Wyong Councils. The discharge factor will be based on those prescribed by the Department of Planning and Environment (DPE).
To apply the demand volatility adjustment mechanism (DVAM) to compensate CCC Water for lost water sales compared to what we forecast for the 2019 Determination, amounting to $2.1M.	CCC Water supports the ongoing implementation of the Demand Volatility Adjustment Mechanism (DVAM). The continuation of the +-5% is also supported. Further information is provided in the *Demand for water services* section of this document.
To not set drought prices for CCC Water for the 2022 Determination.	CCC Water agrees that drought pricing will not be set for this determination. Further information is provided in the *Demand for water services* section of this document.

IPART draft decision	CCC Water comment and reference
Trade waste and miscellaneous prices	
To accept CCC Water's proposed fixed trade waste prices as listed in Table 2.1 in our *Draft Technical Paper – Trade waste and other prices*.	CCC Water accepts IPART's draft report in relation to setting trade waste prices. Further information is provided in the *Trade waste and other prices* section of this document.
To accept CCC Water's proposed compliant and non-compliant usage prices as listed in Table 2.2 in our *Draft Technical Paper – Trade waste and other prices*.	CCC Water accepts IPART's draft report in relation to setting trade waste prices. Further information is provided in the *Trade waste and other prices* section of this document.
To accept CCC Water's updated list of mass-based prices for category 3 customers as listed in Table 2.3 in our *Draft Technical Paper – Trade waste and other prices*.	CCC Water accepts IPART's draft report in relation to setting trade waste prices. There are an additional 4 mass-based prices that need to be included. CCC Water requests IPART accepts these additional Trade waste charges as prescribed by the Environment Protection Licences (EPLs). Further information is provided in the *Trade waste and other prices* section of this document.
To decrease the price for a minority of revenue-intensive miscellaneous charges as listed in Table 3.2 in our *Draft Technical Paper – Trade waste and other prices*.	CCC Water acknowledges IPART's recommended price decrease and challenges that sufficient information has been provided to the IPART consultants. Further information is provided in the *CCC Water's Proposed miscellaneous prices* section of this document.
To set the standpipe hire prices in reference to the corresponding water service price as listed in Tables 3.2 and 3.3 in our *Draft Technical Paper – Trade waste and other prices.*	CCC Water accepts the proposed standpipe hire be set with reference to a 65mm meter size for the annual fee. Further information is provided in the *CCC Water's Proposed miscellaneous prices* section of this document.
To increase miscellaneous prices by CPI only for prices that are not in line with other benchmark utilities as listed in Table 3.3 in	CCC Water acknowledges the increase in miscellaneous prices to CPI only. However, challenge that change in process and personnel

IPART draft decision	CCC Water comment and reference
our *Draft Technical Paper – Trade waste and other prices.*	needs to also be considered to ensure true cost recovery. Further information is provided in *CCC Waters Proposed miscellaneous prices* section of this document.
To accept CCC Water's remaining proposed miscellaneous prices.	CCC Water accepts IPART's draft report for remaining miscellaneous prices to be set as proposed.
To accept CCC Water's proposed removal and introduction of new miscellaneous and ancillary charges as listed in Tables 3.4 and 3.5 in our *Draft Technical Paper –Trade waste and other prices*.	CCC Water accepts IPART's draft decision to remove and introduce miscellaneous and ancillary charges. Further information the *CCC Waters Proposed miscellaneous prices* section of this document.
Other prices	
To maintain our approach from our 2019 Determination of charging retirement villages as standard non-residential customers.	CCC Water agrees with IPART's draft decision to maintain the approach to charging retirement villages. Further information is provided in the *CCC Water's proposed prices for specific customers* section of this document.
To allow CCC Water to charge WICA Licensees as standard non-residential customers if they do not have an unregulated pricing agreement.	CCC Water acknowledges IPART's draft determination that it maintains pricing for the WICA licences. Further information is provided in the *CCC Water's proposed prices for specific customers* section of this document.
To not revoke or replace the current 2019 determination that sets a maximum price for bulk transfers between Hunter Water and CCC Water with reference to the Short Run Marginal Costs (SRMC) but allow for Hunter Water and CCC Water to agree on a different price.	CCC Water acknowledge IPART's decision to not replace or revoke the current bulk water transfer pricing between Hunter Water and CCC Water. Further information is provided in the *CCC Water's proposed prices for specific customers* section of this document.
IPART's draft recommendations	

IPART draft decision	CCC Water comment and reference
1. That the NSW Government reviews whether the current concessions for water and wastewater services are appropriate.	CCC Water welcomes IPART's recommendation that the NSW Government reviews the current concessions for water and sewerage services.
2. That CCC Water promote its hardship assistance programs and water conservation to assist customers to manage paying for their increased water bills.	CCC Water agrees to promote its hardship assistance programs. These will be available and on the website. CCC Water understands the impact to the community regarding higher prices.
3. Commencing at the end of 2022-23, CCC Water should prepare and publish an annual performance report by 31 October 2023, setting out its performance against measures that reflect the community's preferences.	CCC Water agrees to publish an annual performance report by 31 October 2023. CCC Water also intends to publish information quarterly on the website and via social media.
4. That the Minister ask IPART to investigate and report publicly on CCC Water's - performance as a Water Supply Authority - progress implementing management and governance improvements. We recommend that this investigation commence in 2024.	CCC Water welcomes IPART's request to the Minister to investigate and report publicly on CCC Water's performance in 2024.
5. To consider making an adjustment to future prices to address any over or under-recovery of revenue over the 2022 determination period due to material variation between the level of actual water sales and forecast water sales used in making the 2022 determination, where: a material variation is defined as more than 5% (+or-) over the whole determination period we would only consider adjusting for variation greater the 5% (+ or -)	CCC Water supports the ongoing implementation of the Demand Volatility Adjustment Mechanism (DVAM). The continuation of the +-5% is also supported. More information on DVAM can be located in *Demand for water services* section of this document. Further information is provided in the *Demand for water services* section of this document.
6. To consider whether drought prices are appropriate for CCC Water at the 2026 determination.	CCC Water agrees that drought pricing will not be set for this determination. Further information is provided in the *Demand for water services* section of this document.
7. That CCC Water improve its water demand forecasts by incorporating the impacts of climate change in its next pricing proposal.	CCC Water notes IPART's recommendation to report on climate change risk in the next review.

IPART draft decision	CCC Water comment and reference
	Further information is provided in the *Demand for water services* section of this document.
8.That CCC Water report on climate change risks associated with water demand and how it is addressing and managing these risks over the 2026 determination period in its next pricing proposal to IPART. We also encourage a longer-term focus and planning for climate change for CCC Water.	CCC Water notes IPART's recommendation to report on climate change risk in the next review. Further information is provided in the *Demand for water services* section of this document.

3 Draft prices and bill impacts

IPART have proposed to introduce the increase in prices gradually, with a typical residential bill rising by 19% in the first year of the determination and then by 4% plus inflation in the following years. This was in response to customer feedback as well as input from the Public Interest Advocacy Centre (PIAC) to avoid price shock.

CCC Water proposed to increase the price in the first year of the determination and then only by indexation thereafter. It was felt that this would benefit the community by keeping prices consistent over the 4-year period. It would also avoid any large price changes in 2026, providing a level of consistency for the community.

CCC Water understands the community concerns and IPART's proposal to increase prices gradually. Impacts to the community regarding sharp increases and understanding these concerns places the community at the centre of any decision.

The net revenue requirement (NRR) once determined can be lumpy throughout the 4 years, as it is dependent on the expenditure that is estimated throughout the determination period. IPART smooth this revenue and determine the revenue received each year of the determination based on Net Present Value (NPV).

The result is that the revenue received by Council especially for Water and Sewer will vary year by year, increasing gradually so the highest revenue is received in years 3 and 4 as highlighted in the table below:

Table 6 - Proposed regulated revenue received

$M	2022-23	2023-24	2024-25	2025-26	Total
Water	87.5	92.8	99.2	106.7	386.3
Sewer	84.3	86.6	89.0	91.5	351.5
Stormwater drainage	17.7	17.8	17.9	17.9	71.4
Total	**189.6**	**197.3**	**206.1**	**216.1**	**809.2**

The operational expenditure however does not have the same transition, expenditure is consistent throughout the 4-year determination period.

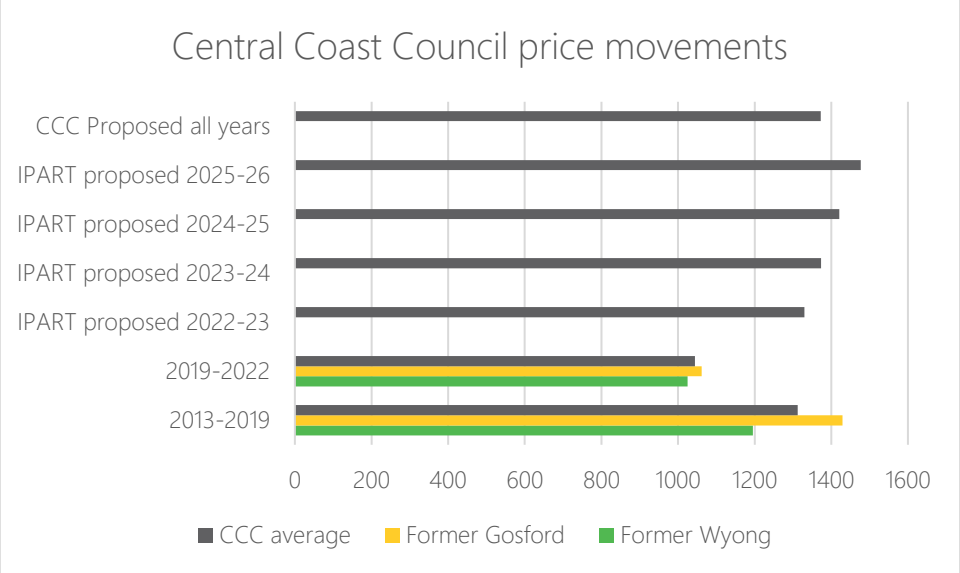
CCC Water requests that IPART consider deferring some operational expenditure for water and sewer in years 1 and 2 to years 3 and 4 due to the changes in the current economic environment. Due to the impacts of COVID nationally and internationally Council is facing challenges in securing resourcing and procurement of materials and services. Further detail regarding deferral of operational expenditure can be found in section 5.

3.1 Customers should pay no more than needed for safe and reliable water services

CCC Water agrees that customers should pay no more than needed for safe and reliable water services and stormwater drainage. However, to provide these services to the community revenue is required.

In the 2019 IPART determination, the requested operational expenditure was reduced significantly. In total, a reduction of $37.6M ($2021-22) over the three years from 2019-22. The reduction in overall revenue resulted in significant reductions in the bills, in some cases up to 53%.

This reduction resulted in lower bills for the community. However, the level of pricing is not sustainable and is resulting in failing asset performance, breaches in CCC Water's Environmental Protection Licence thus impacting its environment and not meeting the regulatory obligations. Council's community will see higher proposed pricing for the 2022 determination to address these issues to that at a similar level in the 2018-19 financial year.



Graph 1 CCC Price movements 2013-2026
**note: CCC price shown above is based on original revenue required, this would be lower using IPARTs proposed revenue. Based on 150Kl residential usage and application of 75% discharge factor to sewer service charge.*

3.2 CCC Water proposed a 35% increase to typical bills

IPART states in the draft information paper "Draft prices and bill impacts" that CCC Water requires the increase to ensure it can provide water services to meet customer expectation.

The current levels of pricing for water and sewer for Council's residential customers are close to the levels of the 2008 determination period for the former Local Government Areas (LGAs) of Gosford and Wyong.

In 2009 the water service charge was:

- $88.48 ($real) for Gosford
- $97.38 ($real) for Wyong
- the current water service charge is $88 ($real).

The 2009 sewer service charge was:

- $446 ($real) for Gosford
- $413 ($real) for Wyong
- the current average sewer service charge is $398 ($real).

The water usage charge is also comparable to what was set in 2019 – $2.00 per kL compared to $1.71 ($real) (with CPI) = $2.07.

CCC Water calculated water, sewer and stormwater drainage prices that allow for the recovery of proposed target revenues. The proposed pricing allows Council to recover the revenue between residential and non-residential customers via the fixed and usage charges for water and sewer and via standard charges for stormwater drainage. This pricing reflects IPART's best practice principles and past IPART decisions.

The bills were calculated to remain consistent in real terms throughout the proposed determination period. This was done by summing up the total revenue required for the proposed 4-year determination period and smoothing the billing evenly so the only increase will be the application of the Consumer Price Index (CPI) per annum.

When establishing CCC Water's pricing for the 2022 determination period, the community was engaged to gather feedback on proposed increases to pricing for specific issues regarding environmental licences and regulatory obligations. Increases were proposed to:

- improve workplace health and safety
- implement a transition strategy to increase proactive maintenance and improvement of risk management planning of critical water and sewer assets
- improve rectification programs, pump station analysis and reduce Sewage Pump Station (SPS) overflows
- increase mains cleaning programs to improve water quality
- increase sewer inspections and maintenance programs
- introduce a Sewage Treatment Plant (STP) improvement program including clean out of the grit chambers, aeration tanks and digesters, wet weather ponds, as well as improvements in sludge management

- improve sampling results with a quality database
- improve bushfire management practices by reducing hazards, reducing water quality risks, maintaining a balanced ecology and protecting water and sewer assets
- improve Council's catchment management practices by elimination or minimisation of all sources of impurity in the catchments resulting in clean and safe water, reducing the costs of treatment as well as protecting the environment
- ensure that mandatory legislative standards are met in relation to dam safety
- improve Council's outfall monitoring thus reducing ecological impacts of effluent to ocean outfalls
- undertake critical asset inspections, cleaning and repair to inform forward planning, manage risk, reduce reactive maintenance requirements and prevent catastrophic asset failure
- deliver floodplain risk management planning required to guide sustainable development and strategic prioritisation of stormwater drainage upgrade works
- improve stormwater quality management to maintain the health of Council's waterways
- implement Plans of Management for creeks identified as being critical to maintaining flood planning levels and preventing flooding of existing properties.

4 Improving performance

4.1 Promoting better performance and more accountability

IPART note in their draft report that it is expected that CCC Water substantially improve performance and to be more accountable for its spending. IPART recommends that CCC Water reports performance and publishes this information on its website to increase transparency. In addition, IPART recommend that the Minister asks IPART to assess CCC Water's performance in two years.

CCC Water agree that an improvement to both accountability and transparency to the community is required. This will be done by publishing expenditure and performance on the website in addition to producing an annual performance report that will include the below.

- Supply services and performance standards
  - overview of water quality
  - drinking water management system
  - water sampling and results
  - drinking water quality improvements
  - water non conformances
  - water continuity including planned and unplanned outages
  - sewer overflows
  - sewer non conformances
  - water pressure
- Water conservation
  - yield
  - production
  - consumption
- Asset Management Strategies and Plans
- Expenditure review
- Compliance with Customer Charter
- Community engagement and complaint resolution and handling

CCC Water also welcomes that IPART review performance in 2024 in relation to adopting better management and governance arrangements.

The additional expenditure that is requested is supported by a Transition Strategy that is the blueprint for increased efficiencies, enhanced asset performance and building trust with the community.

CCC Water aims to deliver a commitment of consistent, simple, and easy interaction with customers and constantly strives to improve the way it listens and responds to the community. Customer service is the responsibility of everyone within CCC Water and Council and the Customer Charter is supported by the Customer Experience Strategy, placing customers at the centre of everything CCC Water and Council does. This was discussed in *Technical Paper 1 Engaging with our Community* section 1.1.4 Council's customer promise.

In addition, CCC Water is in the process of establishing an Accountability Strategy. The Accountability Strategy makes the community central to the business by delivering on CCC Water's proposed expenditure and improving the service it provides in relation to its water and sewer services. This will be delivered by making information available to the community that addresses their concerns in a timely and transparent manner. The Strategy is more than provision of information but is also designed to make the customer central to the business.

CCC Water's commitment regarding performance outcomes will be linked to a new Customer Charter that will be developed with input from our community. It will cover issues such as:

- safe drinking water
- reliable services and maintenance responsibilities
- timely response
- access and assistance
- water usage
- environment and sustainability
- regulatory obligations
- meeting future needs of the community.

The chart below shows the cyclic nature of the accountability strategy.

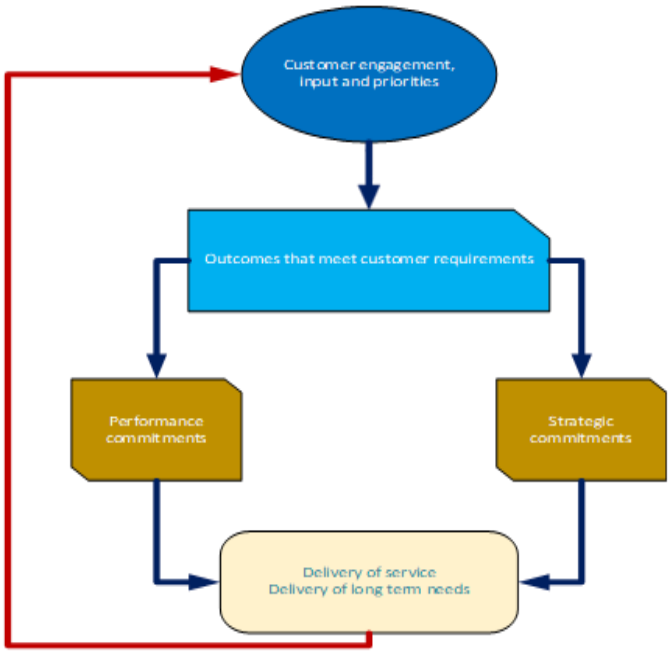


Figure 1 the cyclic nature of the accountability strategy

4.2 IPART considers CCC Water needs to improve its performance

CCC Water acknowledges recommendations made by the consultants and IPART and will work toward finalising and improving in the following areas:

- asset management systems, processes and strategies
- the relationship between investment and customer outcomes
- further developing CCC Water's cost estimation framework
- the implementation of an endorsed Customer Charter with measurable outcomes and reporting.

4.2.1 CCC Water has not met targets for some output measures

Water quality complaints per 1,000 properties:

Water quality complaints are dominated by 'discoloured water' notifications by customers due to colour and turbidity caused by disturbance of iron and manganese in the reticulation network. Several factors contribute to this, including a number of dead-end mains in cul-de-sacs, seasonal changes in water demand causing changes in flow velocity, main breaks from aging assets, and reduction in mains flushing and cleaning programs due to reduce operational expenditure. Increased funding of mains cleaning and flushing programs and mains renewal programs should improve performance of this measure.

Wastewater overflows reported to the environmental regulator, per 100km of main:

Pollution reports to the Environment Protection Authority (EPA) are required for "incidents causing or threatening material harm to the environment". As reports are required immediately, material harm is not known at the time of reporting. CCC Water does not want to introduce a disincentive to reporting potential pollution events by further restricting this output measure. Achievement of this objective is particularly difficult following storm events that cause overflows at several locations due to system capacity issues. These storm events are now occurring at least annually. CCC Water works proactively with the EPA to address issues relating to pollution events. For example, the EPA has introduced a number of Pollution Reduction Plans and Studies to EPL 2647 to better understand stormwater infiltration and system capacity issues, however these will only be rectified following an extended period of capital improvements.

Wastewater odour complaints per 1,000 properties:

Wastewater odour complaints are caused by several factors, including sewer main breaks and chokes, venting of sewer gases following periods of sewer flow dormancy and diurnal changes in demand, and process disruptions at sewage treatment plants. Wastewater odour complaints assist CCC Water in identifying sources of odour that can be rectified by repair, changes in operation or capital upgrade. CCC Water has proposed that funding be provided for several operational and

capital programs to reduce odour complaints, specifically odour and corrosion control projects identified in the step change project portfolio.

Compliance with EPL concentration and load limits:

CCC Water has not complied with EPL concentration and load limits due to recent operational and capital funding restrictions at a number of underperforming sewage treatment plants. CCC Water has worked closely with the EPA to identify and implement improvements, particularity for EPL 2647 where several Pollution Reduction Plans and Studies are required to achieve improvements in the operation of the sewage treatment network. Funding has been sought to implement the operational and capital expenditure improvements required to achieve performance requirements of the respective EPLs[2].

4.2.2 CCC Water should continue to develop its strategic plans and asset management systems

CCC Water is developing its asset management practices, and in particular, asset risk and criticality frameworks, having identified a means of achieving asset management best practices and requirements. These frameworks aim at identifying phased asset intervention activities such as proactive condition assessment and proactive renewals in order to manage the asset risks and are in line with the expected prudent and efficient practices and capital works expenditure.

CCC Water is proposing to increase its level of asset management maturity in accordance with ISO 55001 – Asset Management, as included in the asset management improvements operational step change and supporting business case. To transition to good practice asset management (AM), CCC Water will firstly carry out an AM maturity assessment against the Institute of Asset Management (IAM) across 39 subject areas. The step change is required to create and implement new practices, systems, and technology to transition CCC Water toward industry standard asset management practices such as AM risk and criticality frameworks across all asset classes. These initiatives aim to ensure CCC Water's capital program investments are made in the correct areas and ensure prudency.

4.2.3 Some stakeholders are concerned about CCC Water's performance and accountability

CCC Water acknowledges customer dissatisfaction with current performance levels. Section 4.3 outlines how CCC Water intends to lift its performance and improve customer satisfaction and accountability and to address the community's concerns.

[2] The EPLs have Pollution Reduction Programs (PRP) and Pollution Reduction studies (PRS) attached to the licences.

4.3 Better information to monitor CCC Water's performance

CCC Water agrees with IPART that more frequent information about the quality of services the customer is receiving would be beneficial to the community and is good business practice for service provision utilities. CCC Water is in the process of developing its performance measures and reporting methodologies.

CCC Water is currently investigating, quarterly and annual performance reporting and how the information we provide to the community can be presented in a meaningful and transparent format.

4.3.1 CCC Water should develop and report publicly on a new set of performance measures

CCC Water welcomes IPART's recommendation to:

- implement IPART's findings from their consultation process to develop a new set of performance measures
- undertake further community consultation to inform its performance measures
- implement systems to publicly report on the performance measures on a yearly basis, starting from the first year of the 2022 determination period (2022-23).

CCC Water has reviewed the examples IPART has provided of performance measures that CCC Water could consider reporting on and believes the implementation of annual reporting on these types of measures is reasonable and achievable.

4.4 IPART investigates CCC Water's performance and progress in two years' time

CCC Water welcomes IPART's proposal to investigate its performance and progress. CCC Water looks forward to working with IPART in the future to ensure it provides IPART with the necessary information to adequately assess and publicly report on including:

- CCC Water's performance over the first two years of the determination period
- whether CCC Water has reported on the information that is important to the community
- whether CCC Water has made the necessary improvements that it has committed to.

5 Operational and capital costs

5.1 CCC Water proposed significant operational cost increases to improve services

Under IPART's draft proposal, the operational expenditure for CCC Water is 24% higher than the 2019 review period. The increase is deemed necessary by IPART to deliver services that can meet existing obligations and customer expectations.

The IPARTs consultants reviewed CCC Water's base operational expenditure and the 'step changes' business cases. The process was largely a recategorization of expenditure from being a 'step change' associated with a new regulatory requirement to being part of base operational expenditure.

All expenditure was deemed 'prudent' in that the consultant did not indicate that any of the expenditure was not in the interest of customers.

At this stage, the consultants do not propose any reductions/efficiencies for CCC Water's base operational expenditure.

IPART's draft proposal has the regulatory revenue for water and sewer funds increasing in year 1 from 2022-23 with further gradual increases for water and sewer service charges over the 4-year determination with highest revenue received in years 3 and 4 as highlighted in the table below:

Table 7 - Proposed regulated revenue received

$M	2022-23	2023-24	2024-25	2025-26	Total
Water	87.5	92.8	99.2	106.7	386.3
Sewer	84.3	86.6	89.0	91.5	351.5
Stormwater drainage	17.7	17.8	17.9	17.9	71.4
Total	**189.6**	**197.3**	**206.1**	**216.1**	**809.2**

The operational expenditure however does not have the same transition, the expenditure is consistent throughout the 4-year determination period.

CCC Water requests that IPART consider deferring some operational expenditure for water and sewer in years 1 and 2 to years 3 and 4 due to the changes in the current economic environment. Due to the impacts of COVID nationally and internationally Council is facing challenges in securing resourcing and procurement of materials and services.

Council does not intend to benefit from this deferred expenditure as per the principles of the Efficiency Carryover Mechanism (ECM). Efficiencies will be made to expenditure throughout the determination period.

The deferral of operational expenditure is related to:

- Secure resourcing – change in the operating environment since submission lodged
  - Time taken to recruit is an average of 60 days with the shortest timeframe being 46 days and longest being 91 days.
  - 50% success in filling advertised positions – some positions there were not suitable applicants to interview, and others have declined due to the pay rate offered and counteroffers. In the 8 months prior to Council submitting the pricing submission 68% of positions were filled. The employment market has tightened further since Council's submitted its pricing proposal.
  - Annualised turnover ratio is at 12.8% for permanent positions compared to a historical turnover rate of approximately 8.0%.
  - Vacancy rate is currently at 13.6% for permanent positions which is higher than other departments within Council.
  - Recent Seek data shows that it is currently a candidate's market with statistics from October 2021 showing a 63% increase in job ads posted compared to October 2020, and 44% increase compared to October 2019. This means that Council is competing for talent, particularly in those professional spaces and specialist roles. What were once elements of attraction in terms of living and working locally, are no longer as significant due to remote working for prospective applicants. While frontline roles are more easily filled, Council expects to be challenged in relation to attracting professionals to the organisation in what continues to be a highly competitive market.
  - Looking at alternative resourcing options until positions can recruited and filled – agency hire and day labour however this is not feasible for all positions as some are specialised roles.
- Procurement constraints which will delay some works:
  - Global and local logistic issues resulting in difficulty securing materials or long lead times for delivery of equipment and materials including chemicals
  - Resourcing issues relating to the volume of works and limited availability of skilled resource – apart from resourcing challenges in recruiting employees there have been challenges in engaging external contractors as there have been occasions where there have been no responses from contractors on Council's pre-approved panels

An additional benefit from deferring some of the operational expenditure for water and sewer is improved cash flow, ensuring that the water fund has sufficient unrestricted cash to deliver services.

Table 8 Restricted and Unrestricted funds

Fund	General Fund ($'000)	Water Fund ($'000)	Sewer Fund ($'000)	Drainage Fund ($'000)	Waste Fund ($'000)
External Restricted Funds	186,923	7,411	22,117	37,090	94,166
Internal Restricted Funds	89,914	1,026	877	55	-
Total Restricted Funds	**276,837**	**8,437**	**22,994**	**37,145**	**94,166**
Unrestricted Funds	100,034	(9,932)	118,400	(35,555)	12,965
Total funds by Fund	**376,871**	**(1,495)**	**141,394**	**1,590**	**107,131**

CCC Water is required to report financial performance in accordance with the Office of Local Government (OLG) Code of Accounting Practice and Financial Reporting, which includes non-regulatory expenditure (borrowing costs and depreciation) which is treated differently in the IPART building blocks.

Based on the current draft determination in both the water and sewer funds there is an operating deficit in years one 1 and two 2 due to the smoothing of price changes over the determination period. By deferring operating expenditure into years 3 and 4 it is forecast that the water and sewer funds will have an improvement in the operating profit and loss in each year of the 4-year determination. Both the improved cash flow and operating profit and loss will show improved financial performance for the water and sewer funds – please refer to the Statement of performance measures by fund in the OLG Code of Accounting Practice and Financial Reporting.

The deferral of operating expenditure will not be done with recurring expenditure but repositioning some of the ringfenced "step change" projects predominantly related to water. The amount of deferred expenditure is valued at $12.6M for water fund and $5.0M for sewer fund.

Currently the Water Fund unrestricted funds is negative $10M and overall cash within the fund is a deficit of $1.5M (overdrawn). The Water Fund's "unrestricted funds" are those to meet daily operational expenditure needs and investment into infrastructure/assets.

CCC Water highlights in the tables below the water, sewer and stormwater drainage funds and the position in relation to forecast profit and loss. The cash flow and unrestricted cash for water will include the changes to the capital works program, inclusion of Mardi Water Treatment Plant and $50M in loans to support this project. The profit and loss include the deferral of $12.6M in operational expenditure for water and $5.0M for sewer from years 1 and 2 to years 3 and 4.

Table 9 Water fund forecast profit and loss and cash flows with deferral of expenditure and inclusion of additional loan

Water fund	2022/23	2023/24	2024/25	2025/26	Total
	$M	$M	$M	$M	$M
Regulated Revenue					
- Service charges	26.6	31.6	37.7	44.8	140.7
- Usage charges	60.1	60.4	60.7	61.0	242.3
- Misc charges	1.8	1.8	1.8	1.8	7.1
- CSO	(1.0)	(1.0)	(1.0)	(1.0)	(3.8)
Total Regulated Revenue	87.5	92.9	99.2	106.7	386.3
Interest Revenue	0.3	0.3	0.4	0.4	1.4
Total Operating Revenue	**87.8**	**93.2**	**99.6**	**107.1**	**387.7**
Regulated Expenditure	50.2	54.1	61.2	69.2	234.7
Borrowing Costs	7.8	9.1	8.3	7.7	32.9
Depreciation	30.3	30.5	30.6	31.4	122.8
Total Operating Expenditure	**88.3**	**93.7**	**100.2**	**108.3**	**390.4**
Operating Profit / (Loss)	**(0.5)**	**(0.5)**	**(0.6)**	**(1.2)**	**(2.7)**

Table 10 Sewer fund profit and loss (with deferral of expenditure)

Sewer fund	2022/23	2023/24	2024/25	2025/26	Total
	$M	$M	$M	$M	$M
Regulated Revenue					
Service charges	64.4	66.5	68.7	71.0	270.7
Usage charges	17.6	17.8	18.0	18.1	71.6
Trade waste charges	2.6	2.6	2.6	2.6	10.6
Misc charges	0.6	0.6	0.6	0.6	2.5
CSO	(1.0)	(1.0)	(1.0)	(1.0)	(3.9)
Total Regulated Revenue	84.3	86.6	89.0	91.5	351.5
Interest Revenue	2.1	2.3	2.4	2.5	9.3
Total Operating Revenue	**86.4**	**89.0**	**91.5**	**93.9**	**360.8**
Regulated Expenditure	46.2	48.7	51.4	54.1	200.4
Borrowing Costs	2.2	2.1	1.9	1.7	7.8
Depreciation	33.6	34.0	34.3	34.6	136.5
Total Operating Expenditure	**82.1**	**84.7**	**87.6**	**90.4**	**344.7**
Operating Profit / (Loss)	**4.4**	**4.2**	**3.9**	**3.6**	**16.1**

It should be noted that both the regulated income and operational expenditure for the drainage fund is constant over the draft 4-year determination. Based on the reporting requirements under the OLG Code of Accounting Practice and Financial Reporting the drainage fund will continue to

have operating deficits over the 4-year determination and the negative unrestricted cash balances will continue to increase. This can be attributed to the financial depreciation of $48.6M over 4 years versus the regulatory depreciation allowance of $8.1M over the same period. CCC Water is not proposing to change the operational expenditure profile as there is no additional resourcing requirements and predominately the operational expenditure is delivered by Council resources.

Table 11 Stormwater drainage forecast profit and loss

Stormwater drainage	2022/23	2023/24	2024/25	2025/26	Total
	$M	$M	$M	$M	$M
Regulated Revenue					
Residential	16.3	16.4	16.5	16.5	65.7
Non-residential	1.4	1.4	1.4	1.4	5.7
Total Regulated Revenue	17.7	17.8	17.9	18.0	71.4
Interest Revenue	0.0	0.0	0.0	0.0	0.1
Total Operating Revenue	**17.8**	**17.8**	**17.9**	**18.0**	**71.5**
Regulated Expenditure	10.6	10.6	10.7	10.7	42.6
Borrowing Costs	0.4	0.4	0.3	0.3	1.4
Depreciation	12.0	12.1	12.2	12.3	48.6
Total Operating Expenditure	**23.0**	**23.1**	**23.2**	**23.3**	**92.6**
Operating Profit / (Loss)	**(5.2)**	**(5.2)**	**(5.3)**	**(5.3)**	**(21.1)**

5.2 Key Operational Projects

CCC Water acknowledges that there are some costs that will form base operational costs, however these operational projects that improve performance still need to be reported against for the interests of the community.

This additional expenditure is to address costs associated with:

Planning and Delivery

- customer communications and water resilience
- asset condition assessments
- asset management improvements and strategic planning
- Security of Critical Act 2018 (SOCI Act)

Treatment Plants and Catchments

- outfalls and benthic ecology
- building quality systems to consolidate water and sewer sampling including trend analysis
- treatment plant improvements
- bush fire management

- catchment management
- dam safety

Network Operations and Maintenance

- odour septicity and corrosion
- asset maintenance improvements
- workplace health and safety
- Arc flash analysis[3]
- consolidate SCADA[4] alarms
- improving asset inspections

Stormwater drainage

- dam safety
- critical asset inspection, cleaning and repair

CCC Water requires additional sewerage funding to support the improvements to its Sewerage Treatment Plants (STPs) and the outfall water quality and benthic ecology process.

Sewerage Treatment Plant improvements

Following multiple breaches of Environmental Protection Licences (EPLs) at all three ocean outfalls linked to the eight Sewage Treatment Plants they operate; CCC Water has identified several measures which need to be implemented on a planned cycle across the STPs. To date, maintenance across the STP network has been conducted on a mostly reactive basis, a step change has been proposed to move to a greater amount of proactive maintenance to better balance performance, risk and cost in the management of this critical asset class.

There are multiple assets within the process at each STP where solids (grit, rags, dead cell mass) have been collecting to a level which is impacting on performance (see Figure 1 as an example). This in turn leads to downstream processes being compromised through abrasion of mechanical equipment and accumulation in channels and tanks. As a result, many of these STPs are unable to perform at design capacity leading to increased energy demand, as well as increased maintenance and repair burden. It also results in reduced quality of the final effluent and discharge volumes above EPL limits. This has a negative impact on both the environment and the customer, who will be required to finance EPA fines and may be impacted by increased odour.

What is the risk and why is it important?

[3] Arc Flash is a type of electrical explosion or discharge that is connection through the air or ground to another voltage phase. This can result in serious burns, internal burns (inhaling hot gases) sever injury of death

[4] SCADA – Supervisory Control and Data Acquisition essential for critical water and sewer infrastructure where devices (sensors, pumps, motors etc can be monitored and controlled locally or at remote locations.

- The eight Sewage Treatment Plants (STPs) managed by CCC Water are currently underperforming and require a different management regime.
- With multiple environmental breaches having occurred, increased risk of future service failure and associated costs to maintain the situation is unsustainable. A change is required to avoid further environmental and service impacts, as well as an escalation of costs compounded by inefficient practices.

What is CCC Water proposing to address this risk?

CCC Water proposes to adopt a new risk-based management approach that will include improving:

- the skill base and number of resources
- processes to align with good practice
- data collection and management to support evidence-based interventions.

Is this change prudent?

This step change demonstrates prudency in scope and standard as it:

- aligns with the CCC Water's Strategic Business Plan
- reasonable considering the age and condition of the assets
- includes several risk-based projects to reduce risk to service levels and environmental breaches to an acceptable level
- addresses regulatory requirements (EPA requirements)
- would be supported by the community to deliver services
- aligns with relevant standards and industry best practice
- reasonably reflects the demand for assets.

Is the change efficient?

- This step change demonstrates efficiency, it will be implemented in line with the Council's procurement policies. The estimated costs are based on a combination of historical expenditure, quotes and existing contract rates. The change will also lead to reduced overall operations and maintenance costs due to decreased energy demand, treatment chemical use and reduced unanticipated repairs and maintenance required.

Outfall water quality and benthic ecology process

CCC Water maintains and operates three ocean outfalls in accordance with Environmental Protection Licences (EPLs) issued by NSW Environment Protection Authority (EPA):

- Winney Bay (EPL 1802)
- Norah Head (EPL 2647)
- Wonga Point (EPL 1942)

Each EPL specifies the pollutant concentration and annual load limit, and maximum daily volume to be discharged to the respective outfall. Monitoring occurs at the point of discharge from the sewage treatment plant (STP) to the outfall. Whilst the monitoring program provides an indication of annual pollutant load to the marine environment that it is discharged to, it is difficult to ascertain if the pollutant load is causing long-term ecological harm, particularly in recent years when pollutant loads to Winney Bay and Norah Head have been greater than the annual limit specified in the respective EPL.

A standard EPL condition requires that "except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997". Specifically, the condition prohibits the pollution of waters by the Licensee.

Impacts of the ocean outfalls on the ecological health of the benthos of the receiving environment were last undertaken by Gosford City Council in 1997 and Wyong Shire Council in 2009. The long absence of monitoring of the receiving environments means that CCC Water does not have evidence to conclude that operation of the outfalls is not causing pollution of waters in the long term.

Current expenditure water and sewerage

CCC Water agrees that the existing level of expenditure is below a sustainable level to meet its obligations to the community. The level of expenditure has reduced CCC Water's ability to maintain its assets and to transition to a proactive regime, where planned maintenance and inspection expenditure is higher than reactive expenditure.

The existing reactive maintenance regime is not ideal or sustainable, and if continued will lead to future asset failures, lessen asset potential, and increase the impact on the community and the environment. The lower the operational expenditure the higher the operational risk carried by CCC Water. Unreliable assets are often the source of future additional costs due to an increase in planned shutdowns (interruptions) and unscheduled maintenance.

Unlike measured outcomes related to network performance, (where performance is immediate), sewage treatment plants are harder to monitor and the impacts from poor maintenance activities may not be seen for some time later, often years as is the case. Expenditure required to perform regular maintenance activities is currently not available. Based on criticality and risk, expenditure is currently directed towards keeping sewer overflows to a minimum for public health and safety.

The lack of expenditure has resulted in a reactive response to maintenance. A change to this paradigm will require time and additional budgets to achieve increased efficiencies.

The NSW Environmental Protection Authority (EPA) has further illustrated the issues with reactive maintenance and plant performance by the inclusion of 11 Pollution Reduction Programs (PRP) and

Pollution Reduction Studies (PRS) on the three-sewage treatment plant Environment Protection Licences (EPLs), with delivery from 2021 – 2026.

Four of the PRPs and one PRS directly relate to solids build up and the declining performance of the plants, plus the potential impacts to the local environment. The business case developed in the operational expenditure focused on sewage treatment plants improvements at a cost of $13M. Tipping fees for treatment plants are the major driver behind increased expenditure. The higher the load, the higher the volume of sludge to be disposed of. Water and Sewer waste is normally attributed to broken mains and maintenance (asbestos, ductile steel or concrete pipes). Most of the waste categorised is either general waste or sludge (biosolids) from the treatment plants. On average 26,000 ton of sludge is delivered to the tip annually and charged back at a rate of $85/ton. The remainder of the waste is attributed to general waste and charged at a rate of $360/ton.

The business case developed was aligned to allow outcomes from these improvements to support reaching positive outcomes in the PRPs along with bringing the plants into standard proactive maintenance programming. Having the funding to complete this work will result in avoidance of future PRPs for CCC Water's next five-year EPL review. This will then improve optimisation of the plants towards the end of the 2022 determination and beyond. The funding and completion of these PRPs and PRSs will support CCC Water's Customer Charter and accountability measures over time, highlighting an increase in plant performance and a reduction in pollution costs through the EPA annual return process. In addition, it will meet our regulatory direction regarding the EPA.

Stormwater drainage

CCC Water proposed to consolidate the delivery, management, and funding of stormwater drainage services as part of the 2022 determination – to drive service efficiencies, improve regulatory oversight and reporting, ensure sustainable service provision for its customers and simplify the way the community pays for stormwater drainage. The proposal will also simplify the future conversion of the stormwater drainage charge to a stormwater drainage Special Rate Variation or equivalent – as recommended by IPART and resolved by Council.

It is acknowledged that CCC Water's submission would move some stormwater drainage services that since amalgamation have been funded by a combination of general rates, grants and a Stormwater Levy under the Local Government Act into the remit of the Stormwater Drainage Charge. However, these services should not be considered a 'broadening of the stormwater service definition' as they have each been funded by the Stormwater Drainage Charge in the past.

CCC Water strongly disagrees with IPART's decision to exclude $15.4M of stormwater drainage expenditure, considered to be outside the historic scope of the stormwater drainage charge, from the review. As part of CCC Water's response to the draft determination, a moderated proposal has been presented for these services which is in line with IPART's broader principles and approach – refer to the 'Funding Stormwater Services' section. This would see CCC Water continue to subsidise the functions across the next determination with the level of subsidisation to progressively reduce.

5.3 IPART assessed CCC Water's proposed costs

IPART engaged Frontier Economics to review CCC Water's proposal for cost saving opportunities. IPART has accepted the Frontier Economics analysis and has determined operational expenditure to be $477.7M which is 9% lower than CCC Water's proposal of $524M.

CCC Water argue that additional funding is still required to maintain and improve our sewerage expenditure especially in relation to improvements to the STPs.

Frontier Economic identified three areas where there is opportunity to reduce costs:

- removing $5M from the costs, where costs were double counting in the base cost and added to the water resilience 'step change'
- not accepting to transfer $15.4M related to the stormwater costs currently funded through the local government rates
- applying $33.3M of efficiencies representing a 5% reduction per annum and an additional 0.7% per annum for IPART's expectation of continuous improvement.

CCC Water's proposal compared to IPART's draft decision for operational expenditure is shown in the table below.

Table 12 Comparison of CCC Water's proposed operational costs compared to IPART allowed costs.

$M	2022-23	2023-24	2024-25	2025-26	Total
CCC Water's proposal					
Water	55.9	57.2	61.7	60.1	234.9
Sewer	53.2	56.0	56.4	55.3	220.9
Stormwater drainage	17.1	17.2	17.1	17.2	68.6
					524.4
IPART's draft proposal					
Water	58.2	58.7	58.8	59.0	234.7
Sewerage	49.7	50.2	50.2	50.3	200.4
Stormwater drainage	10.6	10.6	10.7	10.7	42.6
					477.7

Operational expenditure in the 2022-26 determination period

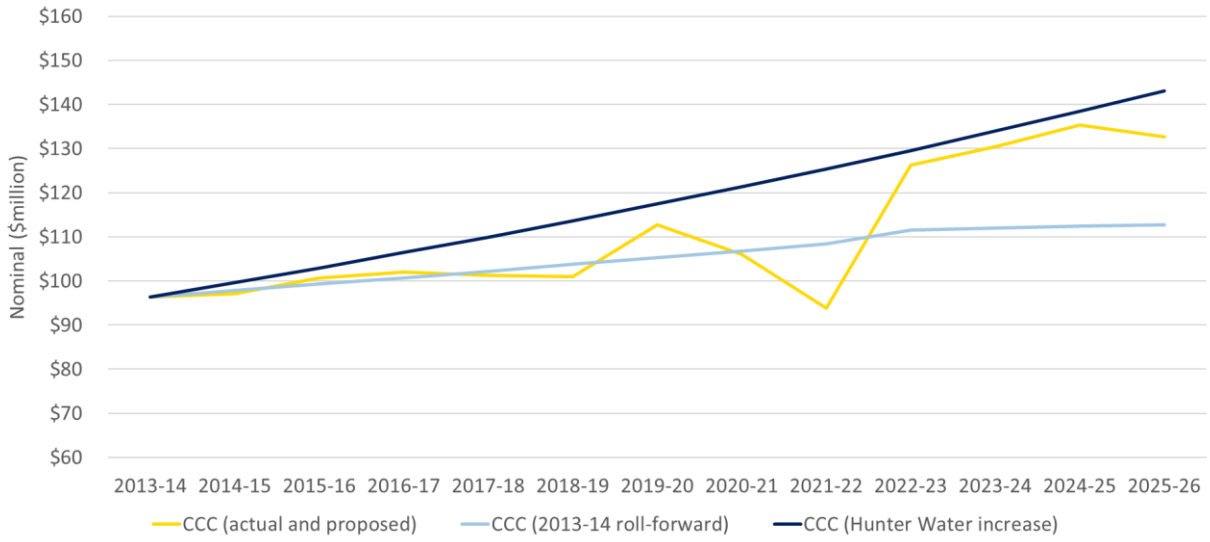
In CCC Water's view, the operational expenditure review concludes that the base operational expenditure and the 'step changes' it has proposed are 'prudent' and necessary, except for double counting of $4.5M for water resilience. CCC Water agrees that this was a double count and should be removed from the proposed operational expenditure.

The consultants did not conduct a line-by-line review of the proposed operational expenditure (as done in previous reviews) but generated a 'benchmarked' operational expenditure based on the National Productivity Report. While benchmarks are a useful analytical tool, the recognised low quality of data in the NPR and the process employed by the consultants to generate the benchmarked operational expenditure does not provide a good basis for a reduction in CCC Water's operational expenditure. The top-down approach undertaken by the consultants discounts the detailed bottom-up approach undertaken by CCC Water to ensure that each operational expenditure line item is prudent and efficient.

In addition, the consultants acknowledge the limitations of the benchmarking process in their report and provide a range of potential operational expenditures of which CCC Water's proposed expenditure sits within.

The use of a second benchmark to roll-forward 2013-14 operational expenditure does not, in CCC Water's view, provide compelling evidence to support the consultant's recommended reduction in operational expenditure. The consultants use a base year that is pre-amalgamation and then escalate costs by approximately 1.5% per year to generate a benchmarked operational expenditure, which is lower than CCC Water's proposed expenditure.

Another benchmark which could have been used, which would have supported CCC Water's proposed operational expenditure, would have been to use the average annual increase of a similar water business like Hunter Water. Since 2013-14, Hunter Water has experienced an average annual nominal increase in operational expenditure of 3.3%. If CCC Water rolled forward its operating costs from 2013-14 based on the average annual increase experienced by Hunter Water, then CCC Water's operational expenditure would be higher than its currently proposed expenditure.



Graph 1 Benchmarking - CC Water proposed expenditure against Hunter Water

CCC Water supports the use of benchmarks as an analytical tool, however IPART's consultants rely on a broad set of benchmarks to recommend a reduction in operational expenditure. CCC Water does not view these benchmarks as sufficiently compelling to warrant a reduction in its proposed operational expenditure.

CCC Water strongly disagrees with IPART's decision to exclude stormwater drainage expenditure considered to be outside the historic scope of the stormwater drainage charge from their review. These services have been approved by IPART as being within the scope of the stormwater drainage charge for former Gosford Council prior to amalgamation.

The excluded related stormwater drainage services are all precedented by inclusion in former CCC Water IPART determinations and are therefore considered within the historic scope of the stormwater drainage charge. These services were excluded from the current pricing period as they were being partially funded by an alternate funding source (a $25 per property annual charge for stormwater management services referred to as a stormwater levy in accordance with s496A of the *Local Government Act 1993*) which has since ceased and was last levied in 2016-17.

CCC Water recommends the associated stormwater drainage fund changes are assessed in full by IPART and should be considered for inclusion in finalising the determination. An alternate, moderated proposal in relation to these services has been put forward – refer to the 'Funding Stormwater Services' section – which would see Council continue to subsidise the functions across the next determination with the level of subsidisation to progressively reduce.

The moderated approach recognises IPART's historic role in establishing and regulating the delivery of these services and supports Council as we plan and consult on the transition to funding stormwater drainage services via local government rates. The moderated proposal would ensure ongoing sustainability of these prudent stormwater drainage functions and maintenance of associated service levels for the community.

Base-step-trend approach

In addition, the forecast operational expenditure, a base-step-trend approach was used where the expenditure was built up from three components (once a reasonable base was established):

1. base expenditure – sustainable and recuring expenditure required to meet service levels for water, sewer and stormwater
2. step changes – required additional expenditure to meet new regulatory requirements or changes to legislation that dictates additional costs. Previous expenditure cannot predict the change in expenditure
3. trend factors – change in recurring expenditure over time due to price changes, growth and improvements related to productivity.

For the forecast expenditure, a base-step-trend approach is supported by CCC Water, it represents a fair and equitable approach to setting efficient operational expenditure.

Benchmarking was raised by IPART in the Water Pricing and Licensing Regulating Water Businesses - Special Review, where it asked "whether the balance of industry data we use to review expenditure is appropriate. For example, in what additional areas could IPART credibly rely on industry benchmarks to establish efficient costs?"

CCC Water supported this approach. This approach can, however, be restrictive especially for those costs that are a one off (COVID-19, flooding, bushfires) or costs that fall outside operational base expenses. This occurred in the current determination where funding for the tunnel inspections were disallowed and considered part of base operational expenditure (even though the expenditure occurred only every 10 years). CCC Water, understanding the risks of failure and safety, covered these additional costs to mitigate risks.

The current method can assess a reduction in expenditure as an efficiency if service levels remain stable. The method does not allow for the long-term realisation of stopping or pausing a function. For example, low or minimal investment in maintenance sees no real service delivery impact to the customer in the short term, however it reduces the life of an asset and increases failure rates in future determinations leading to increases in expenditure.

Using the average expenditure over the determination period as a base line or using a benchmarking approach as opposed to a single financial year (penultimate year approach) would create a more realistic paradigm of the business' expenditure requirements especially in areas where costs can fluctuate (weather).

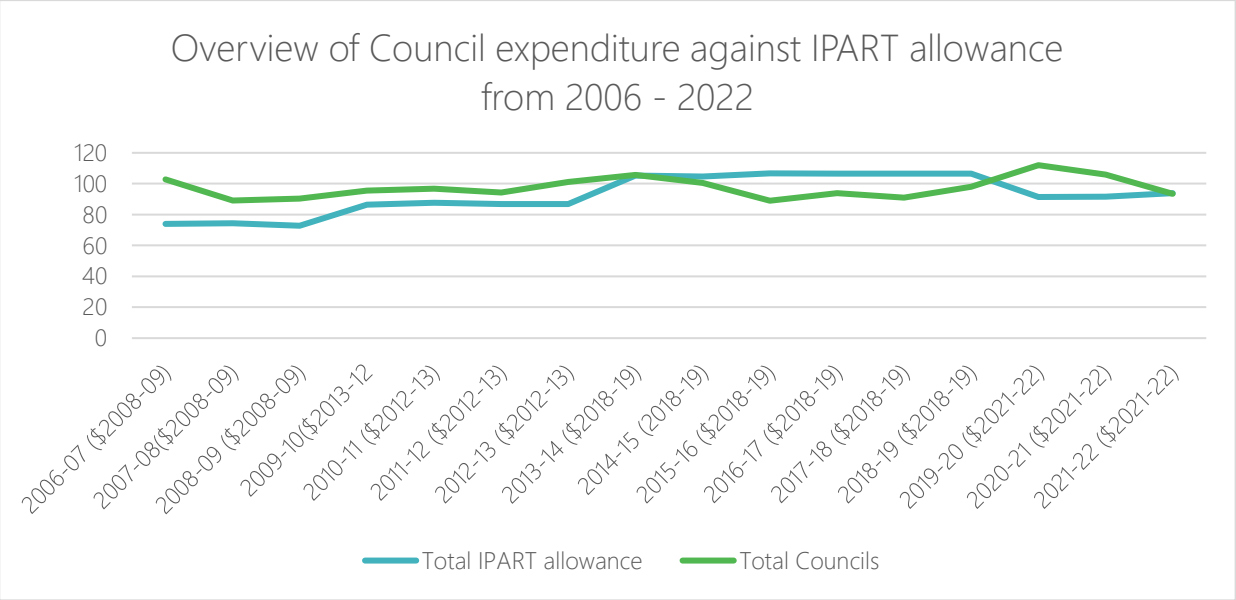
The 'base-step-trend-approach' needs to consider intermittent costs and sharing the revenue risk with customers to maintain the assets and provide the expected outcomes.

5.3.1 Previous operational costs

CCC Water did underspend the IPART allowance in the previous determination period. However, CCC Water has also overspent the operational expenditure in the first two years of the current IPART determination of around $36M. This expenditure is not recouped via revenue for the 2022 determination period. The previous IPART determination period went for six years (twice deferred by CCC Water due to the amalgamation). The average underspend was 10% over this period i.e., IPART allowance $637.2M ($real) compared to actual expenditure $578.7M ($real). The largest underspend occurred in the 2015-16 reporting period as it was 10.5 months (1 July 2015 to 12 May 2016) due to the amalgamation. In the current determination period, the overspend equates to 13%.

Reviewing CCC Water performance going back to 2006, it is evident that the actual expenditure has always been higher than the IPART allowance, where CCC Water accepted the risk, the only years where this was not the case is the three years between 2015-2018.

The graph below illustrates the actual expenditure against the IPART allowance since 2006 (using $M of the day indicated).



Graph 2 Council expenditure against 2006-2022 allowance

The overspend in 2019 and 2021 was required to ensure that the assets were maintained for the community to a reasonable level.

CCC Water was consistently over the IPART expenditure allowance from 2006-2015 and again from 2019-2021 (CCC Water carried the risk).

Table 13 Current determination IPART allowance versus actuals/forecast expenditure

IPART allowed $M	2019-20 $nominal	2020-21 $nominal	2021-22 $nominal	Total	Total $2021-22
IPART Determination	91.1	91.7	93.9	276	284
Actual/Forecast	112.6	105.9	93.5	312	320
Variance $	21.5	14.2	-0.4	36	36
Variance %	19%	14%	0%	13.%	13%

5.3.2 2019 capital costs

CCC Water accepts IPART's decision to reduce sewer capital costs by $0.58M for the Charmhaven Wastewater Treatment Plant project, consistent with the revised cost profile.

CCC Water does not agree with IPART's decision to reduce water capital costs by $6.8M for the Mardi Water Treatment Plant project.

CCC Water maintains that the treatment plant project is prudent and works completed to date were needed and have been undertaken in line with the most efficient option available. CCC Water has provided a detailed response with additional information supporting the prudency, efficiency, and status of the Mardi Treatment Plant project in *Appendix 1: Further Information Mardi Water*

Treatment Plant. CCC Water asks that IPART include costs incurred to date and forecast 2021-22 costs totalling $1.36M in the RAB.

5.3.3 2022 capital costs

CCC Water largely accepts IPART's draft decision to set capital costs at $297.4M over the next 4 years and overall recommendations for efficient capital expenditure for the 2022 determination period, with the exclusion of the targeted reduction in proposed water expenditure.

IPART have advised that they have established an overall amount of efficient capital costs, with reference to Mott MacDonald's findings. However, they have not approved specific programs or projects for CCC Water to undertake. IPART expects CCC Water to manage its own spending priorities ensuring it has provided value for money to customers.

Based on IPART's recommendation, CCC Water has undertaken a further program risk analysis with the financial constraint level set in line with IPART's draft decision for efficient capital expenditure of $297.4M. CCC Water then undertook the same analysis at fund level with water set at $76.3M and sewer $188.3M.

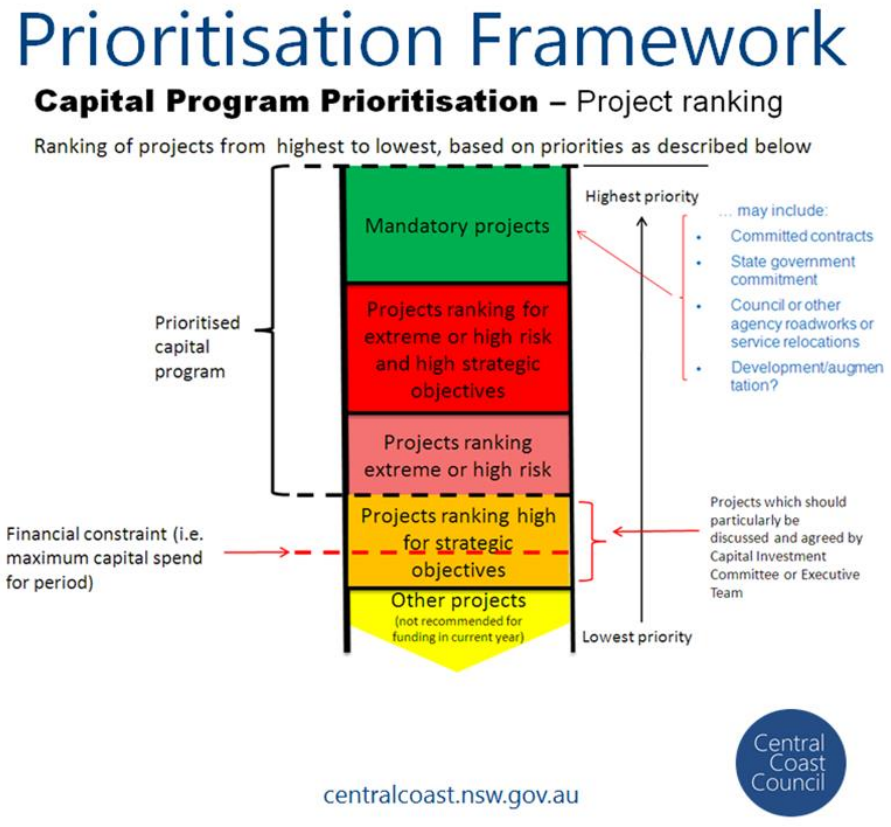


Figure 2 Prioritisation Framework

The proposed efficient level of expenditure set for water, results in CCC Water not having sufficient funding to undertake the necessary upgrades at the Mardi Water Treatment plant, along with

several other critical risk and capacity driven projects currently planned for the 2022 Determination period.

CCC Water notes the consultants recommended proposed minimum efficient capital expenditure displayed in summary Table 38 of their report show, their method for setting an efficient level of water expenditure was to deduct 93% of the total proposed costs for the Mardi Water Treatment Plant project and a further small percentage for efficiency adjustments from CCC Water's proposed expenditure of $116M. The updated proposed expenditure profile for water does not provide any opportunity for CCC Water to re-introduce the treatment plant project to its water capital program and remain within the annual water allowance proposed.

CCC Water currently has several growth and capacity driven projects it must undertake within the next determination along with a small number of critical high risk asset renewals that are likely to fail and have major consequences if deferred to the next determination period.

The current level of water allowance in the draft determination puts CCC Water in a position where, to stay within the overall $76.3M allowance it must choose to either undertake the Mardi Treatment Plant Project and a small number of critical risk and capacity driven projects at the expense of deferring the remainder of its proposed projects and annual asset renewal programs. Alternatively, CCC Water cannot commence the Mardi Water Treatment Plant upgrade until year 4 of the determination. Deferring the Mardi upgrade project to commence later is likely to result in a significant increase in costs, particularly in relation to material expenses and administration connected with returning the project to market. Deferring the Mardi upgrade project places CCC Water at an increased risk of being unable to adequately manage the ongoing provision of clean and safe drinking water to its customers, as will the alternative option of deferring the remainder of its proposed water projects and annual asset renewals. CCC Water maintains that the Mardi Water Treatment Plant is prudent and efficient and has provided additional evidence of this and the risk of not proceeding with the project in *Appendix 1: Further Information Mardi Water Treatment Plan*t.

The below table shows IPART's Draft determination, compared to essential water projects CCC Water must undertake. (Mardi Water Treatment Plant and key critical risk and essential capacity driven projects):

Table 14 IPART Draft water allowance v CCC Water essential capital works

$M	2022-23	2023-24	2024-25	2025-26	Total
IPART Draft Water	8.9	21.6	18.1	27.7	**76.3**
CCC Water Essential Works	13.0	47.9	7.0	8.1	**76.1**

CCC Water asks that IPART revise its proposal for efficient capital water costs to ensure it has enough allowance in water to undertake essential projects including the Mardi Water Treatment Plant.

CCC Water suggests IPART could revise its proposed allowance for water to $100.1M and this increase could be offset by reducing the sewer allowance, resulting in a negligible impact to overall affordability for the customer. CCC Water would also ask that IPART revise its annual phasing of the allowance to better align with what CCC Water believes it needs to deliver.

Table 15 Proposed allowance for water

$M	2022-23	2023-24	2024-25	2025-26	Total
IPART Draft Water	8.9	21.6	18.1	27.7	**76.3**
CCC Water Proposed	17.0	51.9	15.1	16.1	**100.1**

CCC Water's program for sewer capital expenditure is comprised of a variety of large, complex, high-risk projects, annual renewal programs and smaller less complex projects. CCC Water believes as it starts to mature, implementing productivity and efficiency improvements recommended by IPART and the Consultants, there will be more opportunity to reduce delivery costs and re-evaluate options to find savings within the sewer program. CCC Water feels the offset method is reasonable and will enable CCC Water can complete all high risk and critical works on both water and sewer assets and further develop capacity to implement efficiency initiatives.

Table 16 Proposed allowance for sewer

$M	2022-23	2023-24	2024-25	2025-26	Total
IPART Draft Sewer	31.7	40.6	64.3	51.7	**188.3**
CCC Water Proposed	31.7	30.5	55.0	47.3	**164.5**

Table 17 Total proposed allowance

$M	2022-23	2023-24	2024-25	2025-26	Total
IPART Draft Total	40.6	62.2	82.4	79.4	**264.6**
CCC Water Proposed	48.8	82.4	70.1	63.4	**264.6**

CCC Water will work over the 2022 determination period to:

1. deliver its capital projects at lower costs
2. investigate options into better capital planning and project management
3. investigate productivity and efficiency improvements
4. develop asset management plans and strategies.

6 Funding stormwater services

The Central Coast currently has the lowest water bill charges in NSW. This is due to the outcome of the 2019 price determination, which resulted in a reduction in the current stormwater drainage charge. Council supports IPART's decision to increase stormwater drainage revenue as part of this determination as it will help us meet mandatory legislative standards and sustainably manage our stormwater drainage network as infrastructure begins to age and the region continues to grow.

Council proposed to reintroduce flood planning, stormwater quality and urban channel management into this IPART determination and fund associated services using the stormwater drainage charge. At the time of the last determination, these services were funded by a $25 per year stormwater levy under the Local Government Act. This levy was stopped in 2016-17 and Council proposed to simplify stormwater drainage management by consolidating all functions under the one charge.

Council disagrees with IPART's decision to exclude the costs associated with these services from the draft determination for the following reasons:

- the excluded stormwater drainage management functions are core / integral to management of the stormwater drainage network
- the functions are all precedented as being within the scope of Water Authority operations – as evidenced by IPARTs approval of former Gosford Council determinations
- the functions were funded by the stormwater drainage charge in former Gosford Council
- there is strong community support for ongoing and increased investment in these services
- their inclusion will ensure continued provision of related services, mitigating the need for service level reductions – thereby supporting prudent planning in relation to flood events and emergency responses, limiting pollution export into our waterways and strategically managing flood risk across the local government area
- their inclusion will streamline and support Council's transition to stormwater drainage services fully funded by local government rates, a drainage Special Rate Variation or equivalent – simplifying future consultation and reducing community confusion in relation to the scope of Council's stormwater drainage operations.

In line with the above, Council has submitted a moderated proposal for funding these services as part of this response. The proposal is in alignment with IPART's broader determination principles as it excludes the step changes related to these services and would recognise IPART's role in establishing / regulating these functions, ensure ongoing service delivery and support Council as we transition to funding the services via local government rates.

Council fully supports IPART's decision to apply a 4-year price determination for stormwater drainage from 1 July 2022 to 30 June 2026 and agrees that it would be more efficient and appropriate to fund all stormwater drainage services through local government rates from the end of the next determination period.

As acknowledged by IPART this change would require an increase in local government rates – generally equivalent to the drop in charges levied under the Water Management Act – to make sure Council has enough money to continue to fund its stormwater drainage activities.

6.1 Stormwater costs move to local government rates by 1 July 2026

Council agrees that the stormwater drainage network provides a regional benefit to all community members – and in November 2021 passed a Council resolution demonstrating its commitment to fund all stormwater drainage services through local government rates – and not through the charges IPART sets for CCC Water as a Water Supply Authority – by the end of the next determination.

Council agrees it would be more appropriate to fund stormwater drainage services through local government rates, via the introduction of a special rate for stormwater, or by levying an annual stormwater charge under the *Local Government Act 1993* – supported by an equivalent drop in charges levied under the Water Management Act. This is consistent with the draft IPART determination and community feedback obtained during the consultation period.

As acknowledged by IPART, this change would require an increase in local government rates – generally equivalent to the drop in charges levied under the Water Management Act – to make sure Council has enough money to continue to fund its stormwater drainage activities.

This would occur by effectively transferring the stormwater drainage charge that IPART sets for CCC Water to a stormwater drainage special rate variation or equivalent under the Local Government Act. In simplest terms, the stormwater drainage charge would be removed from CCC Water's water, sewer and stormwater bill and added to the Council's local government rates notice.

6.2 IPART's draft decisions signal local government rates should fund stormwater

6.2.1 IPART decided not to include $15.4M in transferred costs in stormwater prices

Council has proposed to simplify how it charges for stormwater drainage by funding all related activities via the single stormwater drainage charge. These activities include managing and maintaining the infrastructure that collects rainwater from roads, parks and private land. It also includes improving the quality of stormwater discharged into our waterways and undertaking flood planning and mitigation.

Council does not agree with IPART's interpretation that flood planning, stormwater quality and urban channel management are 'environmental management activities' as they are intrinsically related to and physically integrated as part of the stormwater drainage network – they are

stormwater management activities, precedented by inclusion in former Council IPART Determinations and should not be considered new or innovative for Central Coast ratepayers.

Council does not agree with IPART's decision to exclude the costs associated with flood planning, stormwater quality and urban channel management – as they are all core stormwater drainage management functions within the scope of Water Authority operation, and all are precedented as being funded by the stormwater drainage charge in former Council IPART determinations. Council has also demonstrated there is very strong community support for these services.

All of the functions were approved by IPART as being funded via the stormwater drainage charge in the former Gosford Council prior to amalgamation. At the time of the last determination, the former Wyong Council was charging a separate Stormwater Levy under the Local Government Act – and as such a decision was made to temporarily remove the functions from the Water Authority whilst the Stormwater Levy was in place and return them at the next determination once the funds collected under the Stormwater Levy have been spent.

This decision was made to simplify the determination for IPART and our customers and ensure there was no cross-subsidisation of funding. The decision was reinforced by the significant reduction in stormwater drainage charge revenue resulting from the last IPART determination – which would have made it unviable to fund these functions via the stormwater drainage charge given the level of funding available.

Now that the Stormwater Levy under the Local Government Act has ceased and expended, the associated stormwater drainage services are currently being subsidised by local government rates – at the cost of other community services. This funding model is not sustainable and places the ongoing provision of these stormwater drainage functions at risk – with service level reductions likely if no alternate funding source is available.

Council requests that IPART recognise its role in regulating these functions in the past and supports Council as it plans the transition to stormwater drainage services funded via an increase in local government rates or a stormwater drainage special rate variation – by reconsidering and including these costs as part of the final price determination.

6.2.2 IPART's draft prices would increase stormwater bills by 17%

Council supports IPART's decision to increase stormwater drainage revenue acknowledging the funding is necessary to maintain and update stormwater drainage works and ensure CCC Water meets its service standards – but does not agree with IPART's decision to exclude the flood planning, stormwater quality and urban channel management (for the reasons documented in the prior section of the report).

In recognition of IPART's position on flood planning, stormwater quality and urban channel management services – an alternate funding proposal has been presented below, which would see

local government rates continue to subsidise these services with the level of subsidisation progressively reducing across the determination. While Council does not support IPART's decision to discount non-legislated stormwater drainage step change proposals – the proposal is consistent with IPART's position on this and has therefore excluded the step change components altogether.

Table 18 Stormwater Drainage Fund Changes

$M	2022-2023	2023-2024	2024-2025	2025-2026
Flood Planning	$0.49M	$0.50M	$0.51M	$0.52M
Stormwater Quality	$0.40M	$0.41M	$0.42M	$0.43M
Urban Channel Management	$0.37M	$0.38M	$0.39M	$0.39M
Former Gosford Council Fund Changes	$1.27M	$1.29M	$1.32M	$1.34M
Flood Planning	$0.49M	$0.50M	$0.51M	$0.52M
Stormwater Quality	$1.62M	$1.64M	$1.68M	$1.71M
Urban Channel Management	$0.10M	$0.10M	$0.10M	$0.10M
Former Wyong Council Fund Changes	$2.21M	$2.24M	$2.29M	$2.33M
Total Fund Changes	$3.47M	$3.54M	$3.61M	$3.67M

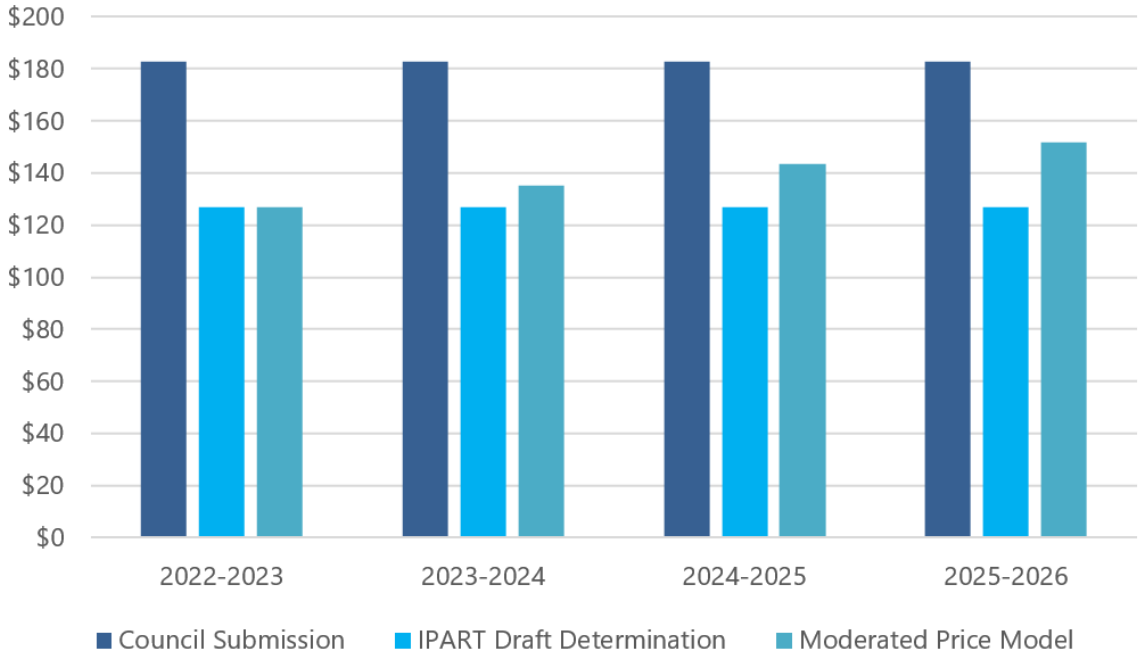
The above price model builds upon the analysis documented in response to IPART's Consultant Review which analysed the fund change components for each former Council relevant to each excluded service – and recognising the historic level of service varied in relation to stormwater quality and urban channel management. It also noted that the step change components have been excluded from this model, consistent with IPART's principle approach to the step changes.

The moderated price model presented below uses the above values to calculate the adjusted residential stormwater drainage charge if the excluded 2025-26 fund changes were fully funded in year 4 of the next determination – with a linear progression starting from zero in year 1 of the determination. Under this alternate model, Council would continue to subsidise historic levels of service through years 1 to 3.

Table 19 Moderated residential stormwater drainage proposal including fund changes

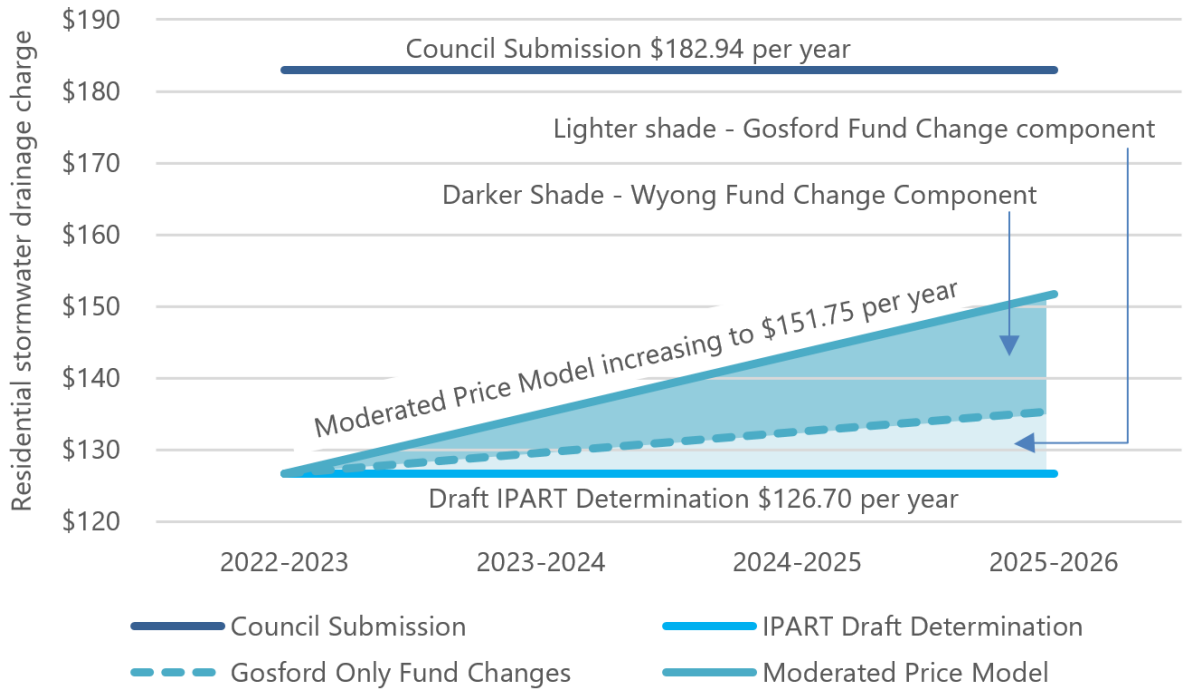
	2022-2023	2023-2024	2024-2025	2025-2026
Council submission	$182.94	$182.94	$182.94	$182.94
IPART draft determination	$126.70	$126.70	$126.70	$126.70
Moderated price model	$126.70	$135.05	$143.40	$151.75

The above price model demonstrates that a 19.8% price increase in year 4 is required to fully fund the excluded fund changes – and it is noted the $25 increase in price is equivalent to the $25 per annum stormwater levy the former Wyong Shire Council previously charged to fund these services. Using the linear progression, this equates to a $8.35 per annum increase in the stormwater drainage charge across the determination period. The above information has been graphed below to illustrate the annual price comparison.



Graph 3 Moderated stormwater drainage price proposal including fund changes

To further analyse the moderated fund change proposal, a secondary graph has been presented below showing the relative proportion of the former Gosford and former Wyong fund change contributing to the price increase. As documented throughout the submission process, the former Gosford services are undeniably within the scope of Water Authority operations as IPART approved their funding via the stormwater drainage charge as part of former Council determinations.



Graph 4 Moderated Fund Change Proposal with Former Council Fund Change Proportions

IPART's consideration of the moderated fund change proposal as part of the final determination is requested in recognition of IPART's historic role in regulating these functions and to support ongoing financially sustainable delivery of prudent stormwater drainage services. The proposal would also support Council as it plans and consults on the transition to fund all stormwater drainage services via local governments rates by the end of the next determination.

6.2.3 IPART has set stormwater prices to $0 after 1 July 2026

In November 2021, Council passed a resolution demonstrating its commitment to fund all stormwater drainage services through local government rates from the end of the next determination period. This is consistent with the draft IPART determination and community feedback obtained during the consultation period.

Council fully supports and appreciates IPART's understanding in applying a 4-year price determination for stormwater drainage from 1 July 2022 to 30 June 2026. This will provide stability for our ratepayers, ensure continued provision of critical stormwater drainage services and prevent any confusion associated with other Special Rate Variation processes which are currently underway.

The 4-year determination length will also provide efficiencies by leveraging the same resources required to support the next Water and Sewer Determination process and allow sufficient time to engage with the community on stormwater drainage services, develop a new rating model and work with IPART to transition the price determination process from IPART's current Water Authority application – to IPART's SRV or equivalent application.

7 Regulatory setting

7.1 IPART regulates CCC Water's prices

CCC Water and the Infrastructure Services Directorate provides water, sewer and stormwater drainage services to the Central Coast community. These services are considered natural monopolies and as such, consumer protection in relation to pricing and delivery of service is regulated by the Independent Pricing and Regulatory Tribunal (IPART). Regulation helps protect consumers by setting parameters to manage the potential risks of monopoly pricing (such as overcharging or poor service).

IPART set maximum prices for services

The current IPART regulatory framework ensures:

1. cost reflective pricing for the community
2. community views are embedded into CCC Water's pricing proposal
3. investment in capital works aligns to mandatory standards and is efficient and prudent
4. a level of operational efficiency is identified by the business.

The current regulatory method used by IPART is 'price capping', which sets a cap on the service and usage charges CCC Water can apply each year of the determination period. The price is determined by the amount of revenue IPART deems necessary to operate an efficient and reliable service for the community. The revenue required is essentially an expenditure review where CCC Water puts forward the expenditure it deems necessary to maintain and renew its assets. This is determined by IPART's Building Block Model (BBM).

Other reviews of the Council and CCC Water

IPART mention in the *Draft technical Paper – Regulatory Setting* that CCC Water's framework is both unique and complex. In addition, CCC Water does not have an operating licence like other water utilities that IPART regulate (Sydney Water and Hunter Water). An operating licence sets performance standards, compliance requirements and established customer contracts.

CCC Water is both a Council under the Local Government Act (LGA) and a Water Supply Authority under the Water Management Act. IPART engaged Frontier Economics (the consultant) to consider whether changes in Council's structure and/or governance framework, including the option of a stand-alone water and wastewater business, may lead to improvements in CCC Water's performance.

In responding to the consultant's report, CCC Water acknowledges the purpose of the consultant's draft report was to:

- potentially inform (but not mechanistically apply to) CCC Water's expenditure allowance

- provide insights into longer-term issues around CCC Water's governance, which enhances IPART's ability to respond to, or influence, potential future developments and to understand and/or manage the potential governance-related risks to the desired outcomes of IPART's determination being achieved.

The consultant's report acknowledges several issues related to a standalone business model for CCC Water. These include:

- governance models
- impacts of a standalone corporation model
- key conclusions and key insights.

Council's current position on a future water and sewer business model

In July 2021, Central Coast Council commissioned an independent review of the model governing its water and sewer operations. At that time, Council's Chief Executive Officer, David Farmer, said the review was about Council conducting due diligence in the ordinary course of its business to explore if there were opportunities to produce better value and return on investment for the Central Coast community.

Kellogg, Brown & Root (KBR) was engaged to review the current operating model of the Council's water and sewer business and provide advice and recommendations to deliver the most sustainable future for both the Council and the water and sewer business (as a Water Supply Authority).

The KBR report lists three potential business models for consideration:

1. **Water Supply Authority (WSA)** – **Keep and optimise** – Do nothing, however, keep and optimise the governance, structure, and reporting lines
2. **Local Water Utility (LWU)** – Remove Council as a Water Supply Authority and become a Local Water Utility
3. **Corporatise** – create a new entity and remove the water and sewer business from being subject to the LGA. This will require enactment of the Central Coast Water Corporation Act 2006 (CCWC) and CCC Water becoming a corporation. It also involves re-establishing the Corporation as the new Water Supply Authority.

On 22 February 2022, Central Coast Council received the KBR report and resolved:

1 *That Council note the recommendation from the Audit Office of NSW's Report on Local Government 2020, specifically that:*

The OLG should clarify the legal framework relating to restrictions of water, sewerage and drainage funds (restricted reserves) by either seeking an amendment to the relevant legislation or by issuing a policy instrument to remove ambiguity from the current framework.

2 *That Council note the report "Structural Review of the Water and Sewer Business" which outlines three options for the future Central Coast water and sewer business model.*

3 *That Council note IPART's Draft Report on the Review of Domestic Waste Management Charges.*

4 *That Council authorise the Chief Executive Officer to investigate options in both reports as well as any other options that they may identify as part of this analysis.*

Stand-alone corporatisation model as base case

The consultant's report has adopted a stand-alone corporatisation model as a 'base case' for analysis and is suggesting that some of the benefits identified in the model have already been realised by Central Coast Council.

The former Gosford and Wyong Councils embarked on an extensive process to establish the Central Coast Water Corporation (CCWC) in 2011.

Council agrees that given a merger has been undertaken (2016) and is already subject to economic regulation, some of the benefits from the CCWC model have been realised.

The Central Coast Water Corporation Act 2006 (NSW) (CCWC Act) was enacted to facilitate the establishment of the Central Coast Water Corporation as a water supply authority and to enable the previous councils – Gosford City Council and Wyong Shire Council – to separately transfer their water supply, sewerage and drainage functions to the corporation. The Act was never proclaimed.

A full review of previous strategies and documentation (done in 2011) may provide a blueprint for change and therefore lessening the scope and magnitude of work required. The previous analysis also addresses the issues raised in the consultant's report in relation to transition, governance, costs and risks.

CCC Water has not yet had the opportunity to complete a cost benefit analysis, risk assessment or a SWOT (Strengths, Weaknesses, Opportunity and Threats) analysis to determine the future outcome and the best option for reform.

CCC Water does not underestimate the time to transition to a new model as well as the risks, costs, complexities and engagement required.

Stormwater drainage

The consultant's report also made comment regarding stormwater drainage:

"In Frontier Economics' view, migrating drainage assets across to a new stand-alone entity would be more complicated than transitioning the water and sewerage services. Consequently, it could be prudent to stage the transitioning of these services, with water and sewerage being initially transferred and drainage services following in several years once the key considerations are resolved."

CCC Water's response to the draft consultant's report did not include stormwater drainage in the review.

Given IPART's position that stormwater drainage services should be funded from local government rates from the end of the next determination and Council's resolution in support of the same – the consultant's recommendations have effectively been superseded.

2022 price determination

CCC Water does not intend to re-open the 2022 price determination. Any additional costs relating to the review will be borne by the water and sewer business.

7.2 IPART has considered matters under the IPART Act

IPART under section 15(1) of the IPART Act, must have regard to the following matters:

a. the cost of providing the services concerned

b. the protection of consumers from abuses of monopoly power in terms of prices, pricing policies and standard of services

c. the appropriate rate of return on public sector assets, including appropriate payment of dividends to the Government for the benefit of the people of New South Wales

d. the effect on general price inflation over the medium term

e. the need for greater efficiency in the supply of services so as to reduce costs for the benefit of consumers and taxpayers

f. the need to maintain ecologically sustainable development (within the meaning of section 6 of the Protection of the Environmental Administration Act 1991) by appropriate pricing policies that take account of all the feasible options available to protect the environment

g. the impact on pricing policies of borrowing, capital and dividend requirements of the government agency concerned and, in particular, the impact of any need to renew or increase relevant assets

h. the impact on pricing policies of any arrangements that the government agency concerned has entered into for the exercise of its functions by some other person or body

i. the need to promote competition in the supply of services concerned

j. considerations of demand management (including levels of demand) and least cost planning

k. the social impact of the determinations and recommendations

l. standards of quality, reliability and safety of the services concerned (whether those standards are specified by legislation, agreement or otherwise).

CCC Water is satisfied that these matters have been addressed in IPART's draft report.

7.3 IPART is seeking feedback on its draft decisions

CCC Water encourages the community to 'have your say' in relation to the prices proposed by IPART and how they should be implemented. This can be done by:

1. submitting your feedback to IPART
2. completing the survey on the IPART website.

8 How IPART sets the revenue level

8.1 IPART's draft decision – CCC Water's required revenue set at $809M

IPART use the Building Block Model (BBM) to determine the revenue that is required over a regulatory period. The BBM is used by IPART for all public utilities such as electricity, gas, water and sewerage.

IPART reviewed the operational and capital expenditure put forward by CCC Water as well as additional allowances for depreciation, working capital and tax. The sum of these individual components determines the revenue that can be collected via service charges and usage charges.

Building block model (BBM)

Operational expenditure

plus

Capital allowance

*Return on Assets = Regulatory Asset Base (RAB) * Weighted average cost of capital*

Return of assets = Regulatory depreciation

plus

Working capital

plus

Tax allowance

Adjustments

Demand volatility allowance

less cost of debt true up

less nonregulated revenue

equals

Notional revenue requirement (NRR)

Figure 3 Building block model

There is a difference of approximately $60M (7%) less revenue from what CCC Water proposed compared to IPART's draft proposal i.e.:

- CCC Water proposed $870M
- IPART proposed $809M.

Revenue is based on many different variables, but the major influences are those related to operational and capital expenditure.

CCC Water has requested higher operational expenditure related to additional revenue for the Sewerage Treatment Plants (STPs) which is deemed necessary, prudent and efficient. If the change in operational expenditure is accepted, then the overall revenue will increase and change the elements of the notional revenue requirement.

The following is CCC Water's response to IPART's *Draft Technical Paper – How we set the revenue level*. For more information regarding operational and capital expenditure refer to the *Operational and capital costs* section of this document.

8.2 IPART set prices for 4 years using price caps

CCC Water welcomes a 4-year price path for the 2022 determination and believes a 4-year price path provides a greater level of certainty regarding:

- demand forecasts
- operational forecasts
- capital works program
- required revenue to ensure asset performance
- price stability for customers
- consideration of customer views.

More information on CCC Water's 4-year price path can be found in *Technical Paper 3 – Form of regulation*.

8.2.1 Price caps

A price cap is part of the existing regulatory framework where IPART sets a maximum on price that CCC Water can charge. The cap is set by reference to the amount of revenue that is required to cover off expenditure, with increases to prices by inflation only. CCC Water agrees with this regulatory approach.

8.3 IPART's building block approach

IPART's building block model is essentially an expenditure review where the revenue that is required from service and usage charges is referenced against the expenditure that CCC Water require to provide essential services. The building block is made up of five components with some adjustments made for lower sales of water, cost of debt true up and any non-regulated income received such as sale of scrap metal and insurance recoveries.

CCC Water requested a total notional revenue of $873M (detail in *Technical Paper 6*) and IPART 's draft report proposes a notional revenue of $809M.

Table 20 Comparison of CCC Water proposed NRR v IPART's draft determination using the BBM

Expenditure category	CCC Water proposed notional revenue ($M)	IPART draft notional revenue ($M)	Difference ($M)
Operational expenditure	$524.2	$477.8	$46.4

Expenditure category	CCC Water proposed notional revenue ($M)	IPART draft notional revenue ($M)	Difference ($M)
Capital allowance (Return on Assets	$200.2	$172.4	$27.4
WACC (Return on Assets)	*3.31%*	*2.9%*	
Regulatory depreciation (Return of Assets)	$122.9	$151.7	-$28.8
Working capital	$5.5	$5.7	-$0.2
Tax Allowance	$20.7	$11.6	$9.1
Total	**$873.0**	**$819.2**	**$55.0**
Adjustments			
DVAM (demand allowance)	$3.5	$2.0	$1.5
Cost of debt true up	-$6.1	-$12.0	-$5.9
Non-regulated revenue	$0.0	-$0.1	-$0.1
Total Notional Revenue Requirement (NRR)	**$870.4**	**$809.1**	**$61.3**

** Note figures may not add up due to rounding*

8.3.1 CCC Water's required operational expenditure

CCC Water proposed operational expenditure of $524.2M, IPART have reduced the expenditure by $46.4M reducing the allowance to $477.8M.
This reduction is attributed to:

- reduced expenditure for water by $0.2M
- reduced expenditure for sewer by $20.2M and
- reduced expenditure for stormwater drainage by $26.0M

The reduction in expenditure is not discussed in this section but covered off in operational and capital cost.

8.3.2 CCC Water's return on assets

Return on Assets proposed by IPART over the 4-year determination period is $172.4M, CCC Water proposed $200.2M. This represents a $27.5M reduction. The reduction in revenue is attributed to three factors:

1. A lower Weighted Average Cost of Capital (WACC)[5]
2. A different Regulatory Asset Base (RAB) rolled forward and

[5] WACC - The weighted average cost of capital (WACC) is a key input for calculating the revenue requirements and setting prices for many of the businesses IPART regulate. The WACC is the weighted average of debt and equity costs required for a benchmark efficient business to invest in necessary infrastructure. - Source IPART website

3. Lower than requested capital costs for 2022-26.

As explained in IPART's *Draft Technical Paper - How we set the revenue level*, the return on assets is based on the regulatory asset base (RAB) multiplied by rate of return which is an estimated WACC. CCC Water estimated post-tax real WACC of 3.31% whereas IPART set the post-tax real WACC at 2.9%. A higher or lower WACC influences the revenue determined in this part of the BBM, the higher the WACC, the higher the return on Assets (WACC * RAB) and therefore the revenue. A lower WACC, the lower the return on Assets and therefore a lower revenue.

Table 21 CCC Water WACC versus IPART proposed WACC

Category	CCC Water's WACC components	IPART's WACC components
Debt funding	60%	60%
Equity funding	40%	40%
Total funding (debt + equity)	100%	100%
Corporate tax rate	30%	30%
Gamma (adjustment for franking credits)	.25 (25%)	.25 (25%)
Cost of debt (nominal-pre-tax)	4.45%	3.70%
Cost of debt (real pre-tax)	2.05%	1.30%

The post-tax real WACC is calculated using the cost of debt % (real post tax) * debt funding + the cost of equity % * equity funding.

This is done using both lower and upper ratios with the midpoint selected. The IPART draft Technical Paper uses the following:

Debt funding 60% * 1.3% = Equity funding 40%*5% = 2.7%.

Using the same calculations, the lower post-tax real WACC = 2.7% and the upper post-tax real WACC = 3.1%. The midpoint is 2.9%.

CCC Water, whilst using a similar calculation, returned a midpoint post tax real WACC of 3.31%. The difference could be attributed to the point in time that it was calculated (June 2021).

The difference in the post-tax real WACC is the primary reason for the reduction in the return on assets between what CCC Water requested and what IPART proposed.

CCC Water accepts IPART's WACC calculation as it uses recent market data.

8.3.3 The Regulated Asset Base (RAB)

In July 2000 the IPART determination for the previous Gosford and Wyong LGA's saw a change in the way prices were calculated.

IPART introduced the "Regulated Asset Base" (RAB) which was/is a key a component in the calculation of the Notional Revenue Requirements (NRR) using the building block model (BBM). The initial RAB calculation was not equal to the value of the Fixed Asset Register (FAR) but a percentage of it. In setting the RAB, IPART introduced what is known as a Line in the Sand (LIS). In the 2000 IPART determination, the LIS valued council's operator's existing assets using a discounted cash flow analysis.

The LIS approach was used to ensure that only new and efficient capital investment was paid for by consumers. An advantage deemed by IPART, that it appropriately reflected the fact that many of assets represented a legacy of previous capital expenditure.

Table 22 Line in the Sand (LIS) calculation on July 2000. ($of the day)

Previous LGA	RAB 2000	Real Asset base 2000	% difference
Gosford	$227,000,000 (included $8,000,000 working capital)	$525,000,000	43%
Wyong	$186,000,000 (included $2,500,000 working capital)	$428,000,000	43%

When calculating the RAB, IPART needed to consider any sharp increases in the usage and access charges to customers resulting from the introduction of the building block methodology, using the Fixed Asset Register's book value, would have increased prices significantly.

When setting the initial prices for customers the usage charge and fixed asset charge from the previous year was determined with appropriate CPI applied. The RAB, being the variant in the building block model, was then applied using a discount factor and a discounted cash flow model.

The closing RAB from 2022 is determined and that is rolled forward to the opening RAB on 1 July 2022.

Table 23 Calculation of Return on Assets CCC Water proposed versus IPART proposed

$M	2021-22	2022-23	2023-24	2024-25	2025-26
CCC proposed opening RAB	1,376	1,445	1,461	1,497	1,533
CCC proposed closing RAB	1,445	1,461	1,497	1,533	1,574

$M	2021-22	2022-23	2023-24	2024-25	2025-26
Return on Assets (using 3.31% WACC)		**48.2**	**49.5**	**50.7**	**52.1**
IPART proposed opening RAB	1,389	1,461	1,451	1,473	1,517
IPART proposed closing RAB	1,461	1,451	1,473	1,517	1,560
Return on Assets (using 2.9% WACC)		**42.1**	**42.3**	**43.3**	**44.6**

Note – Return on Assets based on closing RAB each year x WACC (approximates only shown above)

The main differences for the RAB calculation are attributed to a different opening and closing RAB carried forward from the current determination and the differences in the capital allowance across the course of the determination period.

Table 24 CCC Water proposed capital expenditure versus IPART's proposed capital expenditure for 2022-26

$M	2022-23	2023-24	2024-25	2025-26	Total
CCC Water's proposed capital expenditure (net of cash contributions)	70.0	72.0	72.0	77.5	291.5
IPART's proposed capital expenditure (net of cash contributions)	27.0	60.0	82.0	84.0	253.0

Note figures may not add up due to rounding

8.3.4 CCC Water's working capital allowance

Working capital is the input to the NRR that represents the return the business could earn on the net amount of working capital it requires each year. It measures the costs that CCC Water incurs due to the time delays between providing the service and receiving the revenue.

CCC Water bills customers every quarter retrospectively, for example a quarterly billing cycle may occur from 1 January to 30 March. A meter that is read in January may not get billed until March, therefore the delays in using versus paying for the service varies depending on when the meter is read.

CCC Water proposed a capital allowance of $5.5M (between 2022-26) and IPART proposed $5.7M.

CCC Water accepts IPARTs calculation.

8.3.5 CCC Water's regulatory depreciation

Each determination period the RAB reduces by the amount of regulatory depreciation and increases it from approved prudent and efficient capital expenditure (excluding cash contributions) and indexation.

Regulatory depreciation aims to recover the cost of an asset over its useful life ensuring that customers that benefit from the asset, pay for it.

In previous determinations, regulatory depreciation used an aggregated approach with three asset categories of Water, Sewerage and Stormwater Drainage.

Asset lives were then determined for both new and existing assets and depreciation set using the "straight line" method.

CCC Water disaggregated the RAB for this determination using the weighted average useful lives (WAUL) of its water supply, sewerage and stormwater drainage assets.

The new disaggregation of the RAB resulted in vastly different assets lives. The table below shows the comparison between CCC Water and IPART.

Table 25 Comparison of new and old asset lives

Years	Water	Sewerage (previous Gosford LGA)	Sewerage (previous Wyong LGA)	Stormwater
New assets CCC current 2019-22	75	75	75	95
Existing assets CCC current 2019-22	77	77.2	71.2	80.8
New assets CCC Water proposed 2022-26	69	82	79	94
Existing assets CCC Water proposed 2022-26	52	49	48	60
New assets IPART proposed (weighted average)	60	57	58	91
Existing assets IPART proposed	37	37	38	59

Lower Asset lives are proposed by IPART due to a different calculation method used, weighted average useful lives, weighted by depreciation compared to CCC Water using weighted Average useful lives (WAUL).

Assets across all water utilities have varying assets lives. For example, a civil asset such as a pipe has a longer asset life than electrical motors. Disaggregating these varying types of assets into their own asset categories and applying the asset life applicable to each category changes the way the RAB is depreciated. The three RAB categories of Water, Sewer and Stormwater were disaggregated by CCC Water into the lower asset categories in the table below, IPART accepted the new RAB categories.

Table 26 CCC Water Proposed new RAB Asset categories

RAB categories 2019-22	RAB categories 2022-2026
Water	Civil
	Mechanical/electrical
	Buildings
	Equipment/telemetry
Sewer	Civil
	Mechanical/electrical
	Buildings
	Equipment
Stormwater drainage	Civil
	Mechanical/electrical
	Equipment

Generally, while a lower asset life provides a higher regulatory depreciation allowance (return of assets) and thus an increase in revenue, it also reduces the RAB at a faster rate (depreciation is deducted annually).

CCC Water accepts IPART's asset lives.

8.3.6 CCC Water's tax allowance

The Tax allowance in the building block model represents the tax that a comparable business would be subject to. CCC Water is not a tax paying entity; however, an allowance is provided in the building block model.

In summary, the tax allowance uses the notional revenue requirements as set in Building Block Model (BBM) plus non-cash contributions (assets free of charge (AFOC)). It then deducts expenses such as operational expenditure, depreciation, and interest expenses. The net result is the taxable income that a comparable commercial business would pay tax on.

The corporate tax rate of 30% is applied to the taxable income. In addition, an allowance is made on the tax rate with an adjustment for franking credits (gamma adjustment 0.25).

In CCC Water's calculation, a lower depreciation allowance was used and a consumer price index (CPI) of 2.5% applied.

Table 27 Tax Depreciation allowance CCC Water proposed versus IPART proposed

$M	2022 CCC Water proposed tax depreciation	2022 IPART draft tax depreciation
Water	11.3	22.7
Sewer	11.6	20.3
Stormwater	3.1	4.1
Total	26.7	47.1

Calculation of taxable income and tax allowance below:

Table 28 CCC Water's calculation of taxable income and taxable allowance

$M	CCC Water proposed tax allowance (2022)	IPART draft tax allowance (2022)
Net revenue requirements	210.1	203.3
Non-cash contributions	0.0	14.6
Total revenue	**210.1**	**217.9**
Less operational expenditure	129.7	121.3
Less tax depreciation	26.7	47.1
Less interest expense	39.9	38.7
Taxable income	**13.9**	**10.8**
Tax based on corporate tax rate 30% and gamma .25%	5.2	4.1
Adjustment for franking credit	1.3	1.04
Net	**3.9**	**3.1**

Take the corporate tax of 30% and multiply by gamma of 0.025 1-(30%(1-0.25)) = 0.775. Take 10,758 *30%/0.775*
Some figures may not total due to rounding. In technical paper 3.8m is stated

Using the lower depreciation allowance has an overall impact of a higher taxable income and a higher tax allowance.

The tax depreciation used by IPART is based on the draft decision on the asset lives. CCC Water accepts the higher tax depreciation and therefore the lower tax allowance

8.3.7 CCC Water's allowance for pensioner rebates

CCC Water agrees with the annual allowance for pensioner rebates of $1.92M in $2021-22. This is in line with historical trends. It is difficult to forecast pensioner rebates due to the changes/movement in residents, especially since COVID with the movement from cities to regional areas.

CCC Water supports IPART recommending that the NSW Government review pensioner concessions. Pensioner concessions are determined under the section 575 of the Local Government Act 1993.

To be an eligible pensioner you must receive a pension from either Centrelink or the Department of Veterans' Affairs and be entitled to a pensioner concession card issued by the Commonwealth Government. You can only claim a concession on the property if it is the sole or principal place you live.

The maximum annual amount that CCC Water can reduce water supply special rates or charges is by $87.50 and sewerage supply special rates or charges by $87.50 eligible pensioners.

Any pensioner concessions provided are funded by a government rebate, 55% of the pensioner concession, and the remaining 45% is funded by CCC Water's customers.

Any increase in the pensioner rebates provided without a change in the funding model will increase the amount to be funded by CCC Water's customers.

8.3.8 CCC Water's non-regulated revenue

CCC Water agrees with the non-regulated revenue used by IPART that was stated at $100K per annum over the 4 years. The unregulated income is forecast be $50K per annum and primarily due to the sale of scrap metal, insurance recoveries and miscellaneous receipts.

8.4 IPART set prices using the NRR and assess impacts

Once IPART have calculated the NRR for CCC Water as explained above, they then determine how this revenue will be translated into usage charges and service charges per year.

They do this by using the demand for water calculations (forecast consumption per annum) and the Long Run Marginal Cost (LRMC). Essentially the LRMC becomes the water usage charge. The revenue expected from water usage is LRMC * demand (forecast consumption). The LRMC remains static (except for CPI) over the determination period.

The remainder of the revenue is then used for service charges based on the number of connections. This is explained further in CCC Water's *Technical Paper 8 – Pricing of Water, Sewerage and Stormwater Services*.

CCC Water proposed that the prices for the service charges to rise on 1 July 2022 and remain static over the 4-year determination period except for CPI increases providing the community with consistency of pricing enabling customers to plan and budget.

IPART are proposing to escalate the process by 19% in the first year and 4% plus CPI thereafter.

This will result in the highest prices paid in year 4.

8.4.1 Impacts on CCC Water's financial sustainability

IPART use three finance-ability ratios to determine if CCC Water will have sufficient revenue to deliver the costs of providing its water, sewerage and stormwater drainage services. These tests are:

- real interest cover
- real funds from operations over debt
- net debt (debt gearing).

They also use a "benchmark test" for comparison. The benchmark test uses the same revenue, with a lower expenditure and higher interest (derived from a higher debt and using 1.8% as the real cost of debt benchmark). As mentioned in the draft technical paper, CCC Water carries a lower debt and the test uses a higher cost of debt at 5.1%.

CCC Water

The section below shows the calculations used by IPART for CCC Water.

Of note is that CCC Water will need to borrow $50M to service the capital expenditure for Mardi Water Treatment Plant. This is expected to be $10M in year 1 and an additional $40M in year 2 of the determination period. This will increase interest and loan principal payments, as highlighted in the table below:

Table 29 Additional loan calculations for MWTP

$M	2022-23	2023-24	2024-25	2025-26
Water (Includes MWTP)				
Total Interest	7.8	9.1	8.3	7.7
Total Loan principal repayments	13.1	15.0	15.3	15.7
Sewer				
Total Interest	2.2	2.1	1.9	1.7
Total Loan principal repayments	3.1	3.3	3.5	3.7

This was not included in the financial statements put forward in the Annual Information Report. CCC Water requests that this additional borrowing and interest be considered in the ratios below.

Interest Coverage – This is calculated as Funds From Operations (FFO) plus interest repayments divided by interest payments i.*e. FFO*[6]*+ interest repayments/interest payments*.

This ratio measures CCC Water's ability to service its debt burden using cash flows.[7]

Year 1 FFO =$55.5M ($44.2M+$19.6M+$1.7M-$10.0M)

Net Interest = $8.2M ($10.0M – $1.8M)

($55.5M+$8.2M)/$8.2M = Result = 7.7%

However, CCC Water must include both interest and principal repayments when assessing cash flow estimates. The figures used by IPART are based on interest repayments forecast in June 2021. It does not include additional debt of a proposed $50M to cover the Mardi Water Treatment Plant). This increases the interest payments for year 2.

The additional $50M loan needs to be considered for years 2, 3 and 4 in the determination for this ratio.

FFO divided by Debt– This is a more dynamic measure of leverage than debt gearing because it measures a Council's ability to generate cash flows to service and repay debt. It uses the formula of FFO/Net debt.

The additional $50M loan needs to be considered for all years 2, 3 and 4 in the determination for this ratio.

Debt gearing (gearing) – This is calculated as debt divided by the regulatory value of fixed assets, i.e., the RAB. It measures CCC Water's leverage. This ratio is measured by Net debt/RAB + net working capital.

The additional $50M loan needs to be considered for years 2, 3 and 4 in the determination for this ratio.

8.4.2 End of period True up for annual changes to the WACC

IPART did a review of the WACC method in 2018 with the aim to improve its accuracy and predictability. As shown above the WACC is a key input for calculating the revenue requirements.

The WACC True-up for CCC Water is calculated in IPART's draft technical papers as $12.4M. This amount is deducted from the revenue in year 1 of the determination period (2022-23).

[6] FFO ratio uses **cash flow from operations** (revenue less expenditure, tax paid and change in working capital (change in receivable – less payables)) **Cash flow from operations** less working capital + interest received + interest paid.

[7] Based on original financial statements put forward in the AIR

The value is calculated using a 10-year trailing average for the historic cost of debt and a 4-5 year trailing average for the short-term cost of debt.

IPART then review the regulated asset base in the current determination and using an average, multiples the average by 60% representing the debt portion of the assets.

Average value of Assets between 2019-2022 = $1.3Billion * 60% = $787.5M (outstanding debt) to which to apply the adjustment to.

To calculate the true up the following calculation is performed:

Table 30 True up calculation, total may not add due to rounding when dealing with $Billions

Year	Outstanding debt $M	Real Cost of debt	Total	Outstanding debt $M	Change to cost of debt throughout the determination period	Total	Difference $M
2019-20	$787.5 *	3.0%	$23.6 *	$787.5	3.0%	$23.6	$0.0M
2020-21	$787.5 *	3.0%	$23.6 *	$787.5	2.5%	$19.6	$4.0M
2021-22	$787.5 *	3.0%	$23.6 *	$787.5	2.1%	$16.5	$7.1M
Total							**$11.6M**
Total +CPI							**$12.3M**

CCC Water accepts the WACC true up for the first year of the determination. However, this may change as the cost of debt may increase at the June 2022 quarter.

9 Demand for water services

CCC Water notes the strong alignment between its submission to IPART and IPART's draft determination regarding demand for water services. Due to this alignment, CCC Water's response to IPART's draft determination on demand for water services has been kept high-level.

9.1 IPART set draft prices using CCC Water's demand forecasts

CCC Water supports the use of its demand forecasts and the assessment that those forecasts are considered fit for purpose. The ongoing implementation of the Demand Volatility Adjustment Mechanism (DVAM) to manage the inherent risks in demand forecasting for both CCC Water and our customers is also supported.

The ongoing implementation of DVAM, as in 2019 determination and as recommended by IPART now, with adjustment for variance in excess of plus/minus a 5% limit, is a reasonable mechanism to cover the risk of a customer being overcharged (water authority over recovering) and the water authority losing revenue (due to under recovery).

9.2 IPART accepted CCC Water's proposed demand forecasts

CCC Water supports IPART's draft recommendations regarding demand forecasts for water, wastewater and drainage services.

The draft IPART decisions supported by CCC Water are:

- accept CCC Water's forecast customer numbers and water demand, with average sales of 27,530 megalitres (ML) per year
- adopt slightly different chargeable wastewater volumes to what CCC Water proposed
- apply a demand volatility adjustment mechanism (DVAM) of $2.1M to compensate CCC Water for a loss in water sales across the 2019 determination period
- recommend we consider applying a DVAM as part of our next review of CCC Water's prices to manage the risk that actual customer numbers and demand over the 2022 determination period are materially higher or lower than the forecasts we used in setting prices
- not set drought prices for the 2022 Determination, but recommend that IPART considers whether setting drought prices would be appropriate for the 2026 Determination
- recommend CCC Water report on climate change risks in its pricing proposal for the 2026 Determination.

9.2.1 Forecast customer growth

CCC Water supports IPART's draft recommendations on forecast customer growth.

The draft IPART decisions supported by Council are:

- to set water, wastewater and stormwater prices using the forecast customer in line with CCC Water's proposal

- to set water prices using the water sales forecasts in line with CCC Water's proposal
- for setting developer charges, to maintain the equivalent tenement value per customer at 150 kilolitres (kL)
- for setting wastewater prices, to maintain the wastewater deemed discharge allowance for:
    - standalone residential properties at 125 kilolitres (kL)
    - multiple and mixed multiple premises at 80 kL
    - non-residential properties within mixed multiple premises at 125 kL
- For setting wastewater prices, to maintain the 75% discharge factor for all residential properties and unmetered properties
- To set wastewater prices for non-residential customers using the discharge factors and resulting billable discharge volumes in line with CCC Water's proposal to align wastewater charges for customers in the former Gosford LGA with those in the former Wyong LGA.

9.2.2 Proposed water demand forecasts

CCC Water supports IPART's draft recommendations on proposed water demand forecasts.

CCC Water notes that IPART is satisfied our water demand forecasts over the 2022 determination period are reasonable, and that our water demand model is robust. It is also noted that IPART has adopted CCC Water's forecasts and used them in setting draft water prices for the 2022 determination period.

9.2.3 Wastewater prices using revised non-residential discharge factors

CCC Water supports IPART's draft recommendations on wastewater prices using revised non-residential discharge factors.

9.3 IPART applied the demand volatility adjustment mechanism

CCC Water supports the ongoing implementation of the Demand Volatility Adjustment Mechanism (DVAM) to manage the inherent risks in demand forecasting for both CCC Water and our customers. The continuation of the +- 5% threshold is also supported.

9.4 No drought prices for the 2022 Determination

CCC Water notes that while the DVAM allows for the risk of under recovery of revenue during periods of drought, there are additional operational costs that are incurred during drought preparedness and drought response phases. The role of drought pricing in managing those additional operational costs is supported.

CCC Water notes that is too early to identify the potential benefits of drought prices that may be set by Hunter Water and/or Sydney Water. CCC Water will consider the experience of Hunter Water and/or Sydney Water as part of the process to prepare for our next submission to IPART.

Setting a single drought price during drought is complex, as setting a water restriction Level 1 (50%) as trigger for an enhanced price during drought will have to cover the average cost of

additional costs for various levels of restrictions. Furthermore, every drought can be different. The recent drought (2017-20) started with a water storage levels at 75% (April 2017) in CCC Water's main storage dam (Mangrove Creek Dam) and it took approximately three years to trigger restrictions in February 2020 when storage levels reached 50%. The ideal time (storage percentage) for drought price to be triggered should be at least 10% above the restriction Level 1 trigger to provide the water authority enough time to start promoting/messaging water conservation, avoid/delay going on restrictions and keep supplying unrestricted water supply. This will avoid simultaneously going on restrictions and starting to charge more.

9.5 CCC Water report on climate change risk in the next review

CCC Water notes IPART's recommendations to report on climate change risk in the next review.

The Central Coast Water Security Plan (CCWSP) has considered the range of risks that climate change poses to managing the water supply/demand balance on the Central Coast. Initial assessments on potential increases in demand and reductions in yield have been undertaken within the CCWSP.

As existing climate change research has presented a range of equally likely (but different) future scenarios, further work is required to assess how these should be integrated into pricing frameworks for water sales forecasts and long-run marginal cost assessment. It is understood that Sydney Water and its partners have been able to develop methodologies to address these matters and further feedback from IPART on these approaches would be welcomed.

10 Trade waste and other prices

CCC Water notes the alignment between its submission to IPART and IPART's draft determination regarding trade waste prices. Due to this alignment, CCC Water's response to IPART's draft determination on trade waste pricing has been kept high-level.

However, detailed responses have been provided below where CCC Water do not agree with IPART's draft recommendations on miscellaneous charges.

10.1 CCC Water's proposed trade waste prices

Miscellaneous and ancillary prices are one-off prices levied for services such as water service connections and disconnections, provision of plans, certificates and other documentation, assessment of planning proposals and inspection of developer assets. IPART's consultants conducted a review of CCC Water's proposed prices for the ten most revenue-intensive miscellaneous charges. The review was to examine whether the prices proposal by CCC Water reflected the efficient costs incurred in providing the services and accord with benchmark prices charges by similar utilities. IPART have sought to apply the same principles to the remaining miscellaneous prices that were not examined by the consultants.

10.1.1 Fixed trade waste prices

Compared to the 2019 Determination where CCC Water had only sought to recover direct labour costs, CCC Water's current list of proposed prices include the costs of direct labour, transport, equipment and overheads. This increase to fixed trade waste prices aligns to IPART's pricing principles of full cost recovery of services provided.

IPART's consultant reviewed the input that CCC Water used to arrive at its proposed fixed trade waste prices and noted that the prices appear to be driven by a move towards cost-reflective pricing and that they are broadly in line with charges levied by comparable water utilities, such as Lockart Shire Council and Upper Hunter Shire Council.

CCC Water acknowledges IPART's recommendation to accept CCC Water's proposal to increase fixed trade waste prices.

10.1.2 Volume-based trade waste prices

CCC Water proposed increases to its volume-based (variable) trade waste prices and notes that IPART has accepted the proposed prices as the increases are modest and within the scope of the Department of Planning and Environment (DPE) guideline trade waste usage prices. IPART's consultants were not requested to investigate and comment on these prices.

10.1.3 Mass-based trade waste prices

CCC Water proposed a list of substances and parameters and adopted the default prices provided in DPE's Liquid Trade Waste Regulation Guidelines for routine substance and substance specific to the Central Coast.

CCC Water acknowledges that IPART's recommended list of mass-based prices for Category 3 customers.

CCC Water is seeking to include 4 additional pollutants to the mass-based trade waste (*Table 2.3: IPART's draft decision on list of substances subject to excess mass-based charges*), which were not included in the CCC Water's proposal. These are contained in the Environment Protection Licences for CCC Water's sewage treatment systems.

CCC Water proposes to include:

- mercury (with a charge of $2,600/kg)
- selenium ($55/kg)
- polychlorinated biphenyls ($1,600/kg)
- pesticides ($770/kg).

As CCC Water requires a mechanism for cost recovery from dischargers if any of these substances is detected in the discharges. These charges are not expected to generate any notable revenue as they are seldom detected in CCC Water's sewage streams. CCC Water requests IPART consider these additional charges.

10.2 CCC Water's proposed miscellaneous prices

Miscellaneous and ancillary prices are one-off prices levied for services such as disconnections and connections, accessing documentation and testing. IPART's consultants conducted a review of CCC Water's proposed prices for the ten most revenue-intensive miscellaneous charges. The review was to examine whether the prices proposal by CCC Water reflected the efficient costs incurred in providing the services and accord with benchmark prices charges by similar utilities. IPART have sought to apply the same principles to the remaining miscellaneous prices that were not examined by the consultants.

4 out of 10 most revenue-intensive charges reduced

Table 3.3 in IPART's *Draft Technical Paper – Trade Waste and other prices* does not consider the true cost to CCC Water of providing the services.

CCC Water requests to further understand the methodology used by IPART when calculating the miscellaneous fees and charges to effectively review the charges proposed. Reference is made to 15a being similar to 15b, but they are very different charges in CCC Water's proposal.

Additionally, CCC Water refutes that it did not provide sufficient evidence to Frontier to justify the price rises proposed for charges 2b, 12b, 15b and 21a. CCC Water provided evidence on two occasions, the most recent being February 2022. Frontier did not seek further clarification of the basis for these proposed prices, nor provide any justification for rejecting the evidence provided in their draft report of 25 February 2022.

The proposed charge for 12b Standpipe hire - annual fees (65 mm) is accepted, based on calculation using the revised water supply service charge (20 mm) of $182.37 (Table 2 of Draft Determination)

Increases limited to CPI increase only

Increasing a suite of prices by CPI only disregards the variation in costs to provide individual services. Changes in processes and personnel implemented since Council amalgamation need to be considered when delivering the services being costed, to ensure true cost recovery for those services. Charging less than the cost of provision of a discretionary service to an individual customer results in the service being subsidised by CCC Water's customer base, with any benefit being gained by the remainder of our customers. This was acknowledged by IPART when considering changes to miscellaneous fees and charges in 2019: "*A simplified option may be to apply a common overhead percentage, however we consider this may not be appropriate given the varied nature of these services*" (Review of Central Coast Council's water, sewerage and stormwater prices to apply from 1 July 2019, May 2019).

Table 31 CCC Water's basis of proposed prices

Charge No	Description	Basis of proposed price
2a	Property sewer line and drainage diagrams - manual request (hard copy form or telephone)	Customer Service Officer: 0.20 hr Land Information Officer: 0.47 hr
2c	Property sewer line and drainage diagrams (with long section) - online requests only	Geospatial Officer: 0.17 hr Land Information Officer: 0.47 hr
2d	Property sewer line and drainage diagrams (property complex) - online requests only	Land Information Officer: 0.75 hr
4a	Special meter reading statement - Manual request (hard copy form or telephone)	Finance Officer: 0.5 hrs Water Meter Reader: 0.5 hrs Customer Services Officer: 0.25 hr
4b	Special meter reading statement - (online form on Council website)	Finance Officer: 0.5 hrs Water Meter Reader: 0.5 hrs Customer Services Officer: 0.17 hr

Charge No	Description	Basis of proposed price
6	Building Over or Adjacent to Existing Water or Sewer Statement	It was previously advised that this charge could be revised to $83.25 (21-22), based on the following work breakdown - Establish property and asset affected (5 min) - Search WAE records to determine whether pipe protection provided to Council standards (15 min) - Search development records related to the property (15 min) - Provide letter to advise outcome of investigation (15 min) - Provide technical advice to owner (10 min)
7b	Disconnection of water services	Charge based on quoted service charge of $355.81 from contract plumber, and Council admin/scheduling charge of $52.29. Note that this charge is not comparable to Sydney Water or Hunter Water services, as it involves the physical disconnection of the service line from the main, rather than closer of a stopcock.
10a	Standpipe Hire – Annual Fee 25mm	Agreed, based on information in Table 2 of the Draft Determination
13a	Inspection of new water and sewer assets including encasements and new junctions	Accept proposed charge of $128.26 (22-23)
17b	Medium projects > 10 and < 50 lots, and mains relocation incl R&D unit	Based on total time of 740 min assessment by Development Engineer: - Prep locate development in relation to existing water and sewer assets (15 min) - Site visit (90 min) - Assess requirements for development (60 min) - Liaise with other business units/designer/developer incl meetings (180 min) - Review submissions for compliance (120 min) - Plan resubmission/alterations review (30 min) - QA (45 min) - Plan approval letter (20 min) - Provide technical support to construction group (120 min)

Charge No	Description	Basis of proposed price
		- Incorporate as-constructed details into relevant systems e.g. billing, GIS, AMS, etc (60 min)
17c	Large projects ≥ 50 and <150 lots or large or medium density developments	Based on total time of 1,035 min assessment by Development Engineer: - Prep locate development in relation to existing water and sewer assets (15 min) - Site visit (90 min) - Assess requirements for development (90 min) - Liaise with other business units/designer/developer incl meetings (240 min) - Review submissions for compliance (180 min) - Plan resubmission/alterations review (60 min) - QA (60 min) - Plan approval letter (30 min) - Provide technical support to construction group (180 min) - Incorporate as-constructed details into relevant systems e.g. billing, GIS, AMS etc (90 min)

Introduction and removal of miscellaneous charges

CCC Water acknowledges IPART's draft recommendation to accept CCC Water's list of 12 new miscellaneous and ancillary charges.

CCC Water acknowledges IPART's draft recommendation to accept CCC Water's list of 11 miscellaneous and ancillary charges that should be discontinued. Plumbing and drainage inspections will still be performed by Council, and charges will be set by Council in its annual review of fees and charges.

10.3 CCC Water's proposed prices for specific customers

CCC Water proposed a set of prices for specific customers who use a relatively large amount of water, including retirement villages, Water Industry Competition Act (WICA) licensees and Hunter Water-Central Coast bulk water transfers.

10.3.1 Retirement villages

CCC Water acknowledges IPART's recommendation to accept CCC Water's proposal to maintain the current approach whereby retirement villages are charged on a similar basis to non-residential

properties. This means that each village pays service prices according to the size of its water meters, rather than based on the number of retirement village units or dwellings. This approach to pricing results in retirement villages paying substantially less than they would under dwelling-based service prices, however it was found there was no strong case to change from the current approach, particularly given potential administrative costs and bill impacts of introducing a change.

10.3.2 WICA licences

A WICA licensee is a corporation that obtains a licence to construct, maintain or operate any water industry infrastructure, to supply water or provide wastewater services. CCC Water supplies services to two WICA licensees who are charged standard non-residential customers.

CCC Water acknowledges IPART's draft recommendation that it maintains the current approach to pricing for these two customers. CCC Water also note that IPART supports CCC Water and Narara Eco-Village entering into an unregulated pricing agreement.

10.3.3 Bulk transfers between Hunter Water and CCC Water

CCC Water and Hunter Water are currently entered in an unregulated pricing agreement. The current price structure sets the transfer prices in either direction to the higher of the two utilities' short-run marginal cost (SRMC) of water supply. IPART generally prefer to set the transfer prices at the higher of the two utilities' long-run market cost (LRMC) of water supply. However, as both CCC Water and Hunter Water prefer the simplicity of current arrangement, IPART recommends leaving the current transfer price determination in place.

CCC Water supports this decision as the approach ensures available water supplies between the two regions are optimised. Maximising the efficient use of existing supplies allows CCC Water to delay investment in new supplies and is a key pillar of the Central Coast Water Security Plan.

Appendix A: Further Information Mardi Water Treatment Plant

Executive Summary

CCC Water has undertaken an extensive range of investigations to inform the most appropriate solutions to ensure the ongoing provision of clean and safe drinking water to its customers. CCC Water first identified emerging risks to drinking water quality through the preparation of the 2009 Central Coast Water Sharing Plan and the development of planned upgrades to the Central Coast Water Supply Scheme (Upgraded Lower Wyong River and Mardi to Mangrove Transfer Schemes). Understanding of those risks was further developed in 2013 as part of preparation of the Drinking Water Quality Management System and associated catchment to tap risk assessment. During this time CCC Water has partnered with various industry specialists to understand the key risks and determine the most appropriate solutions. CCC Water has also engaged with our technical regulator (Department of Planning and Environment) to confirm the technical suitability of the proposed works.

Following the commissioning of the Wyong River and Mardi to Mangrove Transfer schemes in 2012, CCC Water has observed a number of these key risks eventuate resulting in low chlorine residuals within the distribution system and high chlorine disinfection by-product residuals leaving Mardi Water Treatment Plant (MWTP), which have exceeded Australian Drinking Water Guideline (ADWG) levels or resulted in subsequent network re-chlorination exceeding ADWG levels.

The inability of MWTP to treat algae laden water has resulted in Mardi Dam being taken offline in each of the five previous years. These outage periods require CCC Water to release water from Mangrove Creek Dam which is otherwise allocated to provide the region's drought security. The outages also prevent further extraction and storage of available flows within the Wyong River and Ourimbah Creek which comprise over 60% of the regions drinking water catchment area. The loss of supply scheme yield over this five-year period has been approximately 7GL/year and continues to impact CCC Water's recovery from the recent drought and reduces resilience to future droughts, forecast population growth and climate change. The Central Coast Water Security Plan (CCWSP) addresses the region's supply/demand balance and identifies three pillars to provide future water security for the region. Pillar Two of the CCWSP is to optimise existing supplies and delay investment in new future climate independent supply sources which form Pillar Three of the plan. Future investments that could replace 7GL/year of scheme yield include a 20ML/d permanent desalination plant at a cost of over $200M.

Operation of the upgraded transfer schemes are required to ensure sufficient water is available for a growing region. While infrequent and short duration interruptions to their operation can be accommodated, the frequency and duration of impacts described within this appendix cannot be adequately managed by alternate source selection and asset derating over the medium to longer

term. CCC Water has systems in place to assess existing and future demand to determine the required scale of the proposed upgrades over the future planning horizon.

A number of immediate optimisation works have previously been implemented at MWTP and CCC Water already practices a range of catchment management approaches and selective abstraction procedures. These cannot manage the full suite of risks alone and a multi barrier approach that includes the upgrade of MWTP, in consideration of a contemporary raw water quality envelope is required. The proposed alternate approach of pre-treatment has been considered previously and is not preferred as the plant would need to be sized larger than the proposed DAF at MWTP (approximately 55% of Lower Wyong River extractions occur at flow rates greater than 160ML/day and approximately 38% at the maximum 320ML/day flow rate) and not provide the same assurances to drinking water quality.

The proposed suite of measures has been developed from a range of specialist studies and has resulted in a final project scope that is supported by CCC Water's Technical Regulator. The final scope has been required to evolve to ensure emerging (now realised) risks relating to Blue Green Algae management were incorporated and other required works at the plant were bundled together to realise delivery efficiencies. This increase in the scope of works and selection of a more robust clarification process has resulted in the escalation of project costs since IPART last assessed the project as prudent and efficient in 2019.

CCC Water has implemented project governance controls through the development of the investigation and design phase and developed and implemented a procurement strategy to appropriately manage risks and obtain value for money within the Local Government procurement framework. The project has now been priced by the market, within a competitive setting, and key risk allocation considerations which have informed the pricing have been able to be communicated between the parties. CCC Water is now able to work with those tenderers to address risk allocation and ensure the most efficient balance of risk between the parties can be achieved.

A clear case has been made relating to the prudency of the proposed upgrades and CCC Water has been seeking the procurement of those works within an efficient procurement methodology. It is noted that the number of previous supporting studies is considerable and CCC Water staff can further discuss or clarify any of the matters raised in those studies in further detail as required. Matters specific to the current procurement negotiation phase can also be discussed in further detail as appropriate.

Introduction

CCC Water has provided a response to the matters raised within the document titled *Central Coast Council - Expenditure Review Draft Report 4 February 2022* prepared by Frontier Economics and Mott Macdonald on behalf of the Independent Pricing and Regulatory Tribunal (IPART). IPART, via its consultants Atkins Cardno last reviewed the proposed upgrades to Mardi Water Treatment Plant (MWTP) in 2019, at that time concluding the proposed works were prudent and applying a number

of efficiency factors including the bundling of related works to improve the capital efficiency of the upgrade. CCC Water has since proposed a revised scope of proposed upgrades to IPART with a higher estimated cost.

This document has been structured with Sections Two, Three and Four providing targeted responses to the nine key dot points presented on page 98 of the draft expenditure review. These are divided within the key themes of the project's prudency, options selection and delivery efficiency. Several supporting attachments have previously been provided to the consultants for review.

Responses to assessment of project's prudency

Unsubstantiated demand forecasting

Assessment of peak day demand

CCC Water uses telemetry/SCADA to measure daily water supplied to the network. A combination of flow meters and level sensors, which record water flows in the system and end of the day volume change in all the service reservoirs, contribute to the calculation of bulk water demand for the day. CCC Water maintains a SQL database to record historical time series data for daily water demand. Water production from both major water treatment plants at Mardi and Somersby are also measured, in addition to transfers to and from Hunter Water. This provides a clear indication of bulk water added into the supply network and water removed (as demand) on a daily basis. This actual observed data has informed the current peak demand estimates for the water supply network.

Examples of CCC Water's SCADA outputs and daily dashboards are provided below, and CCC Water's System Operations group can describe these systems in more detail as required.

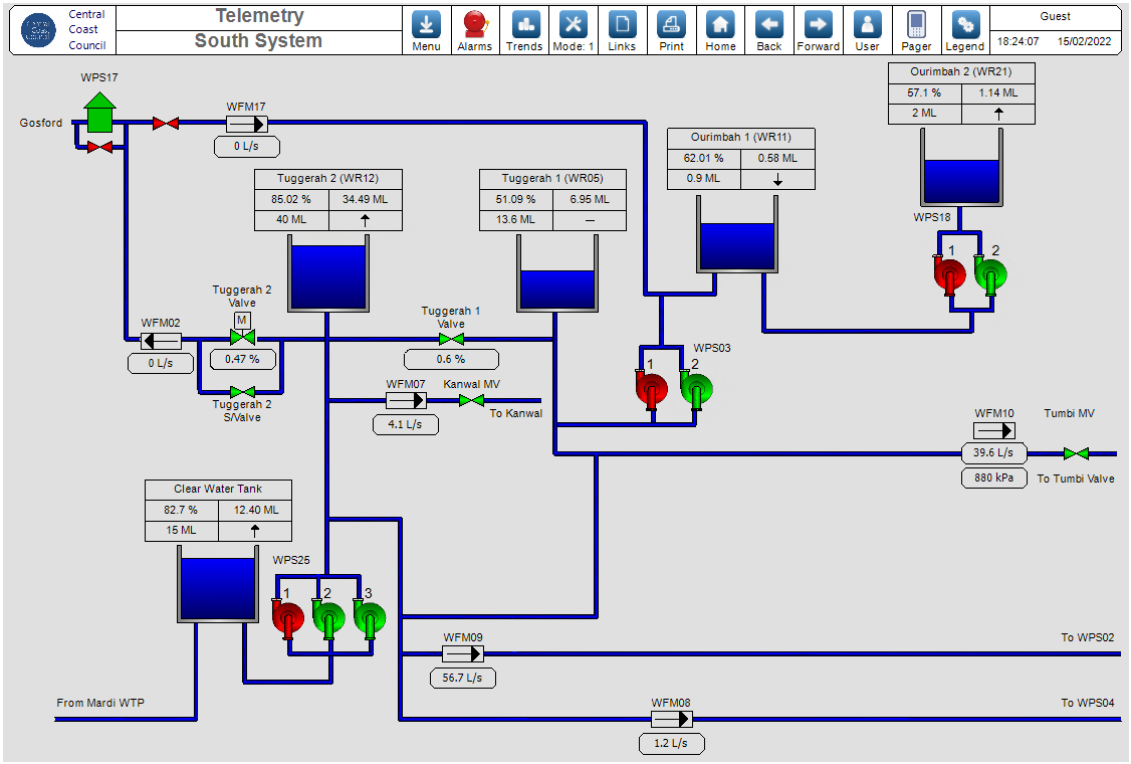


Figure A1 - Example of CCC SCADA system which informs bulk water movement across the network

Figure A2 - Example of daily water report dashboard that informs historical system demand database

Peak day demand and inter-regional transfers

CCC Water supplies drinking water to a growing region, in addition to operating an inter-regional transfer scheme with Hunter Water Corporation, that improves the utilisation of available raw water resources across the two regions. During 2021 CCC Water commissioned the Mardi to Warnervale Pipeline that allows CCC Water to meet its north bound transfer commitments of 30ML/day depending on the prevailing storage level within CCC Water and Hunter Water's bulk supply schemes. Northbound transfers were previously limited to approximately 15ML/day due to network constraints.

Demand on the Central Coast has historically been very sensitive to climate, with peak day demands of over 150 ML/day observed in 2001 and 2002 as outlined in Figure A3. During the Millennium Drought the per capita and peak day demands subsequently reduced amid tightening water restrictions. There has been some 'bounce back' in demand post drought and relaxation of water restrictions, however peak daily demand observations (134ML/day Jan 2018) are indicating a reduced design peak day demand of 139ML/day (peaking factor of 1.6 from average day demand) as shown in Figure A4 (extract from CC Water Demand Summary).

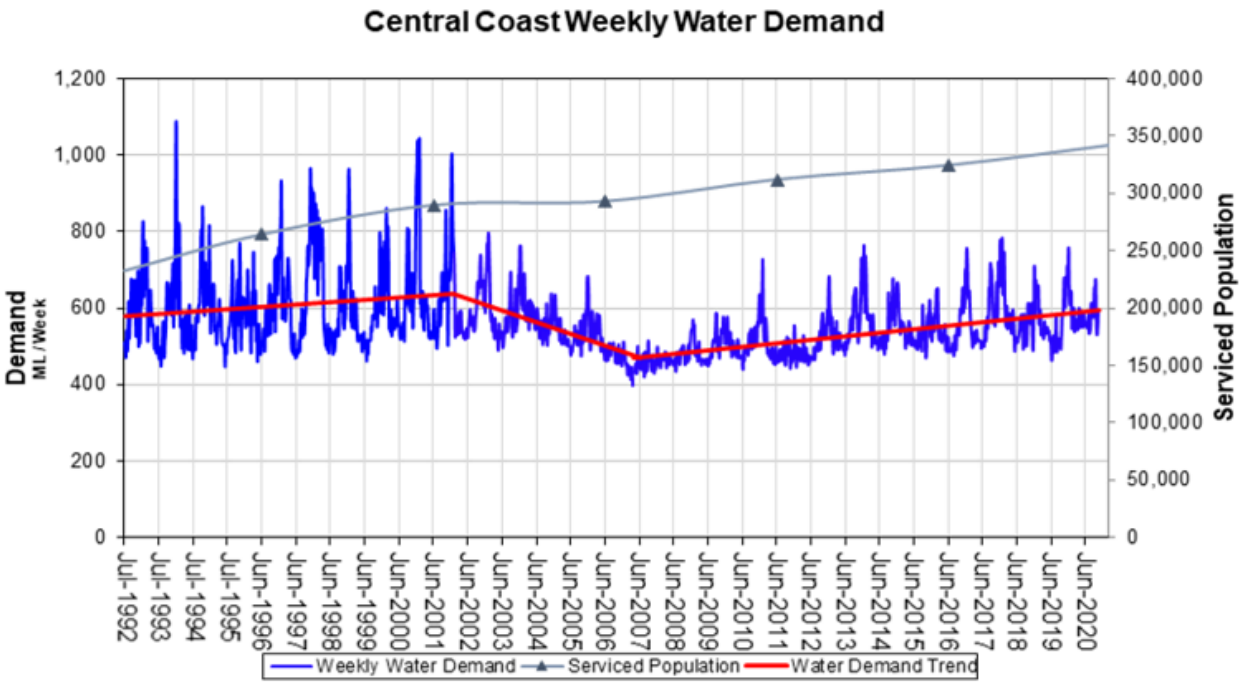


Figure A3 - Historical Central Coast Customer Demand Trends (excludes Hunter Water transfers)

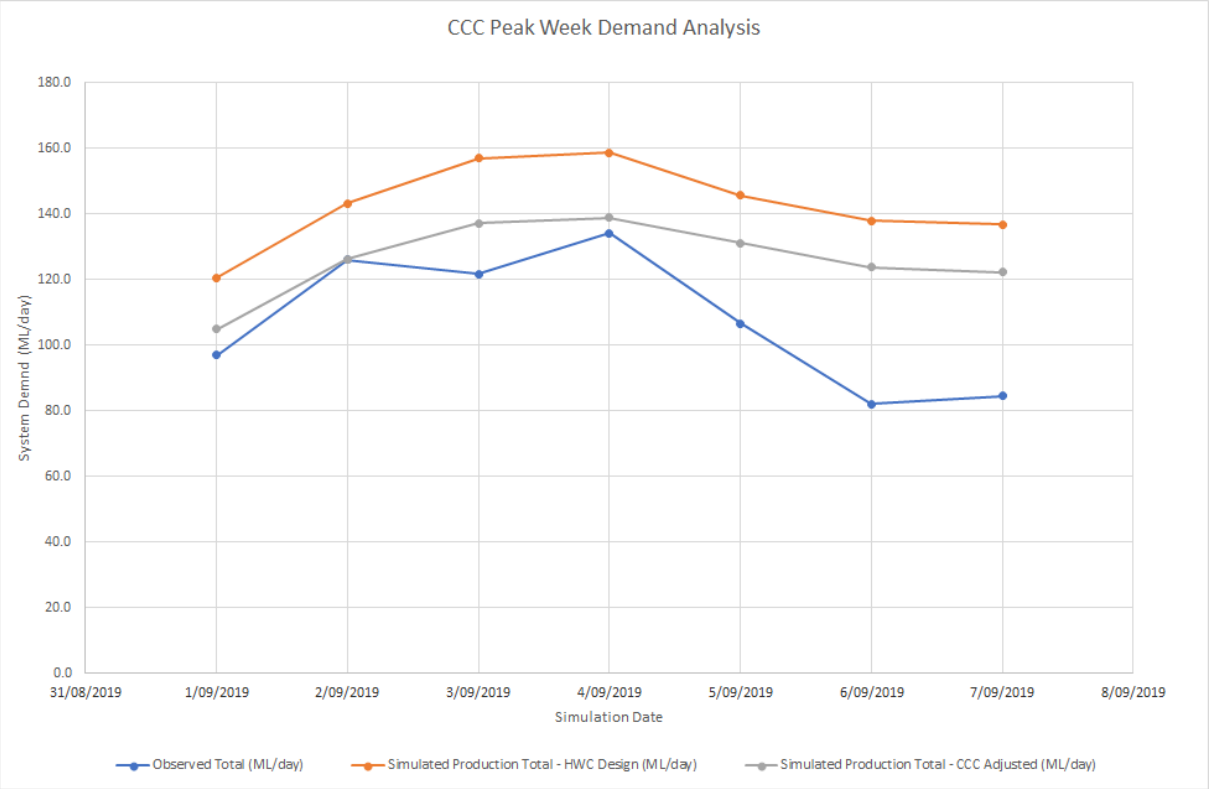


Figure A4 - Revised design Peak Day Demand (PDD) curves downrated from Hunter Water design methodology

This demand will, however, grow as the population continues to increase and summer days become hotter and drier. CCC Water has also commissioned the Mardi to Warnervale Pipeline, which will allow the required 30ML/day north bound transfers to occur as required in line with the Pipeline Agreement. Figure A5 has provided observed demands from January 2018 and overlaid the current 30ML/day transfer commitments. Figure A6 then escalates the CCC customer demand based on current growth projections to a planning horizon of 2050, overlaying the 30ML/day transfer volumes on top to demonstrate future likely demand scenarios. This demonstrates the future demand profile that the proposed assets will be required to service over a nominal 25-year life for the mechanical and electrical assets.

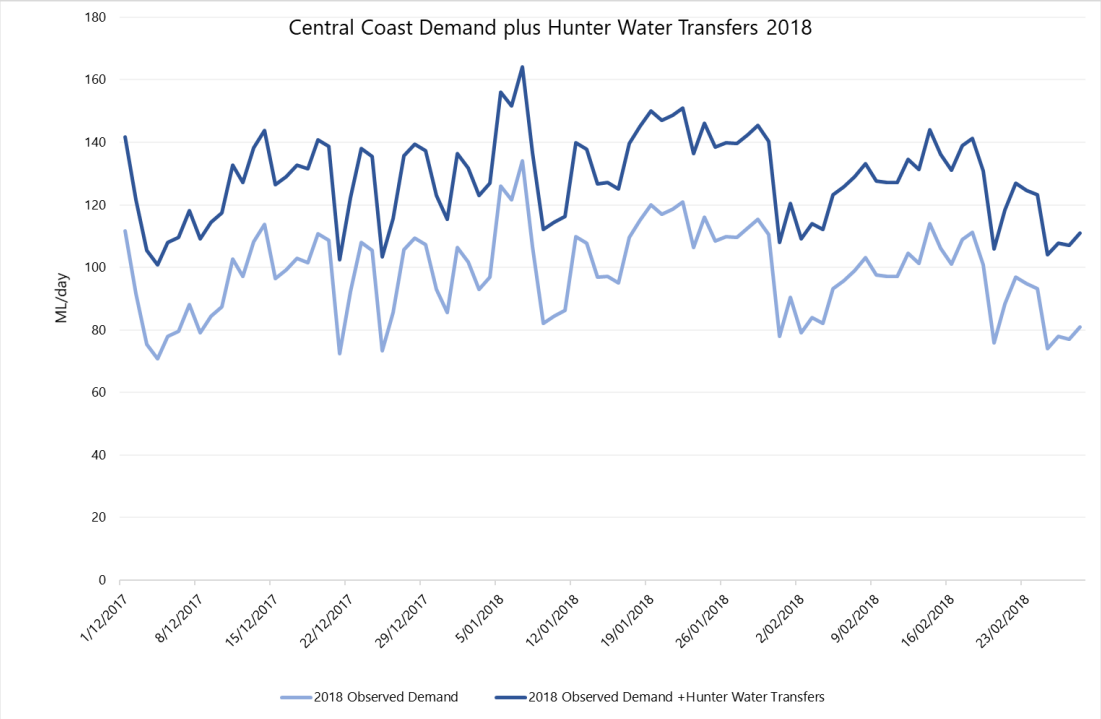


Figure A5 - Observed 2018 demand including Hunter Water transfer commitments

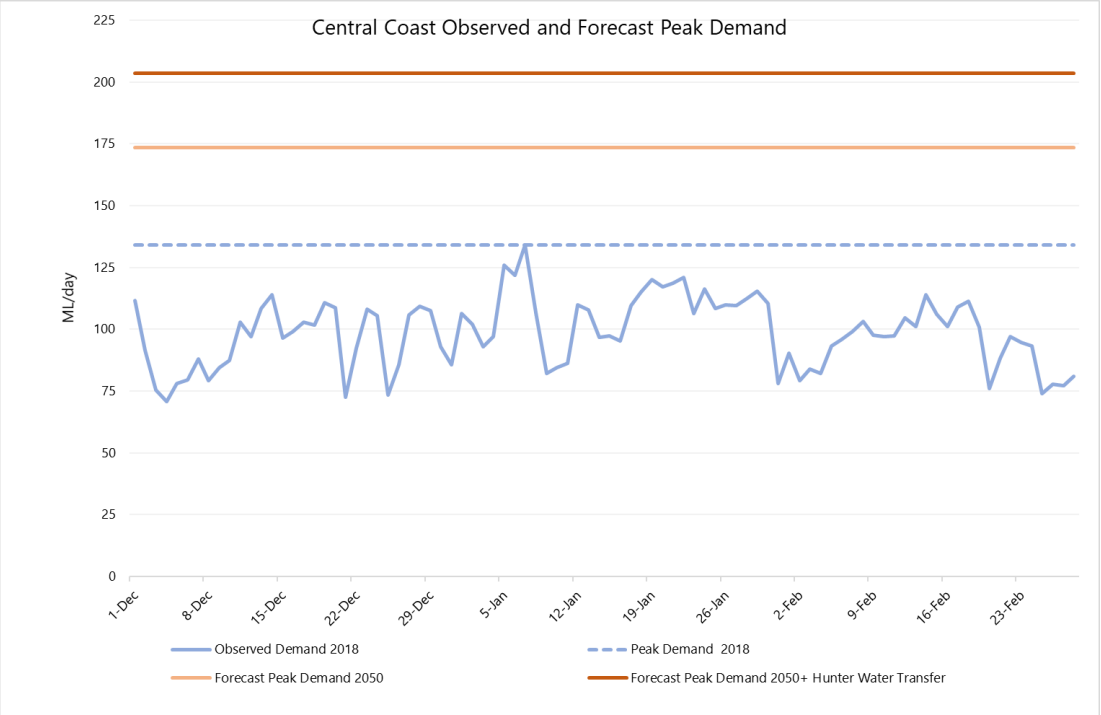


Figure A6 - Observed 2018 demands and forecast peak demand with Hunter Water transfer commitments.

Future average day demand forecasts have been taken from the demand forecasting undertaken for the Central Coast Water Security Plan. The growth in average day demand between 2021 and 2050 (as a percentage) has been applied to CCC Water's current observed peak day demand to derive the above figures.

Existing production capacity to meet the required peak demand

Peak demands

The analysis provided in Section 2.1 has shown that CCC Water has adequate systems in place to assess bulk water demand and future growth in demand, combined with transfer commitments within the Hunter (Central Coast Pipeline Agreement) will result in production requirements of 150 to 160ML/day at present, increasing towards 200 to 210ML/day by 2040. This data is used to inform the sizing of the required upgrades, with the requirement for those upgrades to occur in the upcoming price path described further in the following sections.

CCC Water maintains that the nameplate capacity of 160ML/day at MWTP needs to be reinstated for a contemporary raw water quality envelope and current treated drinking water targets. This will ensure CCC Water is able to provide sufficient clean and safe drinking water to a growing region, while also providing resilience against a range of risks that can impact the operation of Somersby Water Treatment Plant (SWTP), all of which have occurred over the last five years, including:

- raw water issues such as algae in Mooney Dam impacting available supply to SWTP
- mechanical and electrical issues at Mooney or Mangrove Weir water pumping stations impacting supply to SWTP
- failures of the trunk water transfer main supplying SWTP.

Average day demands

It is important to note that the treated water quality from MWTP is currently problematic at average day demands when water quality in the source water is poor and downrating the plant's capacity cannot resolve all the identified risks. This inability to treat a contemporary raw water quality envelope is already resulting in water security impacts and non-conformances to Australian Drinking Water Guidelines in the distribution network.

The extraction, storage, and treatment of water from the Wyong River and Ourimbah Creek is a key part of the Central Coast Water Supply Scheme. These two catchments represent over 60% of the total catchment area and realisation of the schemes design yield depends on the ability to continue extraction, storage, and treatment of these water sources.

Current Water Security Impacts

CCC Water is unable to treat Blue Green Algae (BGA) laden water at MWTP that periodically results from nutrient transfer from Wyong River and Ourimbah Creek. CCC Water currently implements a traffic light approach to selective abstraction based on the prevailing nutrient concentrations in the source waters and Mardi Dam (mass balance) as part of a broader set of catchment management approaches to improve water quality within its storages. However, incidents of BGA events have still occurred since the development of this tool and Mardi Dam was recently taken offline (mid-January 2022) and currently remains offline due to another significant Blue Green Algae event that the current MWTP is unable to treat.

CCC Water's long term water security relies on demands typically being met from available water within Mooney Dam, Mardi Dam and run of river flows at Mangrove Creek Weir. Water held in Mangrove Creek Dam represents the regions drought security and is required to be maximised to reduce the likelihood of triggering drought response desalination (estimated at over $200M). Releases from Mangrove Creek Dam should not occur outside of periods of drought.

In the last five years there have been significant algae events occurring in Mardi Dam. These events have presented challenges and pose great public health risks and severe service disruptions. Currently if an algae event occurs in Mardi Dam, the dam is taken offline, extractions from Wyong River and Ourimbah are impacted and demand from MWTP is required to be met by releasing water held from Mangrove Creek Dam (CCC Water's drought security). Figure A7 shows the loss of water supply yield that has occurred because of being unable to treat algae events within Mardi Dam.

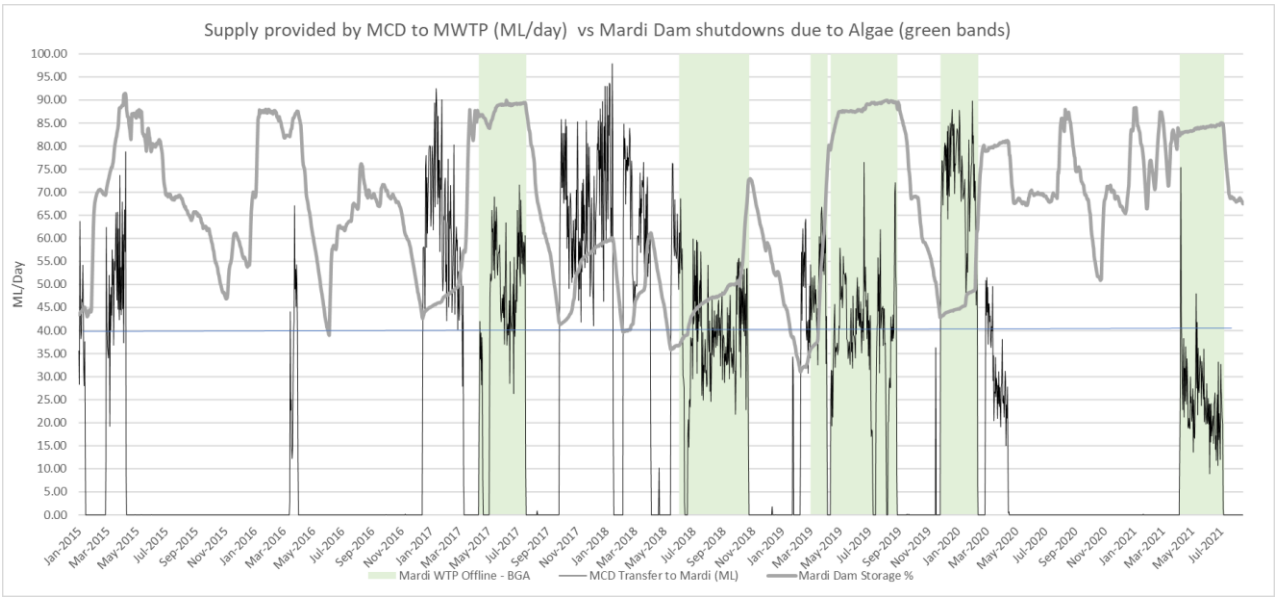


Figure A7 - Historical algae impacts to Mardi Dam and MWTP operation

- From the start of 2015 there have been five significant algae events (green bands) that have required the isolation of Mardi Dam and the release of drought contingency supplies from Mangrove Creek Dam (MCD) to meet demand at MWTP. Four of those events were experienced during the last drought and the last event in 2021 coincided with flooding across the Central Coast region. One of the predicted impacts of climate change is an increase in conditions that support algae growth within dams and waterways and future changes in land use within the Wyong and Ourimbah catchments can increase nutrient levels in the source water. The volume of water required to be released from MCD during those five algae events is in the order of 23,140 ML or an average of 4,630 ML/year over the five impacted years. The lost opportunity for additional extractions from Wyong River and Ourimbah Creek that would have met demand at MWTP, if the Dam was still online over the same period, is estimated at 12,550ML or an average of 2,510ML/year over the five impacted years

- Using an estimated Long Run Marginal Cost (LRMC) of $2.20/kL, the cost to replace that average annual yield loss (7,140ML/yr) is in the order of $15M per year. This reflects the need to bring forward future significant investments such purified recycled water for drinking and desalination identified in the Central Coast Water Security Plan to replace this lost yield over the longer term. For comparison of the scale of yield currently being impacted, the installation of a 20ML/day desalination plant, running 365 days per year at 98% asset availability would replace 7,150ML/yr. The Central Coast Water Security Plan estimated the cost of the 20ML/day desalination plant at over $200M with a levelised cost of $4.59/kL.

Current Distribution System Impacts

CCC Water operates an extensive distribution network consisting of over 2,000km of water mains and over 50 reservoirs to transfer treated water leaving the Water Treatment Plants, to approximately 140,000 separate customers. It is through this distribution phase that poor treated water quality presents risks to maintaining an effective chlorine residual throughout the network. The inability to maintain adequate residual disinfection can result in the requirement to issue a 'boil water' alert or actual public health impacts resulting in illness or death. CCC Water is currently required to undertake an extensive program of chlorine re-dosing throughout the distribution network via manual tablet dosing within water reservoirs.

High levels of organic carbon also result in the formation of disinfection by-products, such as Trihalomethanes (THMs) which can also cause public health impacts. High levels of THMs leaving the plant limit CCC Water's ability to undertake additional dosing within the distribution network. A graph of THM levels leaving MWTP (prior to any network re-chlorination) is provided in Figure A8.

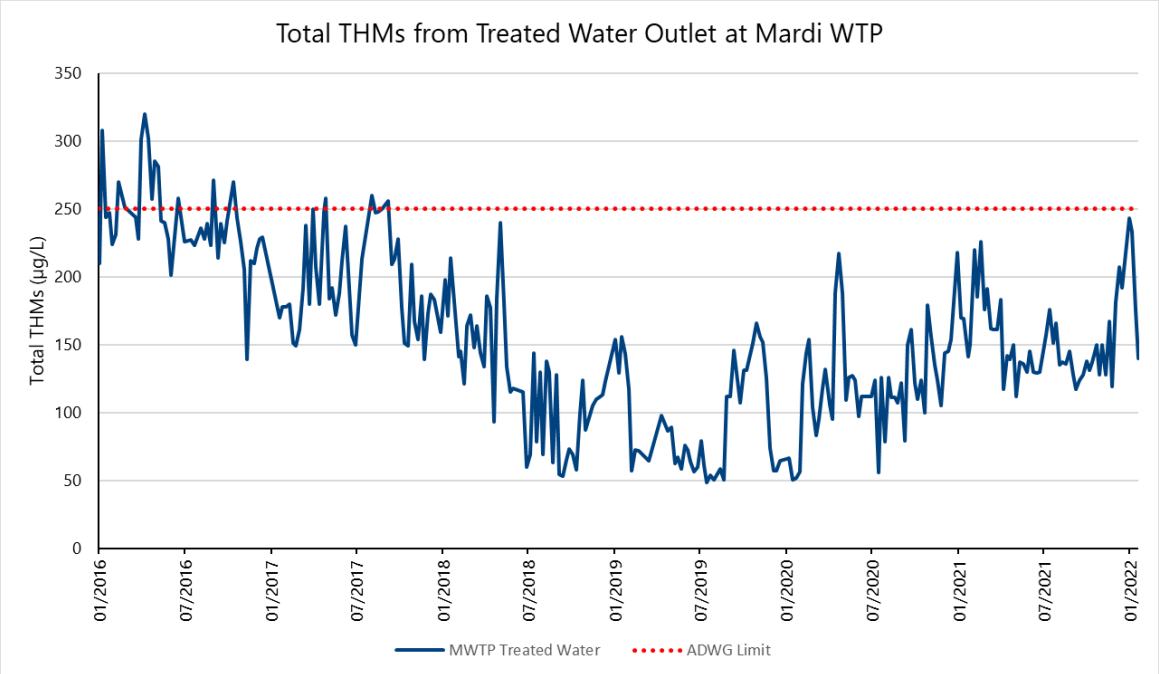


Figure A8 - Historical THM leaving MWTP (prior to network re-chlorination)

The above figure indicates that CCC Water has previously exceeded allowable THM concentrations leaving MWTP and notes subsequent network re-dosing of chlorine creates

furth exceedances when the water leaving MWTP is close to the limit. Derating of the plant's capacity has not been able to manage this issue.

As part of the overall Water Quality works program, MWH (now Stantec) in partnership with the University of Western Sydney in 2016 assessed water age, chlorine decay and THM formation within the northern distribution network. This study was provided to the consultants as part of the supporting project documentation but was not referenced within the Draft Expenditure Review document. It is unclear if the findings from that study have been considered but the key findings are outlined below due to their importance to the prudency assessment for MWTP upgrade.

The executive summary of the above report identifies the following key findings:

- the plant's filtered water contains a significant and variable amount of THM
- treated water contains DOC concentrations of approximately 5 mg/L which is considered
- too high to deliver water with sufficient chlorine residual and acceptable THM <0.25mg/L
- the plant has limited capacity to control DOC in the treated water and has practically no impact on bromide concentration. The fluctuation of bromide in the raw water has a significant impact on chlorine decay and THM formation in the distribution system.
- chlorine decay – the chlorine decay tests indicate that the existing chlorine dose is unlikely to last much longer in the distribution system than two days. Chlorine data collected during the sampling period are consistent with the developed chlorine decay model that chlorine is lasting only approximately 24 hours and then its concentration must be boosted to maintain effective residual concentration
- water age – this plays a significant role in the low chlorine residuals, which is compounded during periods of lower water consumption and the current system operation. Where water age exceeds four days the network is unlikely to have sufficient levels of chlorine to meet standards of service, based on the results of the chlorine decay tests
- using the enhanced coagulation process results in treated water with significantly improved chlorine stability and indicates that an effective disinfection residual can be maintained for up to nine (9) days.
- the results of the chlorine decay assessments indicate that not only does the existing treatment process generates high THMs, it also produces chlorine unstable water which decays rapidly with effective residuals lasting approximately two days. The rapid decay of
  chlorine exposes the drinking water distribution system to the risk of bacterial contamination or need to re-chlorinate, forming further THMs.

The modelled free chlorine concentrations for the scenario of poor raw water quality, combined with Autumn demands within the Northern Distribution Network are provided below in Figures A9 and A10 for a comparison of the existing and proposed upgraded MWTP performance with respect to chlorine residuals within the network.

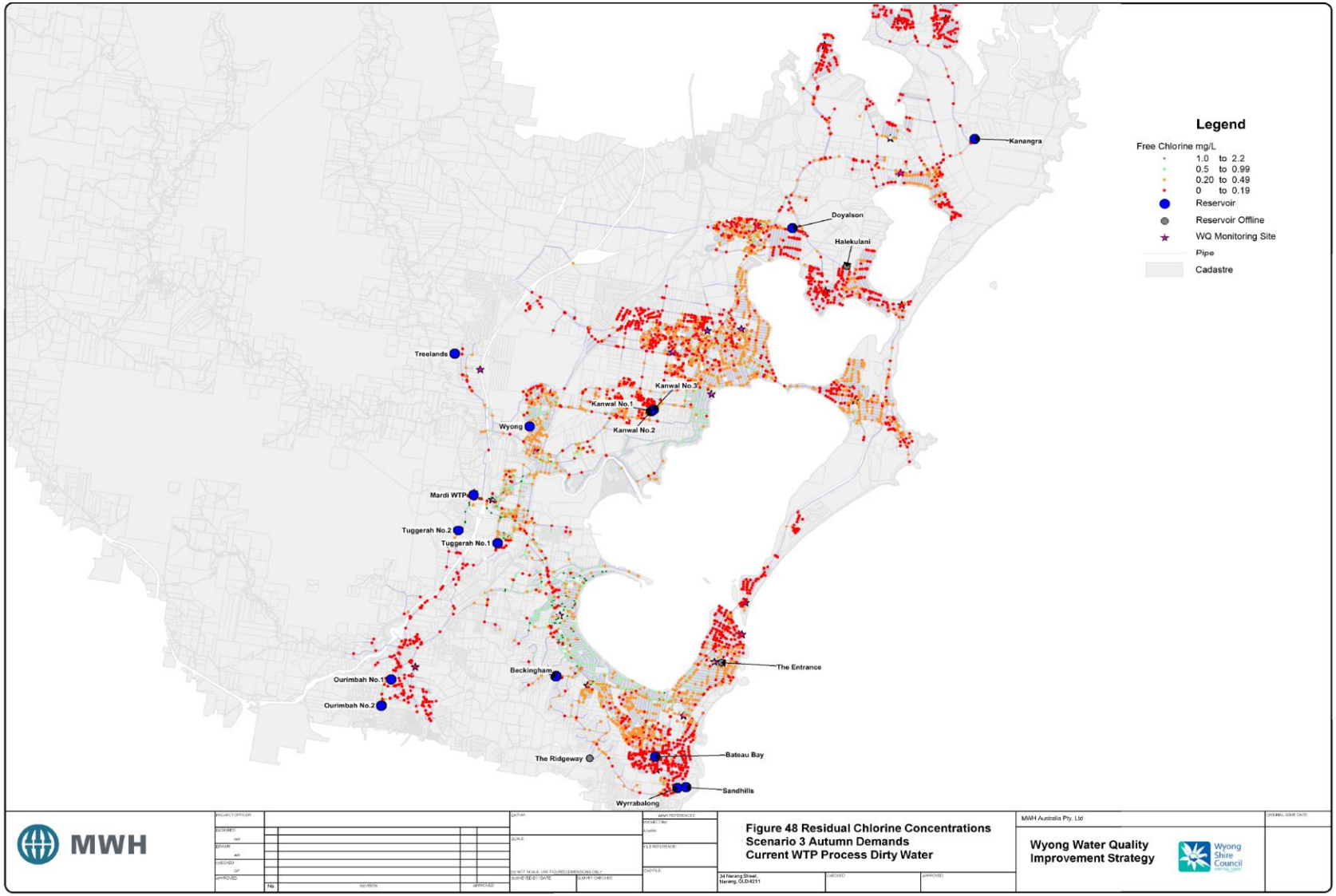


Figure A9 - Existing MWTP treated water chlorine persistence under poor raw water quality and autumn demand profile

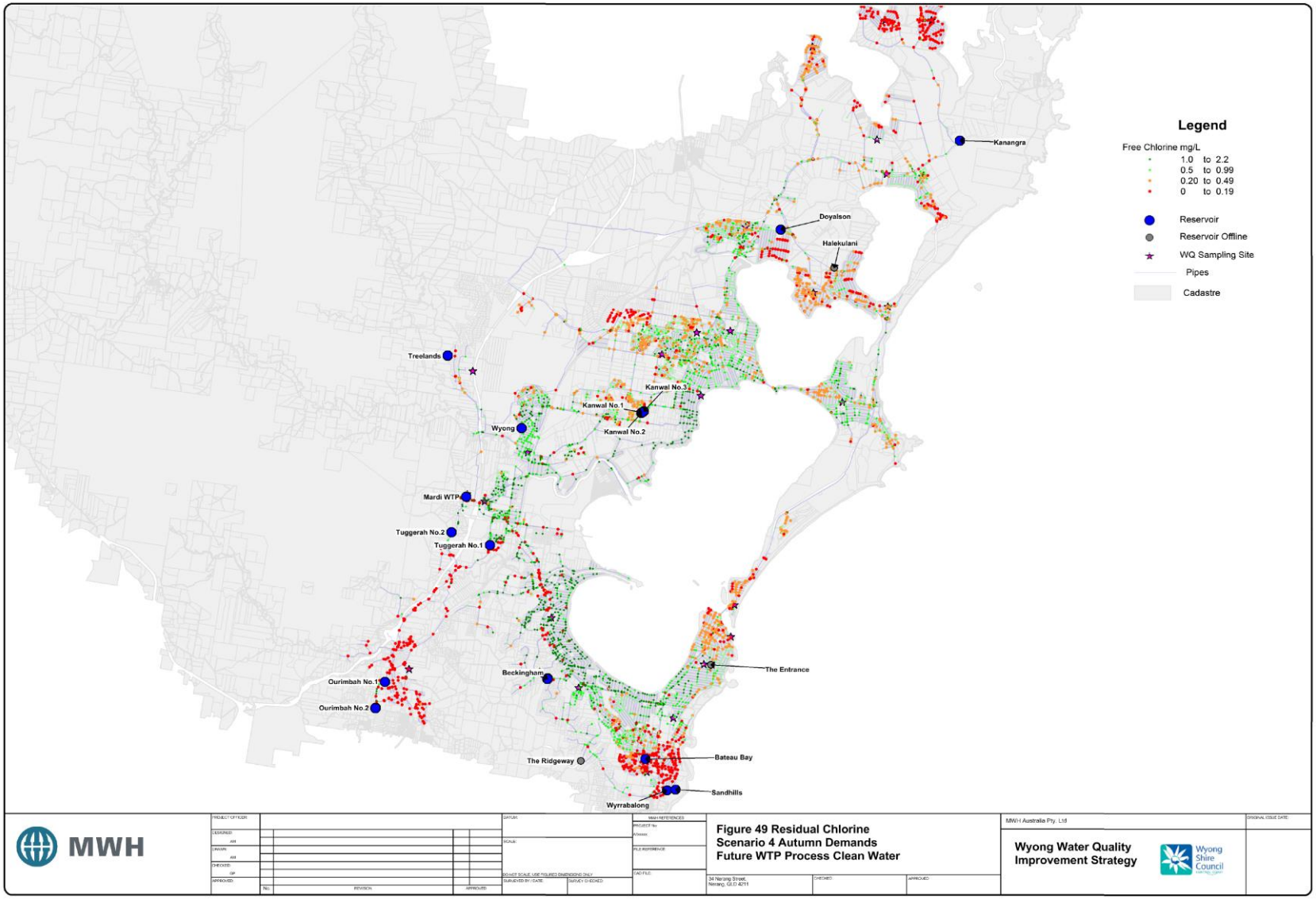


Figure A10 - Proposed MWTP treated water chlorine persistence under poor raw water quality and autumn demand profile

Improvements have been undertaken to reduce water age in the network, however the need to improve treated water chlorine stability (via enhanced coagulation process) and reduce THM formation (through addition of clarification process) to manage existing water quality risks is described and supported through jar testing and hydraulic modelling incorporating chlorine decay and THM formation simulation.

Scenario planning is for a very unlikely event

As outlined in Section 2.2, the inability to properly treat the current raw water quality envelope is already resulting in impacts to long-term water security and significant challenges to managing chlorine residuals and disinfection by-products within the distribution network. These considerations confirm the requirement to undertake an upgrade of MWTP for current production volumes and the analysis of scenario planning is considered to challenge what the capacity of the upgraded plant should be rather than whether an upgrade is required at all.

Given the asset life to be realised by any upgraded process units at MWTP, the future Peak Day Demands, with Hunter Water Transfers outlined in Figure A6 need to be considered when determining the efficiency of adopting the original nameplate capacity of the plant as the treated water flow rate target.

Peak Day Demands and Hunter Water Transfers

CCC Water has analysed the likelihood of overlap annual peak day demand with the occurrence of 30ML/day northbound transfers to Hunter Water. This has been undertaken using outputs from CCC Water's Water Resource System Model (WATHNET) which can undertake stochastic simulations of the Central Coast and Hunter Water combined supply schemes.

This analysis indicates a likelihood of those two events overlapping, in any year to increase from 6% at current demands to 8% in 2050 as demand within the two supply schemes increases. There are also intermediate transfer rates of 15 and 20ML/day stipulated within the Pipeline Agreement that apply when the Central Coast storage levels are at lower levels. Probabilities for overlap between peak day demand and either 15ML/day, 20ML/day or 30ML/day are also presented below.

Table A1 - Probability of Peak Day Demand overlapping transfers to Hunter Water

Demand year	Probability of peak demand day overlapping 30ML/day northbound transfers to Hunter Water.	Probability of peak demand day overlapping 15, 20 or 30ML/day northbound transfers to Hunter Water.
2022	5.7%	6.0%
2040	7.3%	8.4%
2050	8.6%	10.4%

Water Treatment Plant Asset Availability

As described in Section 2.2, CCC Water's long-term water security relies on avoiding releases from Mangrove Creek Dam outside of periods of drought.

When considering the availability of both major Water Treatment Plants (Mardi and Somersby) to meet demand, the performance of those assets over the last five years has been reviewed. Key observations include:

- Both Mooney and Mardi Dam were impacted by BGA for an overlapping period from 1/7/2018 to 23/10/2018. This resulted in the requirement to swap these water sources with Mangrove Creek Dam (MCD) to Mardi dam for Mardi WTP and through Mangrove Creek Weir for Somerby WTP. These incidents impact MCD storage and resulted in approximately 8GL of releases. These could have been avoided if MWTP had the ability to treat BGA impacted water from Mardi Dam.
- From April 2019 to August 2019, when MCD storage was fast depleting and water restrictions were being readied, additional water was released to meet production requirements for MWTP at a time when Mardi Dam was full, but water could not be treated because WTP is unable to handle BGA affected water. Mooney Dam was also full but again also impacted by BGA at the same time and water was also required to be released from MCD to Mangrove Creek weir for Somersby WTP. Releasing water for Somersby through Mangrove Creek results in approximately 10-20% losses of released water due to seepage and evaporation, further compounding the impacts of MWTP not being able to treat a contemporary raw water quality envelope.

It is also noted that Hunter Water have been experiencing increased indicators of BGA within their storages and are planning workshops to review responses to manage any periods of overlapping BGA issues within the two supply schemes storages.

No consideration for abstraction license review

The Water Management Act 2000 (WM Act) provides the legislative framework for water resource management in NSW. The DECC (formerly Department of Environment) published a policy document '*NSW environmental objectives for water quality and river flow'* designed to improve the health of NSW Rivers. WM Act incorporated DECC policy and specified the preparation of Water Sharing Plans for all water sources (rivers and groundwater) to achieve those environmental outcomes.

Water Sharing Plan for Central Coast Unregulated Water Sources (the WSP) which commenced in 2009 was being framed at the same time when long term water strategy, Water Plan 2050 was being investigated. Water Plan 2050 was adopted in 2007.

'NSW Environmental objectives for water quality and river flows' sought to protect low flows in the river and limit the percentage of daily flow extracted. This presented a major risk for the central coast water supply. The introduction of the WSP environmental flow conditions would have affected the extractions from Wyong River. The weir on Wyong River being close to the tidal limit and extractions will affect short sections of the river/creek downstream of the weir. Wyong River is a major tributary of Tuggerah Lakes and changes in flow may affect water quality in the lakes.

Extensive water supply system simulation modelling work was carried out to understand the impact of proposed environmental flow changes and alternative strategies. Extracting more water in flows and lesser in low to medium flows was selected to be a win-win option for both the environment and water supply system. The additional flows harvested during high flow events were proposed to be transferred to Mangrove Creek Dam via Mardi Dam.

Mangrove Creek Dam (MCD) which defines the security of the Central Coast water supply system has a small catchment relative to its storage capacity and was originally designed to be supplemented by additional inflows from neighbouring catchments. Two of the various options considered in Water Plan 2050 were linking MCD by constructing new weir in upper reach (near the Bunning Creek Tunnel portal) of Wyong River and linking existing weir at Wyong River. It was resolved to adopt the latter option which involved construction of:

- a new pumping station on lower Wyong River Weir and duplication of the pipeline to Mardi Dam
- a new pumping station at Mardi Dam and pipeline from Mardi to Mangrove Creek Dam

The key features of the transfer system include:

- ability to harvest more water from the Wyong River and Ourimbah Creek during medium to high flows
- ability to increase storage levels of Mangrove Creek Dam using excess water from Wyong River and Ourimbah Creek
- enhanced environmental flows in the Wyong River during low flows
- improved aquatic ecology in Wyong River with the end of water releases from Boomerang Creek Tunnel to the upper Wyong River, i.e. return to natural flow regime to Wyong River downstream
- good integration with current and future elements of the Central Coast water supply scheme and Hunter Water.

The proposed pipelines and pump stations were completed by the mid of 2011 and CCC Water is required to extract raw water from the Wyong River (for transfer to Mardi Dam for storage) during higher flow events (typically poorer water quality) rather than lower flow events as a result of a major update to the Central Coast Water Sharing Plan (2009) as previously determined by the NSW State Government. The updated Water Sharing Plan was prepared following a number of ecological studies and in consideration of various competing objectives. The new Wyong River pumpstation was designed to achieve compliance with the revised extraction rules.

- The pipeline augmentation and the modified access rules have provided desired environmental benefits for Wyong River and Tuggerah Lakes along with helping restore the water storage levels in MCD. Recently in January 2021 MCD reached record level of 77.2%.
- As anticipated and evidenced in recent past, post change in extraction rules i.e. extracting more during high flows and less in low to medium flows has brought some water quality challenges. Higher turbidity laden water pumping to Mardi Dam has increased the frequency and length of water quality outages (particularly BGA) from Mardi Dam.

There were significant processes involved in the original determination of the 2009 Water Sharing Plan provisions (setting of environmental flow classes) and significant challenges in seeking to

reverse those environmental outcomes in the favour of water treatment plant process selection at the current time. The provisions within the Water Sharing Plan and associated Water Extraction Licences are considered to be a fixed constraint that CCC Water must operate within.

The Department of Planning Industry and Environment (DPIE) reviewed the current Water Sharing Plan (2009) in 2021 but have not yet published its outcomes. Review /reversal of extraction rules was outside the scope of this review as these are still considered the preferred outcome of the Water Sharing Plan process.

Responses to assessment of project options review

Solution provided at full output capacity – poorly defined need

There is significant overlap between this topic and information provided in Section 2. CCC Water has demonstrated the need for an upgrade to improve chlorine stability and reduce THM levels within the treated water quality. Ongoing impacts to water security are significant when considering the average recurring loss of yield and the cost to replace that yield through the purified recycled water for drinking scheme and desalination scheme identified in the Central Coast Water Security Plan. Derating the existing plant has not been able to properly address these risks.

CCC Water maintains the original nameplate capacity of 160ML/day is the most appropriate capacity for the upgraded plant, based on the consideration of future peak day demands and inter regional transfer commitments as outlined in Section 2. Adopting capacity of 160ML/day will result in a plant that can treat up to 80% of future (2050) predicted peak day demand and acknowledges the risk of asset outages that can occur at Somersby WTP and its contributing storages.

Various options not sufficiently investigated

Optimisation of existing process

A number of improvements have been implemented since 2015 aimed at optimising the treatment process. These actions have originated from:

- recommendations from the Investigation and Options Analysis (Hunter H2O, 2015)
- Review of the treatment process in line with Water Research Australia (WRA)'s 2015 version of the *Good Practice Guide to the Operation of Drinking Water Supply Systems for the Management of Microbial Risk*.

The improvements are presented in the table below.

Table A2 - Improvements implemented since 2015 to optimise the treatment process

Area	Target	Action taken
General	Formal training	Plant operators hold Certificate IV in water treatment as well as dam surveillance accreditation.

Area	Target	Action taken
	Experience appropriate to level of risk	Relationships with consultants are maintained to enable advice to be sought in the time required.
	Operator attendance during plant operation	Triggers for plant operation have been adjusted to maximise operating hours while operators in attendance.
Raw water extraction and storage	Online monitoring at the offtake or higher in catchment for early warning	Turbidity meter installed at offtake
	Travel time of raw water from source to WTP	Look up table in place for travel time from dam to plant at various plant flows
	Offtake points and immediate locale regularly inspected for sources of contamination	Catchment officer engaged. Regular monitoring of weir pools undertaken.
	Ensure effective operation of destratification system in Dam	Thermistor chain installed in Mardi Dam to monitor temperatures at depth intervals to optimise the operation of the destratification compressor across the seasons
Coagulation	Well-designed mixing system provided	After 10 years without a flash mixing system, a centrifugal pump was installed for mixing.
	Optimum coagulation pH is controlled with the desirable target range	Pre-Chlorine dosing installed and pH meter relocated from flocculation basin outlet to inlet to enable pH to be controlled by CO2 dose from a pH meter target.
	Optimum coagulation pH is controlled with the desirable target range	Enhanced coagulation implemented to improve Dissolved Organic Carbon (DOC) removal.
	Post coagulation concentration of soluble aluminium or Iron is <0.1 mg/l	Installation of pre-Chlorine dosing has removed the need to utilise excessive alum dosages to reduce coagulation pH
	Chemical dosing optimised with sufficient time to complete the chemical reaction process	PAC dosing point relocated upstream from the flash mixing area across the road to just downstream of the transfer pump station to maximise contact time.
Filtration	Flocs are protected from shearing on entry to filters	Location of pre-filter polymer dosing moved from flocculation basin to after inflow to each filter

Area	Target	Action taken
	Filter operation optimised to remove pathogens	Alarm back to SCADA in the case of a failed turbidimeter to shutdown filter in case turbidity reaches critical level.
	Filter operation optimised	Coated media process implemented to achieve manganese removal
	Clean bed headloss is monitored during operation and trended	Additional monitoring and trending are undertaken.
	Ripening period after backwashing does not exceed the critical turbidity limit	Critical turbidity limits are reflected in filter shutdown triggers.
	Filters are drained and a surface inspection carried out	Filter surface inspections are carried out monthly
Disinfection	System in place to ensure no undisinfected water leaves the WTP	Chlorine meter installed on Clearwater tank inlet to control the post-chlorine dose
	Free chlorine residual is monitored at the primary dosing point using online instruments	Chlorine meter installed on Clearwater tank inlet to control the post-chlorine dose
Equipment and instrumentation	Online monitoring of coagulation pH	pH meter located at the end of the flocculation basin relocated to the inlet, allowing a duty/standby arrangement.
	Suitable online instrumentation	Fluoride and turbidity instrumentation upgraded.
	Dosing systems are adequately maintained	Lime dosing lines flushed with high concentration of chlorine after every plant shutdown to clear the lines.
Water quality information management	Critical alarms are physically tested using where appropriate, using out of spec water samples	Testing is implemented during annual calibrations by equipment service provider.
	Regular sampling is carried out	Raw water sampling increased. UVa testing introduced to allow trends to be established between DOC and UVa. Improvement in THM testing process using Sodium Thiosulphate to avoid false high results.

Catchment-based

As part of implementing CCC Water's Drinking Water Quality Policy, CCC Water is committed to managing and protecting Central Coast drinking water catchments by identifying and managing risks through development and planning controls, catchment improvement programs, inspection and surveillance, community engagement and education, water quality monitoring and reporting.

Catchment characteristics

Mardi Dam receives water from the Mardi Dam, Wyong River and Ourimbah Creek catchments:

- the Wyong River catchment is the largest of CCC Water's six drinking water catchments at 355km^{2}and is an open catchment with 50% in private ownership. Agricultural and peri-urban development occurs along the rivers. Minor land uses include cattle pastures, equine industries, market gardens, nurseries, citrus orchards, turf farms, villages and community facilities and retreats. As CCC Water owns very little land in this catchment, the focus is to work with Local Land Services and private landholders to manage their land to ensure a healthy catchment
- the Ourimbah Creek catchment covers an area of 88km^2, including significant areas of privately-owned bushland. Catchment development is agricultural and peri-urban, mainly along the streams with land uses including nurseries, poultry farms, vegetables, protected cropping, cattle pastures, market gardens, citrus orchards, and equine industries, as well as a sand quarry, waste facility and bird accommodation facility
- Mardi Dam covers 2km^2 and while public access is restricted, private landholders can access the dam.

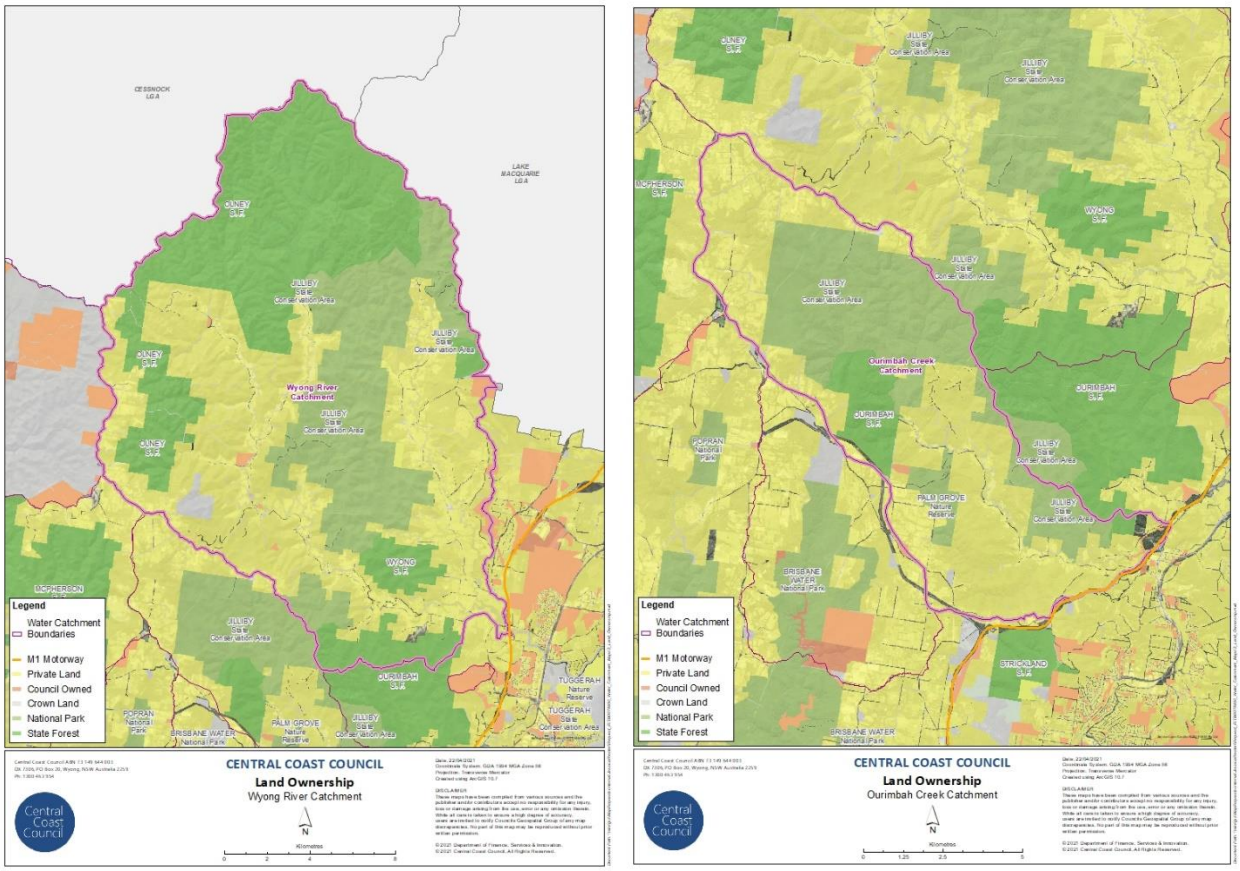


Figure A11 - Wyong River and Ourimbah Creek Catchment Land Ownership

Catchment management

CCC Water has a comprehensive *Central Coast Water Supply Catchment Management Plan* (CMP) dated September 2021. The CMP includes catchment information, previous and proposed catchment management activities, and water quality risks along with contributing factors and planned mitigations.

Catchment management activities have been undertaken for many years and CCC Water's commitment demonstrates this will continue into the future.

The Mardi Dam catchment, incorporating the extensive Wyong River and Ourimbah Creek catchments, form the upper catchment of the Tuggerah Lakes system. Due to the importance of the Tuggerah Lakes system to the Central Coast, there continues to be much focus on water quality monitoring and studies geared towards understanding and improving water quality. CCC Water's CMP leverages NSW Government and CCC Water programs and funding initiatives to progress its commitment to and implementation of drinking water catchment management. Recent and current initiatives include:

5. the Environmental Restoration Fund administered by Greater Sydney Local Land Services, currently provides funding for streambank rehabilitation projects

6. the NSW Government-appointed Tuggerah Lakes Expert Panel's December 2020 report on Tuggerah Lakes water quality provided a range of recommendations relating to funding and implementation, planning, community education and capacity building and opportunities
7. DPE have undertaken monitoring at 28 sites in Wyong River and Ourimbah Creek as part of a wider freshwater monitoring program for catchment planning and management purposes. Report pending.

Catchment risks and actions

CCC Water maintains a Risk Register under its Drinking Water Management System and implements mitigations to manage a variety of risks in the catchments through a range of relevant mechanisms including development controls, fencing programs, pest animal management, bush regeneration and weed management, streambank rehabilitation, environmental education programs, water quality monitoring and working with other agencies. Risks and mitigations include:

- **On-site sewage management systems (OSSMs)**: There are over 1,200 registered OSSMs in the catchments. Whilst Council has legislative delegations to regulate the installation and ongoing management of these systems, landholders also hold responsibility for their operation. Faecal contamination of the water supply is a serious risk and Council is enforcing more stringent development controls to manage this risk. Council has recently adopted a consolidated Development Control Plan (DCP) for OSSMs which automatically rates every system in the drinking water catchments as high-risk and therefore requires a comprehensive wastewater management report as part of the development application process. The DCP will come into force when notified on the NSW Legislation website and will assist in protecting the water supply by requiring that all proposed development in the catchment must have a neutral or beneficial effect (NorBE) on water quality.
- **Private land use practices**: CCC Water promotes good land management by landholders to minimise the risk of decreasing water quality in the catchments. Education and consultation around land management to promote healthy catchments is carried out regularly with landholders and the wider community within the catchments. In conjunction with Local Land Services, CCC Water encourages landholders to vegetate riparian zones and fence waterways. CCC Water has legislative delegations to issue directions or notices to cease activities causing water pollution.
- **Illegal activities on Council land**: CCC Water has taken precautions to prevent illegal activities on Council land in the catchments including restricting access with physical barriers, communications through signage and forms, surveillance via visual inspections and engagement, reporting and compliance action. CCC Water has strictly prohibited recreational use and unauthorised vehicular access in the Mardi Dam catchment.
- **Chemicals**: Actions to prevent the introduction of chemical contaminants to the waterways include a variety of programs to reduce the risk of unused chemicals entering waterways; signage; and CCC Water environmental management plans, risk assessments and procedures.

- **Bushfire**: With a significant proportion of the catchment mapped as bushfire prone, there is an associated elevated risk of bushfire. Water quality risks associated with bushfire include increased erosion and sedimentation, loss of filtration through riparian vegetation, increased organic load, nutrients and taste and odour compounds in waterways, potential release of metals from soils and chemical retardants in waterways from suppression activities. Council is involved in mitigations including management committee, risk management plan and management of fire trails.

  For comparison it is noted that in 2019-20 a major bushfire passed through Mangrove Creek Dam and Weir catchment. The figure below shows the extent of fire and water quality mapping.

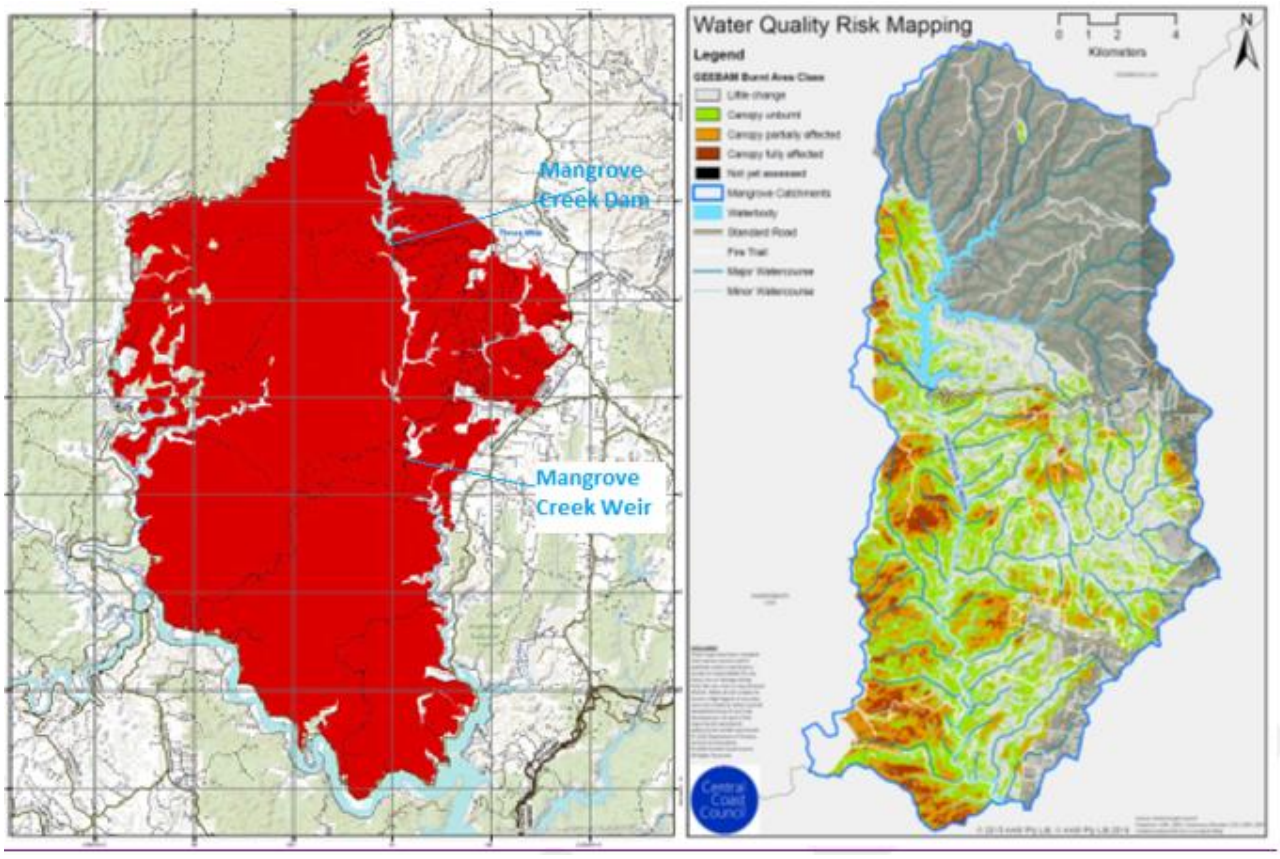


Figure A12 - Mangrove Creek Dam and Weir Bushfire Impacts 2019/20

- **Flooding**: Flood events are linked to elevated turbidity in the waterways. In response, CCC Water carries out post-flood inspections, clean up works and additional water quality monitoring.
- **Unsealed roads**: With over 170,000 km^2 of public and private unsealed roads and fire trails in the catchments, considerable amounts of sediment and nutrients can be added to the waterways during heavy rain. As many are located adjacent to streams, there is insufficient space for the sediment to be filtered or settle out before the dirty water enters the streams. Council undertook a road sealing program in 2017, sealing 13,000km of prioritised roads in the catchments.

- **Emerging contaminants of concern**: CCC Water keeps abreast of emerging contaminants such as Naegleria fowleri and PFAS through literature reviews, industry networking forums and engagement with regulators to understand risk and mitigations.

Catchment water quality

CCC Water carries out water quality monitoring at the MWTP, Mardi Dam and weir pools, allowing source water management decisions to minimise risks to drinking water quality. Critical parameters targeted through the proposed MWTP Upgrade are discussed below.

- **Turbidity**: Ourimbah Creek catchment has a moderate average of 11NTU but has greater spikes. Wyong River has the highest turbidity readings with an average of 16NTU and significant spikes following rain events. Following the construction of the Mardi to Mangrove Link and increased Wyong River transfers to Mardi Dam, Mardi Dam no longer acts as a sedimentation basin, increasing the risk of high turbidity in the raw water with spikes up to 20 NTU, placing extreme pressure on the filters and requiring de-rating.
- **Nutrients**: Excessive nutrients can lead to eutrophication (increased plant and algal growth and therefore their decay resulting in lower oxygen levels) and the potential for harmful algal growth. Mardi Dam was subject to a significant bloom of cyanobacteria from March to September 2019. This bloom persisted for several months and peak toxin concentrations and cyanobacteria cell populations were very high and exceeded trigger levels and guideline values for safe and aesthetically acceptable water supply. Consequently, Mardi Dam could not be used to supply MWTP due to the lack of treatment capability, and this required raw water having to be sourced from Mangrove Creek Dam. Subsequently, CCC Water reviewed and updated operational procedures for water transfers to help manage the risk of the growth of cyanobacteria and their toxic and odorous metabolites in the drinking water supply reservoirs by utilising triggers for harvesting water from Wyong River and Ourimbah Creek to fill Mardi Dam, and to transfer water from Mardi Dam to Mangrove Creek Dam. As a consequence, significant long-term yield is lost from the reduced pumping of Wyong River and Ourimbah Creek flows.
- **Organic load:** Dissolved organic carbon (DOC) is a source of food for microorganism and an increased DOC can support an increased rate of microbiological activity and potential for decrease in dissolved oxygen. Without adequate removal through the treatment process, increased total organic carbon (TOC) and DOC in the treated water supply system can lead to increased risk of disinfection by-products, biofilms, colour, and odour problems. Organics removal is currently inadequate through MWTP leading to difficulty maintaining a chlorine residual in the network, placing drinking water quality at risk of contamination, as well as occasional exceedances of THM limits, which will become a greater problem if the potential reduction in THM limits is implemented.
- **Cyanobacteria and algal indicators:** Following detection of low levels of potentially toxic cyanobacteria in Mardi Dam in 2015, routine monitoring commenced in late 2016. Since this time, CCC Water's Level 1 and 2 alert levels have been exceeded multiple times with the most

significant event in 2019 when 147,200 cells/ml were detected. The *WQRA Management Strategies for Cyanobacteria (blue green algae): A Guide for Water Utilities describes* the cyanobacterial life cycle as involving the planktonic population and benthic resting stages which can be either dormant colonies or akinetes, thick-walled reproductive structures equivalent to spores or seed in plants, which are found in sediments and are very resistant to adverse environmental conditions, can survive many years and are thought to provide a resting stage that may enable the survival of a species. They germinate when environmental conditions are appropriate, thereby providing a source or inoculum for subsequent populations, particularly from one season to the next. Meanwhile other filamentous or single cell/colonial cyanobacteria not known to form akinetes have normal or regular growth cells called vegetative cells that may rest over winter in a state of senescence in the sediment. For example, Microcystis can exist as vegetative colonies in dam sediments, where they may survive for several years, apparently without light or oxygen. The new population may then appear in spring from the normal growth of these colonies by cell division. Previous algal blooms therefore put Mardi Dam at risk of future algal blooms. This is further exacerbated by a 2019 Climate Change Risk Assessment which identified current high level of risk and by 2050, extreme level of risk with respect to extreme heat events affecting ecosystem health resulting in water service interruption due to algal blooms in dam storages.

Microbial risks

The National Health and Medical Research Council (NHMRC) and Water Services Association Australia (WSAA) are endorsing a Health Based Target (HBT) framework which involves water utilities performing Source Vulnerability Assessments and *E. coli* monitoring of the catchments to make a quantitative assessment of microbial source risk and assess adequacy of water treatment.
In 2015, WSAA released a *Manual for the application of Health Based Targets for Drinking Water Safety 2015* and in 2018, NHMRC released a draft revision of the Australian Drinking Water Guidelines (ADWG) *Chapter 5 Microbial Quality of Drinking Water* incorporating a microbial Health Based Target, for public consultation. It is anticipated that health-based targets will be included in future ADWG revisions.

In anticipation of this, a preliminary assessment of the raw water sources feeding MWTP have been provisionally considered a Category 4 catchment and are expected to require Log Reduction Values (LRVs) of 5 for protozoa and 6 for virus and bacteria. The existing direct filtration process at MWTP can achieve a maximum *Cryptosporidium* log reduction value (LRV) of 3.5, provided all individual filters can achieve a filtered turbidity of ≤0.15 NTU 95% of the time (WSAA, 2015). This reduces to 2.5 LRV if the combined filtrate of all filters is only ≤0.3 NTU for 95% of the time. To achieve the required LRV, the guidelines indicate conventional filtration, ultraviolet (*UV*) *disinfection* and chlorination is required, requiring the addition of clarification to the treatment process. UV disinfection is proposed as a future addition to the treatment process in advance of the inclusion of the proposed HBT framework in the ADWG.

In 2020 NSW Health undertook a preliminary risk assessment for *Cryptosporidium* for CCC Water's water supply, assigning a medium risk to the Mardi WTP raw water catchments and recommending assessment of the need for further treatment that can control *Cryptosporidium*.

Conclusion

CCC Water has awareness of catchment-based water quality risks and is already implementing a range of catchment-based controls as part of its Catchment Management Plan. Although catchment management activities are expected to reduce the likelihood and/or severity of water quality events over time, due to the existing catchment being largely unprotected it is not expected that catchment management activities alone can alter the need for a pre-treatment process to be added to the existing direct filtration process and should rather be considered as part of a multi-barrier approach to protecting water quality. Further, once the Health Based Targets are implemented, the current direct filtration process is unlikely to achieve the targets necessary to protect the drinking water supply from microbials.

Pre-treatment

Previous Investigations

The concept of utilising pre-treatment of water prior to storage in Mardi Dam was first investigated by SKM in 2008 as part of a review into potential water quality impacts associated with the proposed Water Sharing Plan and the planned augmentations to the Central Coast Water Supply Scheme.

In 2011 GHD prepared a suite of investigations as part of the design of the Mardi to Mangrove transfer scheme which was constructed to improve the yield of the Central Coast Water Supply Scheme and work within the extraction requirements of the NSW Governments 2009 Water Sharing Plan for the Central Coast water resources. This included a Water Quality Strategy Report (Work Package 05) that considered pre-treatment, improvements to MWTP and chemical dosing within Mardi Dam.

The final design of the upgraded raw water pumpstation at the Wyong River Offtake was based on a maximum capacity of 320ML/day to ensure adequate volume capture during high flow events (in consideration of revised extraction rules). Hydrological and system modelling undertaken in consideration of the updated extraction rules (using hydrology models updated for the CCWSP) indicate that approximately 55% of the overall volume of water extracted occurred at flow rates greater than 160ML/day and approximately 38% of the volume would be extracted at the maximum 320ML/day flow rate. This indicates that a pre-treatment plant would need to be sized up to 320ML/day, with the plant potentially spending extended periods in standby mode.

The construction of a large pre-treatment facility was not preferred as it would need to be constructed to a larger scale compared to an upgraded MWTP process and would not provide the same assurance to drinking water quality as post-treating it at MWTP. The proposed suite of upgrades provides additional benefits related to organic carbon removal through improved PAC dosing, introduction of enhanced coagulation and improved Chlorine Contact via the baffling of the clear water tank.

Chemical dosing of Mardi Dam using 'Phoslock' was also assessed as a precursor to implementing additional treatment at Mardi WTP. This approach however was not preferred by CCC Water due to

concerns over free lanthanum concentrations during operation (worsened by existing elevated lanthanum concentrations in the Mardi Dam sediments), where long term health studies of the effect of Lanthanum accumulation have not been carried out. In addition, Phoslock is more successful with mitigating internal Phosphorus loading from sediments, and not as effective in water bodies where external Phosphorus sources are significant as in Mardi Dam. Upgrades to MWTP were therefore pursued as CCC Water's preferred approach as in addition to the aforementioned concerns, Phoslock would not address the full range of water quality concerns at Mardi.

Selective abstraction

Water Futures and Australis Water Consulting were engaged by CCC Water in 2019 to review triggers for raw water extraction and transfers to Mangrove Creek Dam. The objective was to improve water quality within Mardi Dam which impacts treatability at the existing MWTP and the ability to transfer water for storage in Mangrove Creek Dam. A selective abstraction approach from Ourimbah Creek and Wyong River was developed that seeks to minimise Total Phosphorus (P) transfer into Mardi Dam.

A traffic light approach considers the prevailing storage level and Total P within Mardi Dam and assesses allowable extraction volumes from Ourimbah Creek and Wyong River based in their respective Total P concentrations. The below thresholds are used to assess the risk of the proposed extractions:

Table A3 - Phosphorus thresholds for Mardi Dam transfers

Level	Concentration of Total-P (mg/L)
Target	≤ 0.03
Amber alert	> 0.03 to ≤ 0.06
Red alert	> 0.06

Ongoing refinement of the tool based on the observed outcomes when undertaking extractions within the green and amber ranges is required.

Network storage

Key findings from the MWH Distribution Network Water Quality Strategy are presented in Section 2.2. These include a discussion of the existing excessive water age within the distribution network due to excessive reservoir and trunk main volumes that exacerbate issues with poor treated water chlorine stability and result in low residual free chlorine within the distribution network.

The addition of more reservoir storage to reduce the scale of peak capacity of the upgrades to MWTP would contribute to those issues. Provision of more storage to allow a reduced peak day treatment capacity would also not resolve the existing issues that occur during average day demand as outlined in Section 2.2.

In addition to upgrades to MWTP, CCC Water is undertaking a range of capital and operational initiatives to reduce water age and improve chlorine residuals across the distribution network including:

- improving reservoir mixing and turnover via mixers and flexible operating ranges (draw and fill operation)

- taking existing reservoirs offline as appropriate
- changes to operation of key network control valves
- installation of permanent re-chlorination stations to replace manual tablet dosing.

Parallel solutions

CCC Water has sought clarification from Frontier/Mott Macdonald on the meaning of parallel solutions in the context of the MWTP upgrade. At the time of writing, no clarification has been provided and the above section has addressed why pre-treatment solutions are not preferred. CCC Water also notes that the current proposed clarifier has been designed in a modular manner that can be operated at various capacities (or even bypassed) dependant on prevailing water quality to minimise future operation costs.

MWTP Derating Considerations

CCC Water indicated during the interview process that MWTP could treat the design raw water quality envelope at a derated flowrate of 80-90 ML/d. To clarify, derating would solve a limited range of treatment challenges. Further information on derating considerations is provided below.

Causes of derating

During poor water quality events, the existing MWTP would be primarily 'derated' as a result of media filter performance becoming unsustainable (excessive backwashing or unable to meet filtered water turbidity). Filter derating is most likely to occur because of:

- elevated raw water turbidity/solids loading
- filter clogging algae
- elevated algae cell counts
- elevated Natural Organic Matter (NOM) resulting in weak floc strength and premature breakthrough.

It is noted however that these scenarios will not necessarily always occur during 'poor raw water quality events' which are characterised by short term (days) events. As an example, significant storm events can lead to elevated turbidity which rapidly peaks and then subsides, whereas the elevated NOM and/or nutrients may persist for many years following the event.
Notwithstanding this there is also the potential that the plant would need to be derated based on other water quality parameters, and for some of these events this could be necessary to cease production entirely, for example:

- algal metabolites
    - taste and odour
    - algal toxins, may lead to a cessation of production if safe drinking water cannot be supplied.

For parameters that are measured over a longer period, such as disinfection by products and issues with chlorine demand, and THM formation, it is more difficult to apply derating criteria directly, and generally means that derating the plant is unlikely to meaningfully shift the performance of the plant to align with the requirements as it is not a capacity-based shortcoming. These are issues related to water safety or quality and not quantity of supply.

The proposed Stage 3 upgrade will deal with the following causes of derating:

- excessive suspended solids in the raw water
- excessive solids introduced by the required high rates of chemical dosing (primarily coagulant or powdered activated carbon) in response to a raw water quality event.
- poorly filterable floc as a result of raw water quality (noting this could be low turbidity/high organics).
- reduced DBPs through the removal of NOM prior to pre filter chlorine dosing.
- filter clogging algae.
- removal of majority of intact intracellular algal metabolites (taste and odour and toxins).
- reduced overall treatment risk (multi barrier approach).

Approaches to derating

There are a number of approaches to estimating the derated WTP capacity. However, the actual derated capacity will change from event to event, and the exact capacity will only be known once the WTP performance is reinstated (i.e. filtered water quality met) or operation is once again sustainable.

Across the industry the general approaches to derating include:

- Direct event experience
    - Noting the previous section and the large number of water quality variables that could impact capacity, if there is specific previous experience with key water quality parameters this will provide some insight to the actual capacity of the WTP for that event.
    - There are two types of scenarios,
        - Treated water demand during the event was greater than the actual capability of the plant to produce the water and the plant would be backed off until treated water production becomes sustainable (or the plant shuts down). From a capacity rating perspective these events are the most useful but are very challenging for operational staff.
        - Treated water demand during the event was less than the actual capability of the plant to produce the water and it would not be recognised that the plant would need to be derated if the treated water production was higher. These scenarios probably occur regularly and make anecdotal capacity assessment difficult and likely overly optimistic.

  - Although useful for examining the past, direct event experience cannot be used to predict future events or assess the treatment plants resilience of potential but likely future events (i.e. such as algae toxins).
- Full scale testing
  - For example, reducing the number of filters during a poor raw water quality event to simulate the ability to run at higher throughput during those conditions. This can support understanding of the WTP capacity for those types of events mentioned previously where the actual capacity is not apparent.
  - Understandably there is a lack of appetite for pushing the WTP to the limit in operation. This is compounded at Mardi WTP due to a lack of filter to waste and limited capability to store off spec water.
- Pilot testing
  - Provides more flexibility to push the simulated WTP to failure and better understand the actual capacity.
  - The downside of pilot testing is that it becomes time consuming and somewhat expensive to develop, commission and operate pilot plants. A direct filtration pilot plant is simpler than other treatment processes, especially if it is using pre dosed water. The pilot plant may need to run an extended period to experience a range of raw water quality conditions.
  - Whilst a good approach, there will always be some elements that cannot be replicated on the pilot scale and result in performance differences at full scale, for example deteriorated full scale performance as a result of asset condition or non-optimal characteristics i.e. mixing or flow distribution.
- Extrapolation of previous data using UFRV (Unit Filter Run Volume) and head loss dynamics
  - Another technique to evaluate the likely failure point using event data where the production did not need to be derated because the WTP was running at below the actual (derated) capacity.
  - This technique can be effective but will depend on the mode of filter termination and how closely the filter head loss / breakthrough curves are aligned. If they are not optimally aligned, then the results can suggest greater capacity when the plant could have been on the edge of filter turbidity breakthrough.
  - Useful as a coarse planning tool.
- Advanced/neural net modelling/digital twin
  - Given the complexities of direct filtration and the limited range of filtration parameters that are routinely monitored online, results have not been particularly instructive. It can fail to account for impacts of floc strength, biopolymers etc. if there is no meaningful data or strong relationship to monitored water quality parameters for this.
  - This is a promising future application but not likely to be particularly applicable or instructive for the current situation.
- Other plant experience

  - Can be useful as a coarse estimate for loading rates etc. but fails to account for site specific attributes of the filters, particularly the media configuration and floc characteristics.
- Design Factors
  - Can be useful as a coarse estimate based on standard loading rates or removal percentages but fails to account for site specific attributes.

Filter testing

Full-scale filter stress testing was carried out at MWTP in 2016 during favourable raw water quality conditions. One objective of the trial was to assess if the filters could be operated at a higher than typical filtration rate (industry standard is 10 m/h) to achieve the desired 160 ML/d without the need to add additional filters. Whilst falling short of outlining a direct capacity it does however highlight the significant issues even during 'excellent' water quality conditions and the capability for the filters to experience reasonable run times at design rate throughputs.

A summary of the outputs is below. The report states that run times less than 12 hours will reduce the WTP capacity through excessive headloss accumulation and eventual turbidity breakthrough. At runtimes this low or lower there is not enough time in the day to backwash all the filters and therefore plant capacity progressively declines as filters are taken offline.

Table A4 - High Flow Test 1 Filter Run Time Summary

Period	Filtration Rate (m/h)	Filter Run Time (h)
1 (21/10/16 - 02/11/16)	3-5	30-38
2 (02/11/16 - 11/11/16)	6-7	18-25
3 (11/11/16 - 25/11/16)	10-13	4-13

Of note is that a filtration rate of 12.2 m/h is required to achieved 160 ML/d (or 13.2 m/h when one filter is backwashing), and hence a filtration rate of ~6 m/h represents a reduction in plant capacity of approximately 50%. It is vital to note however that the above trial was performed on raw water with a turbidity of 1.1 NTU which is below the historical average of 2.6 NTU, noting that during rainfall events raw water turbidity can reach upwards of ~20 NTU. Hence during rainfall events (and corresponding increased turbidity) the plant capacity is rapidly eroded.

It should also be noted that prior to the filter flow tests, in 2014, CCC Water refurbished the existing filters with replacement of the filter underdrains and nozzles and a complete replacement and redesign of the granular filter media configuration to allow for increased throughput and longer filter runtimes and thus increase plant capacity.

Recent derating events

Most recent raw water quality events requiring derating of the plant production flowrate have included the following high turbidity and organics events:

Table A5 - Raw water data during recent plant de-rating events

Date	Period	Derated Flowrate	Max Turbidity	Max Colour	Max DOC/TOC
	days	*L/s*	*NTU*	*HU*	*mg/L*
11-26/11/21	16	700	10.6	134	8
20/3-4/4/21	16	650	11	165	12
29/11/21-12/01/22	45	700	9.5	134	11.6

During these events, the plant has been derated by two-thirds to a capacity of 55 ML/d. In all recorded past high turbidity events where turbidity has been above 10 NTU, the plant has operated at this maximum capacity.

During the most recent high organics event over the 2021/22 summer period, de-rating the plant was unsuccessful in achieving treatment targets. The pre-filter chlorine dose rate was increased to address the issue of the organic carbon consuming the free chlorine in the raw water in an attempt to maintain the coated media process. Unable to maintain the level of free chlorine needed in the water entering the filters, the manganese coating on the filters sloughed off. Despite efforts to manage the DOC through the treatment process, the DOC was still so high in the network that a chlorine residual could not be maintained through re-chlorination. Chlorination of the filtered water at the WTP however could not be further increased to assist with chlorination in the water network because this would have likely led to oxidation of the manganese coating, causing a discoloured water event.

Conclusion

Test results and experience has proven that the key water quality challenges proposed to be addressed by the upgrade (turbidity, DOC and algal cells and toxins), cannot be reliably addressed through the existing treatment process. Derating of the treatment plant capacity has been proven successful to address elevated raw water turbidity on some occasions although full scale filter stress testing indicated the filters could not achieve design capacity despite low turbidity of 1.1 NTU. Recent experience with high levels of organics in the raw water has demonstrated that the existing process is unable to remove organics to the level needed to successfully manage adequate chlorination in the network. The existing process is also not designed to treat algal cells and toxins and therefore Mardi Dam must be isolated during algal blooms above alert levels.

Responses to assessment of project delivery efficiency

Lack of challenge of investigation costs

Consultancy engagement

The vast majority of planning works have been completed by consultant, Hunter H2O. Hunter H2O were selected through an open tender process to complete the concept design, cost estimate and environmental assessment and assist with achieving Section 292 approval.

For subsequent tasks including further investigations, options assessments, design basis analyses and scope changes, Hunter H2O's engagement was varied following submission of a fee proposal and approval in accordance with Council's Procurement Policy for single sourced suppliers. The drivers for the engagement of Hunter H2O as a sole provider for the additional design tasks included:

- previous involvement placing Hunter H2O in a strong position to have in-depth knowledge of the project to minimise costs and mitigate CCC Water's risk through eliminating repetition of completed works, minimising time in familiarising with the specific project and site and taking ownership of previous design decisions to ensure a successful solution
- specialist market and extensive experience with design and optimisation of DAF processes.
- previous competitive tender where Hunter H2O's tender for the Concept Design was selected amongst 8 submissions
- timing of the project to avoid delays.

Through tendered arrangements, Hunter H2O have provided services to CCC Water at discounted rates. This has encouraged cost saving efficiencies, reducing total costs through the investigation, concept and preliminary design and procurement phases of the project.

Governance

The project governance framework includes a Project Control Group (PCG) which was formed in March 2019 once Hunter H2O were engaged to prepare the Preliminary Design. Under the PCG's Charter, the PCG's purpose is to assist the Project Manager in the effective delivery of the project. The PCG oversees key aspects of the project at a high level and drives the project team to deliver value for money. The PCG is consulted, and approval sought for any recommended changes in scope to ensure good governance around decisions and assurance of efficient expenditure.

Certain approvals are escalated above the PCG to ensure decisions are consistent with Council's Operational Plan and provide an opportunity for all levels of management to challenge all aspects of the project. The business cases and tender evaluation for the Design Develop and Construct (DD&C) tender are escalated above the PCG for approval.

- The Gate 1 Business Case following preparation of the Concept Design and Procurement Strategy was approved by the Director Water and Sewer in February 2018
- The Gate 2 Business Case following Preliminary Design and Expression of Interest phase was approved by the Acting CEO in February 2021.

DPE endorsement

Department of Planning and Environment (DPE) is a key stakeholder for this project, endorsing the project through the following avenues:

- **Safe and Secure Water Program grant**: Following the Gate 1 business case approval, CCC Water applied to DPE for 25% funding under this NSW Government funding program. The

application process included a business case with cost benefit analysis and responses to assessment criteria which addressed strategic and economic assessment, affordability, and deliverability. CCC Water was successful in obtaining a $6.854M grant in 2019 which is administered by Infrastructure NSW (INSW). INSW, with input from verifiers, Public Works Advisory (PWA), review monthly project reporting against scope, cost, and program indicators since January 2020. Further, INSW endorsed the change of scope, cost, and program at the time of changing the scope from IPS to DAF.

- **Approval under Section 292 of the Water Management Act 2000**: DPE are CCC Water's technical regulator for approval under the relevant legislation for changes to the treatment process. CCC Water has been consulting with DPE since 2016, gaining progressive endorsement at each step of the approval process to the current Step 5 of the 7-step process in December 2021 following evaluation of tenders. In January 2020, following the algae management and clarification options assessment, DPE indicated that the proposed change of scope to a DAF was required to manage algae cells in the raw water envelope which couldn't be managed adequately with IPS.

Increased project capital cost

Cost estimate development

Capital cost estimates have been prepared at each stage of the project with contingency allowances appropriate to each phase. With continuing development of the project scope and design details at each stage, capital cost estimates have correspondingly increased in complexity, detail, and accuracy. As a result, capital costs have increased at each stage. The key objective of the further investigations undertaken at each stage has generally not been to simply reduce the capital cost, but rather to ensure identification of the right solution that meets the project objective in the most efficient manner possible. At each stage, a reassessment of the project need against the updated estimated capex has been undertaken through CCC Water's Gate Review process. Further details are provided below.

- the **$11.8M** reported as the capex estimate for the project at the 2015 options investigation stage, was in fact a capex estimate for the Inclined Plate Settler (IPS) for the purposes of comparing clarifier options. This amount did not include other components of the scope that make up the current proposed upgrade nor did it include investigation, design, project management costs and contingency
- the first project capex estimate was developed at the Concept Design phase in 2016-17. At this time the scope included:
    - IPS
    - flash mixing
    - dosing point relocations
    - filter inlet channel modifications
    - ferric chloride dosing system

    - sludge lagoon works
    - switchroom and electrical/control works.
  - the P90 capex estimate in the Concept Design Report (including 30% contingency) was **$21.5M**.
- CCC Water's Gate 1 Business Case included an adjustment to the Concept Design capex estimate to include:
    - concept design
    - sludge lagoon embankment clearing
    - sludge disposal
    - clearwater tank baffle
    - trim chlorine dosing
    - updated project management costs
  - the adjusted Gate 1 Business Case capex estimate (including 30% contingency) was **$24.56M**
- following a change to the scope from IPS to Dissolved Air Flotation (DAF) in January 2020, the capex estimate was further updated in the Preliminary Design phase. At this time, the cost build-up now included updated cost details and additional scope including:
    - more detailed costing of tasks.
    - upgrades to PAC contact tanks for isolation (WHS and reliability) and asset renewal (bundling of projects for efficiency).
    - flocculation/DAF in place of IPS including overhead structures and associated equipment.
    - refurbishment of outlet structure (bundling of projects for efficiency).
    - cationic polymer dosing system (operational efficiency and improved DOC removal) including refurbishment of chemical dosing room (WHS).
    - PAC dosing system replacement (WHS due to change of design raw water envelope to include algal cells).
    - lime dosing system upgrade (as a result of the changeover to ferric chloride).
    - utility water system upgrade (to service the upgraded plant).
    - transformers and larger switchroom (to service the DAF).
    - additional civil and roadworks associated with the DAF and supporting infrastructure.
    - updated early works (sludge lagoon upgrades) and project management costs.

  The pg90 capex estimate in the Preliminary Design Report (including a 28% P90 risk-based contingency split between the Contractor's and project contingency allowances) was **$41.5M**.

- following the Preliminary Design, CCC Water's Gate 2 Business Case capex estimate, which also included the previous investigation, concept and preliminary design costs in the total project capex estimate was **$45.75M** (including a 28% P90 risk-based contingency split between the Contractor's and project contingency allowances).

Market testing

Market testing of key subcontract elements of the scope has occurred at each stage of the project as follows:

- at the Investigation and Options Analysis stage (2015):
    - a firm quote for an Inclined plated settler clarifier was obtained from a key subcontractor
- at the Concept Design stage (2016/17):
    - market pricing (@ current exchange rate for overseas equipment)
    - budget estimates from suppliers
    - benchmarking of recent projects – Hunter Water EPCM projects etc
    - a firm quote for an Inclined plated settler clarifier was obtained from a key subcontractor
- at the Preliminary Design stage (2019/20):
    - DAF pricing was based on previous supply quotes for a similar size WTP in the Hunter region and escalated for inflation
    - supplier quotes and online pricing (pro-rated and escalated as appropriate)
    - benchmarking against recent projects (pro-rated and escalated as appropriate)
    - recent reference rates for works undertaken for Hunter Water.

Tender prices

Despite the estimate development and market testing, an increase in the contract sum above pre-tender estimates is now likely based on evaluation of the Design Develop and Construct (DD&C) tenders. The market evolved significantly through 2021 with continued impacts projected in 2022 and beyond. The increased tender prices are expected to be associated with:

- market volatility
    - COVID-19 impacts leading to uncertainty and market volatility
    - construction and economic growth – increased demand and insufficient supply of resources
- increased materials costs
    - significant increased costs of raw materials.
    - supply chain constraints including shipping capacity and storage constraints, demands above production capacity and underinvestment leading to supply shortages.
- contractors reluctant to take on risk
    - unknown impacts of COVID-19 moving forward
    - resource availability - supply and demand
- timing of tender – midst of volatility.

Contingency allowance

The pre-tender contingency allowance is likely to be adjusted following contract negotiations due to expected changes to contract risk allocation and further contingency analysis for both time and cost.

At the Preliminary Design stage, the contingency matured from a standard 30% at concept design stage to a quantitative risk-based assessment involving the following steps:

- identification of 21 key risks from the 200-item project risk assessment
- quantitative analysis of the key risks in terms of the potential impact on the program and project cost
- allocation of the possible cost impacts between contractor tender price inclusions, potential contract variations and potential additional client costs. The allocation reflected the risk allocation in the Request for Tender (RFT) contract conditions and specifications
- a risk-based approach to these contingencies was then applied using a Monte-Carlo analysis and a P90 contingency adopted, split between the contractor's and project contingency.

Generation of efficiencies

CCC Water has applied a number of efficiencies in the development of this project. These have arisen from the following areas:

- IPART's 2019 Determination recommendations: Specifically, value engineering through bundling of other projects approved to proceed at MWTP into the scope of the main upgrade, saving project management costs and minimising overall contingencies and WHS risks associated with separate contractor interfaces and security of supply risks associated with multiple extended shutdowns. These include:
    - PAC system upgrade: Included separately in the capital works program, the original project definition did not consider the requirements arising from the current project. By bundling into the DD&C contract, the suitability of the project scope and timing of project completion is assured of meeting the objectives of the main upgrade
    - filter outlet structure refurbishment: Included in the capital works program for the current IPART project, this project requires an extended 3-week shutdown of the plant. By bundling into the DD&C contract, the shutdown can occur simultaneously with other works in the upgrade requiring an extended shutdown, in particular the installation of clearwater tanks baffles and works in existing tanks and channels.
    - clearwater tank overflow tower repair: The need for this work was identified during condition assessment of the clearwater tank in 2018. Requiring draining of the clearwater tank and extended shutdown of the plant, this becomes a significant task however by bundling into the DD&C contract, the repair work can be undertaken whilst the tank is shut down for more extensive clearwater tank works, resulting in minimal cost.
- Project experience and lessons learned: Specifically, from the successful delivery of the Mardi to Warnervale Pipeline (M2WP) project which was delivered below budget. These efficiencies include:

- contract conditions and risk allocation: The M2WP project's success was partly attributed to the robust Conditions of Contract, an amended form of AS2124. A similar model has been adopted for the MWTP upgrade project, which is based on AS4902 but includes corresponding clauses used successfully in the M2WP contract. These clauses minimise CCC Water's risk during execution of the contract while considering appropriate risk allocation between the parties to avoid unnecessary over-pricing by tenderers. These contract conditions have been further refined through market feedback to find an acceptable risk allocation balanced with price
- contingency management: The process for quantitative risk-based contingency assessment, has followed the process utilised for the M2WP project where contingency allowance was more than adequate to ensure consideration and quantification of key risks. As with the M2WP contingency allowance, the cost, schedule, and risk analysis will be continually refined as the project progresses to ensure only appropriate levels of contingency are maintained
- resources: The project team model adopted for the M2WP project was key to the success of the project and a corresponding team will be formed to manage the delivery of the MWTP upgrade. Team members are predominantly externally sourced but working in-house in CCC Water to ensure a concentrated and committed project-focus through to completion. This model was found to the most cost-effective, minimising reliance on external consultancies and avoiding BAU CCC Water staff losing focus on delivering the remainder of the capital works program.

Poorly defined capital efficiencies

CCC Water has identified $3.2M in delivered capex efficiencies through further investigations and assessment of project scope elements and design development through the project phases. A portion of this is derived through Net Present Value analysis to account for the reduced future capital works as a result of scope decisions made at this stage, specifically relating to protective coating of concrete tanks and bunds which require re-coating in an estimated 15 years.

In Table 4.3 of the *IPART Supporting Business Case*, it is identified that since the 2019 IPART submission, an additional $3.6M has been spent on additional investigations, preliminary design, technical advice, survey, and geotechnical investigations. This additional expenditure was not targeted at reducing the capital cost but rather to:

- re-assess the project design criteria as a result of the emerging risk of algae in the raw water and confirm the right solution to meet the objectives of the project
- complete the preliminary design for the new scope
- carry out additional investigations and options analyses arising from the change of clarifier to refine the whole project scope and address new project risks.

In this way, whilst cost effectiveness and value engineering have been considered at all stages, including through optioneering and value management workshops, the $3.2M identified in capex efficiencies is not directly related to the $3.6M additional expenditure on investigations over and above the 2019 IPART submission as indicated in the *Expenditure Review Draft Report*.

Proposed procurement model increasing capex value significantly

Procurement strategy

Following the concept design, a procurement strategy was developed in late 2017. This involved a workshop facilitated by Hunter H2O, which brought together key stakeholders in both CCC Water and Hunter H2O, including procurement and contract specialists. The procurement planning considered the project details including objectives, characteristics and risks, various contract systems including their advantages and disadvantages, and the capacity and capability of both the market and Central Coast Council to deliver the project. Using a Multi Criteria Analysis (scope, time, risk, constructability, sensitivity, capacity and capability, budget, and location) contract selection tool, the delivery, contract, and tendering systems were selected which were most likely to achieve project objectives and align with the project characteristics and risks. Alliancing and partnering contracts were not considered due to being incompatible with the Local Government Act.

The selected strategy involved the following:

- early works package to deliver sludge lagoon modifications
- progression of the concept design to a preliminary design by an external consultant
- design develop and construct (DD&C) contract to deliver the project
- invite expressions of interest (EOI) and evaluate on non-price criteria to establish a shortlist of tenderers
- early tender involvement (ETI) process to ensure appropriate allocation of risk, identify innovation and address constructability issues.
- request for tender (RFT) issued to shortlisted tenderers.

During the Preliminary Design phase, the procurement strategy was reviewed. The ETI phase was deleted from the procurement strategy to save time and costs. It was also seen that it can be difficult to obtain the desired value out of an ETI phase as tenderers tend to guard their Intellectual Property and are wary of CCC Water incorporating their innovations into the RFT. To ensure the objectives of an ETI phase would still be achieved, the following revised procurement strategy has been adopted:

- early works packages to minimise the risks of delaying the main works
- preliminary design phase which included consultation with other water authorities and DAF suppliers to obtain feedback on the design basis parameters and proposed performance guarantees and ensure the preliminary design and contract conditions would be suitable for the market
- expression of interest phase selecting three shortlisted tenderers with two reserve tenderers due to the expected delays between the EOI and RFT phase

- extended tender period incorporating early tenderer involvement workshops to ensure scope, accountabilities and expectations were understood and suitable and to understand the tenderer's proposal and possible qualifications
- design Develop and Construct contract including a design phase overlapping with procurement and construction phases.

As similar two-stage procurement process was utilised successfully on the M2WP recently, contributing to the efficiency of that project.

Preliminary design followed by DD&C contract has been used on smaller treatment plant upgrade projects and has shown to allow CCC Water to have good control over preferred and non-negotiable parts of the design while still allowing the contractor to offer an efficient and innovative solution.

Market testing

In March 2020 during the Preliminary Design phase, CCC Water engaged with two key DAF suppliers to ensure the preliminary design, technical specifications and technical risk allocation would proceed in an optimal manner and to gather additional information to inform the solution. The agenda included:

- contract role and previous experience –the DAF supplier's preferred role in the overall contract and level of engagement and lessons learned
- design matters including interaction with the design of upstream processes (coagulation, flocculation, plant flowrate changes); input to chemical selection and dose changes; raw water parameters that will influence key design aspects of the DAF process (including loading and recycle rate); and jar testing
- contractual matters including subnatant water quality performance guarantees and supply chain constraints.

The feedback from this engagement was considered in finalising the Preliminary Design and Process Specification for the RFT.

In September 2020, a request for Expressions of Interest (EOI) was released to the open market. The EOI document included proposed contract terms, preliminaries and technical information and drawings. The Term Sheet set out a summary of CCC Water's position on particular issues that CCC Water anticipated would be reflected in the Contract and feedback was sought from Respondents through a Schedule of Qualifications, Departures and Assumptions for consideration in finalising the contract document. While also allowing CCC Water to shortlist suitably qualified, experienced, and capable entities to participate in the subsequent RFT process undertaken in 2021, the EOI process allowed CCC Water to further test the market in relation to the proposed terms and technical requirements of the contract.

Costs were not sought during the above processes given the market testing of key elements of the scope at each prior stage of the project.

Risk allocation

During the Preliminary Design phase and prior to preparing the EOI Terms, stakeholders workshopped the key project risks and the preferred allocation of risk between the parties, seeking to minimise CCC Water's exposure to risk and allocate it to the party most suitable to hold it. Contractual conditions were developed on this basis.

Of critical importance to CCC Water is the allocation of process risk to the party responsible for the design, construction, and commissioning of the process. While this risk has been qualified through tender responses, the market has confirmed that a reasonable level of process risk is acceptable, which reflects the market examination carried out previously.

Other risks, particularly procurement and construction risks impacted by current concerns such as COVID-19 disruptions, direct costs, and material cost volatility, have caused more concern for tenderers than expected at the time of allocating those risks.

Contract status

With tender prices above pre-tender estimates, Council resolved in January 2022 to reject all tenders and negotiate with any or all the tenderers or any other entity with a view to entering into a contract in relation to the subject matter of the tender. This process allows Council to address outstanding concerns and provides an opportunity to modify the contractual terms and project delivery structure as part of negotiations.

The Expenditure Review has noted that a more risk balanced target cost model may lower the cost. Given the current position, options will be considered that seek to adjust the risk allocation or the mechanism to manage risk in order to seek the best value outcome for CCC Water and avoid inflated contingency allowances. With little experience in collaborative contracting, CCC Water will rely on the guidance of its advisors for the preferred solution that complies with legislative requirements.