

AtkinsRéalis



Final Report

Essential Services Commission of South Australia

9 January 2024

SA WATER CAPEX REVIEW RD24

Notice

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Executive Summary

The Essential Services Commission of South Australia (ESCOSA) appointed AtkinsRealis to undertake a review of SA Water's capital expenditure for the current (1 July 2020 to 30 June 2024) (RD20) and upcoming (1 July 2024 to 30 June 2028) (RD24) regulatory determination periods. This report presents the findings of that review.

SA Water has been open and engaged with AtkinsRealis during the review process and prepared high-quality presentations and background documents which have greatly helped with this review. We would like to thank all those who participated during the process, engaged with us during the interviews and meetings, and responded to our questions and requests for information.

Recommendations

In our experience, and having had regard to comparator utilities and other regulatory determinations that we have been involved in, we found that SA Water has a number of significant strengths including:

- a strong procurement system and supplier relationships.
- that it puts significant effort into understanding and benchmarking its suppliers' overheads and margins.
- that it has recognised limitations observed during RD20 in relation to cost estimation and has an improvement plan in place.
- that it has used modelling as a decision-support, rather than as a decision-making tool, and its Board has appeared to take ownership of the level of expenditure and risk in its proposal for RD24.
- that it has applied an efficiency challenge to its proposed expenditure.
- that it has challenged itself by not requesting significant increases in 'sustain' expenditure (outside of large projects).

However, as with all utilities, there are a number of areas of potential improvements. These include:

- **Project development and decision making:** We consider that SA Water would benefit from more robust early project scoping, optioneering and decision-making. Business cases should be more robust and have a stronger decision-making framework than the current reliance on Multi Criteria Assessment (MCA), whose limited justification for criteria, weightings and scores leave the process vulnerable to subjectivity. For example, it could utilise a decision criterion which selects the solution that meets the objective at lowest whole life cost unless there is a very good reason not to do this. These changes would help SA Water make better decisions earlier (including 'don't spend' decisions).
- **Value engineering (VE) throughout project and program development:** VE should cover all phases of project development from defining project goals and drivers to scope definition and on to alternative construction techniques. We have seen efficiencies identified at the later stages of this but little evidence of strong full scope value engineering (i.e. challenging the project goals and areas of scope which are not necessary or are 'nice to have' to meet stakeholder requests). Many of the projects we reviewed saw significant scope creep with few examples of the opposite effect.
- **Procurement:** in general, we find that SA Water has a good and reasonably mature approach to procurement. However, we consider there remains further efficiency to be made. The two main levers which we think could be used for this are: (i) greater use of mini-competition within frameworks and (ii) benchmarking of full outturn costs (not just contractor overheads, margins etc) to other utilities costs, which would allow SA Water to identify areas of relative inefficiency which can then be focused on.



- **Costing:** we consider it would be useful for SA Water to start to measure and therefore improve the accuracy of cost estimates and develop an empirical approach to contingency allowance based on outturn costs. We also consider that it may be useful to develop a more refined classification of cost estimates to better separate the confidence in the estimate (i.e. maturity of scope, unit costs and risk understanding) related to its use.
- **Empirical asset health:** the current focus of renewals planning and modelling is largely based on condition grade with a weaker link to performance data. We consider it would be useful to make more explicit the link to performance (e.g. breakdown frequencies) as a more empirical indicator of the effectiveness (and effects) of decision making. We consider it would be useful to carry out more regular empirical reporting of overall asset health with factors such as work order numbers, expenditure, asset outage and similar measures.

RD20 Capex Review

Outturn Capex:

- Outturn capex in the first three years of RD20 (those for which we have outturn expenditure) was \$229.3M or 16% less than the RD20 Determination. It appears likely that much of the early underspend is due to project preparation and delivery challenges, especially in Enhance¹ projects, and large Sustain projects, such as the Morgan Whyalla Pipeline No1 Replacement project. SA Water is forecasting a significant increase in expenditure in FY24 which, if it is fully incurred, would lead to an overspend of \$50M (or 3% of the capital expenditure across the RD20 period).

Large projects:

- There are six large² projects in RD20 which might have a significant impact on outturn expenditure. Individually, these projects have seen large variance from RD20 Determination assumptions, ranging from 73% underspend to 364% overspend. However, the overall impact of the large projects has been a more modest overspend of \$22.2M (6%) compared to the RD20 capital expenditure assumptions. This reflects two counteracting effects:
 - There have been delays (project slippage) largely due to the complexities of project development and delivery. This has caused underspend in projects such as Mount Bold Dam Safety Upgrade, Eyre Peninsula Desalination Augmentation and Morgan Whyalla Pipeline No1 Replacement.
 - In projects which have proceeded to delivery there has been overspend due to the emergence of greater complexity than was assumed at the time of RD20. This has led to overspend in projects such as Bolivar WWTP Capacity Growth Upgrade and Kangaroo Island Desalination.

Deferral / reprioritisation during RD20

- The RBP sets out that SA Water expects to have deferred approximately \$440M of RD20 expenditure. It is understood that the deferrals were of items which were in SA Water's delivery plan at the time rather than necessarily of specific items from the RD20 assumptions. Even after the reprioritisation process,

¹ We define 'enhance' to be all expenditure which is not classified as 'sustain services'. The 'enhance' classification is discussed in section 2.

² Projects for which SA Water either included more than \$50M in its RD20 post-Determination modelling or is now expecting to spend more than \$50M on.



expenditure on the programs identified is expected to be very close to their RD20 capital allowance (just 0.9% or \$10.4M below it).

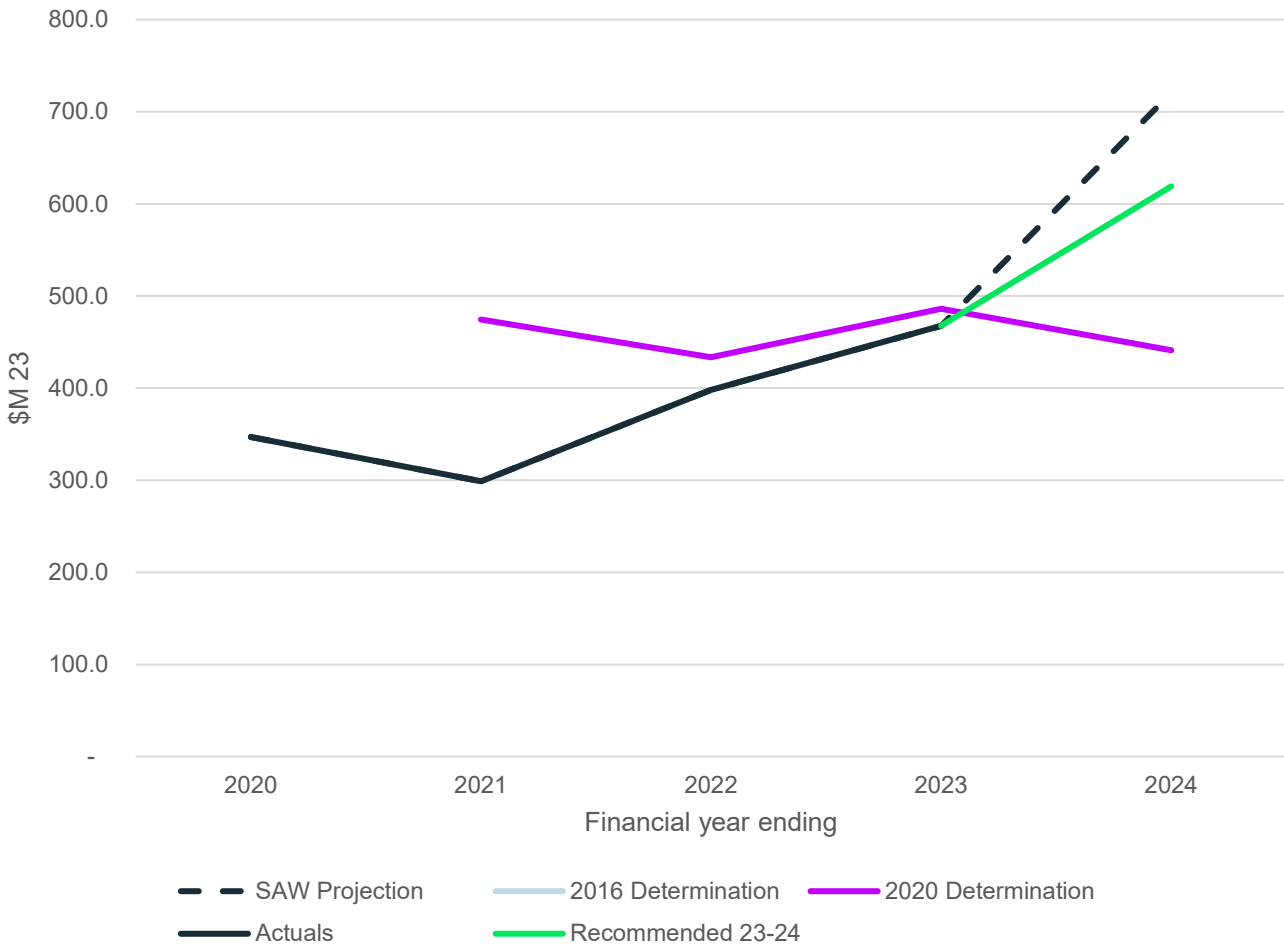
- The majority (62%) of the programs affected by the deferral are “Sustain” (i.e. largely involve reprioritising of activities such as asset renewals). Reprioritising of deferrals is considered to be reasonably standard industry practice and the change does not appear to have adversely affected performance.

RD20 adjustments. We have recommended adjustments to reflect:

- A more reasonable FY24 forecast for a selection of projects and programs based on our understanding of SA Water’s operation, the historical and future proposed expenditure patterns (\$48.4M reduction).
- Reprofiling of Morgan Whyalla Pipeline No1 Replacement expenditure in FY24 based, in part, on SA Water’s most up to date view of the likely spend and our assessment of SA Water’s business cases and documentation (\$36.2M reduction).
- An ex-post adjustment related to the Kangaroo Island Desalination project. We understand that SA Water is paying to relay the Stage 1 trunk main. In our experience, it is highly unusual to (1) have to relay a brand-new water main and (2) for the risk of deficiency to sit fully with the corporation and its customers. We have recommended an ex-post adjustment of \$14M so that customers do not have to pay for the defective asset. Additionally, we have re-profiled \$3M from FY24 to FY25 for new connections which results in a \$17.0M total reduction in recommended RD20 capex.
- Our recommended RD20 capex is \$1,682.8M which reflects a \$101.6M reduction from SA Water’s forecast of \$1,784.3M in capex. This is summarised in a graphical form below.



Figure 0-1 Recommended RD20 capex



Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: this is full net capex i.e. it includes corporate Technology capex but is net of capital contributions

RD24 Capex

- In its RBP, SA Water has proposed total capex of \$2,831.4 M. This is a 47% increase compared with the RD20 capital expenditure assumptions. Major projects (above \$100M) represent 37% of the total proposed capex.

Sustain:

- Based on the work order breakdown data provided by SA Water, the health of non-pipe assets appears to be on an improving trend and the health of pipeline assets appears to be broadly stable. We have therefore recommended maintaining “general” Sustain expenditure (excluding large projects³) at RD20 levels with the exception of the Adelaide Desalination Plant membrane replacements, which we consider to be necessary additional expenditure above the RD20 level. This results in a scope adjustment of -\$4.5M (2%)

³ Eyre Peninsula Desalination and MWP



for wastewater. No adjustment is recommended for water as the proposed expenditure is in line with RD20 spend levels when adjusted for membrane replacement.

- We have recommended scope adjustments for the Eyre Peninsula Desalination project to take account of the high level of contingency and a reprofiling of expenditure to account for the fact that consents are not yet in place.

Growth:

- We reviewed the Summit System Growth project and considered it unlikely that a scheme which has not started the gateway process at this point, and for which there are not current but rather future expected performance challenges, will spend \$12.1M next financial year and thereafter. We have therefore recommended the reprofiling of water growth expenditure to be broadly consistent with the backloaded profile in RD20.
- We understand based on SA Water's RBP that the Metropolitan North Subsystem Growth project is likely to be subject to a Ministerial Section 6 Direction. We have therefore not reviewed the project or recommended any adjustments to the expenditure profile.
- We have recommended applying scope adjustments to Bolivar and Glenelg wastewater network growth projects. We have not recommended any adjustments to wastewater treatment capacity as the increase is relatively minor.

Improved service and external requirements

- We have recommended a scope adjustment to the Metro Water Quality project to allow for the installation of new treatment technology at just one, rather than two, water treatment plants (WTPs). We consider this is prudent given that it is a new technology for SA Water and there is potential for challenges and disruption of construction within existing assets.
- We have also recommended a scope adjustment to the Mount Bold Dam Safety Upgrade project. Given that SA Water is planning to revisit its optioneering, and there is, in our view, likely to be a lengthy time to fully develop a solution, we consider it prudent to allow for project development costs rather than construction costs in RD24. We note that any construction capex could, as per ESCOSA's methodology for assessing capital expenditure, be taken into account in a future ex-post review.
- We have not recommended any scope adjustments to wastewater External Requirements expenditure. We understand from SA Water's RBP that the Tea Tree Gully (TTG) Sustainable Sewers Program project is likely to be subject to a Ministerial Section 6 Direction. We have therefore not reviewed the project or recommended any adjustments to the expenditure profile.

Efficiency challenge:

- We consider that there are significant efficiencies still to be made to move to the efficient frontier. The opportunities for efficiency are in three key areas: (i) project development and decision making, (ii) value engineering (VE) throughout project and program development and (iii) procurement. We have recommended a catch-up efficiency of up to 5% p.a. on this basis.
- We have assumed a Frontier Shift of 0.5% per annum cumulating over the Determination period. This is the same level as was applied in RD20 and is broadly consistent with a range of other recent Determinations as set out in Section 3.3.



Recommended capex:

- Total recommended capex is \$245.5M or 9% less than SA Water’s post-efficiency proposal but still \$648.3M or 35% higher than RD20 capex.

Figure 0-2 SA Water proposed and our recommended post-efficiency capex - excluding expected Section 6 Direction projects (\$FY23 M)



Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: this excludes the Metro North and TTG projects

- We consider that there is significant uncertainty related to external factors (growth and labour markets) as well as internal factors (SA Water’s systems and focus) and have set out a number of scenarios as follows.



Table 0-1 Alternative capex scenarios (\$FY23 M)

Capex scenario	2025	2026	2027	2028	RD24 total
High case	601.7	637.1	707.8	884.8	2,831.4
Medium case	593.6	615.8	702.0	674.5	2,586.0
Low case 1- underspend	474.9	541.9	617.8	674.5	2,309.1
Low case 2- recent capacity	418.0	464.5	464.5	510.9	1,857.9

Source: *Atkins Realis analysis and projections and 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx*

Note: *this table presents gross post-efficient capex including Technology*

Capital contributions:

- SA Water has assumed it receives total capital contributions of \$2.5M p.a over the RD24 period. Compared to both historical contributions (\$20.2M p.a.) and proposed growth schemes, this appears to be a significant underestimate.
- SA Water has agreed to revisit its capital contribution assumptions in its submission after the Draft Determination. We would expect these to be at least as large as those received in RD20 given the growth schemes envisaged. The Draft Determination could potentially utilise the historical contributions from the RD20 period given the limitations in SA Water’s RBP.



1. Introduction

The retail services provided by SA Water are subject to economic regulation by the Essential Services Commission of South Australia (ESCOSA or the Commission) under the Essential Services Commission Act 2002 (ESC Act) and the Water Industry Act 2012 (WI Act). The economic regulatory regime has two main elements:

- SA Water is licensed by ESCOSA under the WI Act to provide retail services, subject to conditions (section 25(1) of the WI Act). While some matters are addressed through licence conditions alone, ESCOSA is able to make industry codes and rules that prescribe the rules of conduct and procedures that SA Water must follow in providing retail services (section 28 of the ESC Act). This relates in particular to the setting of service standards and the nature and scope of consumer protections that must be adhered to by SA Water.
- ESCOSA also has the discretion to make determinations relating to pricing for SA Water's retail services (section 25 of the ESC Act and section 35 of the WI Act). Under the legislative settings of the regime, ESCOSA regulates the revenues that can be earned by SA Water for the provision of retail services (having regard to the service standard, consumer protection and other regulatory requirements), with SA Water being responsible for setting the specific prices that recover the relevant revenues.”

To facilitate the review and submission, ESCOSA established a framework and approach for the SA Water regulatory determination for RD24⁴. Additionally, the Commission issued guidance papers covering guidance for the development of the business plan, stakeholder engagement, and the assessment of the business plan^{5,6,7}.

In August 2023, the Commission appointed AtkinsRealis (Atkins) to undertake a review of SA Water's capital expenditure for the RD20 and RD24 regulatory determination periods. The review assesses SA Water's efficient level of expenditure and evaluates its prudence. Our review will inform ESCOSA in its determination of the revenue cap for SA Water for the RD24 regulatory determination period.

1.1 Scope

As part of the review process, Atkins' scope includes providing a recommendation regarding the prudence and efficiency of SA Water's capital expenditure. Our recommendation is based on a review of SA Water's historical and proposed capex in two parts as follows:

- Ex-post evaluation of historical capital expenditure (1 July 2019 to 30 June 2023) and current capital expenditure forecasts for the period 1 July 2023 to 30 June 2024:
 - Evaluate how SA Water's systems and processes performed over the period.
 - Assess SA Water's financial and service performance against targets.
 - Review a sample of projects and programs to inform a view on SA Water's overall historical performance.
 - Consider the appropriateness of including expenditures during the regulatory period.

⁴ SA Water Regulatory Determination 2024 – Final Framework and Approach, ESCOSA, September 2021

⁵ SA Water Regulatory Determination 2024 – Guidance Paper 1: The Regulatory Business Plan, ESCOSA, December 2021

⁶ SA Water Regulatory Determination 2024 – Guidance Paper 2: Engaging with stakeholders to develop the Regulatory Business Plan, ESCOSA, April 2022

⁷ SA Water Regulatory Determination 2024 – Guidance Paper 3: Assessing the Regulatory Business Plan, ESCOSA, July 2022



- Provide recommendation and advice on the efficient and prudent level of expenditure over the RD20 period (including 2019-20).
- Ex-ante evaluation of proposed future capital expenditure (1 July 2024 to 30 June 2028).
 - Assess SA Water’s development of its business proposal for RD24.
 - Evaluate the appropriateness of proposed solutions developed to address issues identified.
 - Consider deliverability of SA Water’s business plan having regard to SA Water’s capacity and the wider economic environment of South Australia.
 - Review a sample of proposed projects and programs in detail to understand SA Water’s wider proposed program.
 - Provide recommendation on the level of efficient and prudent expenditure for RD24.

Our scope includes the delivery of a draft and final reports that encompasses our advice and recommendation based on our review of SA Water’s capital expenditure. We are also required under this scope to deliver any excel sheets that were used in our review to allow the Commission to integrate our recommendation into the revenue cap model.



1.2 Review methodology

Our methodology for undertaking this review is based on the combined experience of the team in undertaking similar expenditure reviews across Australia and internationally.

Our review work commenced in September 2023. Our initial task included the review of SA Water's Regulatory Business Plan (RBP) submission, which laid out the company's financial and technical performance during the current regulatory determination (RD20) as well as detailed its proposed capital expenditure program for the next regulatory determination (RD24). Based on the initial review of the proposal, we prepared an inception report that detailed our intended approach throughout the schedule of the review. Along with the inception report, we made an initial request for information (RFI) prior to commencing the detailed interviews, which took place on the week of 25 September 2023.

As part of our methodology to carry out the capex review, we proposed to cover a range of projects and programs for the ex-post and ex-ante capex reviews, through the review of a representative sample. In selecting the sample, we considered the value of the projects and programs as well as their service type and driver. Additionally, we engaged with ESCOSA to ensure that the sample selected is in line with their expectation and understanding of SA Water's operational environment.

Our approach in selecting the sample included grouping the expenditure for each RD period within service type and driver categories. This allowed us to quantify the value of expenditure against each service type and driver, and analyse the spread of expenditure. Then, we selected programs and projects that we understand to be significant in spend and relevant based on our experience. Finally, the list of selected programs and projects were finalised in consultation with the Commission. A total of 18 programs/projects (nine for each RD period) were agreed with the Commission to be included in the detailed review sample. For the ex-post expenditure, the reviewed sample represented 23% of RD20 capex, where the ex-ante sample represented 32% of SA Water's proposed RD24 capex. The following two sections provide further details on the selected samples.

To engage in a productive discussion, through ESCOSA, we provided SA Water with a detailed schedule including subjects and topics for each session that we wanted to cover during the interviews. Based on the proposed schedule and feedback from ESCOSA, we held interviews with SA Water to cover a range of topics including:

- RD 2020 outcomes, RD 2024 overview.
- Major drivers and variance.
- Processes and governance underlying development of RD 2024 capex program.
- Performance measures.
- Deliverability of RD24 program.
- Long term planning.
- Approach to renewals planning.
- Capex processes and governance.
- Approach to costing, risk and contingency.

Additionally, we undertook detailed reviews of projects during the interview stage for a sample of projects for both RD20 and RD24. The selected projects are discussed in detail in this report in the following sections.

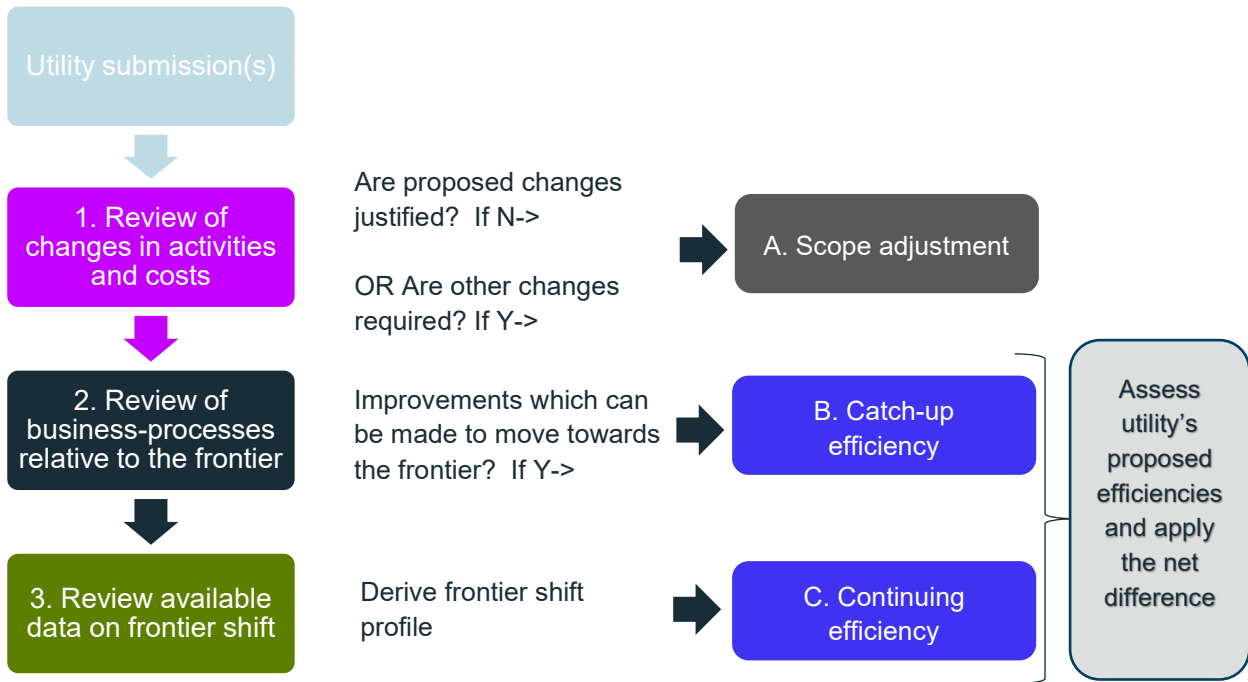
Based on information from SA Water's submission, interviews, and requested information and documents, we reviewed the activities and costs associated for RD20 and RD24. We considered the historical and proposed costs and assessed any changes to determine any specific scope adjustment recommendations. Additionally, based on SA Water's systems and processes in delivering or developing historical and proposed projects and programs, we



considered efficiency adjustments, including adjustments related to frontier shifts. Figure 1-1 highlights our high-level methodology and approach to the expenditure review.

It is worth noting that our review process adapts to issues arising from the review such as our approach to understanding SA Water’s cost estimation class system. We also aimed at incorporating our understanding of the deliverability of the program based on SA Water’s historical performance.

Figure 1-1 Approach to assessing efficiency



1.3 Price base

SA Water provided its historical and forecast expenditure for the period between 2019 and 2024 in nominal values (\$nominal). For the RD24 proposal, SA Water presented the figures in real 2022-23 (\$FY23).

In our review, for the purpose of consistency and our analysis, we used a \$FY23 price base throughout our report, unless stated otherwise. To convert values received to \$FY23, we utilised the following index shown in Table 1-1 to inflate/deflate values received. The index was used having had regard to feedback from ESCOSA.

We understand that the Commission might need to adjust the indices to apply in its model should it utilise an alternative price base.

Table 1-1 Index used to convert values to \$FY23 price base

	2018	2019	2020	2021	2022	2023	2024
Index	112.1	114.1	115.6	117.2	121.3	130.8	136.4
Factor used for conversion to \$FY23	1.167	1.146	1.132	1.116	1.078	1.000	0.959

Sources: For 2018 to 2020: *RD24 Revenue model - Final ESCOSA.xlsx*, ESCOSA, September 2023. For 2021 to 2024: ESCOSA projections.

2. RD20 capex review

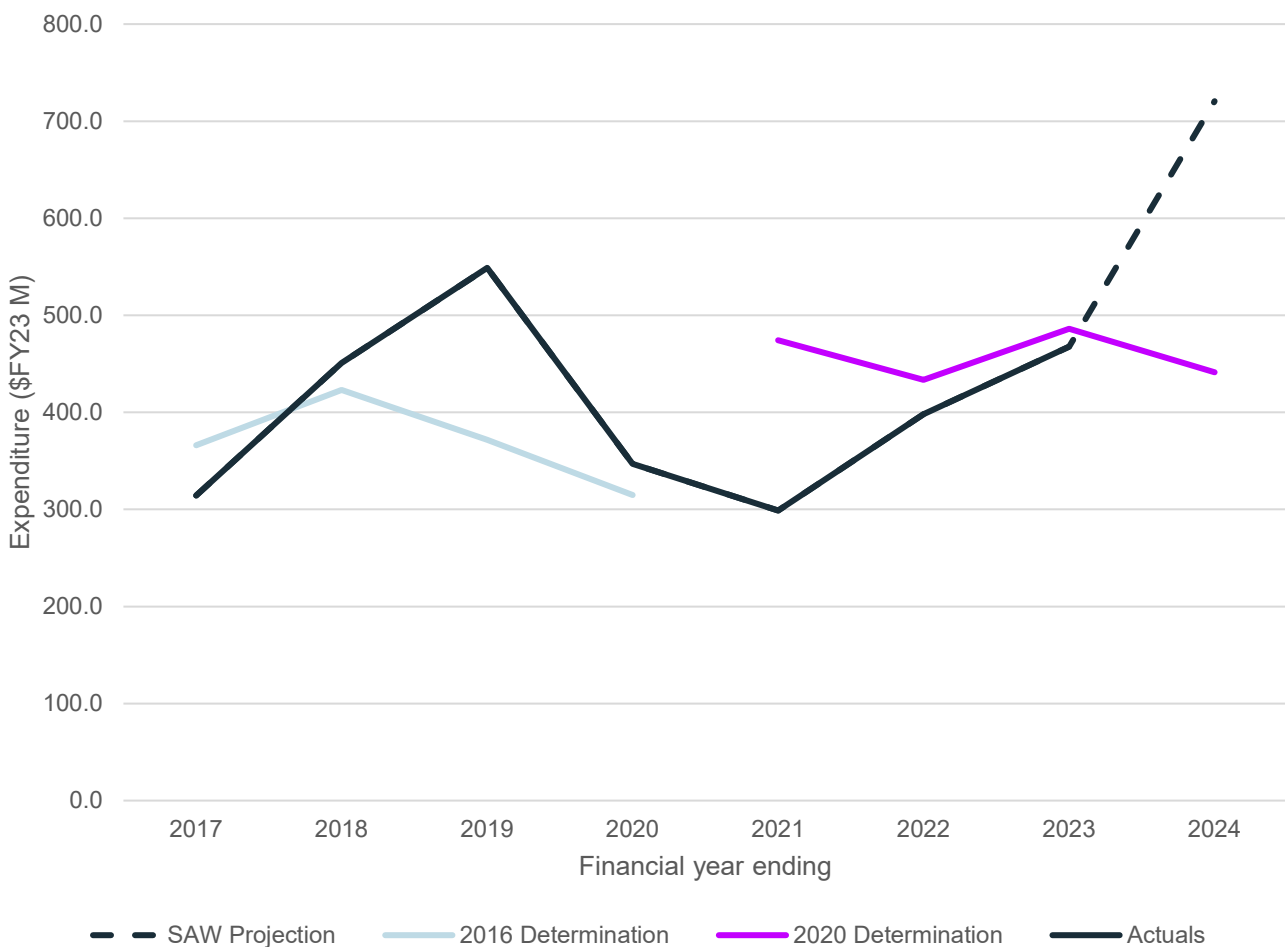
2.1 Outturn capex

In its RBP, SA Water has highlighted a number of challenges that it faced in the RD20 period. This included a number of factors affecting its capex program including Covid and its impact on contractor procurement, cost escalation and supply availability for materials and equipment, significant new connection applications in FY21 and FY22, and SA Water’s response to 2022-23 floods.

Outturn capex in the first three years of RD20 (those for which we have outturn expenditure) was \$229.3M or 16% less than the 2020 Determination. However, SA Water is forecasting a significant increase in expenditure in FY24, which, if it materialises, would lead to an overspend of \$50M (or 3% across the RD20 period).

Outturn capex is compared to the 2016 and 2020 Determination assumptions in table form and graphically below. This makes clear the significant underspend in the first year of RD20, with a ramp up in expenditure narrowing the gap to the Determination level and the significant increase in expenditure projected by SA Water in FY24.

Figure 2-1 Outturn capex and the Determination allowance



Source: Cardno/Atkins 2020 report, SA Water RBP24 and SA Water Revenue Model.

Note this is net capex and includes corporate Technology expenditure



Table 2-1 Variance from Determination allowance (\$FY23 M)

	2017	2018	2019	2020	2021	2022	2023	2024 (forecast)
Net Capex (includes Corporate Technology)	314.2	451.0	548.9	346.9	298.8	398.1	467.6	720.6
2016 Determination	366.2	423.1	371.5	314.8				
2020 Determination					474.3	433.5	486.1	441.2
Variance from Determination	(52.1)	27.9	177.3	32.0	(175.5)	(35.4)	(18.5)	279.3

Source: Cardno/Atkins 2020 report, SA Water RBP24 and SA Water Revenue Model

We examine below some of the causes of the variance from the RD20 Determination.

2.1.1 Variance in large project expenditure

There are six large⁸ projects in RD20 which have had a significant impact on outturn expenditure. Individually, these projects have seen large variance from RD20 Determination assumptions, ranging from 73% underspend to 364% overspend. However, the overall impact of the large projects has been a more modest overspend of \$22.0M (6%) compared to RD20 assumptions.

This is because there have been two counteracting effects at play:

- There have been delays largely due to the complexities of project development and delivery. This has caused underspend in projects such as Mount Bold, Eyre Peninsula Desalination and Morgan Whyalla Pipeline.
- In projects which have proceeded to delivery there has been overspend due to the emergence of greater complexity than was assumed at the time of RD20. This has led to overspend in projects such as Bolivar WWTP Upgrade and Kangaroo Island Desalination.

We reflect on the implication of these factors for RD24 further in Section 3.

⁸ Projects for which SA Water either included more than \$50M in its RD20 post-Determination modelling or is now expecting to spend more than \$50M on.

Table 2-2 Forecast RD20 variance for large projects (\$FY23 M)

Project Name	RD20 allowance	Forecast outturn in RBP24	Variance	Variance	Comment on variance
Mount Bold Dam Safety Upgrade	97.9	26.1	(71.8)	-73%	Project has returned to option selection phase due to higher complexity and cost than expected
Eyre Peninsula Desalination Augmentation	98.2	78.5	(19.8)	-20%	Delays due to revisiting of site selection and decision-making complexities
Morgan Whyalla Pipeline No1 Replacement	70.1	56.1	(13.9)	-20%	Delays due to complexities of environmental approvals
Tea Tree Gully WW Works	67.9	59.5	(8.4)	-12%	Not reviewed
Bolivar WWTP Capacity Growth Upgrade	25.7	49.1	23.4	91%	Project was more complex to deliver than assumed
Kangaroo Island Desalination Plant	30.9	143.4	112.5	364%	Higher costs due to development conditions, need to lay main twice and SA Water view that original cost estimate was too low
TOTAL FOR THESE PROJECTS	390.6	412.7	22.0	6%	

Source: analysis of spreadsheets: “Just for records - SAW RD20 capex by project as per August 2020 following determination” and “20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033)”.

Note: the variance is based on SA Water’s forecast FY24 expenditure so the actual variance may differ.

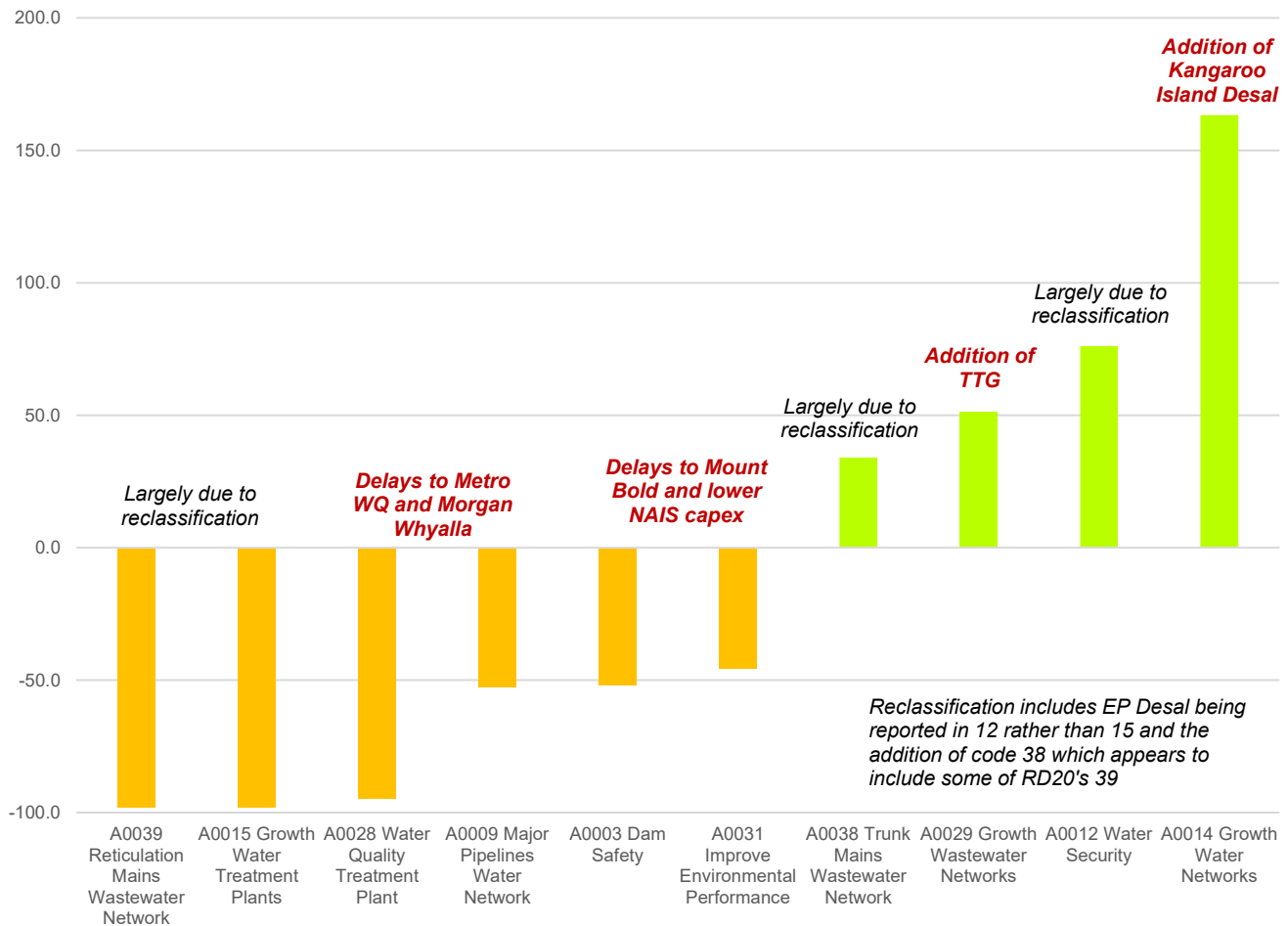
2.1.2 Variance by program

We have examined RD20 capex variance by program, comparing SA Water’s forecast outturn expenditure with its assumed program level expenditure after the 2020 Determination⁹. As can be seen, the largest variances are driven by reclassification of projects between programs, delays to large projects discussed above, and addition of projects after the RD20 capex review (Tea Tree Gully and Kangaroo Island desalination¹⁰).

⁹ Based on SA Water spreadsheet “Just for records - SAW RD20 capex by project as per August 2020 following determination.xlsx”

¹⁰ For example, as explained in the Commission’s RD20 final determination, following publication of the Commission’s Draft Determination for RD20, the Minister for Environment and Water issued to SA Water a direction pursuant to section 6 of the Public Corporations Act 1993, which required SA Water to construct a desalination plant and associated delivery infrastructure on Kangaroo Island.

Figure 2-2 Top 10 program variances (\$FY23 M)



Source: analysis of spreadsheets: “Just for records - SAW RD20 capex by project as per August 2020 following determination” and “20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033)”.

We have commented in Appendix A.1 on all program variances greater than \$15M.



2.1.3 Variance by broad driver

SA Water categorises its capital expenditure using four drivers: sustain services, external responsibilities, enable growth and improve services. We have examined variance in the capex program using two broader drivers: “sustain” and “enhance”¹¹. We feel that this is a more useful categorisation as some projects have been reclassified between the enhance drivers making comparison over time difficult. We also consider that “enhance” is a useful category to examine in its own right as many of the projects share the characteristics of requiring more detailed project development in a way which is distinct from the approach taken to asset renewals.

Table 2-3 Broad drivers

SA Water Driver	Our broad driver
Sustain services	Sustain
External responsibilities	Enhance
Enable growth	
Improve services	

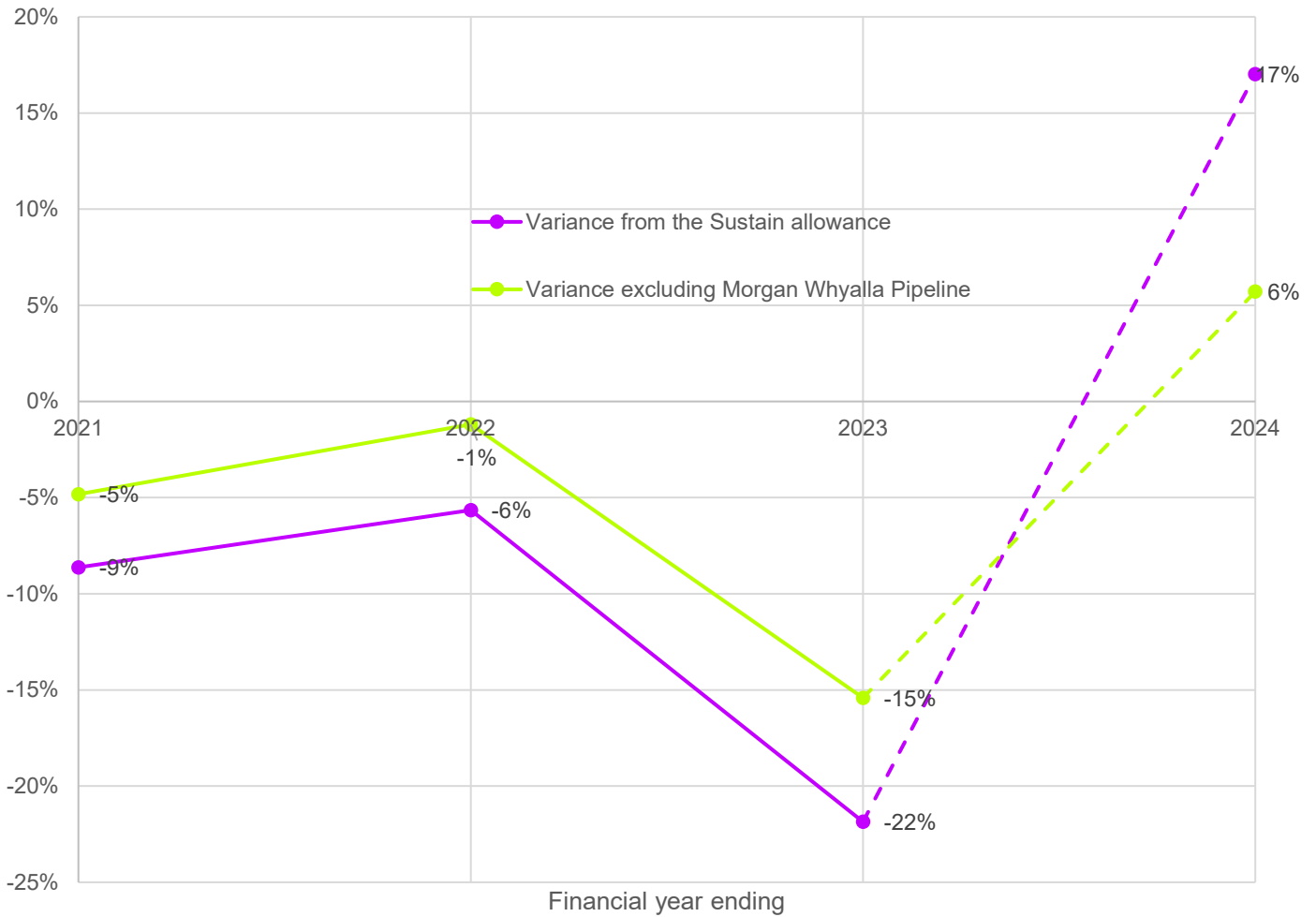
Sustain

As can be seen below there has been underspend against the Sustain driver for every year of actuals (i.e. FY21 to FY23), although this underspend is less if we adjust for the Morgan Whyalla Pipeline project which has been delayed due to issues such as environmental permitting. SA Water’s forecast for FY24 indicates a significant overspend in the last year of RD20. We note that this overspend is significantly less than SA Water forecasts for Enhance. We have also recommended some adjustments to assumed FY24 expenditure which reduce this overspend.

Outturn Sustain capex in the first three years of RD20 was \$93M or 12% less than the 2020 Determination. However, SA Water is forecasting an increase in expenditure in FY24 which, if it materialises, would reduce the underspend to \$52M or 5% across the RD20 period.

¹¹ All expenditure which is not classified as ‘sustain services’

Figure 2-3 Variance against RD20 capex allowance for the Sustain driver



Source: analysis of spreadsheets: “Just for records - SAW RD20 capex by project as per August 2020 following determination” and “20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)- ESCOSA (A3167033)”.

Enhance

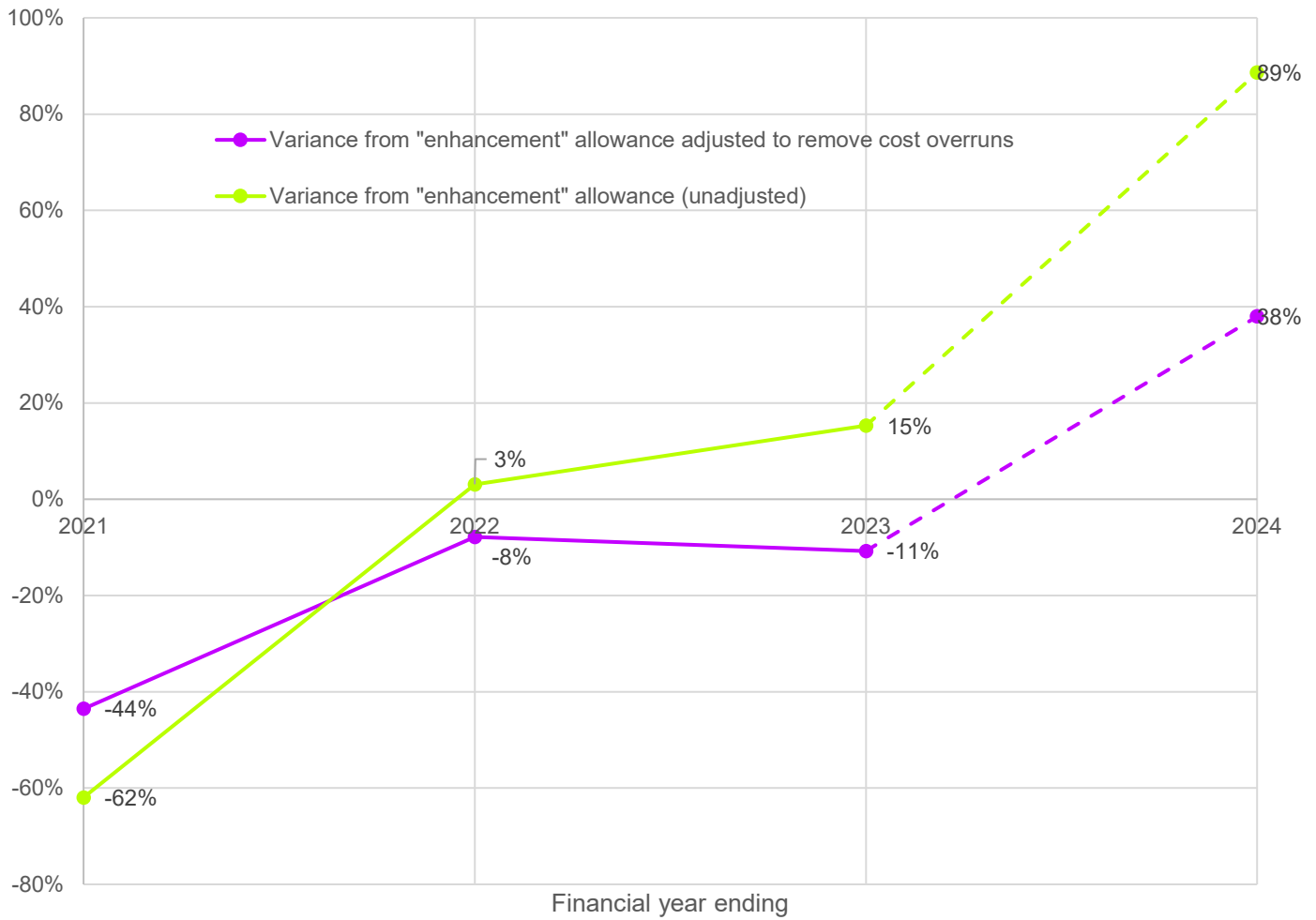
Outturn Enhance capex in the first three years of RD20 (i.e. the actuals) was \$139M or 22% less than the 2020 Determination. SA Water is forecasting a significant increase in expenditure in FY24 which, if it materialises, would lead to an overspend of \$32M or 4% across the RD20 period.

As can be seen below, the extent of underspend in FY21 enhance expenditure was very significant. This is then followed by overspend in FY22 and 23 and, if SA Water’s forecasts are correct, FY24 (noting that we have recommended some adjustments to which would reduce this expenditure). This pattern is consistent with the observations of the large projects set out in Section 2.1.1 i.e. a mix of delays and project overspend.



We have also presented a version with the impacts of cost overruns in two large projects¹² removed. This allows us to see what the variance would have been if SA Water had accurately forecasted expenditure for these projects at RD20.

Figure 2-4 Variance against RD20 capex allowance for “enhance” spend



Source: analysis of spreadsheets: “Just for records - SAW RD20 capex by project as per August 2020 following determination” and “20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)- ESCOSA (A3167033)”

¹²Forecast cost variances resulting from the Bolivar WWTP Capacity Growth Upgrade (\$25M overspend) and Kangaroo Island Desalination (\$94M) have been removed.



2.1.4 Impacts of Covid

In March 2020, South Australia's state borders were closed. Restrictions and outbreaks continued to affect the State in different ways for the next two to three years.

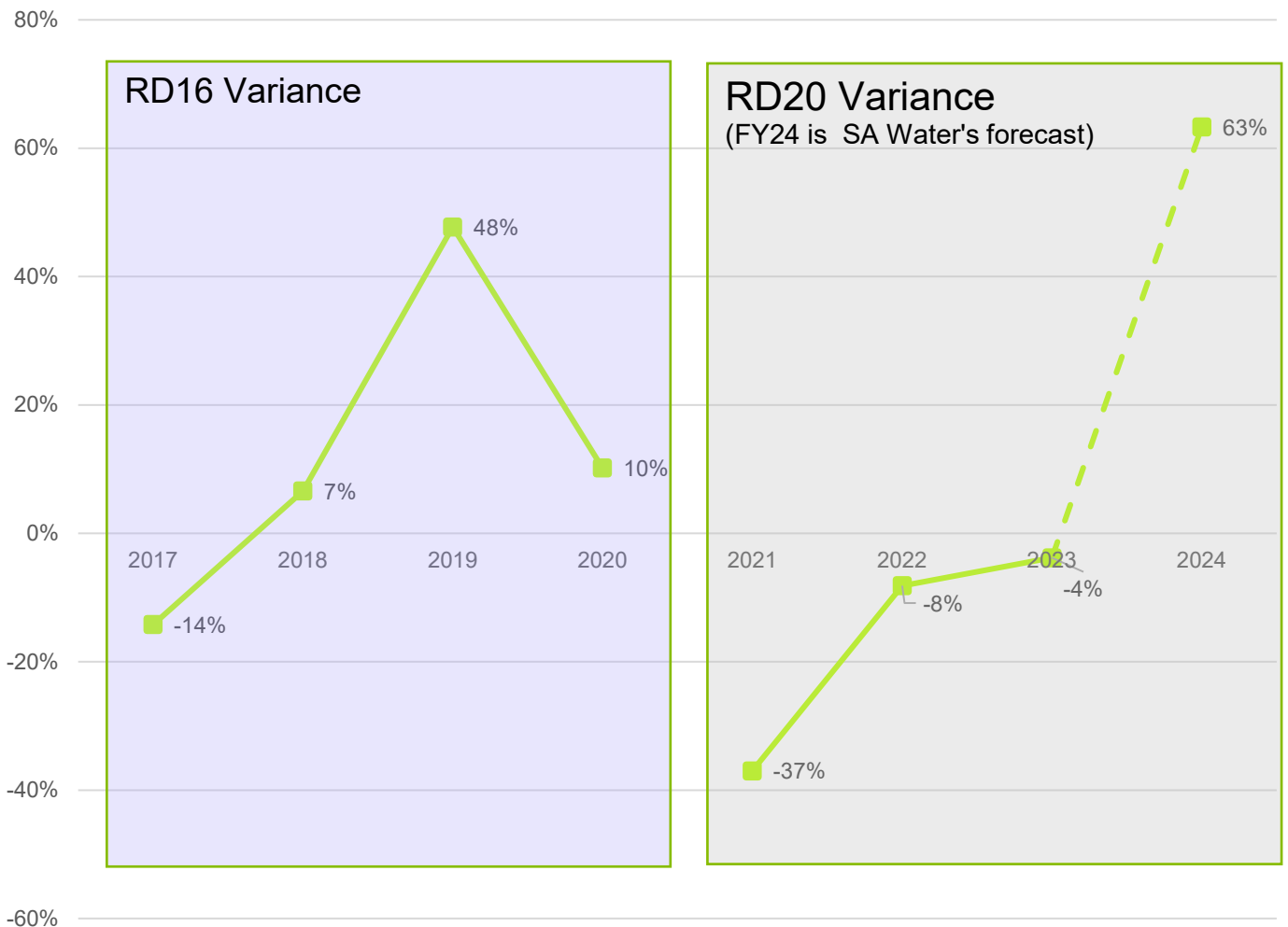
The RBP cites Covid as one of the main reasons for delivery varying from expectations in RD20 along with the effects of the Ukraine conflict.

COVID-19 impacts contributed to a large underspend of capital expenditure in 2020-21 and 2021-22 and resultant rephasing of works".¹³

Examples given of the impacts include delays to non-essential or non-critical path construction activities until risk reduced, delays caused by personal leave especially in the first half of 2022 and delivery delays due to sickness or isolation.

There was indeed a significant underspend in FY21 and FY22 and to some extent FY23 as can be seen below.

Figure 2-5 Variance from Determination allowance

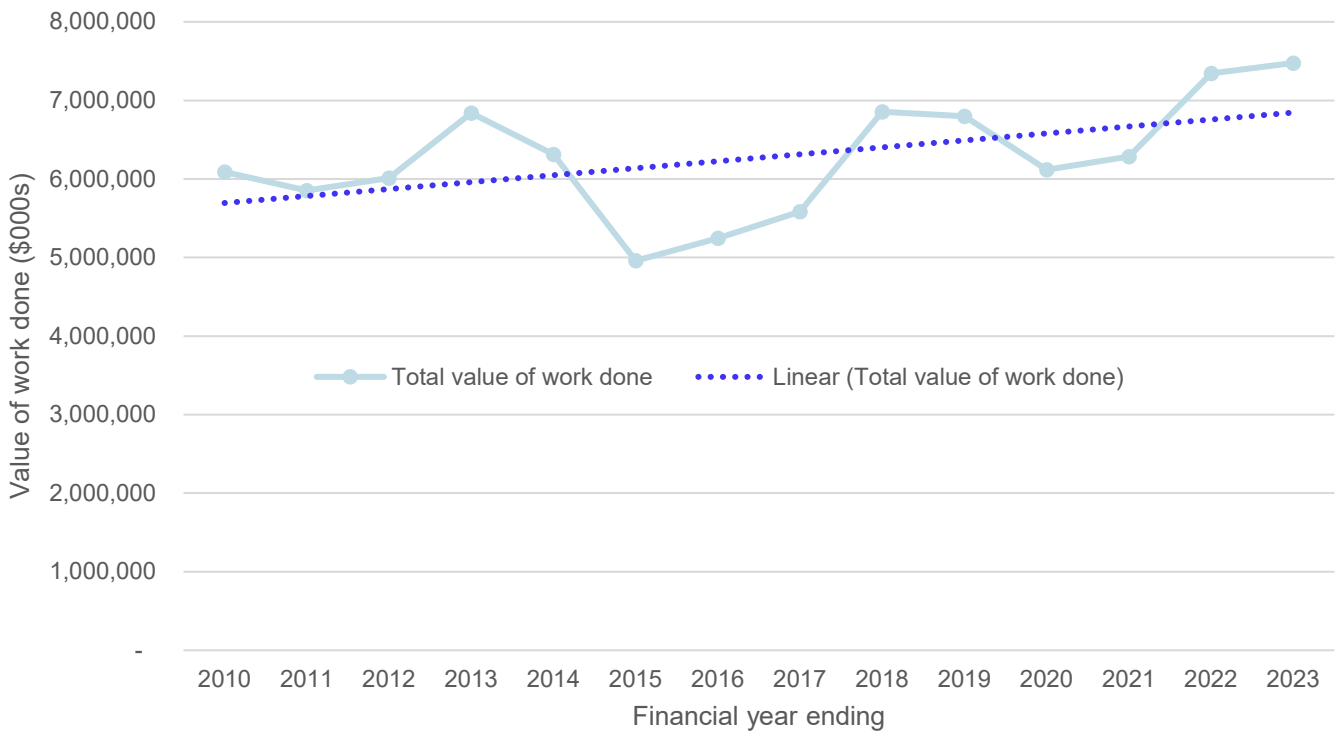


¹³ Section 3.1.1.1 of the RBP.

However, our view is that the underspend in FY21 and FY22 is likely partially, rather than fully, due to Covid as:

- SA Water also underspent in the first year of RD16 by 14% suggesting a Year 1 effect may be possible (i.e. schemes do not progress as rapidly at the start of the period as assumed by SA Water in the RBP).
- Based on the sample of projects reviewed, many Enhance projects in RD20 were primarily delayed due to revisiting optioneering, scope evolution and emerging complexities rather than Covid (see project specific text below and summaries in Section 2.1.1). This contributed to very significant underspend in Enhance expenditure in FY21 but also FY22 and FY23 if cost overruns are stripped out (see Figure 2-4).
- There was a much more minor underspend in Sustain capex in FY21 and 22 suggesting that it was possible to keep a significant part of the capital expenditure program on track (see Figure 2-3).
- The ABS real price adjusted index of engineering outputs suggests a real terms dip in construction output in South Australia of 7.0% in FY20 and 5.7% in FY21 respectively, but this is followed by 8.7% and 9.2% above trend outputs in FY22 and FY23 respectively¹⁴. This suggests that in FY22 and 23 construction was able to recover to above normal levels.

Figure 2-6 Value of engineering work done in South Australia by financial year



Source: ABS Series ID A1831459K, Value of work done; Chain Volume Measures¹⁵; South Australia \$000s.

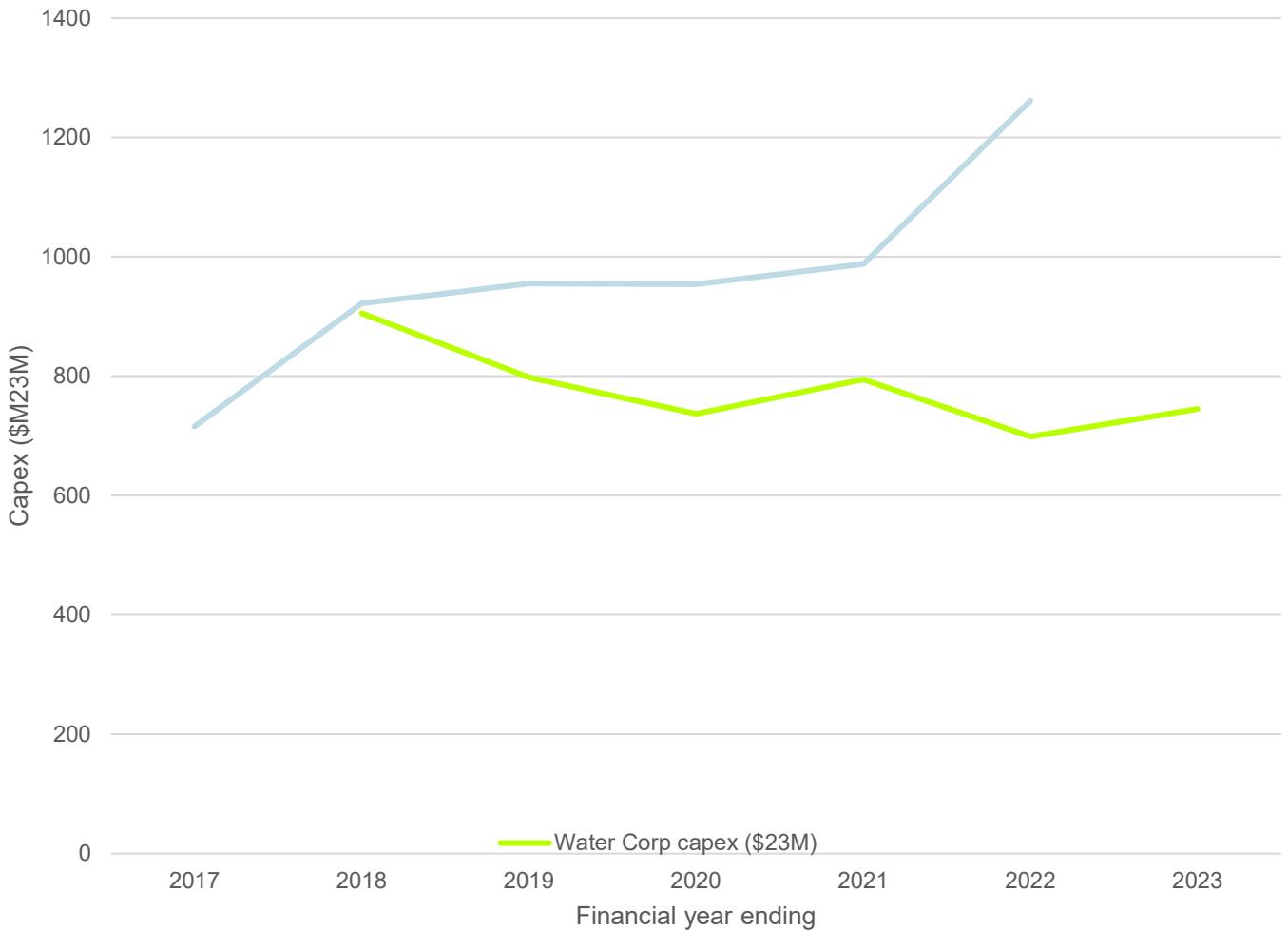
¹⁴ Based on a linear trend line from 2010 to 2023.

¹⁵ “Chain volume” measures changes in value after the direct effects of price changes have been adjusted for and therefore only reflect volume changes. See ABS methodology for more detail e.g. [Engineering Construction Activity, Australia methodology, June 2023 | Australian Bureau of Statistics \(abs.gov.au\)](#).



- Other comparator utilities, such as Sydney Water and Water Corporation – Perth, didn't see the significant drops in capex in FY21 that SA Water experienced ¹⁶.

Figure 2-7 Water Corporation and Sydney Water Capital Expenditure (\$23M)



Source: Sydney Water and Water Corporation's annual reports

It therefore appears likely that much of the early underspend is due to project preparation and delivery challenges especially in Enhance projects and large Sustain projects such as the Morgan Whyalla pipeline.

¹⁶ Sydney Water's expenditure was below the 2020 Determination assumption in FY21 but this appears to be at least partly due to a slow ramp up in capex as was also seen at the start of the 2016 Determination period.



2.1.5 Deferral / reprioritisation during RD20

The RBP sets out that SA Water expects to have deferred approximately \$440M of RD20 expenditure, stating that:

The first 2 years of the RD20 period, 2020-21 to 2021-22, were affected by the significant challenges discussed in Section 3.1. Some of these effects remain, impacting the rest of the regulatory period, resulting in deliverables from RD20 being deferred to future regulatory periods.

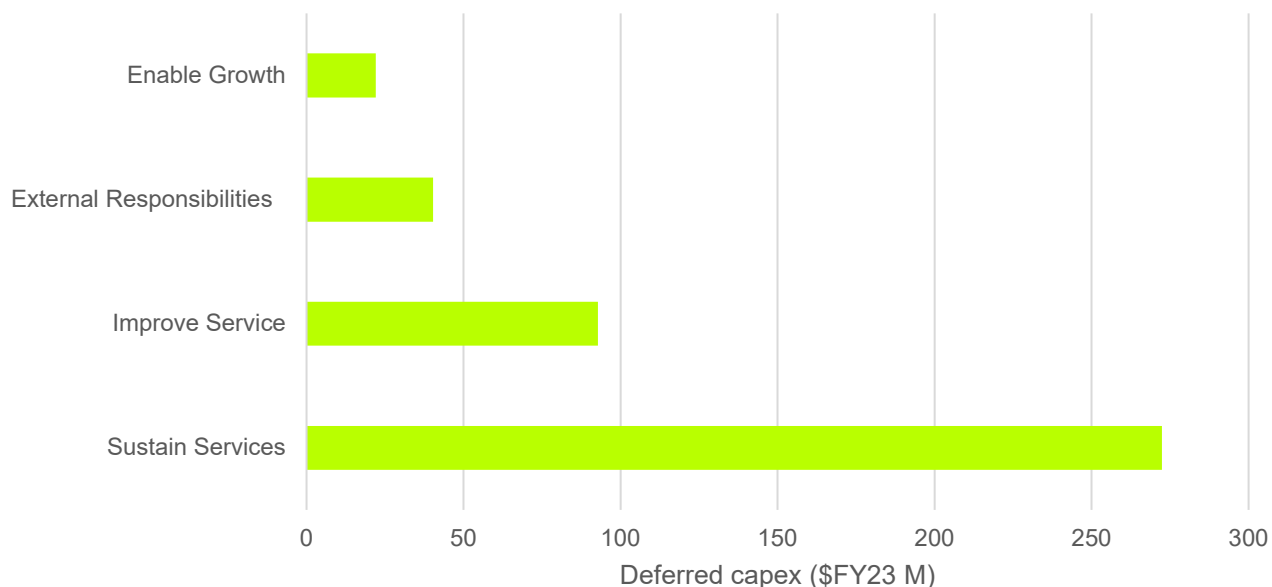
...Reprioritisation in RD20 has resulted in a significant portion of projects being deferred for consideration and assessment through the RD24 development process, together with other initiatives already expected to be considered in this period. After year 2 of the current regulatory period, around \$330 million of deferrals had been processed because of market driven cost pressures, changing business priorities and out of cycle growth. Further reprioritisation during year 3 is projected to deliver around \$110 million in additional deferrals.

SA Water has provided a breakdown of the programs affected by the process. Even after the reprioritisation process, expenditure on the programs identified is expected to be above, or very close to, their RD20 capital allowance (just 0.9% or \$10.4M below the allowance). During interviews with SA Water staff, it became clear that the deferrals were of items which were in SA Water's delivery plan at the time rather than necessarily of specific items from the RD20 allowance.

The majority (62%) of the programs affected by the deferral are "sustain" (i.e. largely involve reprioritising of activities such as asset renewals). Reprioritising of deferrals is considered to be reasonably standard industry practice and the change does not appear to have adversely affected performance as seen in Section 3.2.1.

We note that 'Improve Service' is the next largest driver affected by the process. We note that this may relate largely to the Metro water quality program, deferred following lessons learned from the Myponga pilot as discussed in Section 3.2.3.1.1.

Figure 2-8 'Deferred' capex by driver



SA Water document "RD24064" and 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

We comment in Table A-2 on the programs identified as have been affected by the deferral process and their variance from the RD20 assumed expenditure.

2.2 Project reviews

In our review of SA Water’s capital expenditure, we evaluated its financial and technical performance for RD20. As part of our methodology, we have selected a number of projects to review at a more detailed level. We requested, for the selected projects, that SA Water presents and discusses the status of the delivery, in detail, of these projects during the interview stage. We have utilised these detailed reviews to inform our view on SA Water’s capex efficiency and prudence over the RD20 period, in addition to other discussions and information received.

We identified nine (9) programs/projects to look into in detail as part of our review of SA Water’s capex. In our selection, we recognize that expenditure line items provided by SA Water might include programs with multiple projects. Using ex-post expenditure data received from SA Water, we ranked each program/project per spend and categorized projects per service type and driver. In our selection, we aimed at having a sample that includes major expenditure programs/projects and covers a range of service types and drivers. The list of programs and projects shown below were selected in consultation with the Commission.

Table 2-4 Selected ex-post programs and projects for detailed reviews

C Number	Project Name	Service Type	Driver
C4094	Kangaroo Island Desalination Plant	Water	Enable Growth
C5240	Eyre Peninsula Desalination Augmentation	Water	External Responsibilities
C3673	AP Mains WN WMR Metro OP20	Water	Sustain Services
C3828	Morgan Whyalla Pipeline No1 Replacement	Water	Sustain Services
C1928	Bolivar WWTP Capacity Growth Upgrade	Wastewater	Enable Growth
C3033	NAIS Infrastructure	Wastewater	External Responsibilities
C3756	AP Structures WWTP BWWTP	Wastewater	Sustain Services
C4699	Regional Areas WQ Improvement WTP	Water	Improve Service
C8056	Major Plant Acquisition	Other	Sustain Services

As part of the review, we held interviews with SA Water regarding each of the selected projects and programs. During the interviews, SA Water presented its view on the programs and projects’ delivery and status. In this section, we present our view on SA Water’s level of efficiency and prudence in delivering each of these programs and projects. Additionally, our specific detailed reviews informed our understanding of SA Water’s RD20 capex program as a whole.

2.2.1 Morgan Whyalla Pipeline No1 Replacement

The Morgan Whyalla Pipeline is a dual pipeline which takes water from Morgan on the River Murray to Whyalla and the Upper Spencer Gulf region of South Australia. The first pipeline (MWPL1) is 358km long, mainly above ground, and was laid in the 1940s with a duplicate (MPWL2) added two decades later. MWPL1 ranges from 0.5 to 1.0m diameter and is made of cement-lined mild steel.

There are approximately 1000 patch repairs in a single year on MWPL1. SA Water has identified stretches of the pipeline which need to be renewed using walkovers and pipe diver and scanning.

SA Water revisited the options appraisal and determined that it was better to replace a longer continual section rather than piecemeal replacement and that replacing 34km would cost the same as the originally envisaged 14km of shorter sections.



A decision was also made to pause renewals between Port Augusta and Whyalla in case the Northern Water project changed the need for that section of the pipeline. [REDACTED]

One of the major framework partners (MFPs), McConnell Dowell and Diona Joint Venture, was strong in this area and was selected to undertake the works in a design & construct arrangement. However, construction has not started as at the date of this review and actual expenditure is \$41.9M less than the RD20 allowance. SA Water consider that one of the main reasons for the delays is the environmental constraints. For example, the Mallee Bird was first gazetted in December 2021 and surveys in January 2022 identified a number of threatened fauna.

The expenditure to date has included purchase of materials (including 8.4km of pipeline, now in storage), valves and fittings. At the date of interview, no Target Outturn Cost (TOC) had been agreed and the project was going through the TOC assurance process.

The project timeline presented by SA Water indicates that the project is currently scheduled to be complete in FY26. However, even this appears potentially optimistic with environmental consenting still not complete at the time of interview. This is acknowledged by SA Water in its RFI response¹⁷.

Table 2-5 Morgan Whyalla Pipeline Replacement Project Timeline

Milestone	Original Timeline	Current Timeline
Full Financial Approval	Q2 2021	Q3 2021
Pre-Construction and Procurement	Q3 2021 – Q4 2021	Q3 2021 – Q4 2023
Construction	Q1 2022 – Q4 2023	Q1 2024 – Q4 2024*
Practical Project Completion	Q1 2024 – Q4 2024	Q4 2025 – Q2 2025*
Final Completion / End Defects Period	Q1 2025	Q2 2026

*Subject to EPBC referral and outage availability

Source: SA Water presentation

We therefore recommend assuming completion in FY27 and have reprofiled expenditure as follows. We have assumed a low level of expenditure (similar to FY23) in FY24 and have spread the remainder of the spend over a three year construction period as set out below.

¹⁷ SA Water document '20231005 - SAWRD24 - RD24103 - Response to RFI (A3205487)'

Table 2-6 Proposed, outturn and recommended capex for Morgan Whyalla Pipeline No1 (\$FY23 M)

	2021	2022	2023	2024	2025	2026	2027	2028	RD20 Total	RD24 Total
RD20 allowance	9.8	24.6	24.5	11.2					70.1	-
Outturn/forecast	1.8	12.4	2.8	39.2					56.1	-
Variance	(8.0)	(12.2)	(21.7)	28.0					(13.9)	-
Recommended expenditure	1.8	12.4	2.8	3.0	12.1	12.1	12.1	-	20.0	36.2
Recommended adjustment	-	-	-	(36.2)	12.1	12.1	12.1	-	(36.2)	36.2

Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx and "Just for records - SAW RD20 capex by project as per August 2020 following determination".

2.2.2 Kangaroo Island Desalination Plant

In its RD20 regulatory submission, SA Water proposed \$28M for the construction of a new desalination plant and 17km of trunk main on Kangaroo Island to increase water availability and reduce reliance on rainfall. ESCOSA's draft regulatory determination did not find the project to be prudent. Following the bushfires on Kangaroo Island in 2020, the Minister at the time provided a Section 6 Direction directing SA Water to include up to \$28M of capex for the construction of a 2Mld desalination plant and "associated infrastructure", with additional contributions of \$19.8M from the South Australian and Commonwealth Governments i.e. a total expenditure of \$47.8M. We understand that the \$19.8M was added to the total to allow for extension of reticulation to townships on the island.

The plant is being constructed next to the small existing desalination plant at Penneshaw, which is being retained. One of the main reasons that the site was chosen was the proximity to the power grid. When complete the project will consist of:

- Stage 1 trunk main: 15kms of pipeline from Penneshaw to Pelican Lagoon.
- Stage 2 trunk main: approximately 35km extension of the Stage 1 trunk main to Cygnet River
- Desalination plant (2Mld), electricity connection and marine works, with some elements sized for 6Mld to allow for future expansion
- Four packages of township reticulation (Island Beach & Sapphire town, Baudin Beach, American River, Muston Road express main).

Having originally estimated the costs of the plant and trunk main at \$28M and being directed to spend a total (gross) of \$47.8M in May 2020, the anticipated expenditure on the project has more than tripled to \$143.4M. Less than a year after the Direction, in April 2021, the SA Water Board approved an increased budget of \$64.9M with the increases linked to design development and community engagement. This was then more than doubled in 2022 to \$143.4M due to "technical, procurement, development conditions and community engagement challenges"¹⁸.

In discussion with SA Water, we understand that development conditions increased expenditure by tens of millions, with removal and avoidance of native vegetation more challenging than expected, and community engagement leading to

¹⁸ SA Water presentation 26 September 2023.

greater costs to mitigate visual impacts. It appears likely that the original cost estimates significantly under-estimated the complexity and costs of delivering a project of this sort.

We also understand that SA Water is paying to relay the Stage 1 trunk main. There are confidentiality challenges around provision of information, but we understand that approximately 13km of the main had been constructed when it became clear that it had to be re-laid.

In our experience, it is highly unusual to (1) have to relay a brand-new water main and (2) for the risk of deficiency to sit fully with the corporation and its customers. **We have recommended an ex-post adjustment of \$14M so that customers do not have to pay for the defective asset.**

It is expected that new connections will start to receive water from mid 2024 and that, in reality, approximately \$3M of expenditure is expected to slip into FY25. We have reflected this adjustment in our recommended RD20 expenditure along with the ex-post adjustment as summarised below.

Table 2-7 Proposed, outturn and recommended capex for Kangaroo Island Desalination Plant (\$FY23 M)

	2021	2022	2023	2024	2025	2026	RD20 Total	RD24 Total
RD20 allowance	52.8	-	-	-			52.8	-
Outturn/forecast	3.7	19.5	49.8	70.3			143.4	-
Variance	(49.0)	19.5	49.8	70.3			90.6	-
Recommended expenditure	3.7	19.5	49.8	53.3	3.0	-	126.4	3.0
Recommended adjustment	-	-	-	(17.0)	3.0	-	(17.0)	3.0

Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx and "Just for records - SAW RD20 capex by project as per August 2020 following determination"
 Note that the costs in this table differ from the values quoted in the text above as they are in \$FY23 rather than nominal

2.2.3 Eyre Peninsula Desalination Augmentation

The Uley South Borefield is one of the main sources of water for the Eyre Peninsula. A number of studies have raised concerns about the sustainability of the level of abstraction from the field. A project to develop a 4Gl p.a. desalination plant on the Eyre Peninsula and reduce abstraction from the Borefield was proposed and found to be prudent in the RD20 review. The purpose of the project is to provide a climate independent water source in the face of seawater intrusion into the basin.

Strategic optioneering was initially carried out in 2018. This was followed by a protracted site selection process. SA Water identified a preferred site at Sleaford North in 2019. This was then revisited in 2020 to try to reduce costs following receipt of ECI contractor estimates. A multi-criteria analysis was carried out which led to the selection of an alternative site at Billy Lights Point in October 2021. The then Minister announced a 12-month project "pause" in November 2021 to allow for further community engagement about alternative sites and for further baseline monitoring and investigations. An independently chaired Site Selection Committee was established in early 2022 and recommended a site in Sleaford West in August 2022. Significant investigations then revealed significant challenges at the site (native flora, cultural heritage, whale aggregation, length of pipeline connection). These led to a decision, announced by Government in March 2023, to revert to the site at Billy Lights Point (i.e. the preferred site in 2021). This site is preferred because it is in an industrial area, closer to water and electricity networks, limited adverse impacts and ability to expand if needed in future.

This has led to significant delays in delivery of the project with major construction scheduled to commence in 2024 and practical completion is expected in FY26. Costs have also increased significantly: from \$98.2M (\$FY23) in RD20 to \$316.4M (\$FY23).

We understand that the reasons for the project being more expensive include:

- It is now being designed for 5.3Gl p.a. because of the increased demand as the project has been delayed.
- Expenditure on the protracted site selection process and accompanying investigations.
- Cost escalation and under-appreciation of the full costs of developing and delivering a desalination plant in the Eyre Peninsula including the transportation costs, marine and environmental approvals and the rocky nature of the coastline.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

The project includes construction of 7.4 km of pipeline and 4 km of electricity infrastructure. In FY23 the major expenditure item was land purchase. We understand that the project is at 30% design phase and SA Water does not yet have an ECI contract in place [REDACTED]

[REDACTED] The team is confident that it will spend approximately \$52M (\$FY23) in the year.

The costs in the RBP are a Class 2 estimate. SA Water has provided a breakdown of the costs as follows. We cannot recommend that a P90 estimate is included in the capital program so have **recommended an adjustment of \$22.7M²⁰ to ensure that the central (P50) estimate is included instead of the P90.**

Table 2-8 Cost estimate for Eyre Peninsula Desalination

Cost Item	Cost Estimate (\$FY23 M)
Marine	
<i>Intake</i>	\$41.1
<i>Outfall</i>	\$26.4
Desalination Plant	
<i>Civil</i>	\$28.6
<i>Buildings</i>	\$28.2
<i>Mech/Elec/Process</i>	\$68.5
Transfer Pipeline	\$25.0
High voltage electrical connection	\$15.6
Client Delivery	\$19.1
Actual costs to April 2023	\$27.3

¹⁹ [REDACTED]

[REDACTED]

[REDACTED]

²⁰ \$22.7M is the difference between the P90 and P50 risk allowances (\$37.6M and \$14.9M respectively).



Cost Item	Cost Estimate (\$FY23 M)
Total	\$279.8
P50 Risk Allowance	\$14.9
P50 Total	\$294.7
P90 Risk Allowance	\$37.6
P90 Total	\$317.4

Source: SA Water document “20231106 - SAWRD24 - RD24134 - Response to RFI 20231019 (A3282999)”

During interviews, SA Water presented a revised profile of expenditure showing their updated view of likely spend. We considered recommending an adjustment to reflect this profile. However, we understand that consents are not yet in place at the time of this review. This can be a significant programme risk as demonstrated by recent experience on the Morgan Whyalla and Kangaroo Island projects. We have therefore recommended an alternative profile as follows.

Table 2-9 Proposed, outturn and recommended capex for Eyre Peninsula (\$FY23 M)

	2021	2022	2023	2024	2025	2026	2027	2028	RD20 Total	RD24 Total
RD20 allowance	98.2	-	-	-					98.2	-
Outturn/forecast	6.7	7.9	12.0	51.9	59.5	59.5	59.5	59.5	78.5	238.0
Variance	(91.5)	7.9	12.0	51.9	59.5	59.5	59.5	59.5	(19.8)	238.0
Recommended expenditure	6.7	7.9	12.0	51.9	15.0	50.0	100.0	50.3	78.5	215.3
Recommended adjustment	-	-	-	-	(44.5)	(9.5)	40.5	(9.2)	-	(22.7)

Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx and “Just for records – SAW RD20 capex by project as per August 2020 following determination”

2.2.4 Regional Areas WQ Improvement WTP

Prior to the RD20 Final Determination, SA Water received a Section 6 Direction to commence the upgrade of the water supply of customers in regional areas to a potable water supply. The wording of the Direction was as follows:

During the third regulatory period, SA Water must upgrade the water supply to potable water in the regional areas of Yunta, Oodnadatta, Maree, Terowie, Marla, Manna Hill (and the associated filling station at Peterborough).

SA Water will fund capital expenditure of up to \$40.5 million over the third regulatory period

The works involved construction of desalination plants in Oodnadatta, Marla and Maree, and new storage and disinfection systems at Terowie, Yunta and Mannahill. This project line relates to the delivery of the desalination plants in Oodnadatta, Marla and Maree, noting that the improvements at Terowie, Yunta and Mannahill are understood to be part of a separate project line “A0027 Water Quality Network”.

The communities involved currently receive non-potable water. The aim of this project is to move them to a potable water supply. It involves construction of containerised desalination plants, storage tanks and lagoons.



Under the terms of the Section 6 Direction, the project was expected to be completed within RD20. SA Water is reasonably confident that it will meet this deadline. The status of the plants at the time of review is summarised as follows:

- Oodnadatta- is complete.
- Marla- was being tested with potable water supply expected in October 2023.
- Marlee- SA Water is reasonably confident it will be complete at the end of the 2024 financial year.

Table 2-10 Proposed, outturn and recommended capex for Regional Areas WTP (\$FY23 M)

	2021	2022	2023	2024	2025	2026	RD20 Total	RD24 Total
RD20 allowance	3.6	3.6	3.6	3.6			14.5	-
Outturn/forecast	-	2.9	18.6	5.8			27.2	-
Variance	(3.6)	(0.7)	14.9	2.2			12.8	-
Recommended expenditure	-	2.9	18.6	5.8		-	27.2	-
Recommended adjustment	-	-	-	-	-	-	-	-

Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx and “Just for records – SAW RD20 capex by project as per August 2020 following determination”

The works have been procured through the major framework provider (MFP) route. One of the MFPs was considered well suited because they were able to self-perform the mechanical and electrical works. Use of an MFP has allowed SA Water the flexibility to only commit to packages of work when they are ready to and when the commercial risk is low. This means that the team could move work between sites when Oodnadatta was flooded, mitigating the cost and programme impacts.

A number of complexities emerged during project development and delivery which led to cost increases and delays. These include issues over the different title claims for the land, flooding which closed roads, limited accommodation, stakeholder engagement requirements leading to the need to create wider community benefits. The remoteness of the location has led to the need to containerise the plants and manufacture them in Adelaide. It also means that SCADA and on-site storage have been put in place with the closest operators being in Port Augusta.

We note that this project is another example of costs being higher than expected, partly due to what appears to have been under-appreciation of the potential complexities of project delivery. We consider that the progressive approach taken by SA Water with a series of TOCs has proven to be an appropriate mechanism to deal with the uncertainties in this program. We have not recommended any adjustments.

2.2.5 Bolivar inlet capacity growth

This is SA Water’s largest sewage treatment plant, treating 70% of Adelaide’s wastewater. In 2017, a study by SA Water concluded that the inlet is overloaded with flows exceeding its capacity and is not sufficient for the projected future flows²¹. A flow larger than capacity would potentially cause bypassing of treatment, which would lower the standard of the effluent wastewater quality. Additionally, due to the poor conditions of some of the inlet’s components, the operation requires the manual intervention of SA Water’s staff, which poses a safety risk. In RD20, the inlet at the Bolivar wastewater treatment

²¹ Presentation Document - Session 2 - RD20 Bolivar WWTP Capacity Growth Upgrade, SA Water, September 2023

plant was identified to be upgraded with the objectives to improve asset conditions, increase capacity, and reduce safety and environmental risks.

The Bolivar WWTP inlet capacity growth upgrade project was estimated to cost \$25.7M (\$FY23) in capital expenditure. However, as the project was initiated, site investigations and constructability assessment concluded the need for a staged cutover plan. This change caused a significant delay in schedule and increased the estimated cost. SA Water estimated a total cost for the project of \$67.7M (\$FY23) with \$50.1M spent in RD20 and the remaining \$18.6M in the first year of RD24, which is covered under the Growth WWTP and RWTP business case²².

During the interview stage of this review, SA Water presented an overview of the inlet capacity upgrade project and its status. The presentation highlighted that SA Water worked with its major framework delivery partner to navigate through the challenges of the project to ensure safe and efficient delivery. The development process took place over a year and the contract was awarded in 2022. The project is currently under construction and, from interview discussions, on track for completion in early 2025.

We consider the challenges posed by the project to be generally reasonable, given that it addresses a complex issue. The RD20 estimate and planning was at the early stages, which caused the project to further develop as more information became available. SA Water appears to have engaged its delivery partner effectively to establish a plan that identifies risks and its allocation among all parties involved.

Based on the information provided, we have not recommended any adjustment for this project for the RD20 period. We note that Table 2-11 highlights the outturn and forecast cost for both RD20 and RD24. However, we have not reviewed in detail the cost proposed by SA Water for the RD24 business case where this project continuation of work is covered under. Therefore, any overlying adjustment for RD24 such as efficiency and others, will still apply to the proposed RD24 for this project.

Table 2-11 Proposed, outturn and recommended capex for the Bolivar WWTP inlet capacity upgrade project (\$FY23 M)

	2021	2022	2023	2024	2025	2026	2027	2028	RD20 Total	RD24 Total
RD20 allowance	4.0	6.5	7.7	7.5	-	-	-	-	25.7	-
Outturn/forecast	1.2	2.5	10.0	35.4	18.6	-	-	-	49.1	18.6
Variance	(2.8)	(4.0)	2.3	27.9	18.6	-	-	-	23.4	18.6
Recommended expenditure	1.2	2.5	10.0	35.4	18.6	-	-	-	49.1	18.6
Recommended adjustment	-	-	-	-	-	-	-	-	-	-

Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx and “Just for records – SAW RD20 capex by project as per August 2020 following determination”

*the value of \$18.6M was from the BC-134 document which broke down the cost for BC-134 including the estimation for the Bolivar inlet capacity works.

We note that this recommendation takes into consideration SA Water’s comprehensive decision-making process. This highlights that projects identified at early stages in the regulatory period have the potential of facing delays and cost overruns. We understand that SA Water, since RD20, has developed a more robust cost estimation process, which allows the company to estimate more accurately.

²² Business Case 134 - Growth WWTP and RWTP 1.0 as of 24 Aug 2023, SA Water, September 2023.



2.2.6 Northern Adelaide Irrigation System (NAIS)

The Northern Adelaide Irrigation Scheme (NAIS) is a project with an objective to utilise effluent from the Bolivar WWTP. NAIS planned outcomes included supporting economic growth, reducing nitrogen discharge to the gulf, and providing customers with water. Initially, the project involved building a water recycling plant with 12 giga litres per year (GL/year). However, the SA Water Board approved the recommendation to reduce the size of the plant to 6 GL/year with ability for future expansion²³.

The scheme with the 6 GL/year plant was completed in March 2020²³. We understand that since the completion, SA Water has been utilising this expenditure budget to connect customers to the re-use water scheme, which is mostly reflected in FY22 and FY23 actual spend. SA Water has forecasted an expenditure for NAIS in FY24 of \$8.6M (\$FY23)²⁴, which is over 16 times higher than its aggregate spend for 2021-22 and FY23.

During the interview process, SA Water indicated that the increase in forecast represents an allowance to connect customers. Table 2-12 was shared by SA Water to show the number of committed customers and estimated budget for the projected connections²⁵. The table shows that the total estimated cost for committed connections is \$3.3M. Out of this amount, only \$0.2M is associated with a signed contract. Additionally, the value allocated under this budget for uncommitted customers is \$5.4M. SA Water did not provide an estimate for projected contributions from customers.

Table 2-12 New NAIS connection requests, status, and budget breakdown (\$FY23 M)

Location	Demand (ML/a)	Status	C3033 Budget Estimate (\$FY23 M) 2024*
Buckland Park Rd Two Wells	[REDACTED]	[REDACTED]	[REDACTED]
Ellis Rd	[REDACTED]	[REDACTED]	[REDACTED]
Hart Road extension 2	[REDACTED]	[REDACTED]	[REDACTED]
Bailey Road West cluster	[REDACTED]	[REDACTED]	[REDACTED]
Agrisano	[REDACTED]	[REDACTED]	[REDACTED]
TOTAL -committed			[REDACTED]
Uncommitted**			[REDACTED]
Total forecast as at July 2023			[REDACTED]

*Project costs are estimated and are subject to +/- 30-50%.

**If no additional customer demand is committed by June 30 2024, this will be carried over to the next regulatory period to enable fulfilment of the Government's Section 6 direction to expand the NAIS network to sell the remaining capacity.

Source: RD24131 – Response to RFI – NAIS FY24 projection cost break down, SA Water, September 2023

Based on the information provided, we consider that an efficient expenditure can be determined using actual customer requests. It is reasonable that SA Water expects to deliver the requested connections for contracted and committed customers soon. However, given that the cost estimates and the projects status are in early development, we believe

²³ Presentation Document - 20230928 - 29 - Session 1 - RD20 NAIS Infrastructure, SA Water, September 2023.

²⁴ 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx, SA Water, September 2023.

²⁵ RD24131 – Response to RFI – NAIS FY24 projection cost break down, SA Water, September 2023.

that some of the expenditure for committed customers will likely extend to FY25. Therefore, we recommend that half of the committed expenditure to be included for FY24 and the other half in FY25. We do not consider the remaining allowance under this budget to be efficient and have not recommended to include it. This recommendation represents a decreasing adjustment of \$7.0M in RD20 and increase of \$1.6M in RD24 as broken down in Table 2-13.



Table 2-13 Proposed, outturn and recommended capex for the NAIS project (\$FY23 M)

	2021	2022	2023	2024	2025	2026	2027	2028	RD20 Total	RD24 Total
RD20 allowance ²⁶	1.3	1.1	24.4	0.3					27.1	-
Outturn/forecast	4.0	0.4	0.1	8.6	-	-	-	-	13.1	-
Variance	2.6	(0.7)	(24.3)	8.4	-	-	-	-	(14.0)	-
Recommended expenditure	4.0	0.4	0.1	1.6	1.6	-	-	-	6.1	1.6
Recommended adjustment	-	-	-	(7.0)	1.6	-	-	-	(7.0)	1.6

Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx and “Just for records – SAW RD20 capex by project as per August 2020 following determination”.

Based on our review of this project, we investigated the step-change increase forecasted in SA Water’s overall capex program for FY24. The detail review of the step-change is covered in section 2.3.1.

2.2.7 Asset Program (AP) structures Bolivar WWTP

The Bolivar AP Structures program is a sub-program that is part of an umbrella program called AP Structures. The program focuses on the renewal of civil structures of SA Water’s assets with the aim to maintain reliability of these assets. The reviewed sub-program is specific to the renewal of civil structure assets at the Bolivar Wastewater Treatment Plant (WWTP). Per a presentation given by SA Water, the RD20 the Bolivar AP Structures sub-program included 12 renewal projects²⁷. However, after assessment by SA Water, six projects were added to the sub-program. The sub-program’s cost is estimated is projected to reach \$33.0M (\$FY23) by the end of the RD20. The projected estimate is \$4.7M lower than the allowance provided in RD20 for this sub-program. This is understood to be due to the re-prioritisation which shuffled projects based on further assessments during the implementation of RD20.

We understand that projects under the sub-program were identified based on SA Water’s continuous assessment of its assets. To deliver the project, SA Water engaged one of its Major Framework Partner, Fulton Hogan. This engagement was based on multiple considerations including the partner’s capacity and required scope. It is also worth noting that Fulton Hogan already has multiple projects in the Bolivar WWTP. SA Water explained that awarding the contract to Fulton Hogan allows for ease of coordination among the different working teams which reduces safety and interruption risks.

At the time of the review, SA Water stated that majority of sub-program is anticipated to be delivered at the target outturn cost and within the intended schedule²⁷. Per the information received, we consider that the delivery of the sub-program to be efficient and prudent. Therefore, we recommend the expenditure for the sub-program with no adjustment as highlighted below.

²⁶ The allowance for NAIS includes the line item for C3033 and “NAIS timing error” line item in the “Just for records - SAW RD20 capex by project as per August 2020 following determination” sheet. The values in the allowance row are gross.

²⁷ 20230927 - 23 - Session 2 - RD20 AP Structures WWTP BWWTP, SA Water, September 2023.

Table 2-14 Proposed, outturn and recommended capex for the AP Structures Bolivar WWTP (\$FY23 M)

	2021	2022	2023	2024	2025	2026	2027	2028	RD20 Total	RD24 Total
RD20 allowance	5.8	9.6	11.2	11.0					37.7	-
Outturn/forecast	10.0	9.6	7.9	5.6	-	-	-	-	33.0	-
Variance	4.1	0.0	(3.4)	(5.4)	-	-	-	-	(4.7)	-
Recommended expenditure	10.0	9.6	7.9	5.6	-	-	-	-	33.0	-
Recommended adjustment	-	-	-	-	-	-	-	-	-	-

Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx and “Just for records – SAW RD20 capex by project as per August 2020 following determination”

2.2.8 Major Plant Acquisition

SA Water has 239 assets that it quantifies as Major Plant Acquisition. These assets consist of heavy machinery and fleet, such as backhoes, excavators, loaders, graders, service trucks, and others. The value of these assets is reported by SA Water to be around \$239M²⁸. The assets are managed by a contracted fleet management service that advises SA Water on the health and life of the assets.

In RD20, the Major Plant Acquisition program was allocated a total of \$13.18M (\$FY23), which allows SA Water to replace assets in this category. The approach utilised by SA Water to replace these assets includes the evaluation of the information provided to them by the asset management contractor to make decisions on the optimisation of assets. For example, SA Water may elect to transfer an older asset that operates in a demanding operational condition to another site that is less demanding. SA Water has explained that this allows them to extend the life of the asset and delays the need for investment. Additionally, SA Water has procurement and risk management processes in place to ensure an efficient delivery of this program. By the end of the RD20 period, SA Water is forecasting to have replaced 59 major plant assets with a projected spend of \$13.25M (\$FY23).

Based on the information reviewed for this program, we recommend the proposed outturn and forecast cost as shown below.

²⁸ 20230927 - 22 - Session 2 - RD20 Major Plant Acquisition, SA Water, September 2023

Table 2-15 Proposed, outturn and recommended capex for the Major Plant Acquisition (\$FY23 M)

	2021	2022	2023	2024	2025	2026	2027	2028	RD20 Total	RD24 Total
RD20 allowance	3.4	3.3	3.3	3.2					13.18	-
Outturn/forecast	2.8	3.7	3.7	3.0	-	-	-	-	13.25	-
Variance	(0.6)	0.4	0.5	(0.2)	-	-	-	-	0.06	-
Recommended expenditure	2.8	3.7	3.7	3.0	-	-	-	-	13.25	-
Recommended adjustment	-	-	-	-	-	-	-	-	-	-

Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx and “Just for records – SAW RD20 capex by project as per August 2020 following determination”

2.2.9 Asset Program (AP) Mains Water Network Renewal – Metro

The mains water network renewal is a continuous program that aims at managing water mains and maintaining reliability of service. The program was developed and included in RD20. Under this program, there are two sub regional programs: metro and country. This specific detailed review focused on the metro water mains network renewal (C3673). RD20 included \$13.0M (\$FY23) per year for meeting the technical level of services and \$4.3M (\$FY23) per year for community benefits (proactive renewals, trialling trenchless technology, etc.).

The performance targets associated with this program is the failure rate, set at a target of 21 failures per 100 km for the metro area; this represents the technical level of service (LoS). The customer LoS, interruption per 1000 connections is tracked (targets for interruptions are shown and discussed below). SA Water, as highlighted in its business proposal, utilises PARMS modelling for the planning of renewal investment needed to meet the target²⁹. For RD20, SA Water projected the need to deliver 20 to 30 km per year in renewal to achieve the level of service target over the RD20 period. To deliver the program, it followed a procurement process to appoint a partner with a 4-year commercial framework arrangement. The process involved competitive tender to the market seeking the support to deliver the program. [REDACTED]

³⁰.

As of August 2023, SA Water has been able to achieve the technical level of service target for failure rates per 100 km, which is demonstrated in Table 2-16.

Table 2-16 RD20 water mains failures per 100 km in the metro area

year ending	2021	2022	2023	2024*
Target	21.0	21.0	21.0	21.0
Actual	19.7	20.0	19.7	18.5*

*rolling 12-month figure as of August 2023

Source: 20230927 -16 – Session 1 – RD20 AP Mains WN WMR Metro OP20, SA Water, September 2019

SA Water’s customer LoS for this program is associated with tracking interruptions for customers. This includes setting the target and tracking the performance of the number of properties with three or more (3+) unplanned water interruptions.

²⁹ 2024-28 Regulatory Business Plan, Pages 172-174, SA Water, September 2019.

³⁰ 20230927 -16 - Session 1 - RD20 AP Mains WN WMR Metro OP20, SA Water, September 2019.



Table 2-17 and Figure 2-9 demonstrate SA Water’s performance against this customer LoS over the RD20 period. Although SA Water exceeded the target in 2023, it has overperformed in the prior two years. Additionally, according to SA Water, it is on track to achieve the target for 2023-24³⁰.

Table 2-17 RD20 number of properties with (3+) interruptions for metro

year ending	2021	2022	2023	2024*
Target	1,400	1,300	1,200	1,183
Actual	1,221	921	1,275	1,275*

Source: 20230927 -16 – Session 1 – RD20 AP Mains WN WMR Metro OP20, SA Water, September 2019

*rolling 12-month figure as of August 2023

Figure 2-9 Historical number of properties with (3+) interruptions for metro



Source: 20230927 -16 – Session 1 – RD20 AP Mains WN WMR Metro OP20, SA Water, September 2019

Because the mains renewal metro program is part of a larger general renewal program, it is difficult to assess how the program performed at a granular level using capex allowance data. However, per information received from SA Water, the program is forecasting a spend of \$67.0M (\$FY23) against an allowance of \$78.1M (\$FY23)³¹. This reflects a negative variance of \$11.1M. By the end of RD20, SA Water is forecasting to have issued 68.8 km of relay to be delivered, as shown in Table 2-18. We understand that this underspend is associated with SA Water’s re-prioritisation of different projects to address pressures placed on the RD20 program.

Table 2-18 RD20 AP mains expenditure and lengths issued for relay

Year	2021	2022	2023	2024	RD20 Total
Metro Retic (\$FY23 M)	8.8	21.7	21.1	15.4	67.0
Metro km issued to deliver (km)	17.0	23.9	21.3	6.5	68.8

*Issued to date

Source: 20230927 -16 – Session 1 – RD20 AP Mains WN WMR Metro OP20, SA Water, September 2019

Based on our review, we consider SA Water’s processes in program identification, procurement, and delivery to be appropriate. Even with an underspend over RD20, we note that SA Water was able to mostly achieve its technical and customer level of service targets. Therefore, we do not recommend any adjustment to the proposed actual and forecast expenditure proposed by SA Water for the AP water mains renewal. The table below shows a summary of the allowance, forecast, and variance for the program.

³¹ 20230927 -16 - Session 1 - RD20 AP Mains WN WMR Metro OP20, Page 7, SA Water, September 2019.



Table 2-19 Proposed, outturn and recommended capex for the AP water network mains renewal (\$FY23 M)

	2021	2022	2023	2024	RD20 Total
RD20 allowance ³²	19.5	19.5	19.5	19.5	78.1
Outturn/forecast	8.8	21.7	21.1	15.4	67.0
Variance	(10.7)	2.2	1.6	(4.1)	(11.1)
Recommended expenditure	8.8	21.7	21.1	15.4	67.0
Recommended adjustment	-	-	-	-	-

Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx and “Just for records – SAW RD20 capex by project as per August 2020 following determination”

2.3 Recommended efficient capex

In this section we present the overall recommended efficient capex for RD20. This is based on our review of the overall program as well as the individual project reviews discussed earlier. Our RD20 recommendation includes an adjustment for the forecast FY24 capex, which was a result of reviewing in detail the unusually high step-change increase proposed by SA Water. At the end of the section, we also provide a summary of the RD20 recommended capex.

2.3.1 FY24 capex profile

As discussed in earlier sections, during our detailed review of the NAIS project, we have identified that the forecast for FY24 for the project included \$8.9M (\$FY23) in expenditure, which represents a significant step-change increase compared to the last two years rate of spend associated with this project. This review triggered a more detailed study of SA Water’s overall forecast capex program for FY24. We utilised data provided by SA Water regarding the linking of programs and projects delivered in RD20 to business cases presented in RD24³³. For each business case, we analysed the forecast FY24 against the rate of actual expenditure in RD20 and future proposed expenditure for RD24.

Based on the initial analysis, we have identified several projects that show significant step change increase between FY23 and FY24 as well as forecast 1.5x higher expenditure than the rate of expenditure proposed for RD24. This was done by identifying business cases line items with a step-change that is 75% higher than the actual spend in FY23. Additionally, another flag was added to identify projects with FY24 forecast expenditure that is 1.5 times higher than the rate of expenditure proposed for RD24. For each project that satisfied the two identification flags, we undertook a desktop review for linked business cases as well as individual sub-projects for RD20 to understand the context of the step-change. One of the criteria that was looked at for the identification is the driver of investment. For example, we considered the step-change related to growth projects to be reasonable as SA Water is facing growth demands.

After comprehensively reviewing business cases with significant change, we identified seven with a FY24 step change that we thought was outside of the reasonable expenditure trends. Per the information provided, each RD24 business case is linked to multiple RD20 projects. Therefore, in our review, we examined each step-change at both the business case and individual project levels. The step-change for each identified business case ranged from 100% to almost 700% increase in FY24 forecast compared to actual FY23 expenditure as shown in Table 2-20.

³² The annual allowance was established using the total RD20 allowance provided by SA Water and dividing it by four for the years in period.

³³ SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx, SA Water, September 2023.

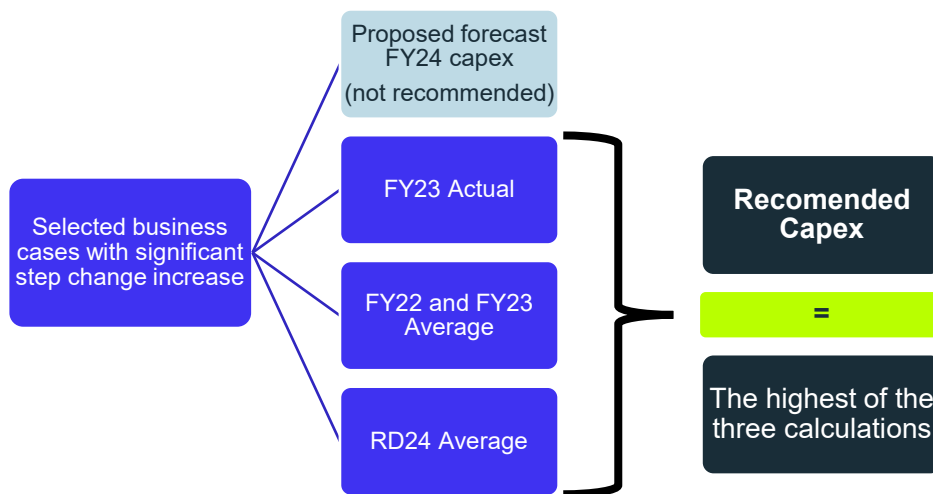
Table 2-20 Projects identified to have significant step-change increase in 2024 forecast (\$FY23 M)

Business Case Name	2021	2022	2023	2024	%change FY23 to FY24	2025	2026	2027	2028
IEP of WW RW Systems ³⁴	3.2	4.9	6.6	15.8	138%	13.7	13.7	13.7	13.7
Dams And Weirs Mgt Dam Safety	2.5	1.0	2.2	16.9	670%	2.2	2.2	2.2	2.2
Water Third Party Works	10.0	6.1	7.1	15.3	116%	6.7	6.7	6.7	6.7
Water Accommodation	2.3	1.7	4.6	11.4	148%	5.8	6.6	7.1	5.8
Wastewater Third Party Works (Major and Minor)	4.7	11.8	6.5	13.1	101%	7.9	7.9	7.9	7.9
SCADA Systems Reliability Renewals	1.4	2.5	2.4	8.5	261%	0.3	0.3	0.3	0.3
Water Security	0.8	5.3	1.1	4.5	312%	0.3	0.3	0.3	0.3

Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

To determine the appropriate adjustment for the forecasted step-change increase, we calculated the average capex for the proposed RD24 and average capex for the past two years (to subtract FY21 covid impacts). Additionally, we accounted for the FY23 actual expenditure. We consider that the two calculated averages and FY23 actual spend represent a more reasonable forecast for FY24. Therefore, we selected the highest of the three calculations as a recommendation for FY24 expenditure for the selected programs. We consider that this approach offers a reasonable forecast for FY24 that is in line with historical and future spend rates. The following diagram demonstrates our approach to the selection of expenditure. The below

Figure 2-10 Approach to recommended FY24 capex for projects with significant step change



The below table summarises the applied adjustment to each of the selected programs. In the table, we have highlighted the recommended calculated option in green for each of the selected business cases.

³⁴ IEP of WW RW Systems includes the NAIS project. However, because we have adjusted for NAIS individually, NAIS (C3033) was removed from this analysis and adjustment.

Table 2-21 Recommended expenditure and adjustment for projects with significant FY24 step-change increase (\$FY23 M)

	Proposed FY24	Calculated Options			Recommendation	
		FY23 Actual	FY22-FY23 average	RD24 average	Recommended Expenditure	Recommended Adjustment
IEP of WW RW Systems ³⁵	15.8	6.6	5.8	13.7	13.7	(2.1)
Dams And Weirs Mgt Dam Safety	16.9	2.2	1.6	2.2	2.2	(14.7)
Water ThirdPartyWorks	15.3	7.1	6.6	6.7	7.1	(8.2)
Water Accommodation	11.4	4.6	3.1	6.3	6.3	(5.0)
Wastewater Third Party Works (Major and Minor)	13.1	6.5	9.1	7.9	9.1	(3.9)
SCADA Systems Reliability Renewals	8.5	2.4	2.4	0.3	2.4	(6.1)
Water Security	4.5	1.1	3.2	0.3	3.2	(1.3)

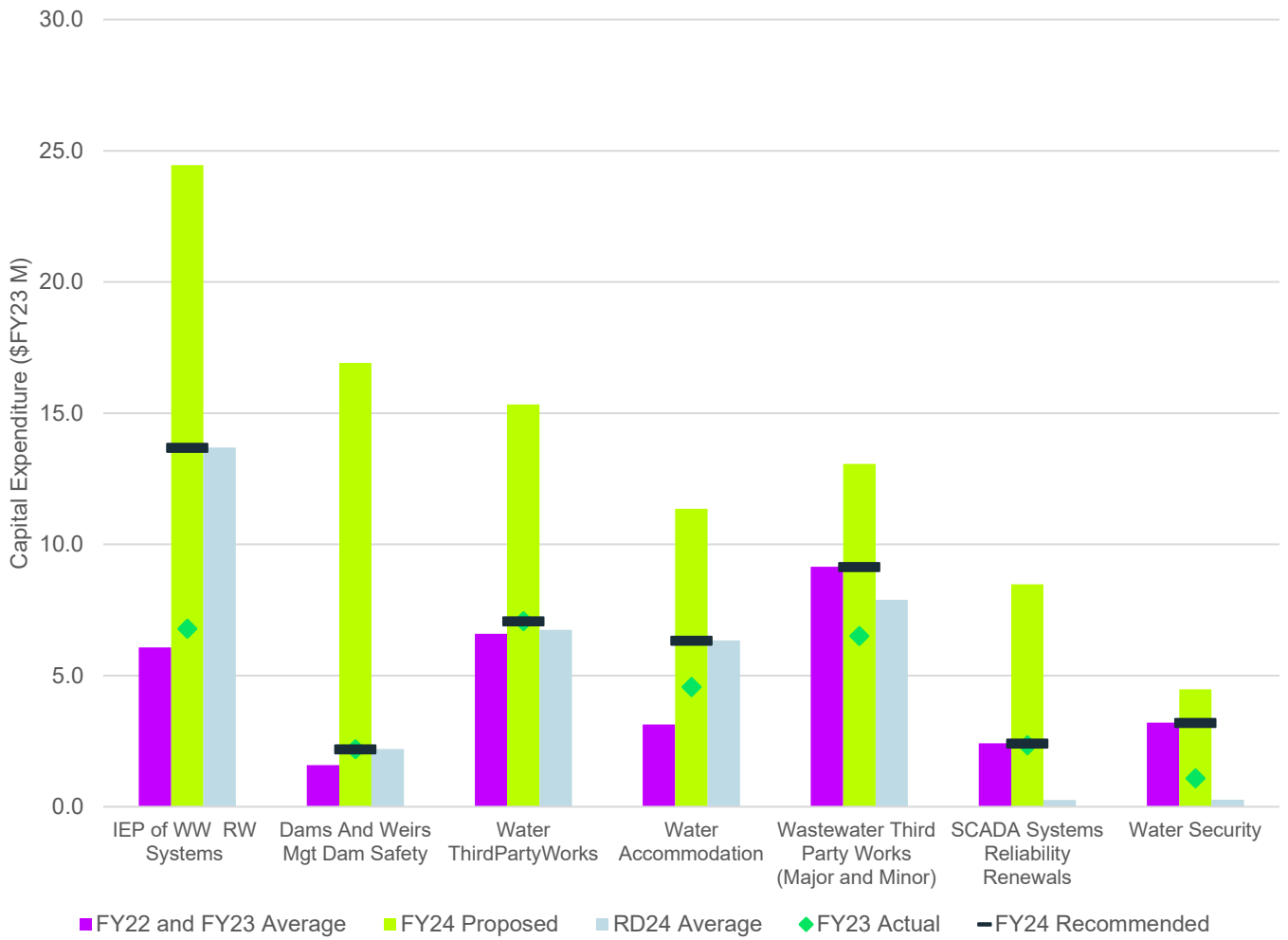
Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

In Figure 2-11 below, we highlight the significance of the step-change increase proposed compared to the FY22-FY23 average expenditure and the average rate for RD24. Our recommendation includes spend levels that are consistent with SA Water’s historical and future proposed expenditure.

³⁵ IEP of WW RW Systems includes the NAIS project. However, because we have adjusted for NAIS individually, NAIS (C3033) was removed from this analysis and adjustment.



Figure 2-11 Summary of the step-change increase proposed by SA Water compared with the averages of 2022 and 2023, and RD24 as well as recommended expenditure



Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

To summarise this adjustment, we accumulated the business cases expenditures under a category called “projects with significant step-change for FY24.” Table 2-22 provides the total recommended expenditure and adjustment for this category. We note that it is not possible to provide the allowance for this category adjustment as there are multiple projects under selected business cases that do not have a specific allowance allocated in the information received from ESCOSA and SA Water.



Table 2-22 Recommended expenditure and adjustment for projects with significant step-change for FY24 (\$FY23 M)

	2021	2022	2023	2024	2025	2026	2027	2028	RD20 Total	RD24 Total
Outturn/forecast	25.0	33.3	30.4	85.4	36.9	37.6	38.1	36.9	174.1	149.4
Recommended expenditure	25.0	33.3	30.4	44.1	36.9	37.6	38.1	36.9	132.8	149.4
Recommended adjustment	-	-	-	(41.4)	-	-	-	-	(41.4)	-

Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Additionally, we have considered SA Water’s actual expenditure for the September quarter against its quarterly budget. This showed that SA Water has underspent by \$29.5M in the September quarter compared to the planned budget. Out of that underspend, \$14.8M was associated with KI and the Morgan to Whyalla pipeline. The remaining \$14.7M of underspend was across the list of expenditure items planned for FY24³⁶. We consider that it is reasonable to predict that this rate of underspend might continue throughout FY24, which is likely to result a total underspend of \$58.8M against the FY24 budget. Table 2-23 provides SA Water’s actual September quarter spend and FY24 quarterly budget.

Table 2-23 FY24 actual expenditure and FY24 quarterly budget

	Actual	Budget				
	Sept Quarter	Sept Quarter	Dec Quarter	Mar Quarter	Jun Quarter	Total
FY24 Total Budget	129.7	159.2	185.0	176.3	212.9	733.5

Source: 20231106 – SAWRD24 – RD24173 Response ESCOSA (A3283054).xlsx, SA Water, October 2023

Therefore, we consider that our recommended FY24 forecast adjustment of \$48.4M (including NAIS adjustments) to be consistent with SA Water’s actual performance in relation to the FY24 budget.

³⁶ 20231106 - SAWRD24 - RD24173 Response ESCOSA (A3283054).xlsx, SA Water, October 2023.



2.3.1 RD20 Recommended capex summary

We recommend that SA Water’s actual capex in the RD20 period be adopted with the following adjustments, as explained above.

Table 2-24 Recommended gross RD20 water and wastewater capex (\$FY23 M)

	2020	2021	2022	2023	2024 (forecast)	RD20 Total
SA Water Proposal						
Total	332.1	289.3	398.4	447.7	648.8	1,784.3
Water	185.2	188.0	276.9	311.9	470.2	1,247.0
Wastewater	146.9	101.3	121.6	135.9	178.5	537.4
Recommended Adjustments						
Unusually high FY24 spend (excluding NAIS)	0.0	0.0	0.0	0.0	(41.4)	(41.4)
NAIS (specific adjustment)	0.0	0.0	0.0	0.0	(7.0)	(7.0)
Kangaroo Island (ex post adjustment and reprofiling)	0.0	0.0	0.0	0.0	(17.0)	(17.0)
Morgan Whyalla (reprofiling)	0.0	0.0	0.0	0.0	(36.2)	(36.2)
Total adjustments						
Total	0.0	0.0	0.0	0.0	(101.6)	(101.6)
Water	0.0	0.0	0.0	0.0	(95.5)	(95.5)
Wastewater	0.0	0.0	0.0	0.0	(6.1)	(6.1)
Recommended capex						
Total	332.1	289.3	398.4	447.7	547.2	1,682.8
Water	185.2	188.0	276.9	311.9	374.7	1,151.5
Wastewater	146.9	101.3	121.6	135.9	172.5	531.3

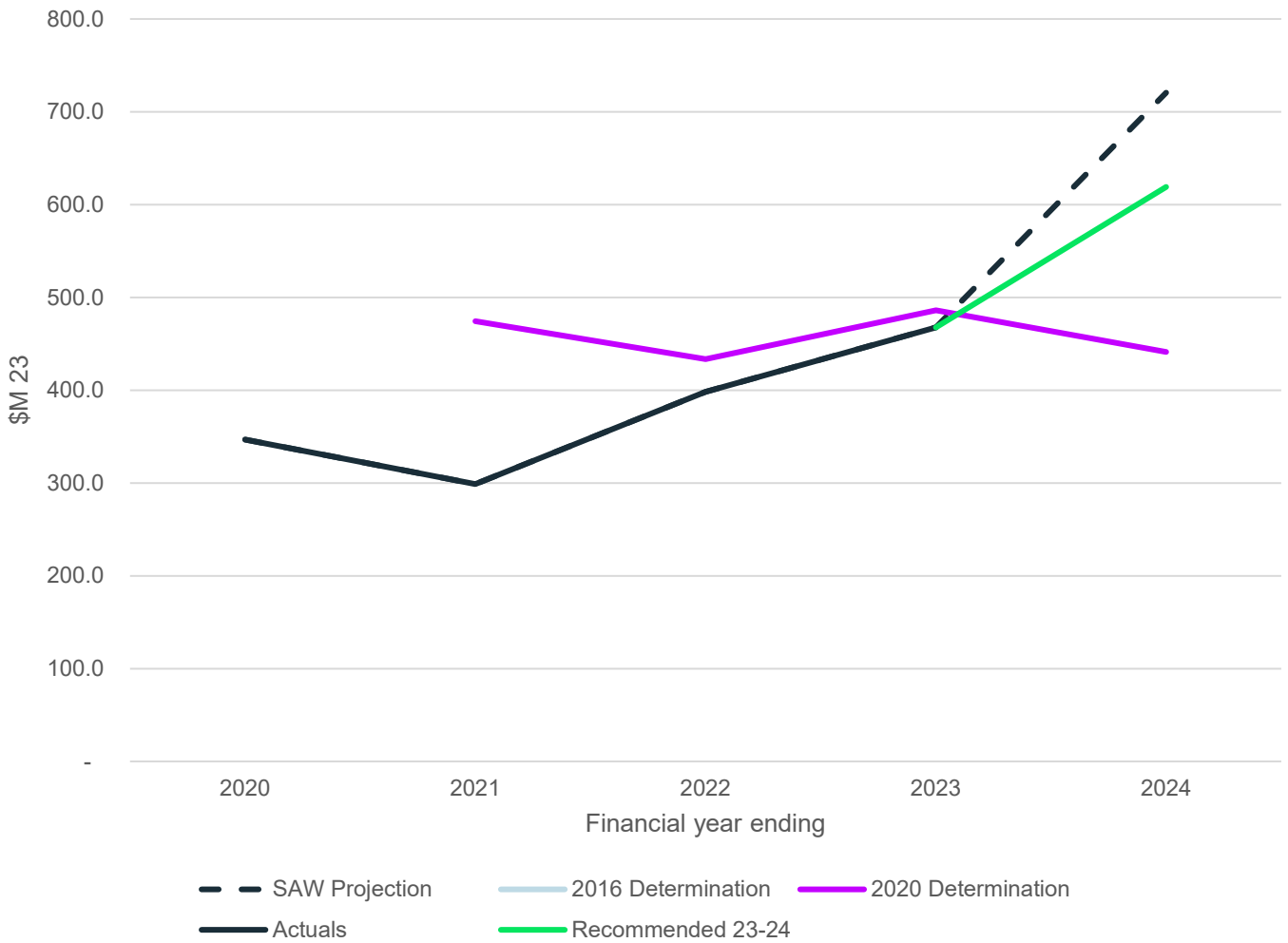
Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: excludes corporate Technology capex

This is also summarised in graphical form below. Note that this graph presents ‘full’ net capex (i.e. it includes corporate Technology capex but is net of capital contributions so that it can be compared to the Determination on a like-for-like basis).



Figure 2-12 Recommended RD20 capex



Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: this is full net capex i.e. it includes corporate Technology capex but is net of capital contributions

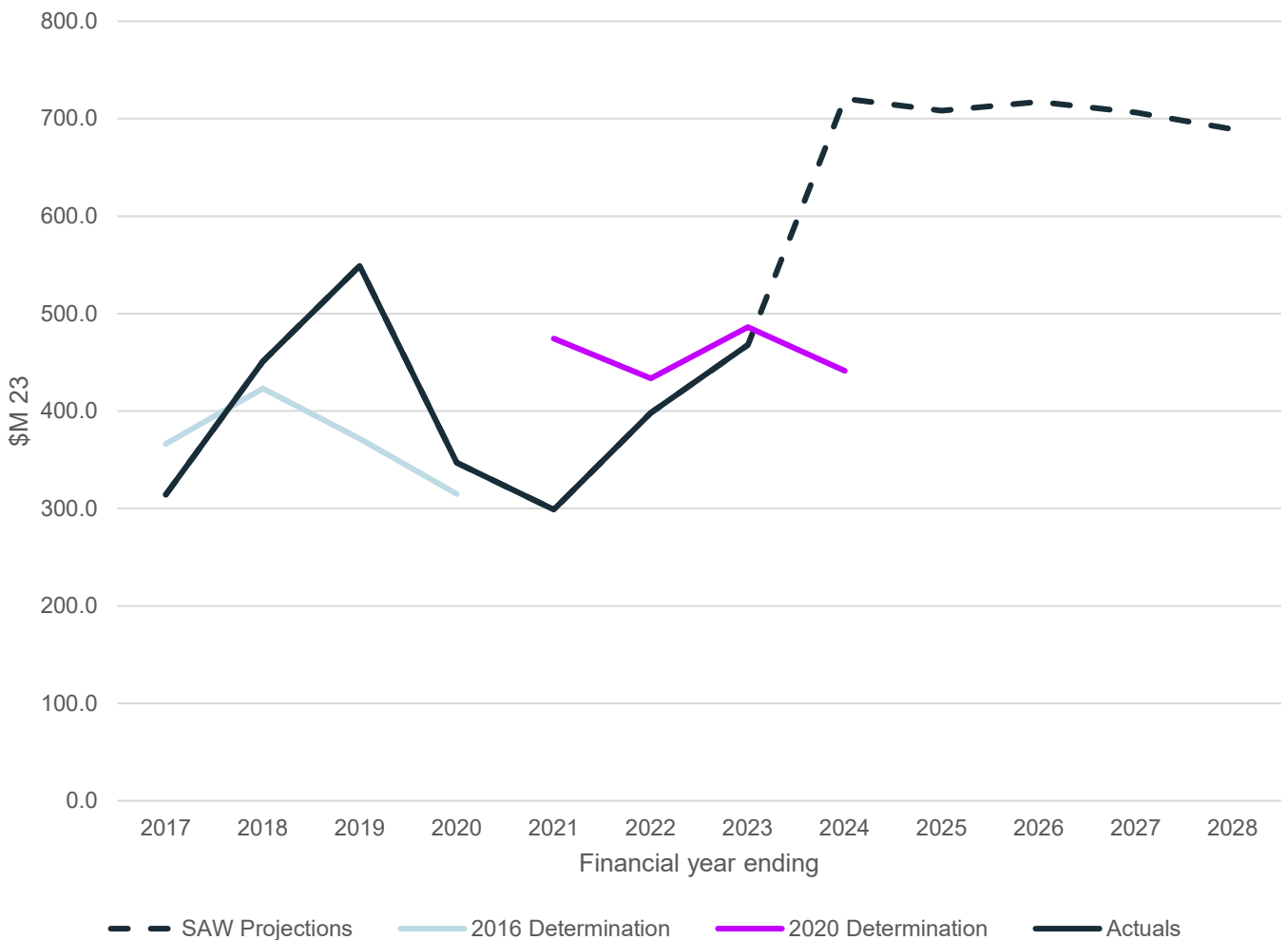


3. RD24 capex review

3.1 SA Water’s proposal

In its 2024-28 regulatory business plan, SA Water proposed a total gross capital expenditure program of \$2,831.4 M (\$FY23) for the next regulatory period (RD24).³⁷ This is a 47% increase compared with the RD20 allowance of \$1,835.1M (\$FY23)³⁸.

Figure 3-1 SA Water proposed capex



Source: Cardno/Atkins 2020 report, SA Water RBP24 and SA Water Revenue Model.

Note: this is net capex and includes corporate Technology expenditure

We have identified proposed capex per driver as shown in Table 3-1 below. We note that we have excluded the Technology proposed capex for this review. We understand that a separate review is being undertaken for Technology

³⁷ 2024-28 Regulatory Business Plan, SA Water, August 2023.

³⁸ 2020-24 Regulatory Determination, ESCOSA, 2020.



capex. This review therefore focuses mainly on proposed expenditure excluding Technology. For clarity, the proposed expenditure in the RD24 period can be summarised as follows:

Gross pre efficiency capex: \$2876.0M [of which Technology: \$171.7M and non-Technology: \$2704.3M]

minus proposed efficiency: \$44.6M

= Post efficiency gross capex: \$2831.4M

minus capital contributions: \$10.1M

= Post efficiency net capex: \$2821.2M

Because (i) SA Water's efficiency challenge has been applied to the total program rather than individual projects and programs and (ii) we have applied our own efficiency challenge as set out in Section 3.3 below, the analysis presented below is focused on gross pre-efficiency non-Technology capex (i.e. the proposed \$2,704.3M). For completeness, and as requested by ESCOSA, we have then incorporated Technology capex into the total recommended gross capex presented in Section 3.4.

We have identified proposed capex per driver as shown in Table 3-1 below.

Table 3-1 Proposed RD24 capex per service type and driver (\$FY23 M)

Year ending	2025	2026	2027	2028	RD24 Total	Change from RD20
Water						
Sustain Services	252.4	259.9	245.7	225.3	983.4	+130.1
External Responsibilities	51.3	51.3	51.3	51.3	205.3	+80.0
Enable Growth	111.1	111.1	111.1	111.1	444.2	+219.9
Improved Services	40.4	40.4	40.4	40.4	161.6	+118.0
Total – Water	455.2	462.7	448.5	428.1	1,794.5	+548.0
Wastewater						
Sustain Services	59.2	59.2	59.2	59.2	236.7	+4.5
Enable Growth	123.0	123.0	123.0	123.0	492.0	+372.5
External Responsibilities	45.3	45.3	45.2	45.2	181.1	-4.6
Improved Services	-	-	-	-	-	-
Total – Wastewater	227.5	227.5	227.4	227.4	909.8	+372.4
Total RD24 Capex (exc. Technology)	682.6	690.2	675.9	655.6	2,704.3	+920.4

Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: this is gross pre-efficiency capex and excludes Technology expenditure

SA Water has highlighted that much of the proposed increase in expenditure in RD24 relates to major projects above \$100M. These major projects, set out in the table below, represent 37% of the total proposed capex for water and wastewater.



Table 3-2 Proposed RD24 expenditure for major projects (\$FY23 M)

Year ending	2025	2026	2027	2028	RD24 Total
City of TTG Sustainable Sewers Program	71.0	71.0	71.0	71.0	284.0
Eyre Peninsula Desalination Augmentation	59.5	59.5	59.5	59.5	238.0
Metro North Sub System Growth	91.2	91.2	91.2	91.2	364.8
Mount Bold Dam Safety Upgrade	27.5	27.5	27.5	27.5	110.0
Metro Water Quality Improvement (RD20 Continuation)	40.4	40.4	40.4	40.4	161.6
Total RD24 Capex	289.6	289.6	289.6	289.6	1,158.4

Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: this is gross pre-efficiency capex

Table 3-3 below provides an overview of the proposed capex program excluding major projects as an indication of the changes in the ‘underlying’ capital program. From this it becomes clear that the proposal includes a significant increase in wastewater capex, especially in the Growth program whilst proposed underlying water capex is lower than in RD20.

Table 3-3 Proposed RD24 capex per service type and driver excluding major projects (\$FY23 M)

Year ending	2025	2026	2027	2028	RD24 Total	Change from RD20
Water						
Sustain Services	192.9	200.4	186.2	165.9	745.4	-29.4
External Responsibilities	23.8	23.8	23.8	23.8	95.3	-4.0
Enable Growth	19.9	19.9	19.9	19.9	79.4	+ 0.6
Improved Services	40.4	40.4	40.4	40.4	161.6	-
Total – Water	277.0	284.5	270.3	249.9	1,081.7	-32.7
Wastewater						
Sustain Services	59.2	59.2	59.2	59.2	236.7	+4.5
Enable Growth	52.0	52.0	52.0	52.0	208.0	+88.5
External Responsibilities	45.3	45.3	45.3	45.3	181.1	+55.0
Improved Services	-	-	-	-	-	-
Total – Wastewater	156.4	156.4	156.4	156.4	625.8	+147.9
Total RD24 Capex (excluding major projects and technology)	433.4	441.0	426.7	406.4	1,707.5	+115.2

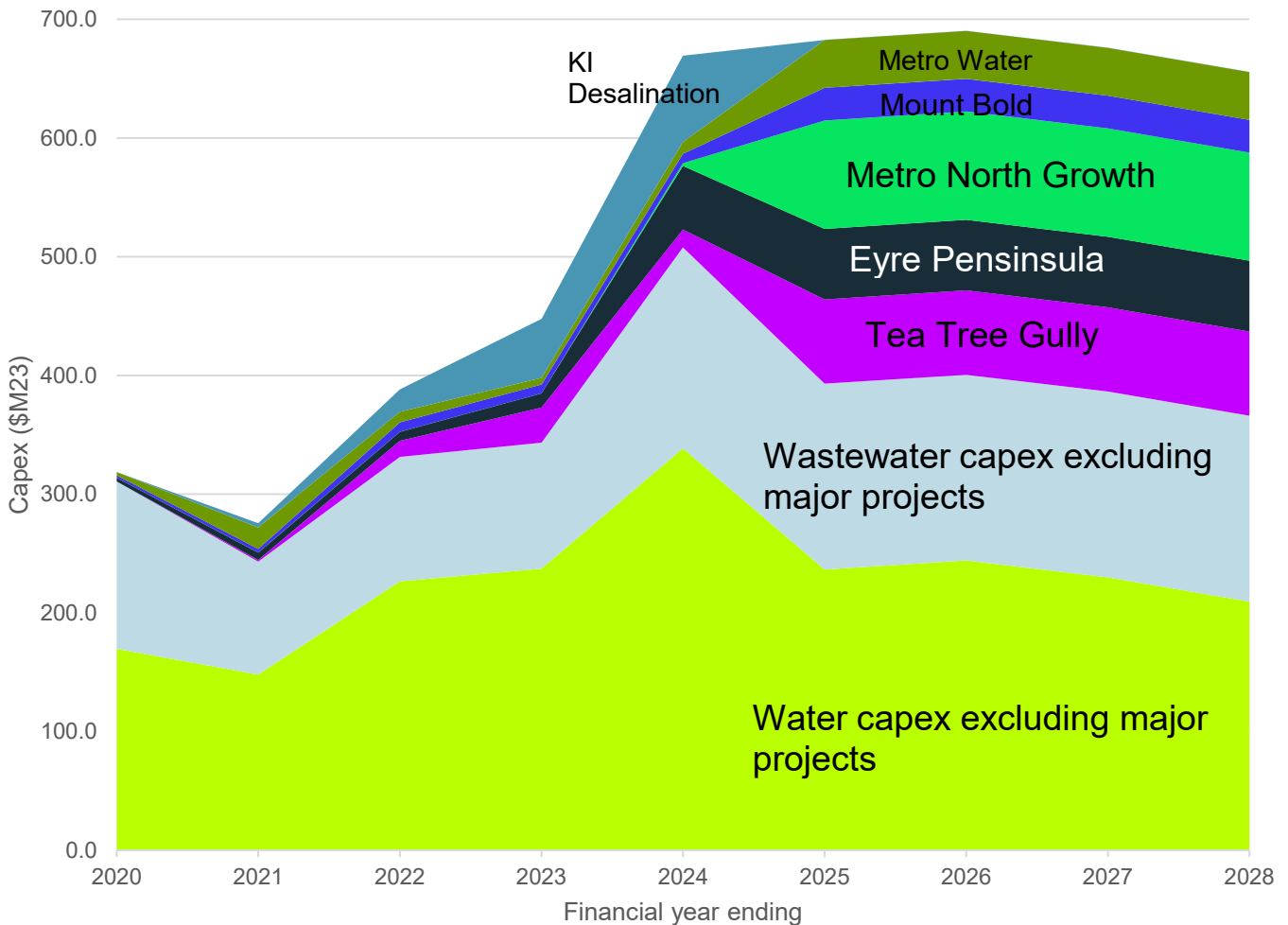
Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: this is gross pre-efficiency capex



The impact of major projects is summarised graphically below. This highlights that major projects are largely responsible for the proposed increase in expenditure with other expenditure remaining at levels just a little higher than the FY23 level.

Figure 3-2 SA Water proposed major project and other capex



Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: this is gross capex and excludes Technology expenditure

As part of this review, we examined SA Water’s project development, costing and delivery approach to evaluate its appropriateness in proposing an efficient and prudent program. SA Water provided information relating to this in its RD24 proposal as well as in presentations during the interview stage and through documents requested.

We understand that SA Water’s process of developing the RD24 proposal included the following stages:

- **RD20 feedback and lessons learned:** Feedback received internally and from ESCOSA.
- **Written guidance:** This included guidance from ESCOSA such as the approach and framework documents and ESCOSA’s RD24 guidance papers.
- **Customer and community engagement:** Involved direct engagement with customers as well as surveys.
- **Prioritisation:** Assessment of developed business cases and SA Water’s determination of efficiency and innovation, and
- **Regulatory submission:** the final proposed business program submitted for RD24.



In its engagement of stakeholders, SA Water used Customer Challenge Groups (CCG) to inform its business plan for RD24. This occurred in three phases where the customer groups were able to provide responses to SA Water in relation to its approach, experience and value, and prioritisation process³⁹. Engagement outcomes included an indication that SA Water should prioritise its core services (sustain).

SA Water's RBP sets out that it has taken into consideration cost escalation, climate impact, growth, and intergenerational risk. Assets with high risk are predicted by SA Water to carry over to an unacceptable level as the period progresses if the current level of regulatory expenditure is maintained. SA Water's performance and asset health are discussed further in later sections.

Projects and programs proposed in RD24 had undergone SA Water's gateway process to prioritise and optimise capital expenditure. We understand that this includes several governance stages that allows for the different stakeholders to provide feedback on identified projects and programs.

SA Water utilises a cost estimate classification system that is associated with the accuracy of cost as well as the stage of the project development. Table 3-4 below provides a summary of information for each estimate class used by SA Water⁴⁰.

Table 3-4 SA Water's cost estimate classification

	Class 1	Class 2	Class 3	Class 4
Estimate type	Project identification	Project scoping	Project development	Project delivery
Intended use	Planning / budgeting	Feasibility or options analysis	Project business case / financial approval	Procurement
Target accuracy	-30% to +50%	-20% to +30%	-10% to +15%	-5% to +5%
Definition of scope	Statement of project brief	Options report or documentation	Concept design and documentation	Final documents
Indicative level of design	10%	20%	40%	80-100%
Basis of cost (major items)	Work breakdown structure, historical costs, benchmarked overheads, real SA Water overheads	Work breakdown structure, unit rates, benchmarked overheads, real SA Water overheads	Work/cost breakdown structure, first principles, benchmarked overheads, real SA Water overheads	Cost breakdown structure, real overheads, real SA Water overheads

Source: 20230926 - 9 - Session 1 - Approach to costing and risk, SA Water, September 2023

³⁹ 20230925 - 6 - Session 2 - Development of RD24 capex program, SA Water, September 2023.

⁴⁰ 20230926 - 9 - Session 1 - Approach to costing and risk, SA Water, September 2023.



Figure 3-3 below was developed using information provided by SA Water that provide the estimate class for each project identified for RD24. We note that a proportion of RD24 projects included planner estimates or no estimate class.

Figure 3-3 Breakdown of proposed RD24 capex by cost classification



Source: analysis of SA Water document RD24088

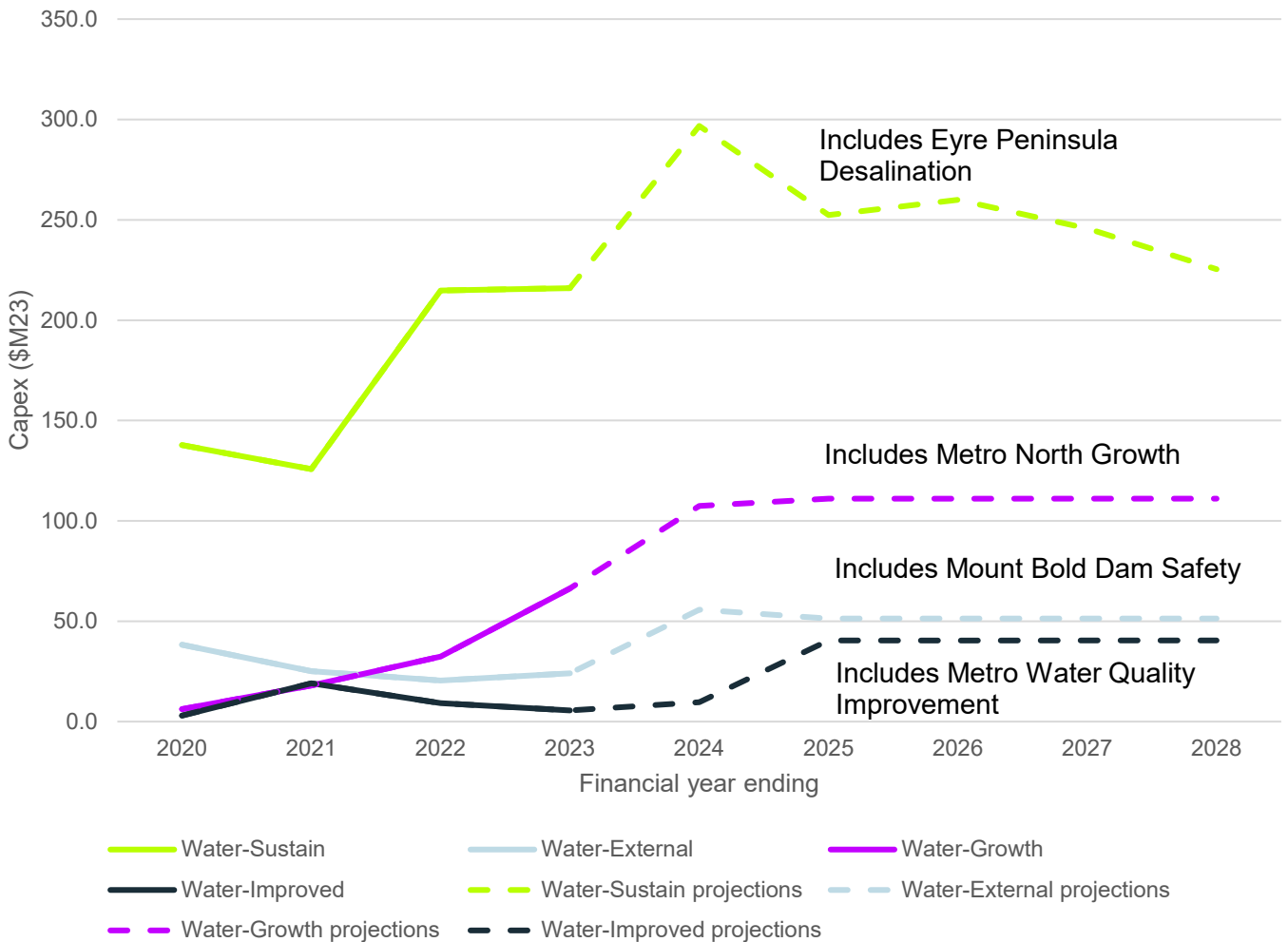
Note: this is assumed to be gross pre-efficiency expenditure excluding Technology



3.1.1 Expenditure by driver

Examining expenditure by driver gives a similar picture, with the majority of proposed expenditure being “Sustain” at similar levels to those seen recently. There is, however, a significant proposed increase in “external responsibilities” and “growth” expenditure, especially related to the wastewater service.

Figure 3-4 Water expenditure by driver



Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: this is gross pre-efficiency expenditure excluding Technology



Figure 3-5 Wastewater expenditure by driver (including major projects)



Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: this is gross pre-efficiency expenditure excluding Technology

3.2 Review of proposed expenditure

Our review of the SA Water’s proposed capital expenditure for RD24 involved the review of the full program as well as a detailed review of selected individual projects. To form a comprehensive understanding of the proposed capex program, we selected programs and projects across investment drivers and service types (water and wastewater). In our selection, we considered the overall size of the program under each driver, service type, and the amount proposed against each program and project. The overall aim of the sample is to assist us in forming a comprehensive view on the efficiency and prudence of the proposed RD24 capital expenditure program. Below is a table of selected programs and projects from RD24 that were reviewed in detail.



Table 3-5 Selected ex-ante programs and projects for detailed reviews

BC Number	Project Name	Service Type	Driver
001	Water Reticulation Mgt Reliability	Water	Sustain Services
131	Eyre Peninsula Desalination Augmentation	Water	Sustain Services
110	WWTP RWTP Reliability	Wastewater	Sustain Services
112	Adelaide Wastewater Trunk Main Renewal	Wastewater	Sustain Services
168	Mount Bold Dam Safety Upgrade	Water	External Responsibilities
119	Millicent EIP	Wastewater	External Responsibilities
037	Summit System Growth	Water	Enable Growth
128	Bolivar WW Network Growth	Wastewater	Enable Growth
027	Metro Water Quality Improvement (RD20 Continuation)	Water	Improve Services

The detailed reviews comprised of a deep dive into the business cases and interviews with SA Water to investigate the development process and delivery plan for each selected program and project. The following sub-sections include our view of the proposed capex program for each driver, which was formed based on our review of SA Water’s proposal, additional documents received, and interviews. In addition, our view is informed by our judgment and experience having undertaken work relating to utilities, regulators, and regulated entities in Australia and internationally.

3.2.1 Sustain/Renewals

SA Water Proposal:

- SA Water is proposing a 16% real terms increase in water sustain expenditure and a 3% increase in wastewater expenditure.
- The majority of the increase in water sustain expenditure is due to the \$238.0M proposed expenditure for the Eyre Peninsula Desalination project.

“General” Sustain expenditure:

- Based on the work order breakdown data provided by SA Water, the health of non-pipe assets appears to be on an improving trend and pipeline assets appear to be broadly stable. We have therefore recommended maintaining “general” Sustain expenditure (excluding large projects⁴¹) at RD20 levels with the exception of Adelaide Desalination Plant membrane replacement which we consider to be additional to RD20 activity levels.
- This results in a scope adjustment of -\$4.5M (2%) for wastewater. No adjustment is recommended for water as the proposed expenditure is in line with RD20 spend levels when adjusted for membrane replacement.

Eyre Peninsula Desalination:

- As set out in Section 2.2.3, we have recommended scope adjustments for the Eyre Peninsula Desalination project to take account of the high level of contingency and a reprofiling of expenditure to account for the fact that consents are not yet in place.

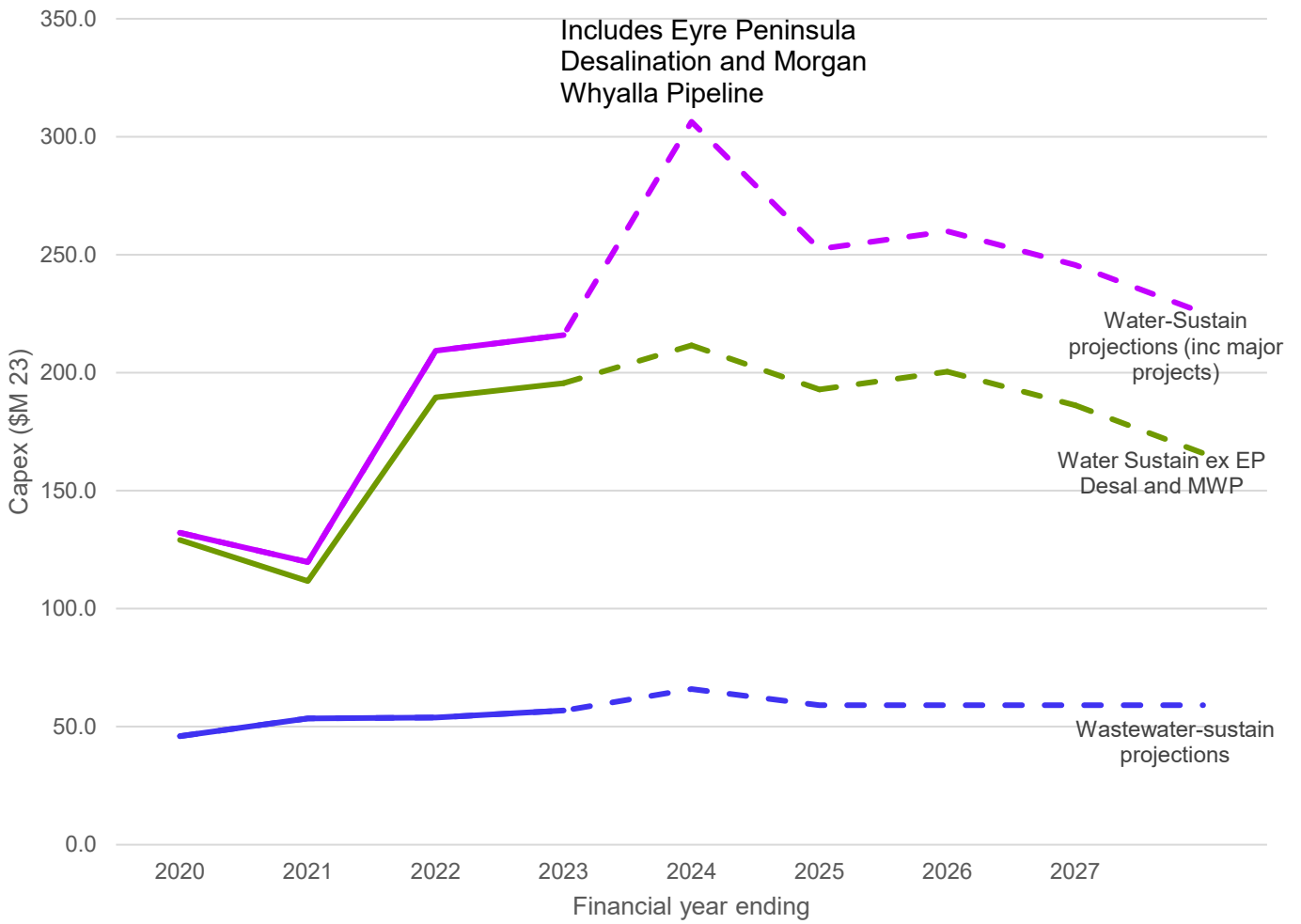
SA Water is proposing a 16% real terms increase in water sustain expenditure and a 2% increase in wastewater expenditure. The majority of the increase in water sustain expenditure is due to the \$238.0M proposed expenditure for the Eyre Peninsula Desalination project discussed in Section 2.2.3. Without Eyre Peninsula Desalination and the Morgan Whyalla Pipeline No1 Replacement project, the ‘underlying’ proposed increase in water sustain expenditure is \$33.0M or 5% compared to RD20.

The proposed and recent actual expenditure are summarised below. Unless otherwise noted, all expenditure figures quoted in these sections are gross pre-efficiency capex.

⁴¹ Eyre Peninsula Desalination and MWP.



Figure 3-6 Proposed Sustain expenditure



Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

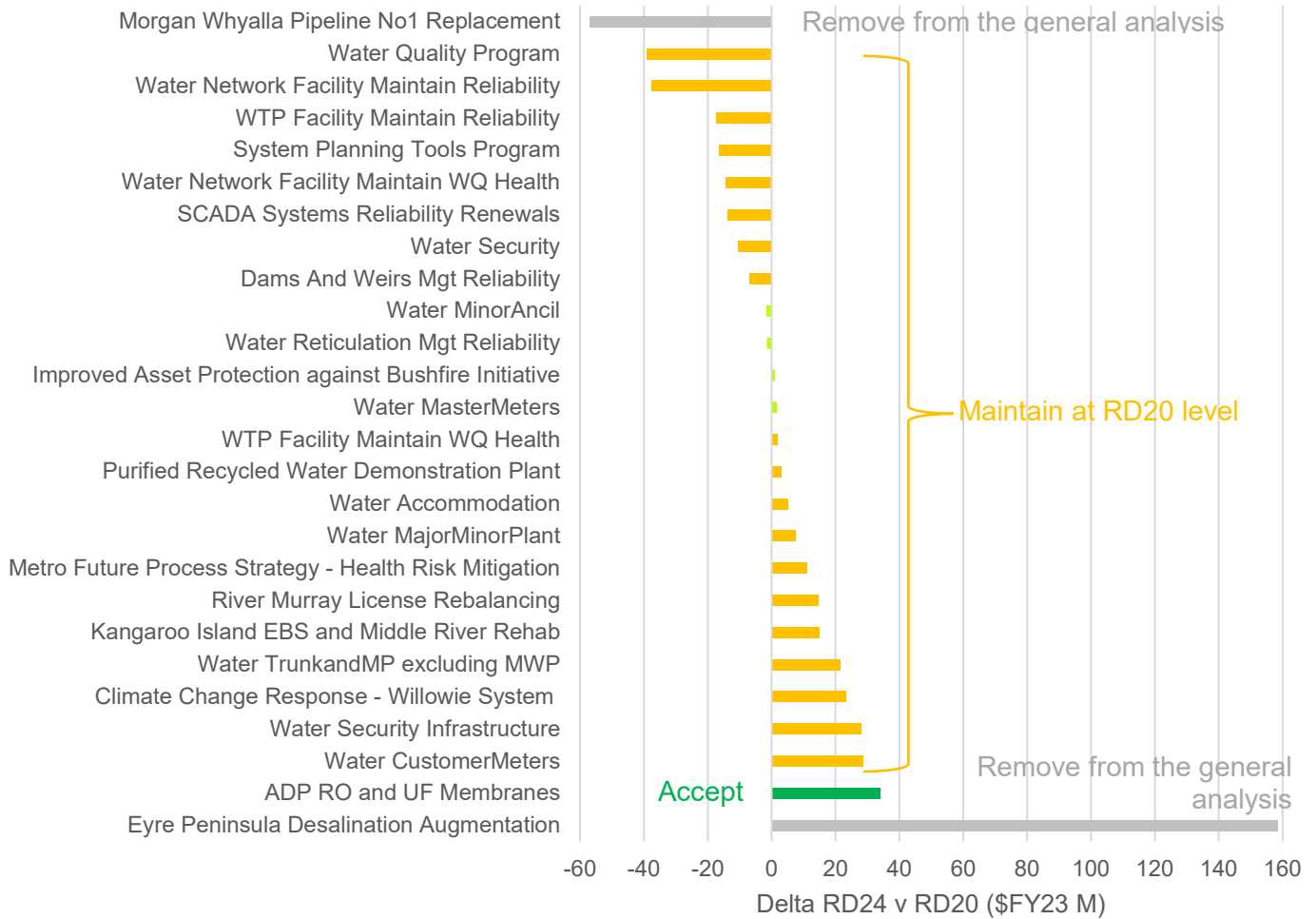
Note: there are no major projects in the proposed wastewater sustain program.



3.2.1.1 Water

The RBP proposes a range of ‘unders’ and ‘overs’ for different project lines within the Sustain driver. We have excluded large projects (EP Desalination and MWP) from our analysis and looked at the remaining as ‘general’ sustain expenditure. The deltas between RD20 and RD24 proposed spend are summarised graphically and in table form below.

Figure 3-7 Proposed water sustain expenditure- proposed changes compared to RD20



Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx



Table 3-6 Proposed water sustain expenditure (\$FY23 M)

	2021	2022	2023	2024	2025	2026	2027	2028	RD20 Total	RD24 Total
Water Reticulation Mgt Reliability	26.9	21.2	39.1	41.2	34.8	37.8	36.6	36.7	147.9	146.0
Water Trunk and MP excluding MWP	10.2	12.4	40.3	20.0	32.1	37.5	27.8	9.6	86.6	107.1
Morgan Whyalla Pipeline No1 Replacement	-	1.8	12.4	2.8					56.1	-
Water Customer Meters	2.1	2.0	3.8	2.5	9.6	9.7	9.6	9.6	10.0	38.6
Water Minor Ancil	1.3	0.7	1.2	0.6	0.2	0.2	0.2	0.2	2.6	0.8
Water Master Meters	0.6	0.6	0.4	0.5	2.9	3.0	0.3	0.3	4.8	6.5
Water Accommodation	4.4	2.3	1.7	4.6	5.8	6.6	7.1	5.8	20.0	25.3
Water Major Minor Plant	6.3	3.9	5.7	5.7	9.0	7.5	6.2	5.3	20.7	28.0
Water Security Infrastructure	11.4	0.4	2.4	3.2	9.6	9.6	9.6	9.6	10.3	38.4
Water Network Facility Maintain Reliability	28.2	30.0	43.5	45.4	32.6	32.6	32.6	32.6	168.8	130.3
WTP Facility Maintain Reliability	6.9	13.0	18.9	5.3	7.2	7.2	7.2	7.2	47.1	28.8
Water Network Facility Maintain WQ Health	10.3	17.7	12.7	12.4	8.9	8.9	8.9	8.9	51.2	35.8
WTP Facility Maintain WQ Health	1.7	0.9	0.8	1.6	2.4	2.4	2.4	2.4	7.5	9.4
Water Quality Program	9.1	4.1	5.9	32.7	8.7	8.7	8.7	8.7	73.5	34.9
Water Security	0.4	0.8	5.3	1.1	0.3	0.3	0.3	0.3	11.7	1.0
System Planning Tools Program	4.0	1.3	6.0	12.1	0.7	0.7	0.7	0.7	19.4	2.7
Metro Future Process Strategy - Health Risk Mitigation	3.9	3.1	3.6	0.1	4.4	4.4	4.4	4.4	6.8	17.6
Improved Asset Protection against Bushfire Initiative	-	-	-	-	0.2	0.3	0.2	0.2	-	1.0
River Murray License Rebalancing	-	-	-	-	3.7	3.7	3.7	3.7	-	14.8
Climate Change Response - Willowie System	-	-	-	-	5.8	5.8	5.8	5.8	-	23.3
Kangaroo Island EBS and Middle River Rehab	-	-	-	-	3.7	3.8	3.7	3.7	-	15.0
Dams And Weirs Mgt Reliability	0.5	1.5	0.8	4.2	0.0	0.0	0.0	0.0	7.2	0.2

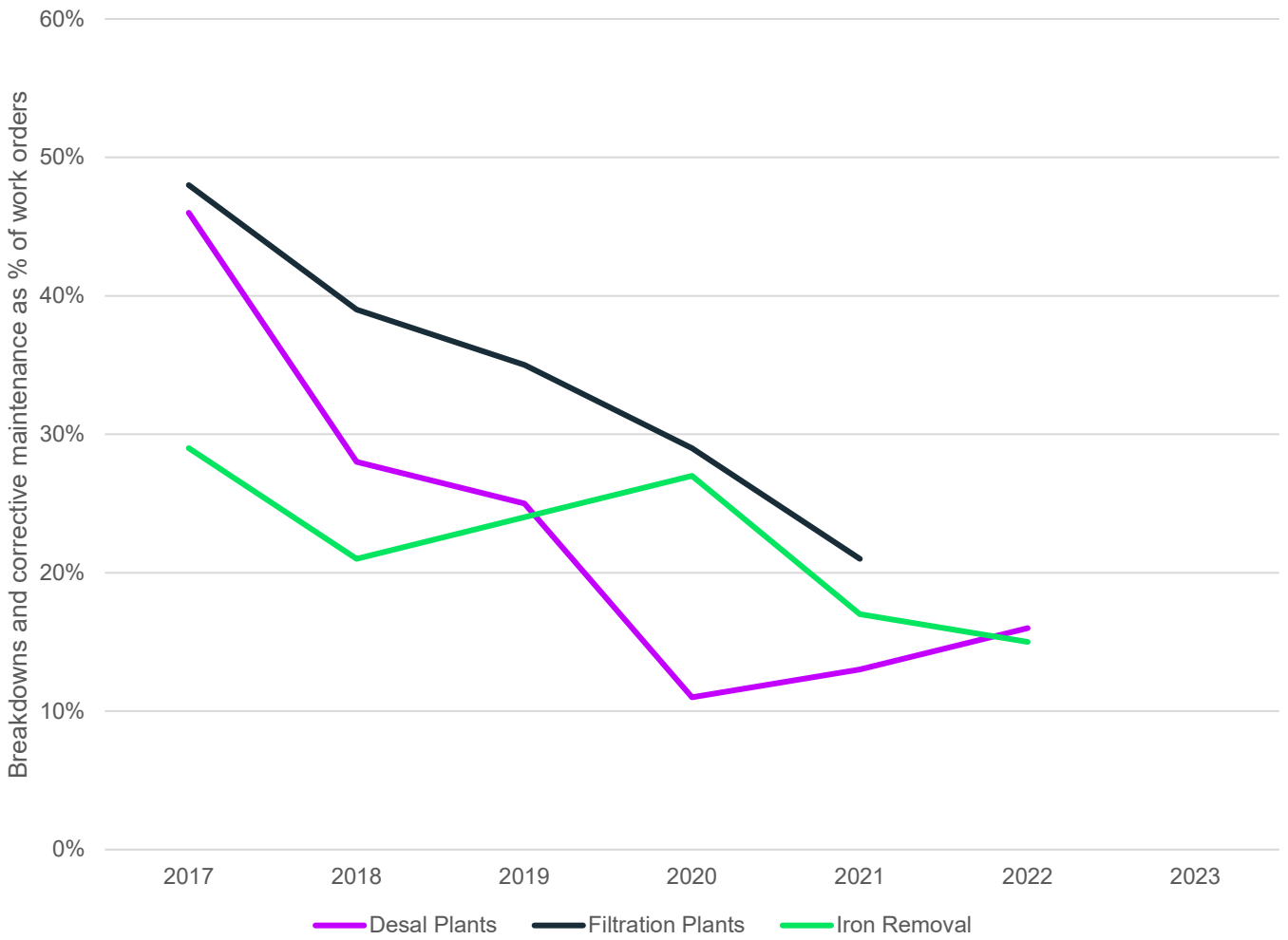
	2021	2022	2023	2024	2025	2026	2027	2028	RD20 Total	RD24 Total
SCADA Systems Reliability Renewals	6.2	1.4	2.5	2.4	0.3	0.3	0.3	0.3	14.8	1.0
Eyre Peninsula Desalination Augmentation	3.2	6.7	7.9	12.0	59.5	59.5	59.5	59.5	78.5	238.0
Purified Recycled Water Demonstration Plant	-	-	-	0.0	1.2	1.2	1.2	1.2	1.5	4.6
ADP RO and UF Membranes	-	-	-	-	8.5	8.6	8.5	8.5	-	34.2
Total	137.7	125.8	214.8	210.4	252.4	259.9	245.7	225.4	847.0	983.4
Total excluding large projects (EP Desal and MWP)	134.5	117.3	194.5	195.6	192.9	200.4	186.2	165.9	712.4	745.4

Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

SA Water has provided a percentage breakdown of work orders by breakdown, corrective and scheduled maintenance. In our experience, assets which are in deteriorating health tend to see an increasing number (and therefore proportion) of reactive work orders such as breakdowns and corrective actions.

The data for water facilities (non-pipes) is encouraging and suggests that the assets have been seeing improving health with breakdowns and corrective work orders making up a generally decreasing trend. The exception to this is the desalination plants, which have seen a slightly increasing trend from FY20 to FY22 (albeit still significantly lower than in FY17 to FY19). With this in mind and acknowledging that membrane replacement is a significant and periodic activity, we have recommended accepting SA Water's proposed increase in ADP membrane expenditure.

Figure 3-8 Trends in water facility reactive maintenance

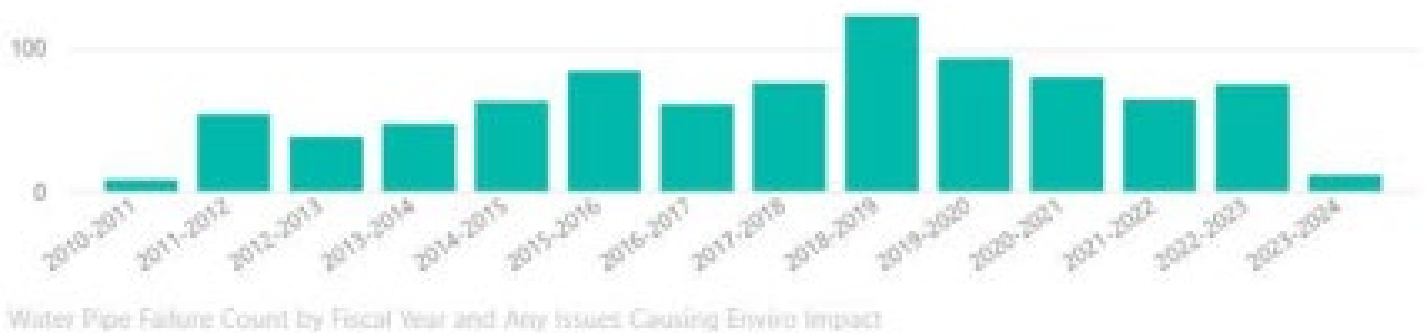


Source: SA Water document “RD24089 - Asset health - Facility Dashboard ESCOSA Summary RD24 (A3271428).pdf”

Note: this is the sum of breakdowns and corrective maintenance as % of work orders

The rate of pipe failures can be significantly affected by external factors such as weather. The data provided by SA Water does not indicate a strong worsening trend and performance appears to be generally stable.

Figure 3-9 Trends in water pipe failures



Source: SA Water document “RD24089 - Asset health - Facility Dashboard ESCOSA Summary RD24 (A3271428).pdf”



3.2.1.1.1 Water reticulation program

In its regulatory business plan for RD24, SA Water has proposed the water reticulation management program, aimed at sustaining service by maintaining reliability of the network. The water reticulation program covers pipe networks that transport water between the trunk mains and customer connections. Reticulation pipes range between 63 mm and 374 mm. SA Water's reticulation network has a length of 23,527 km, which makes up 87% of the utility's pipe network length. The proposed expenditure for the water reticulation program over RD24 is \$146.0M, which includes renewal of reticulation network, valve installation, pressure management, and trialling water conditioning program⁴².

As discussed in the RD 20 AP Mains program review, SA Water utilises PARMS modelling to plan the level of investment needed to maintain the level of service (LoS) target. For the proposed output, the associated LoS are pipe failures, leakages, and unplanned interruptions. The table below provides SA Water's LoS targets for RD24 under the water reticulation management output as well as its baseline performance.

Table 3-7 Level of service (LoS) targets associated with the water reticulation management output

Level of service		Baseline performance	RD24 Target	Realisation time
Customer	properties experiencing three or more unplanned interruptions (rolling 12 months)	1482	<1750	End of RD24
	properties experiencing an unplanned interruption per 1000 properties	145.8	<153	Rolling 12 months
	Customer environmental perception	85%	(>75%)	Annual
	Average unplanned outage duration (minutes)	179	<200	Rolling 12 months
	Brand health /10 (Flooding of properties & traffic disruption)	7.5	>7.0	Annual
Technical	failures per 100km per year (metro)	20	<21	Rolling 12 months
	failures per 100km per year (regional)	9.2	<11	Rolling 12 months
	kL per km per day	2.29	<2.0	Annual
	L per connection per day	85	<85	Annual
	ILI Ratio		1	

Source: Business Case 001 – Water Reticulation Management Reliability as of 24 Aug 2023, SA Water, September 2023

SA Water is outperforming almost all its LoS targets associated with water reticulation management, as demonstrated in the table above. This highlights that under the sustain driver, SA Water will require an RD24 investment for renewals that is similar to RD20 to maintain the current level of service. This aligns with the business case put forward for the water reticulation management program, as SA Water is proposing a \$146.0M investment compared with the RD20 outturn/forecast expenditure of \$149.0M and the RD20 baseline of \$176.0M (\$FY23). The table below shows the level of expenditure across the different sub-programs, highlighting the proposed and outturn/forecast expenditure.

⁴² Business Case 001 - Water Reticulation Management Reliability as of 24 Aug 2023, SA Water, September 2023.



Table 3-8 Water reticulation management RD20 expenditure baseline and outturn/forecast compared with proposed in RD24 (\$FY23 M)

	RD20 Baseline (\$FY23 M)	RD20 actual/forecast (\$FY23 M) ⁴³	RD24 Proposal (\$FY23 M)
Water reticulation mains - Metro	78.1	67.1	62.6
Water reticulation mains - Country	58.6	50.4	67.6
Water reticulation valve installations ⁴⁴	6.8	5.7	3.7
Smart networks & pressure management	32.5	25.8	7.0
Water conditioning trial program	-	-	5.2
Total	176.0	149.0⁴⁴	146.0

Source: 20230926 -13 - Session 2 - RD24 Water reticulation Mgt Reliability, SA Water, September 2023 and 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

The table above also summarises the change in proposed expenditure across the different programs. For example, in RD24, SA Water is proposing a smaller expenditure for pressure management and bigger expenditure in the country (regional) area water reticulation management. We understand that, for pressure management, this was due to increase in spend in RD20 to establish the pressure management system such as installing gauges and other supporting equipment. On the other hand, the increase in country renewals program (from \$50.4M to \$67.6M) is a result of the PARMs model projections of the needed level of investment to achieve the LoS targets. This increase is understood to be due to the assumptions in the PARMs modelling. Additionally, for RD24, SA Water is proposing to trial a water conditioning program, which is claimed to offer long term financial gains by extending the life of the assets.

During the development of the RD24 proposal, SA Water undertook options analysis to determine the most beneficial solution in accordance with its long-term plans. This options analysis, provided six options, including a base case of reactive response only. All the other five options included a capital replacement program. The recommended option (option 5) includes an opex uplift relating to items such as ground movement prediction. Under all options, besides the reactive-only option, the failure rate for the Country area is predicted to be the same (Metro's failure rate decreases further under the water conditioning option) as shown in Table 3-9 below.

Table 3-9 Forecast failure rate (technical) LoS for Metro and Country areas

	June 2022 failure Rate	June 2028 failure rate	June 2048 failure rate
Metro – capital replacement only	20.0	21.1	20.4
Metro – water conditioning included	20.0	21.1	17.3
Country	9.2	10.8	11.3

Source: Business Case 001 – Water Reticulation Management Reliability as of 24 Aug 2023, SA Water, September 2023

The review of both asset and financial performance of the water reticulation management program indicates that SA Water has invested an amount that allows it to meet its customer and technical Levels of Service (LoS's). We note that the outturn/forecast expenditure in RD20 was lower than the allowance for this program as discussed earlier. Taking into

⁴³ We utilised 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx to reconcile forecast with information provided by SA Water in the interview sessions. This allowed us to present the figures in \$FY23 value.

⁴⁴ Some of the amount included in valve installation in this table is inclusive of costs associated with BC002 – Water Trunk Mains. Therefore, the \$148.5M figure is slightly different than the RD20 actual/forecast of \$147.4M linked to BC-001 water reticulation management.

account the increased RD20 expenditure to enhance its pressure management program, SA Water is proposing a higher expenditure for RD24, specifically for the Country water reticulation program. SA Water was able to over outperform against its performance targets during RD20 with and underspend against the Country water reticulation allowance which was established using PARMS. Therefore, we believe that the PARMS modelling might be overestimating the level of investment needed to maintain the level of service targets over the long term. However, this is not the same for Metro, where investment projected by PARMS appears to have been (or forecasted to be) delivered and achieving LoS targets.

Although we are noting the potential overinvestment predicted by PARMS for the Country, we have not recommended a specific adjustment for this program. However, we are recommending an adjustment across the regulatory business proposal for projects and programs within the water-sustain driver category.

3.2.1.1.2 Recommended water sustain scope adjustments

Taking into account the apparently improving health of water facilities and broadly stable pipe asset performance, we recommend adjusting the expenditure so that it reflects the level of spend in RD20. We have considered whether a further reduction should be applied because of the improving asset health, but have not applied one in order to avoid the perception of double-counting with catch-up efficiency challenges.

We have, however, recommended accepting SA Water's proposed increase in ADP membrane expenditure, acknowledging that membrane replacement is a significant and periodic activity and that desalination plants have seen a slightly increasing trend in reactive work order percentages from FY20 to FY22. This recommendation is built into the adjustment set out below.

Table 3-10 Recommended adjustments to water sustain expenditure (\$FY23 M)

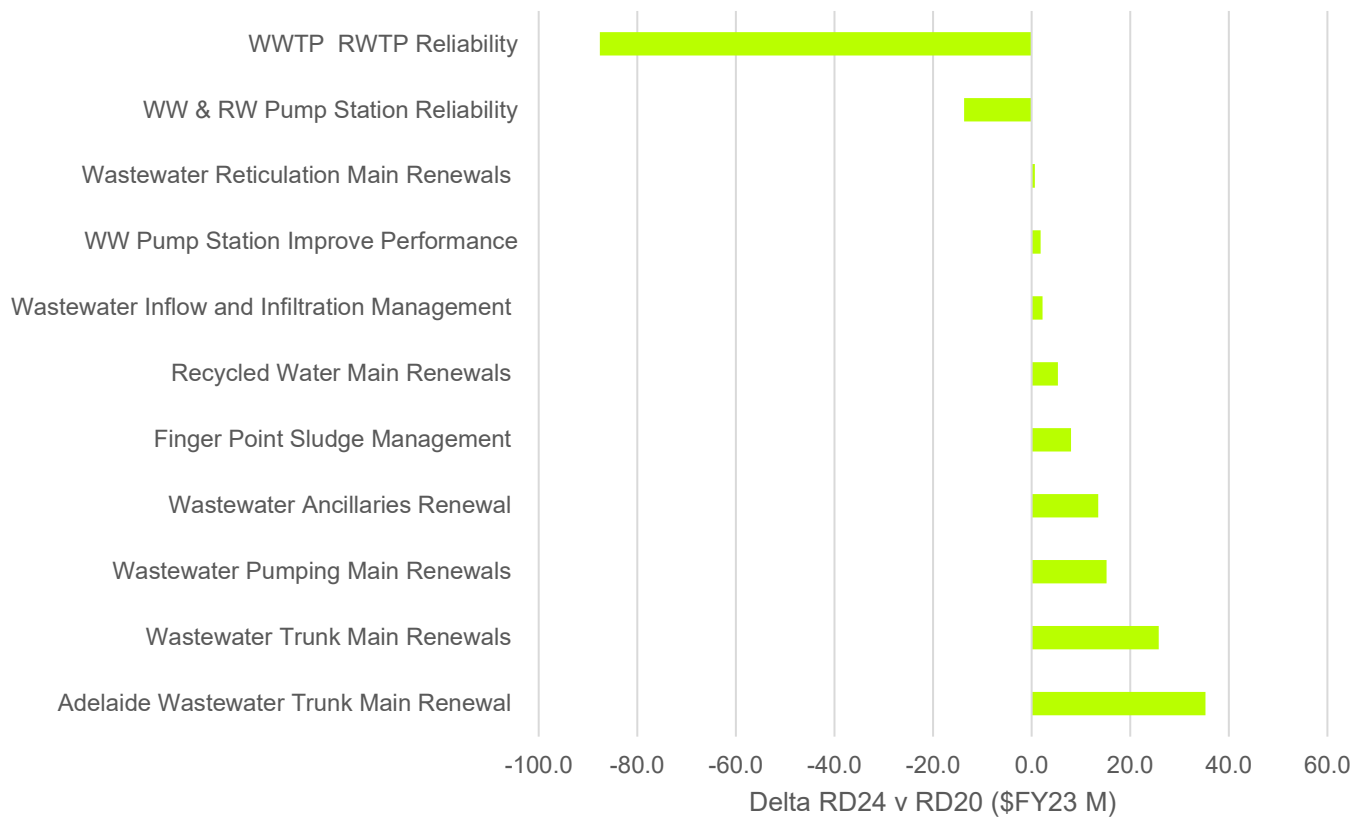
	2025	2026	2027	2028	RD24 Total
Total (ex EP Desal and MWP)	192.9	200.4	186.2	165.9	745.4
Recommended adjustments					
Water Sustain spend reprofiling	-6.5	-14.1	0.1	20.5	0.0
Total (ex EP Desal and MWP)	186.4	186.4	186.4	186.4	745.4

Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

3.2.1.2 Wastewater

As with water, the RBP proposes a range of 'unders' and 'overs' for different project lines within the Sustain driver. We have reviewed the WWTP RWTP reliability project. This is the largest component of the proposed RD24 program but also the largest reduction having been by far the largest spend item in RD20. We have also reviewed the second largest proposed RD24 line, the Adelaide trunk main renewal project, below. The deltas between RD20 and RD24 proposed spend are summarised graphically and in table form below.

Figure 3-10 Proposed wastewater sustain expenditure- changes compared to RD20



Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx



Table 3-11 Proposed wastewater sustain expenditure (\$FY23 M)

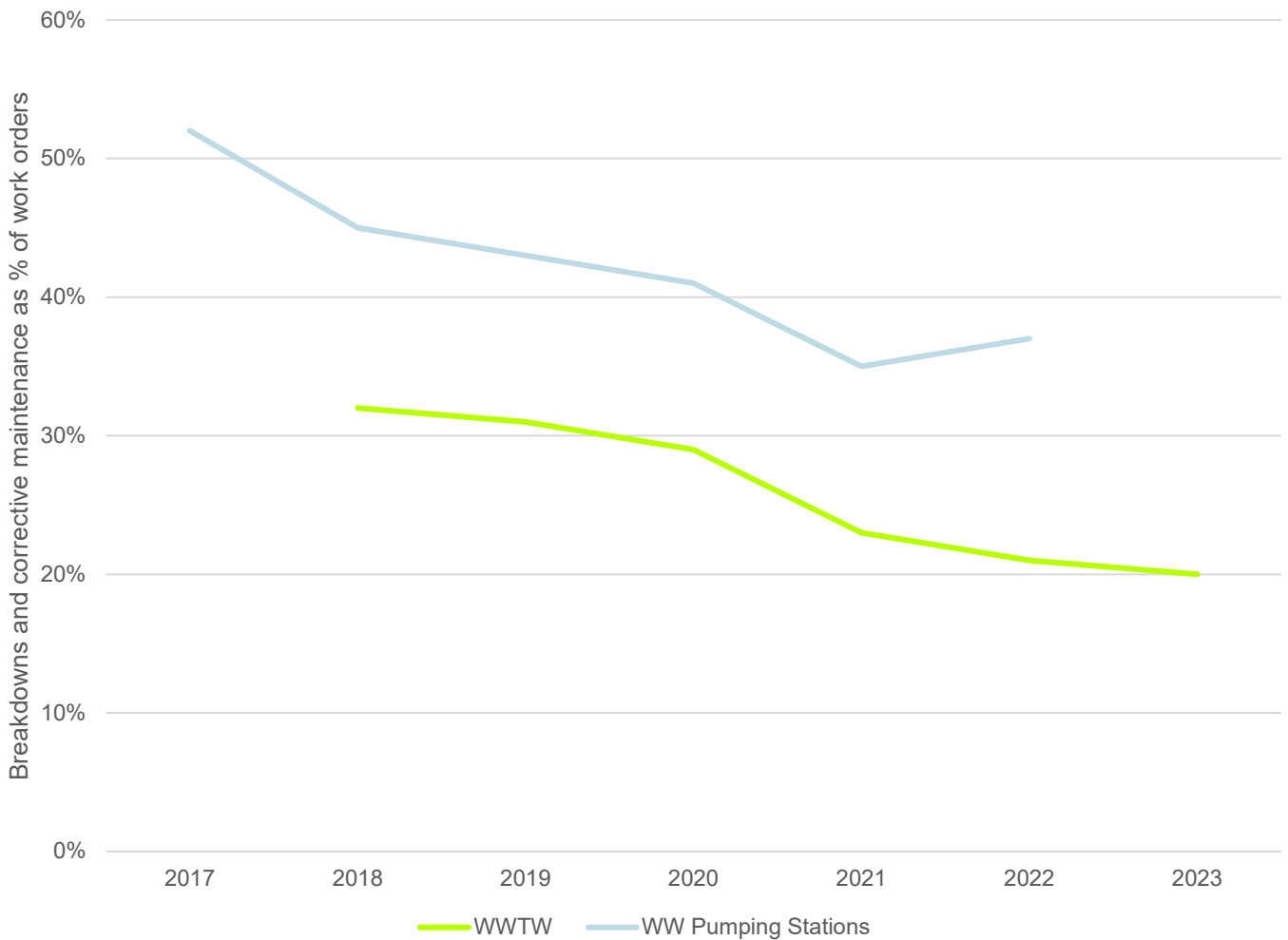
	2021	2022	2023	2024	2025	2026	2027	2028	RD20 Total	RD24 Total
Wastewater Reticulation Main Renewals	4.6	7.6	2.1	4.9	4.9	4.9	4.9	4.9	19.2	19.6
Wastewater Pumping Main Renewals	2.1	0.3	5.8	3.6	6.8	6.8	6.8	6.8	11.9	27.1
Wastewater Trunk Main Renewals	0.2	0.0	0.0	0.5	6.6	6.6	6.6	6.6	0.7	26.5
Wastewater Ancillaries Renewal	2.4	2.8	2.1	1.8	5.6	5.6	5.6	5.6	9.1	22.5
Recycled Water Main Renewals	-	-	-	-	1.3	1.3	1.3	1.3	-	5.4
WWTP RWTP Reliability	40.1	40.3	30.7	36.4	14.5	14.5	14.5	14.5	147.5	58.1
WW & RW Pump Station Reliability	5.9	1.9	12.8	15.5	5.7	5.7	5.7	5.7	36.1	22.6
Adelaide Wastewater Trunk Main Renewal	-	-	-	-	8.8	8.8	8.8	8.8	-	35.3
Wastewater Inflow and Infiltration Management	0.5	0.7	1.9	-	1.3	1.3	1.3	1.3	3.1	5.3
WW Pump Station Improve Performance	0.4	1.6	1.4	1.2	1.6	1.6	1.6	1.6	4.6	6.4
Finger Point Sludge Management	-	-	-	-	2.0	2.0	2.0	2.0	-	8.0
Total	56.2	55.3	56.9	63.9	59.2	59.2	59.2	59.2	232.2	236.7

Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx



As for the water assets, SA Water has provided a percentage breakdown of work orders by breakdown, corrective and scheduled maintenance. The data for wastewater facilities (non-pipes) is encouraging and suggests that the assets have been seeing improving health with breakdowns and corrective work orders making up a generally decreasing trend.

Figure 3-11 Trends in wastewater facility reactive maintenance

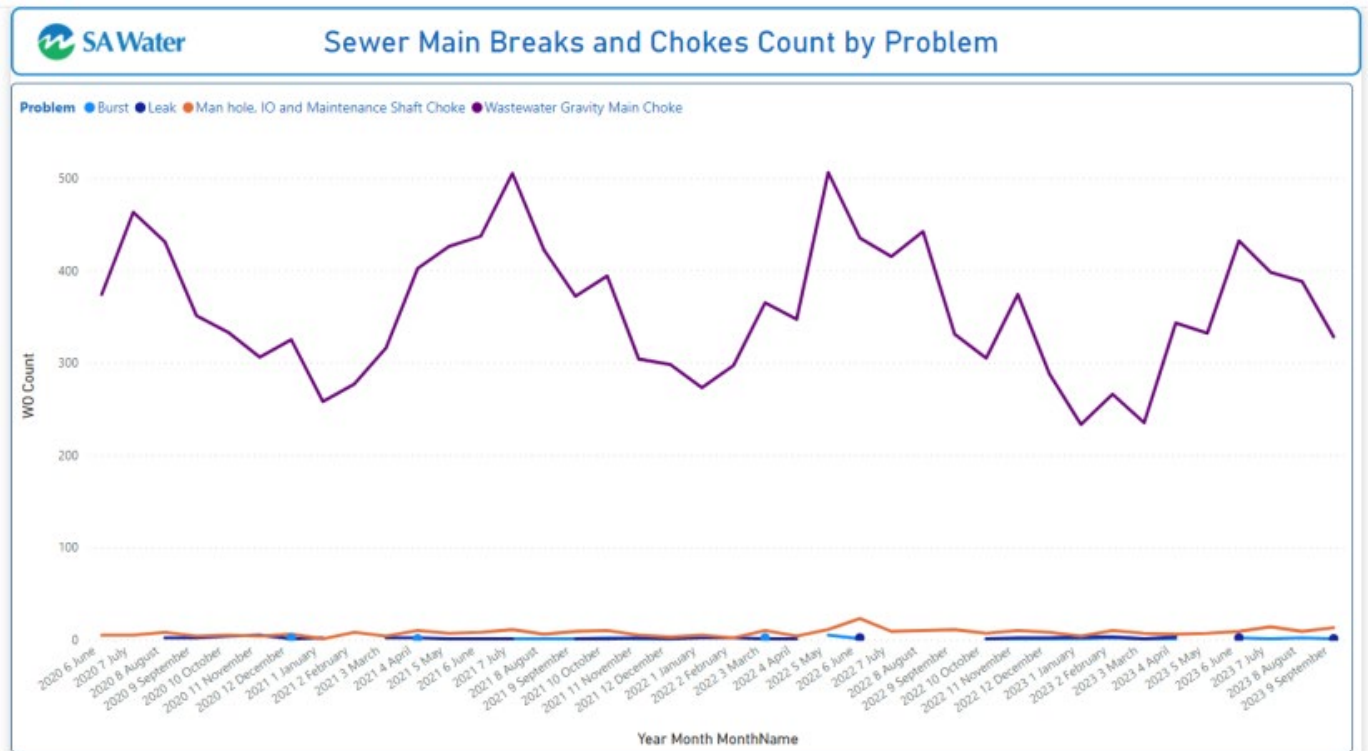


Source: SA Water document “RD24089 - Asset health - Facility Dashboard ESCOSA Summary RD24 (A3271428).pdf”

Note: this is the sum of breakdowns and corrective maintenance as % of work orders

The rate of pipe failures can be significantly affected by external factors such as weather. The data provided by SA Water provides a shorter timescale than for water pipes but similarly does not indicate a strong worsening trend and performance appears to be generally stable.

Figure 3-12 Trends in wastewater pipe failures



Source: SA Water document “RD24089 - Asset health - Facility Dashboard ESCOSA Summary RD24 (A3271428).pdf”

3.2.1.2.1 Adelaide wastewater trunk main renewal

In RD24, SA Water is proposing to undertake a relocation of the Adelaide wastewater trunk main that is currently within the Adelaide Railway Station rail yard. This project was triggered after a condition assessment that took place to inform SA Water in its management of risk across its assets. The condition assessment, using CCTV and core sampling, reported that a medium likelihood of failure (11%-50% within the next 3 years) with a high consequence. The option selected by SA Water after its options assessment is to re-align the trunk main away from the railway tracks. This option has an expenditure estimate of \$30.8M⁴⁵.



⁴⁵ 20230928 - 24 - Session 1 - RD24 Adelaide Wastewater Trunk Main Renewal, SA Water, September 2023.



Table 3-12 Optioneering and cost for the Adelaide Trunk Mains (snippet from SA Water presentation)

Optioneering	Class 2 Estimate	Notes	MCA
Manhole Rehabilitation Options Tunnel Entry, Shallow Tunnel, Enlarge Existing, Side Entry, New Manhole	\$32.9M - \$35.1M	<ul style="list-style-type: none"> Assumes 8-week rail shutdown for construction Does not include any rehabilitation to trunk mains 	2.54 (3)
Existing Trunk Main Rehabilitation Options CIPP, Spiral Wound PVC Rotaloc, Slip Lining	\$13.2M - \$32.9M	<ul style="list-style-type: none"> Requires manhole rehabilitation option occur first Significant by-pass pumping required in order for sewer lining to occur Some lining methods not considered feasible due to design of trunk main 	Not Assessed (Dependant on MH Rehabilitation)
Option 1 - Existing Trunk Main Rehabilitation Enlarging existing manholes & rehabilitate trunk main with cured in place pipeline (CIPP)	\$40.7M	<ul style="list-style-type: none"> Assumes 12-week rail shutdown for construction Does not address access constraints into rail corridor 	2.56 (2)
Option 4 - New North - South Alignment Enlarge Existing Manholes, CIPP Liner EW & New Trunk NS (micro-tunnelling)	\$54.6M	<ul style="list-style-type: none"> Largest rail impact due to extensive works in the rail corridor Does not address access constraints into rail corridor 	2.41 (4)
Option 5 - New East – West Alignment New E-W alignment constructed outside northern boundary of rail corridor and new N-S trunk constructed under rail (micro-tunnelling)	\$39.4M	<ul style="list-style-type: none"> Assumes 8-week rail shutdown for construction Option ruled out due to significant impact on natural vegetation and Aboriginal heritage. 	2.18 (5)
Option 6 - New Alignment - Alternative East West New E-W alignment south of rail corridor to connect to N-S Trunk (micro-tunnelling)	\$30.8M	<ul style="list-style-type: none"> Minimises rail impact due to excavation activities occurring outside of rail zone and pipe jacking under rail Transfers trunk main out of the rail corridor, improving access 	2.59 (1)
Option 7 - New Wastewater Pumpstation New 240L/s wastewater pumpstation and associated pumping main constructed within rail corridor discharging into DN1000 GRP trunk in Bonython park	\$40.1M	<ul style="list-style-type: none"> Transfers flows out of rail corridor O&M costs ongoing Increased risk of odour to nearby Hospitals Size, depth, location of WWPS make these option not feasible 	1.84 (6)
Cost estimates are influenced significantly by DIT rail shut down costs			

Source: 20230928 - 24 - Session 1 - RD24 Adelaide Wastewater Trunk Main Renewal, SA Water, September 2023

Additionally, we understand that SA Water undertook a multicriteria assessment (MCA) for the selection of the most beneficial option in the long term. As can be shown in the table above, the scoring between option 6 (recommended) and option 1 indicates a close margin. It is reasonable to see that if shutdown costs are minimized through coordination and potential contributions from the DIT, option 1 would have been scored higher. This suggests that there might be some efficiencies to be gained in the area of project development and MCA (discussed in the recommended improvements section).

We have not recommended any specific adjustment for this project, but we have included adjustment at a wastewater sustain program level to address the project development inefficiencies identified for this program.

3.2.1.2.2 Wastewater and recycled water treatment plant reliability

This program line relates to asset renewals for the portfolio of 29 wastewater treatment plants (WWTPs) and four recycled water treatment plants (RWTPs) owned by SA Water.

Activities within the programme are defined largely by condition grade established by asset inspection, age-based inference and information provided by Asset Maintenance and Operations personnel such as operational issues flags. SA Water uses a condition grade range of 1 to 5 based on current condition and expected remaining asset life, where Grade 1 assets are in the best condition and Grade 5 assets are in the poorest condition.

As can be seen in Table 3-11, SA Water is proposing a reduction in expenditure in this program line compared to RD20. SA Water explained that in RD20 its objective was to manage all Grade 4 and 5 assets, whereas its proposal for RD24 is based mainly on replacing or refurbishing Grade 5 assets and only some Critical Grade 4 assets based on their risk score and ability to mitigate in the case of failure. It was explained to us that this was determined by the Executive as part of its capex program level risk and expenditure scenario decision-making.

We understand that SA Water looks to reassess condition grades for approximately 20% of its assets per annum. Age-based condition inference is understood to be used for 12% of WWTP and 43% of RWTP assets⁴⁶. We understand that the condition grades definitions used by SA Water are based on estimated percentage of life remaining (e.g. grade 4 is expected to have 10 to 25% of asset life remaining).

We recognise that condition assessment is challenging, and that some subjectivity is inherent in the use of inspections. However, if the definition of *percentage* of remaining asset life is indeed the focus rather than *absolute* remaining asset life, this seems like a potentially inappropriate way to determine the extent of renewals and refurbishment needed in a fixed period of time⁴⁷. **We would recommend ensuring that future assessments are firmly focused on absolute remaining asset life in this kind of assessment.**

The cost classification breakdown⁴⁸ provided by SA Water indicates that the program has \$5.9M of “no estimate class”, \$23.6M of Class 1, \$26.0M of Class 2 and \$2.6M of Class 3 expenditure. However, it is clear that there is significant uncertainty in some of the cost estimates, in particular the \$25.2M Finger Point outfall replacement project, which is the largest project within the program and makes up nearly all of the Class 2 elements of the program.

During the interview, the costs of the outfall replacement were described to us as a ‘class zero’ ‘order of magnitude’ estimate, derived from the length of the current outfall multiplied by a rough cost per metre following discussions with one potential supplier and that it had not yet been decided whether the outfall will need to be relocated (i.e. the length and location). Whilst these costs may well be being used for project scoping, it appears unlikely that the estimate in the RBP would fit within the Class 2 target accuracy of -20 to +30%. This suggests that there may be a **misalignment between cost estimate use and accuracy which is not captured by the cost classification system, with some cost estimates being less robust than their classification would suggest.**

We have not recommended any adjustments specific to this program line as we are recommending a general adjustment as set out below.

3.2.1.2.3 Recommended wastewater sustain scope adjustments

Taking into account the apparently improving health of wastewater facilities and broadly stable pipe asset performance, we recommend adjusting the expenditure so that it reflects the level of spend in RD20. We have considered whether a further reduction should be applied because of the improving asset health but have not applied one in order to avoid the perception of double-counting with catch-up efficiency challenges.

Table 3-13 Recommended adjustments to wastewater sustain expenditure (\$FY23 M)

	2025	2026	2027	2028	RD24 Total
Total proposed wastewater sustain expenditure	59.2	59.2	59.2	59.2	236.7
General wastewater sustain adjustment	-1.1	-1.1	-1.1	-1.1	-4.5
Revised total	58.1	58.1	58.1	58.1	232.2

Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

⁴⁶ SA Water document “WWTP & RWTP Reliability Business Case”.

⁴⁷ E.g. 20% remaining asset life for a 60 year civil asset would suggest that it doesn’t need to be replaced or refurbished within RD24 whereas 20% remaining asset life for a 15 year mechanical asset life asset would suggest that it does, despite both of the assets having the same condition grade.

⁴⁸ SA Water spreadsheet “20231106 - SAWRD24 - RD24179-RD24088 Projects by Class of Estimate - ESCOSA_3.11.23 (A3282949)”.



3.2.2 Growth

Water:

- The proposed Water Growth program represents a significant increase (+\$219.9M or +98%) compared to RD20. It is dominated by the Metro North and Summit System Growth projects.
- Proposed expenditure excluding the major projects (KI Desalination in RD20 and Metro North in RD24) is very similar in RD24 to RD20.
- We reviewed the Summit Growth project and considered it unlikely that a scheme which has not started the gateway process at this point, and for which there are not current but rather future expected performance challenges, will spend \$12.1M next financial year and thereafter.
- We have therefore recommended reprofiling of water growth expenditure to be broadly consistent with the backloaded profile in RD20.
- We understand that the Metro North project is likely to be subject to a Section 6 Direction. We have therefore not reviewed the project or recommended any adjustments to it.

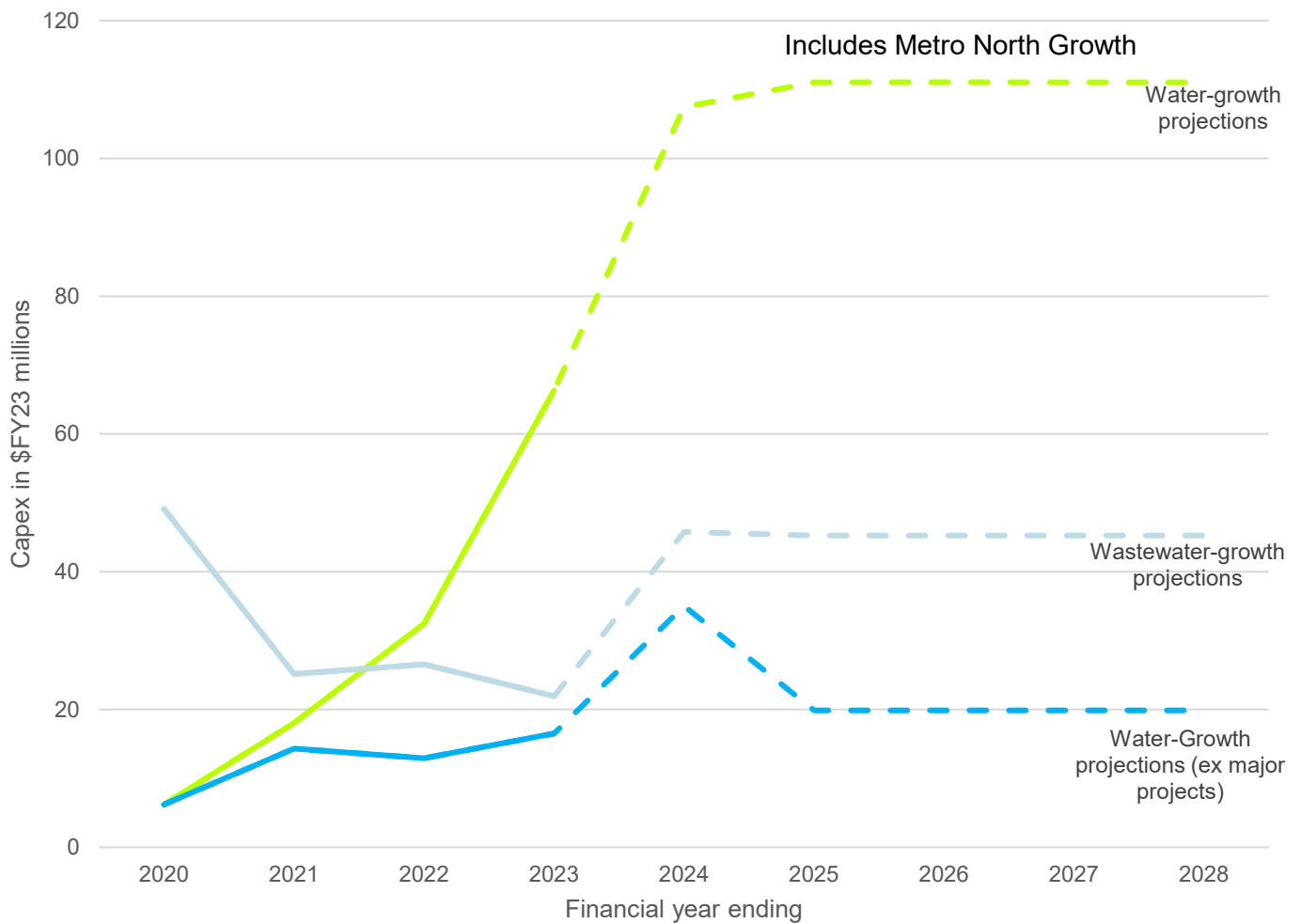
Wastewater:

- SA Water is proposing nearly double the RD20 expenditure on network growth expenditure. This is mainly due to two large network growth projects in Bolivar and Glenelg. The drivers for this increase are growth projections in greater Adelaide and Glenelg.
- Expenditure on wastewater treatment capacity is proposed to increase by a more modest 16% or \$10.6M.
- We reviewed the Bolivar WW Network Growth proposed output and found that projects identified under this business case are at the early stages of development. This is reflected both in the business case, estimate class, and cost breakdown documents.
- Glenelg WW Network Growth is similar to the Bolivar business case. We undertook a desktop review of the Glenelg output and found that a similar approach was used to develop the proposed expenditure.
- For both Bolivar and Glenelg WW Network Growth outputs, we recommend a phased rate of expenditure with expectation that the full proposed rate of investment would be achieved in RD28. This reflects a recommended adjustment of \$59.1M for both outputs.

Proposed growth expenditure is dominated by the water service and specifically by the Metro North project as set out below.



Figure 3-13 Proposed growth expenditure



Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: there are no major projects in the proposed wastewater sustain program.

3.2.2.1 Water

The proposed Water Growth program represents a significant increase (+\$218.2M or +97%) compared to RD20. It is dominated by the Metro North and Summit System Growth projects, both of which are discussed below. Total proposed expenditure excluding the major projects (KI Desalination in RD20 and Metro North in RD24) is very similar in RD24 to RD20. However, it is likely that some of the general expenditure has moved from the general program to Metro North.

The Metro North project relates to the water supply system which covers the northern metropolitan region of Adelaide. The scope includes new and duplicate supply mains, tanks and valves. We understand that the project is likely to be subject to a Section 6 Direction. We have therefore not reviewed the project or recommended any adjustments to it.



Table 3-14 Proposed water growth expenditure (\$FY23 M)

	2021	2022	2023	2024	2025	2026	2027	2028	RD20 Total	RD24 Total
Growth Program (ex KI Desal)	14.3	12.9	16.5	34.2	5.7	5.7	5.7	5.7	77.9	22.8
Kangaroo Island Desalination Plant	3.7	19.5	49.8	70.3					143.4	-
Wirrina Water Supply	-	-	-	0.9	2.0	2.1	2.0	2.0	0.9	8.2
Summit System Growth	-	-	-	-	12.1	12.1	12.1	12.1	-	48.4
Metro North Sub System Growth	-	-	-	2.1	91.2	91.2	91.2	91.2	2.1	364.8
Total	18.0	32.5	66.3	107.5	111.1	111.1	111.1	111.1	224.3	444.2
Growth spend ex KI desal and Metro North	14.3	12.9	16.5	35.0	19.9	19.9	19.9	19.9	78.8	79.4

Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

We have reviewed the Summit System Growth project as set out below.

3.2.2.1.1 Summit System Growth

This project relates to proposed capacity upgrades of infrastructure within the Summit water supply system to provide for growth in the areas it serves the Adelaide Hills, Mount Barker, and Alexandrina regions.

SA Water is proposing a new 32MI earth bank storage which helps with peak demand servicing, a 10MI storage tank and new feeder mains. There is a small interconnection between Summit and the Metro (Happy Valley) system, but this cannot be used because of the different disinfection used (Happy Valley is chlorinated. Summit is chloraminated).

More than half of the costs (\$25.0M) of the project are currently classified as “no estimate class” and the rest are Class 2. We understand that the project was not at M1 in the gateway process yet at the time of review, and that there are not currently any water pressure issues, but rather that they are expected in future based on hydraulic modelling.

We acknowledge that expenditure is likely to be required to support growth in this area. However, we find it unlikely that a scheme which has not started the gateway process at this point and for which there are not current but rather future expected performance challenges will be expending \$12.1M next financial year (FY25) and thereafter. We have therefore recommended reprofiling of expenditure as summarised in Table 3-15 below. This is broadly consistent with the backloaded profile expected by SA Water in RD20.

We also note that, in its RBP, SA Water is forecasting to receive capital contributions from customers of \$10.1M over the RD24 period of which \$7.0M relate to the water service. During interviews with SA Water, there was some uncertainty about the amount of capital contributions which this project would generate. However, it did appear to be potentially significant and inconsistent with the contribution assumptions in the RBP. SA Water has agreed to revisit its capital contribution assumptions in its submission after the Draft Determination.

3.2.2.1.2 Recommended water growth adjustments

We consider it likely that water growth expenditure will follow a similar pattern to RD20, with many investments not yet mature and taking time to develop and commence implementation. We have therefore recommended a reprofiling adjustment to 'general' growth spend (i.e. excluding large projects such as KI Desalination and Metro North) to match approximately the patterns seen in RD20. We have not recommended an adjustment to the total quantum of spend, just the timing of it. The proposed adjustment is shown below.

Table 3-15 Recommended adjustments to water growth expenditure (\$FY23 M)

	2025	2026	2027	2028	RD24 Total
Total	111.1	111.1	111.1	111.1	444.2
Growth spend ex KI desal and Metro North	19.9	19.9	19.9	19.9	79.4
Water growth spend reprofiling	-6.9	-6.9	-2.9	16.6	0.0
Total	104.2	104.2	108.2	127.6	444.2
Growth spend ex KI desal and Metro North	13.0	13.0	17.0	36.4	79.4

Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

3.2.2.2 Wastewater

SA Water is proposing a significant increase (+\$61.6M or 52%) in wastewater growth expenditure. This is driven by two large network growth projects: Bolivar and Glenelg. The combined effect is to approximately double expenditure on wastewater network capacity to \$103.5M.

Expenditure on wastewater treatment capacity is proposed to increase by a more modest 16% or \$10.6M. We comment below on the Bolivar and Glenelg WW Network Growth projects.

Table 3-16 Proposed wastewater growth expenditure (\$FY23 M)

	2021	2022	2023	2024	2025	2026	2027	2028	RD20 Total	RD24 Total
Bolivar ASR Capacity Upgrade	-	-	-	-	7.5	7.5	7.5	7.5	-	30.0
Bolivar WW Network Growth	-	-	-	-	17.1	17.1	17.1	17.1	-	68.3
Bolivar WWTP Capacity Growth Upgrade	1.2	2.5	10.0	35.4	18.6				49.1	-
“Growth WWTP and RWTP” (ex Bolivar WWTP Capacity Upgrade)	7.9	4.5	2.1	3.4	7.2	7.2	7.2	7.2	17.9	28.9
Glenelg WW Network Growth	-	-	-	-	8.2	8.2	8.2	8.2	-	32.9
Growth WW & RW Network	16.1	19.5	9.9	7.0	0.6	0.6	0.6	0.6	52.5	2.3
Total	25.2	26.6	21.9	45.8	59.2	40.6	40.6	40.6	119.5	181.1

Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: RD24 “Growth WWTP and RWTP” and Totals have been amended to reflect the known expenditure profile for “Bolivar WWTP Capacity Growth Upgrade”.

3.2.2.2.1 Bolivar WW network growth

The Bolivar WW Network Growth program is aimed at addressing the potential impacts of growth in the Bolivar wastewater network catchment. SA Water provides that this expenditure will enable SA Water to meet agreed levels of service, regulatory obligations, and minimising overflows⁴⁹. SA Water’s business plan for RD24 proposes \$68.3M in expenditure against this program.

In its development of this business case, SA Water utilised its hydraulic model and growth demand documents to understand the required wastewater-related growth needs. According to the business case document, SA Water projects over 2,000 sewer connection for development by 2030. Based on these projections and taking into account SA Water’s network constraints, SA Water modelled the potential growth impact on the Bolivar network catchment, which is shown in Table 3-17. The modelled result presented by SA Water suggested that the Bolivar network addressed in this project is forecasted to undergo significant pressure if the planned growth takes place. SA Water provided in the business case

⁴⁹ Business Case 128 - Bolivar WW Network Growth 1.0 as of 24 Aug 2023, SA Water, September 2023.



document that the current performance of the network is “barely satisfactory” as the 5-year annual average of type 1 and 2 overflow incidents is 113, which remains below the 135 incident Level of Service (LoS) target.

Table 3-17 Catchment impact under 1-in-5-year ARI storm event (\$FY23 M)

	Predicted impact on catchment	Current	Future
Bolivar North	# of Spill sites	3	19
	Total spill volume	40.9 kL	3858 kL
Bolivar South	# of Spill sites	19	93
	Total spill volume	77.8 kL	1125 kL

Source: Business Case 128 - Bolivar WW Network Growth 1.0 as of 24 Aug 2023, SA Water, September 2019

The risks associated with the network constraints and potential impacts were assessed using the Wastewater Growth Risk Framework, which evaluated the consequences and likelihood to meet SA Water’s LoS targets. Based on the findings and risk assessment, SA Water presented the following potential impacts⁴⁹:

- Reduce SA Water’s ability to meet customer and technical levels of service measures: (Type 1 & 2 environmental incidents from wastewater network overflows (5-year annual average) (Target <135))
- Increase OPEX (e.g., due to tankering) to reduce overflows
- Have environmental and public health impacts, due to spillage and overflows to the environment (breach of WSAA guidelines on overflow risks)
- Increase the propensity for odour in networks with limited capacity
- Reduce SA Water’s ability to meet external obligations, such as the Section 6 directive for the City of Tea Tree Gully Community Wastewater Management System (CWMS) to be transitioned over to the SA Water sewer system

In the business cases for this WW augmentation project, SA Water presented its options analysis, which largely considered the following options:

- Do nothing
- Operational intervention (e.g. pumpstation optimisation, tinkering, reviewing trigger points for overflows)
- Upgrade / augment WW network capacity
- Consider integrated water management opportunities that reduces some or all of the growth demand (e.g. sewer mining)

Each option included benefits and risks based on SA Water’s analysis. With this consideration, the recommended option was to “implement a mixed optimised solution, tailored to each part of the network, which used the investigation outcome.” The recommendation included outputs/projects for specific parts of the network, which then were evaluated by stakeholders within the business using MCA to present a list of outputs and projects. This recommendation included an initial capital expenditure of \$151.7M.

Following SA Water’s processes, this business case has undergone gateway reviews, which finally reduced the list of outputs/projects for a total RD24 capital expenditure of \$68.31 M, as broken down here in Table 3-18.



Table 3-18 Bolivar WW network growth cost breakdown by project (\$FY23 M)

Insight	Title	CAPEX Total \$M	OPEX, Total (efficiency applied) \$M	Inherent
A0029-0057	Parafield WWN Upgrade BLVS-WW-001	25.4		High Risk
A0029-0058	Cobblers Creek WWN Upgrade BLVSWW-007	1.4		High Risk
A0029-0061	Grand Junction Rd WWN Upgrade BLVSWW-086	10.2		High Risk
A0029-0224	BLVN-WW-Edinburgh North Development Stebonheath Rd / Bellchambers Rd DN525/DN600	0.6		High Risk
A0029-0234	BLVN-WW-Smitham Rd, Munno Para Downs Stebonheath Rd, MH1050752 DN450	10.7		High Risk
A0029-0238	BLVN-WW-Munno Para Sewer Servicing Strategy	20.0		High Risk
TOTAL BC #128		68.3	6.0	

Source: *Business Case 128 - Bolivar WW Network Growth 1.0 as of 24 Aug 2023, SA Water, September 2019*

As part of the review, SA Water provided cost breakdown for each of the projects identified in the table above as well as the class estimate for each output and business case identified for RD24^{50,51}. All the projects identified under this business case are class 1 estimates, which are done at the project identification stage using early design (~10% level of design) and historical cost rates. This is also reflected in the cost breakdown documents with other costs (contractor indirect costs, project delivery, SAW risk allowance, and others) accumulating to around 50% of the target outturn cost.

Based on the information provided, we consider that the Bolivar WW network growth to be in early development. The business case has been triggered by the growth projections understood from the different planning documents by SA Water as well as other planning entities, which is considered reasonable. However, the level of investment and approach has been based on model projections as opposed to actual practical indicators such as connection request increases in areas proposed under this business case. Additionally, the development of solutions proposed appears to be in early stages. According to SA Water, class 1 estimates have an accuracy target of -30% to +50%⁵², which implies the early stages of development.

In practice, we expect that SA Water will continue to develop the design and options to address the growth projections in the Bolivar catchment area. This will require SA Water to spend some capex to progress with designs and engage in part of the delivery of this program. We consider that a more realistic timeline would push the rate of spend proposed to later in RD24 and RD28. Additionally, we believe that the full program to address the growth projections will be developed at a much more mature stage for the RD28 period. By the next regulatory period, it is expected that indicators, such as connection requests, are well understood, established, and integrated into the proposed solution.

⁵⁰ RD24178 response with cost breakdown for each project in BC 128, SA Water, November 2023.

⁵¹ SAWRD24 - RD24179-RD24088 Projects by Class of Estimate - ESCOSA_3.11.23 (A3282949).xlsx, SA Water, November 2023.

⁵² 20230926 - 9 - Session 1 - Approach to costing and risk, SA Water, September 2023.



Therefore, for RD24, we have recommended an adjustment to reflect a phased rate of spend, with the assumption that the full rate of spend proposed will be realistically achieved by the second year of RD28. Noting that, per SA Water's business case, other outputs that were not included in RD24 will also be considered for RD28. Table 3-19 below summarises our recommendation for this business case.

Table 3-19 Bolivar wastewater network growth recommendation summary (\$FY23 M)

	2025	2026	2027	2028	RD24 Total
Proposed (RBP)	17.1	17.1	17.1	17.1	68.3
Proposed (business case)	2.0	27.3	27.3	11.7	68.3
Recommended expenditure	2.8	5.7	8.5	11.4	28.5
Recommended adjustment	0.9	(21.6)	(18.8)	(0.3)	(39.8)

Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Because the proposed Bolivar WW network growth business case shares similar characteristics with the proposed Glenelg WW network growth business case (#135), we undertook a desktop review of the RD24 Glenelg WW network growth. In our review, we aimed at determining the level of development of the proposed solution and costing included in the business case for this output. Similar to the Bolivar WW network growth business case, the Glenelg project cost proposed is based on a class 1 estimate⁵³. Additionally, the proposed solution is triggered and determined by a modelling approach using growth assumptions.

Therefore, we have applied the same adjustment to the Glenelg WW network growth project. The adjustment assumes that the proposed rate of investment will take place at the second year of RD28. As shown in Table 3-20, we recommend a phased rate of expenditure with the full proposed rate of investment achieved in RD28.

Table 3-20 Glenelg wastewater network growth recommendation summary (\$FY23 M)

	2025	2026	2027	2028	RD24 Total
Proposed	3.3	13.2	13.2	3.3	32.9
Recommended expenditure	1.4	2.7	4.1	5.5	13.7
Recommended adjustment	(1.9)	(10.4)	(9.0)	2.2	(19.2)

Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

3.2.2.2 Recommended wastewater growth adjustments

We have recommended applying the scope adjustments to Bolivar and Glenelg wastewater network projects as set out above. We have not recommended any adjustments to wastewater treatment capacity as the increase is relatively minor. The recommended adjustments are summarised below.

⁵³ Business Case 135 - Glenelg WW Network Growth 1.0 as of 24 Aug 2023, SA Water, September 2023.

Table 3-21 Recommended adjustments to wastewater growth expenditure (\$FY23 M)

	2025	2026	2027	2028	RD24 Total
SA Water Proposed	59.2	40.6	40.6	40.6	181.1
Recommended adjustments					
Bolivar wastewater network growth	(14.2)	(11.4)	(8.5)	(5.7)	(39.8)
Glenelg wastewater network growth	(6.9)	(5.5)	(4.1)	(2.7)	(19.2)
Revised total	38.1	23.7	28.0	32.2	122.0

3.2.3 Improved service and external requirements

Water:

- The RBP proposes a significant increase (~c\$203M) in Improved Service and External Requirements expenditure mainly driven by the Metro Water Quality Improvement project (+\$118M) and the Mount Bold Dam Safety Upgrade (+\$84M).
- We have recommended a scope adjustment to the Metro Water Quality project to allow for the installation of the new treatment technology at one rather than two WTPs. We consider this is prudent given that it is a new technology for SA Water and the potential challenges and disruption of construction within existing assets.
- We have also recommended a scope adjustment to the Mount Bold project. Given that SA Water is planning to return to the drawing board on optioneering and that it is likely to take time to fully develop a solution, we consider it prudent to allow for project development costs rather than construction in RD24. We note that any construction capex could be taken into account in a future ex-post review.
- We have not recommended any scope adjustments to other lines because they are broadly in line with historical levels of activity.

Wastewater:

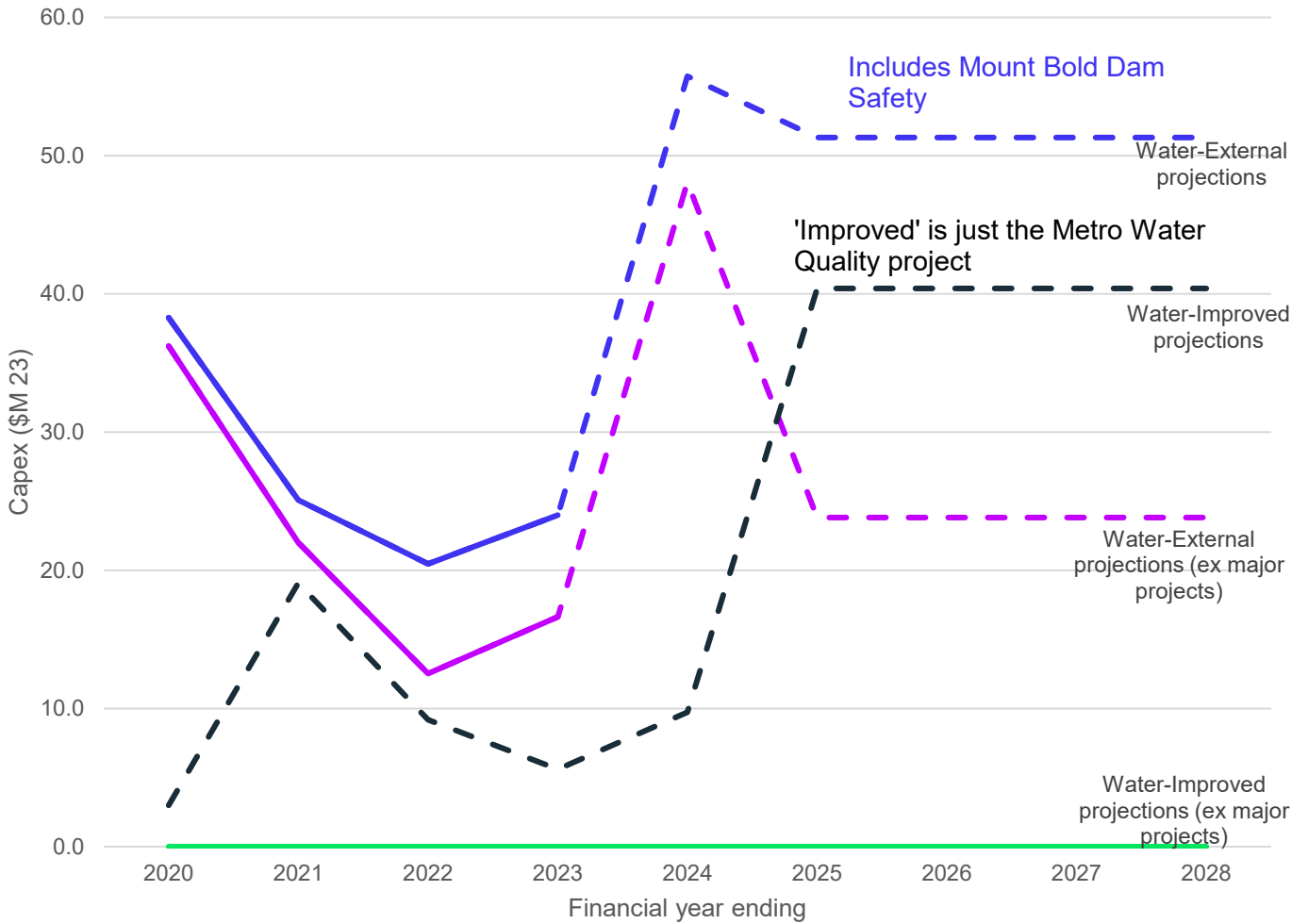
- SA Water is also proposing a significant increase in wastewater expenditure. A large part of this (\$284.0M or 58%) relates to the City of Tea Tree Gully (TTG) Sustainable Sewers Program. SA Water is also proposing increased expenditure (+\$89.8M) to implement Environmental Improvement Programmes (EIPs).
- We have not recommended any scope adjustments to wastewater External Requirements expenditure. We did not recommend any adjustments to Millicent and have assumed that other EIP driven expenditure does not need adjustment. Other lines are broadly in line with historical levels of activity.
- We understand that the TTG Sustainable Sewers Program project is likely to be subject to a Section 6 Direction. We have therefore not reviewed the project or recommended any adjustments to it.



3.2.3.1 Water

SA Water proposes an increase of approximately \$203M in Improved Service and External Requirements expenditure. This is mainly driven by two projects: the Metro Water Quality Improvement project (+\$118M) and the Mount Bold Dam Safety Upgrade (+\$84M), both of which we have reviewed as part of our projects sampling. Our review is summarised below.

Figure 3-14 Proposed Water Improved Service and External Requirements expenditure



Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx



Table 3-22 Proposed water External Requirements and Improved Service expenditure (\$FY23 M)

	2021	2022	2023	2024	2025	2026	2027	2028	RD20 Total	RD24 Total
Water Reticulation Mgt WQ	-	-	-	-	2.0	2.0	2.0	2.0	-	8.0
Water Mandated Growth	1.8	1.1	1.2	4.9	2.1	2.1	2.1	2.1	8.9	8.4
Water Third Party Works	10.0	6.1	7.1	15.3	6.7	6.7	6.7	6.7	38.5	27.0
Metro Water Quality Improvement	19.1	9.2	5.6	9.7	40.4	40.4	40.4	40.4	43.6	161.6
Dams And Weirs Mgt Dam Safety	2.5	1.0	2.2	16.9	2.2	2.2	2.2	2.2	22.6	8.8
Dams And Weirs Mgt WQ	1.0	1.0	0.3	0.5	2.0	2.0	2.0	2.0	2.8	7.9
Warren Dam Safety Upgrade	-	-	0.4	1.0	3.0	3.0	3.0	3.0	1.3	12.0
Health & Safety Improvement	2.2	3.2	5.5	9.3	5.8	5.8	5.8	5.8	20.3	23.2
Mount Bold Dam Safety Upgrade	3.1	7.9	7.4	7.7	27.5	27.5	27.5	27.5	26.1	110.0
Total	39.7	29.5	29.6	65.3	91.7	91.7	91.7	91.7	164.1	366.8

Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: the only Improved Service project is Metro WQ

3.2.3.1.1 Metro Water Quality Improvement

At RD20, SA Water proposed to spend \$122.2M on:

- switching Metro Adelaide from chlorine to chloramine to reduce health risks and improve aesthetics; and
- addition of ozone disinfection and biological activated carbon (BAC) at Happy Valley WTP.

ESCOSA determined that \$80.8M was the prudent and efficient level of spend. However, only \$21.0M was actually spent on the program during RD20, of which at least \$7.0M was RD16 carryover spend. One of these RD16 carryover projects, to switch to chloramination at Myponga WTP, found that whilst the health risk reduced, customers' perception of water quality decreased and there were skin rash complaints and impacts on aquatic pets.

This led SA Water to reconsider its approach and revisit the optioneering MCA. This concluded in July 2022 and suggested a different approach with ozone and BAC at Happy Valley and Barossa WTPs rather than chloramination being the preferred option.

The proposed works in RD24 consist of:

- Happy Valley WTP: install ozone disinfection units and convert filters to biological filters; and
- Barossa WTP: install ozone disinfection units and install tertiary biological filtration.

We understand that these are new treatment solutions for SA Water and that the Happy Valley upgrade would involve winter shutdowns especially as it involves installing equipment inside existing assets.

Given that use of BAC and ozone will be new to SA Water, we consider it would be prudent to first install it at one plant before learning the lessons from it to apply at the next one. As carrying out these works at Happy Valley WTP is likely to be challenging and potentially disruptive due to the repurposing of currently operational assets, we consider it would be prudent to first install the solution at Barossa WTP in a less complex setting. We recommend an adjustment to just include the Barossa WTP upgrade (\$63.7M) and an allowance of \$5M for further development of the Happy Valley scheme in the RD24 period.

Given that the Barossa WTP scheme is understood to be at M2 gateway stage with expected completion in 2028, we have assumed that delivery spend is concentrated in the last two years of the period. The adjustment is summarised below.

Table 3-23 Proposed, outturn and recommended capex for Metro Water Quality Improvement (\$FY23 M)

	2021	2022	2023	2024	2025	2026	2027	2028	RD20 Total	RD24 Total
RD20 allowance	23.0	22.9	22.8	22.7					91.5	-
Outturn/forecast*	6.3	2.6	3.1	9.2	40.4	40.4	40.4	40.4	21.0	161.6
Variance	(16.8)	(20.4)	(19.8)	(13.5)	40.4	40.4	40.4	40.4	(70.4)	161.6
Recommended expenditure	6.3	2.6	3.1	9.2	5.0	5.0	29.4	29.4	21.0	68.7
Recommended adjustment	-	-	-	-	(35.4)	(35.4)	(11.0)	(11.0)	-	(92.9)

Source: 20230921 – SAWRD24 – RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx and “Just for records – SAW RD20 capex by project as per August 2020 following determination”

3.2.3.1.2 Mount Bold Dam Safety Upgrade

SA Water reviews the risk at their large dams through regular Portfolio Risk Assessments. South Australia does not have specific regulations for dam safety, but SA Water follows the Australian National Committee on Large Dam (ANCOLD) guidelines to assess and manage the risks.

In its RD20 RBP, SA Water identified that Mount Bold, its largest storage reservoir, was beyond the limit of tolerability for failure risk. At that stage detailed optioneering was underway. The preferred option at that stage was Option M3: full downstream buttress, downstream apron, new gated spillway and saddle dam. The RBP included \$86.9M in RD20 and a further \$215M post RD20 (in nominal dollars).

Detailed fluid dynamics modelling in 2021 found that the designs previously envisaged were not feasible due to the risk of turbulence at the toe and that different solutions were required. In 2022, two concept designs were progressed and finalised. Late in 2022, early contractor involvement produced revised estimates for these designs and indicated costs of c~\$679M.

At the time of this review, SA Water was planning to restart optioneering for the dam in FY25 and it was not clear what the solution might be. The RD24 submission assumes \$70M on concept and detailed design then \$40M of enabling and early works in FY28.

As is evident from the experience in RD20, establishing the best feasible option for addressing safety risk for SA Water’s largest storage will be complex and require significant investigation, modelling and project development. Mount Bold supplies more than half of Metro Adelaide’s water, has eight vertical gates and is in a geologically complex site. We

consider it would be useful for SA Water to have a clear objective for RD28 to define and develop the best feasible solution. SA Water is planning to revisit the optioneering stage and it is likely to take time to fully develop a solution. We therefore cannot recommend construction capex for a major capital scheme which has not yet been defined. We find that it prudent to allow for project development costs in RD28 with construction costs in the next period. We recommended an expenditure adjustment to reflect this. The adjustment has been made by removing the estimated enabling and early works costs. The amount is based on SA Water’s business case breakdown which indicates that these works will take place in FY28 and the \$40M proposed expenditure in that year.

Table 3-24 Proposed, outturn and recommended capex for Mount Bold (\$FY23 M)

	2021	2022	2023	2024	2025	2026	2027	2028	RD20 Total	RD24 Total
RD20 allowance	1.4	3.1	37.3	56.2					97.9	-
Outturn/forecast	3.1	7.9	7.4	7.7	27.5	27.5	27.5	27.5	26.1	110.0
SA Water Business Case					15.0	20.0	35.0	40.0		110.0
Variance	1.7	4.9	(29.9)	(48.5)					(71.8)	-
Recommended expenditure	3.1	7.9	7.4	7.7	10.0	10.0	20.0	30.0	26.1	70.0
Recommended adjustment	-	-	-	-	(17.5)	(17.5)	(7.5)	2.5	-	(40.0)

Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx and “Just for records - SAW RD20 capex by project as per August 2020 following determination”

We note that if the project development does progress well any construction capex could be taken into account in a future ex-post review.

3.2.3.1.3 Recommended water scope adjustments

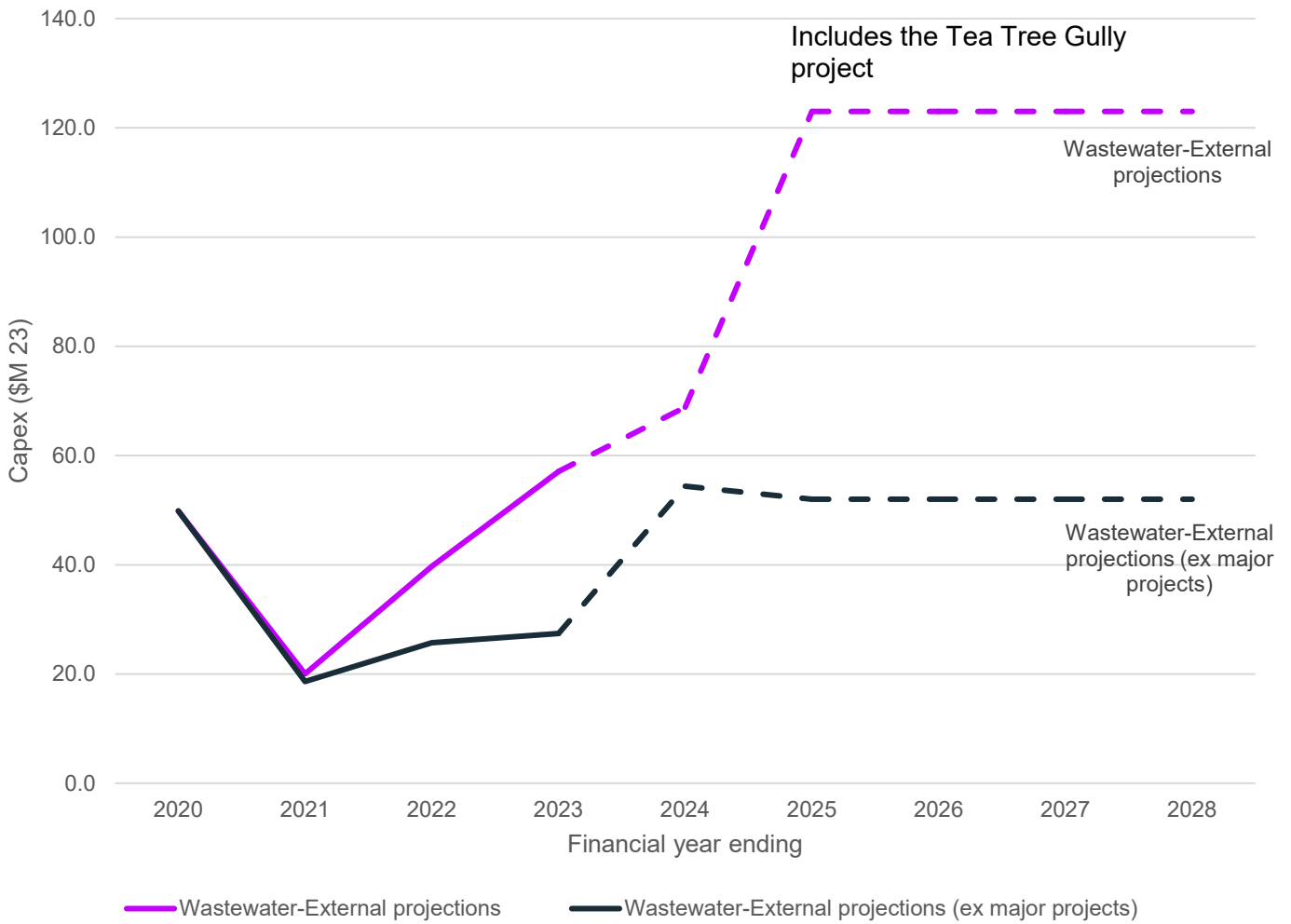
We have not recommended any scope adjustments to water Improved Service or External Requirements expenditure other than those affecting Mount Bold and Metro Water Quality. This is because the other lines are broadly in line with historical levels of activity. We note that Warren Dam Safety Upgrade does not have a formal class level and that the solution has not yet been developed. However, the risk level is high and the capex relatively minor, so we have not recommended any further adjustments.

3.2.3.2 Wastewater

SA Water is also proposing a significant increase in External Requirements wastewater expenditure. A large part of this (\$284.0M or 58%) relates to the City of Tea Tree Gully (TTG) Sustainable Sewers Program. However, SA Water is also proposing increased expenditure (+\$89.8M) to implement Environmental Improvement Programmes (EIPs), the largest of which (Millicent) is reviewed below.



Figure 3-15 Proposed Wastewater External Requirements expenditure



Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx
 Note: there are no Improve projects in the proposed wastewater program



Table 3-25 Proposed wastewater External Requirements expenditure (\$FY23 M)

	2021	2022	2023	2024	2025	2026	2027	2028	RD20 Total	RD24 Total
Wastewater Third Party Works (Major and Minor)	4.7	11.8	6.5	13.1	7.9	7.9	7.9	7.9	36.0	31.5
Wastewater Network Odour Management	2.0	5.3	7.8	6.2	5.4	5.4	5.4	5.4	21.3	21.5
Health & Safety Improvement	2.2	3.2	5.5	9.3	5.3	5.3	5.3	5.3	20.3	21.4
Millicent EIP	-	-	-	-	12.2	12.2	12.2	12.2	-	48.9
Port August East EIP	-	-	-	-	7.5	7.5	7.5	7.5	-	30.0
IEP of WW RW Systems	7.2	5.3	6.8	24.5	13.7	13.7	13.7	13.7	43.8	54.7
City of TTG Sustainable Sewers Program	1.4	14.0	29.7	14.5	71.0	71.0	71.0	71.0	59.5	284.0
Total	17.5	39.6	56.3	67.5	123.0	123.0	123.0	123.0	180.9	492.0

Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: There are no Improved Service projects in the proposed wastewater program.

3.2.3.2.1 Millicent EIP

The Millicent Environmental Improvement Program (EIP) output was proposed in the RD24 business plan for SA Water to address compliance requirements from the Environmental Protection Authority (EPA). The EPA requirement includes limiting the harm of the effluent from the Millicent WWTP which ultimately drains to Lake Bonney. The investment for the developed solution under this output has a cost of \$48.9M over the RD24 period⁵⁴.

The current Millicent WWTP was built in 1968 and has incorporated a reuse scheme in 2002 to minimize discharge and increase reuse. Per SA Water's documents, the plant is currently operating over 2.5 times its design hydraulic capacity which is causing poor quality discharge into the lake. In 2017, an environment monitoring study was carried out to determine the concentration of pollutants (nutrients) contributed by the plant to the overall load entering the lake. The study concluded that the Millicent WWTP discharge has a significantly greater nutrient load than the load contributed by the greater downstream discharge.

⁵⁴ Business Case 119 - Millicent EIP 1.0 as of 24 Aug 2023, SA Water, September 2023

The EPA completed a prioritisation exercise in 2017 that placed the Millicent WWTP high in respect to environmental impacts, location, facility control and management. Noting the requirement for increased summer reuse and additional storage and process improvement, SA Water agreed on an EIP license condition to⁵⁵:

- undertake investigative work in the regulatory period 2020-24
- delivery of the solution in the regulatory period 2024-28

SA Water subsequently developed this output to be included in the RD24 business plan. This included addressing the operational and physical constraints such as groundwater infiltration, limitations on reuse, and algal bloom. SA Water utilised its option analysis process to define the most optimal solution. The analysis involved the development of four options and financial assessment for each, as well as undertaking an MCA. The conclusion of SA Water's internal assessment was to construct a new treatment process to maximize the level of reuse while utilising the current lagoon storage. This option is to reduce the risk of discharging certain pollutants (cyanobacteria) to the drain, increase the volumes of reuse and reduce discharge.

The cost developed for the option recommended and included in SA Water's proposal is a class 2 estimate, which is used for feasibility or option analysis. This estimate reflects an indicative 20% level of design and utilises unit rates and benchmarked overheads.

In the case of this project, the class 2 estimate does not represent an advanced development stage of the project. We expect that SA Water will need to further develop the project and solution over the first years of RD24. However, we acknowledge that this project includes external pressures, such as the EIP conditional license, that will incentivise SA Water to prioritise this project and potentially deliver it in RD24, per the license conditions. Therefore, we have recommended the RD24 proposed expenditure for this output as shown in the table below. While our recommendation does not include project-specific adjustments, other adjustments such as efficiency will still apply.

Table 3-26 Millicent EIP recommendation summary (\$FY23 M)

	2025	2026	2027	2028	RD24 Total
Proposed	12.2	12.2	12.2	12.2	48.9
Recommended expenditure	12.2	12.2	12.2	12.2	48.9
Recommended adjustment	-	-	-	-	-

Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

3.2.3.2.2 Recommended wastewater scope adjustments

We have not recommended any scope adjustments to wastewater External Requirements expenditure. We did not recommend any adjustments to Millicent and have assumed that no adjustments are needed for other EIP driven expenditure.

We understand that the TTG Sustainable Sewers Program project is likely to be subject to a Section 6 Direction. We have therefore not reviewed the project or recommended any adjustments to it.

⁵⁵ 20230927 -19 - Session 1 - RD24 Millicent EIP, SA Water, September 2023.



3.3 Efficiency

In its RBP, SA Water has applied a 'general capital efficiency' of \$44.6 million to its RD24 proposed capex. It states that this is equivalent to around 2% of capex net of expected Ministerial directions. The RBP states that these efficiencies are planned to be achieved through 'continued innovations in capital delivery approaches' across the full portfolio.

Consistent with the approach set out in Section 1.2, we have considered the potential for efficiency in two categories: catch-up and continuing efficiency.

3.3.1 Catch-up efficiency

Catch-up efficiency is what we consider is required to achieve the performance of a Frontier Company. The efficiency challenge we apply also takes account of what is realistically achievable in the timeframes of a regulatory period.

In RD20, a catch-up efficiency challenge, building up to 6% p.a., was applied to capex taking account of the potential to improve needs identification, justification, and decision-making. We consider that these improvements were not fully realised and there are significant efficiencies still to be made to move to the efficient frontier.

The opportunities for efficiency are in three key areas:

- **Project development and decision making:** We consider that SA Water would benefit from more robust early project scoping, optioneering and decision-making. Business cases should be more robust and have a stronger decision-making framework than the current reliance on MCA. For example, a decision criterion which leads to selection of the least whole life cost feasible solution unless there is a very good reason not to do this. These changes should help SA Water make better decisions earlier (including 'don't spend' decisions).
- **Value engineering (VE) throughout project and program development:** VE should cover all phases of project development from defining project goals and drivers to scope definition and on to alternative construction techniques. We have seen efficiencies identified at the later stages of this but have seen little evidence of strong full scope value engineering (i.e. challenging the project goals and areas of scope which are not necessary or are 'nice to have' to meet stakeholder requests). Many of the projects we reviewed saw significant scope creep with few examples of the opposite effect.
- **Procurement:** In general, we find that SA Water has a good and reasonably mature approach to procurement. However, we consider there remains further efficiency to be made. The two main levers which we think could be used for this are:
 - Greater use of mini-competition within frameworks (i.e. framework partners being required to submit competing bids for packages of work). We note that SA Water is considering this.
 - Benchmarking of full outturn costs (not just contractor overheads, margins etc) to other utilities costs to identify areas of relative inefficiency which can then be focused on.

These opportunities for efficiency are also reflected in the recommendations set out in Section 4.

The level of recommended catch-up efficiency is set out below. These are based on experience with other utilities and should be eminently achievable at a capex program level given the scale of opportunities for efficiency improvement.



Table 3-27 Recommended catch-up efficiency challenge

Delivery scenario	2025	2026	2027	2028
Catch-up efficiency: value engineering	1.00%	2.00%	2.00%	2.00%
Catch-up efficiency: program development and decision making	1.00%	2.00%	2.00%	2.00%
Catch-up efficiency: procurement	0.25%	0.50%	0.75%	1.00%
Total catch up efficiency	2.25%	4.50%	4.75%	5.00%

Source: AtkinsRealis analysis and projections

Note: the figures are the % to be applied in the given year and are applied to SA Water's pre-efficiency proposal

We have not applied a program-wide efficiency challenge or scope adjustment for activities such as cost estimation and contingency. This is because we have observed consistent exceedance of project estimates mainly due to underappreciation of scope or scope creep.

3.3.2 Continuing efficiency

The continuing improvement element of efficiency, termed 'Frontier Shift' or continuing efficiency, relates to the underlying increased productivity from new systems and technology that well-performing businesses should achieve even if they are at the frontier. We have assumed a Frontier Shift of 0.5% per annum cumulating over the Determination period. This is the same level as was applied in RD20 and broadly consistent with the range of values applied to other utilities as set out below.

Table 3-28 Examples of recent continuing efficiency challenges

Utility	Year	Efficiency applied
Sydney Desalination Plant, NSW	2023	Continuing efficiency of 0.7% p.a.
Icon Water, ACT	2023	Capex: 0.42% efficiency adjustment Opex: 1.2% p.a. efficiency adjustment
Seqwater, QLD	2022	None (consultant's recommendation 0.5%)
SA Water, SA	2020	Continuing efficiency of 0.5% p.a.
Sydney Water, NSW	2020	0.8% p.a. (from FY22 onwards)

Why are we applying efficiency challenges to the whole program⁵⁶?

We have recommended applying both the catch-up and continuing efficiency to SA Water's full program of pre-efficiency capex except for projects which are expected to be subject to a Section 6 Direction.

We have applied efficiency challenges to the whole program after scope adjustments (except for Section 6 Directions), consistent with our methodology in Section 1.2 because:

- The types of scope adjustments we have made reflect reversion to historical expenditure levels and profiles, and the catch-up efficiencies are being applied relative to historical practice (i.e. they are an efficiency relative to what SA Water has been achieving in RD20). This therefore avoids double-counting. For example, we have not reduced Sustain expenditure below historical levels despite the apparently improving trend in (non-pipe) asset health, instead applying this catch-up efficiency to the historical spend; and
- We have not incorporated these types of challenges in the scope adjustments we have set out above.
- We understand that ESCOSA are considering continuing and catch-up efficiencies relating to SA Water's operating expenditure that may be different to our recommendations for capital expenditure.

⁵⁶ Excluding projects expected to be subject to a Section 6 Direction

3.4 Recommended capex

The recommended (pre-efficiency) scope adjustments are summarised in Table 3-29 below.

Table 3-29 Recommended RD24 capex adjustments (\$FY23 M)

Year ending	2025	2026	2027	2028	RD24 Total
Recommended Scope Adjustments					
North Adelaide Irrigation System (NAIS)	1.6	-	-	-	1.6
Kangaroo Island (ex post adjustment)	3.0	-	-	-	3.0
Eyre Peninsula Desalination	(44.5)	(9.5)	40.5	(9.2)	(22.7)
Morgan Whyalla (reprofiling)	12.1	12.1	12.1	-	36.2
Water growth spend reprofiling	(6.9)	(6.9)	(2.9)	16.6	0.0
General Wastewater Sustain adjustment	(1.1)	(1.1)	(1.1)	(1.1)	(4.5)
General Water Sustain adjustment	(6.5)	(14.1)	0.1	20.5	0.0
Mount Bold	(17.5)	(17.5)	(7.5)	2.5	(40.0)
Metro Water Quality Improvements	(35.4)	(35.4)	(11.0)	(11.0)	(92.9)
Bolivar WW Network Growth	(14.2)	(11.4)	(8.5)	(5.7)	(39.8)
Glenelg WW Network Growth	(6.9)	(5.5)	(4.1)	(2.7)	(19.2)
Total recommended scope adjustments					
Water	(94.1)	(71.3)	31.3	19.3	(114.8)
Wastewater	(22.2)	(18.0)	(13.8)	(9.6)	(63.5)
Total	(116.3)	(89.3)	17.5	9.7	(178.3)

These adjustments have been combined with the proposed efficiency challenges to derive recommended capex in Table 3-30. We have included a sub-total excluding the expected Section 6 projects Metro North and TTG. The recommended capex with and without these projects are summarised graphically in Figure 3-16 and Figure 3-17 below. Total recommended capex is \$245.4M or 9% less than SA Water's post-efficiency proposal but still \$648.3M or 35% higher than RD20 capex⁵⁷. We note that recommended expenditure peaks in FY27 because of the assumed completion of the Eyre Peninsula Desalination project in that year.

For completeness, we have included Technology expenditure in the recommended capex figures below. We have not applied any scope adjustments to the Technology expenditure but have applied the same catch-up and continuing efficiency challenges as to the rest of the program.

⁵⁷ Based on SA Water's submission



Table 3-30 Recommended gross RD24 capex [including Technology] (\$FY23 M)

Year ending	2025	2026	2027	2028	RD24 Total
SA Water Proposal (pre-efficiency)- including Technology					
Water	474.9	483.3	470.5	451.7	1,880.3
Wastewater	247.2	248.0	249.5	251.0	995.6
Total	722.1	731.3	720.0	702.6	2,876.0
Recommended Scope Adjustments					
Water	(94.1)	(71.3)	31.3	19.3	(114.8)
Wastewater	(22.2)	(18.0)	(13.8)	(9.6)	(63.5)
Total	(116.3)	(89.3)	17.5	9.7	(178.3)
Adjusted pre-efficiency capex					
Water	380.8	412.0	501.8	470.9	1765.6
Wastewater	225.0	230.0	235.7	241.4	932.1
Total	605.8	642.0	737.5	712.4	2697.7
Efficiency challenge					
Catch-up efficiency	2.25%	4.50%	4.75%	5.00%	
Water	(6.5)	(14.4)	(19.5)	(19.0)	(59.4)
Wastewater	(3.5)	(7.2)	(7.8)	(8.5)	(27.0)
Continuing efficiency	0.50%	1.00%	1.49%	1.99%	
Water	(3.1)	(5.8)	(7.2)	(17.5)	(3.1)
Wastewater	(1.5)	(2.3)	(3.2)	(7.8)	(1.5)
Post-efficiency recommendation					
Water	372.9	394.5	476.5	444.8	1,688.7
Wastewater	220.8	221.3	225.5	229.7	897.3
Total	593.6	615.8	702.0	674.5	2,586.0
Post-efficiency recommendation excluding TTG and Metro North					
Water	281.7	303.3	385.3	353.6	1,323.9



Year ending	2025	2026	2027	2028	RD24 Total
Wastewater	149.8	150.3	154.5	158.7	613.3
Total	431.4	453.6	539.8	512.3	1,937.2

Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: this includes Technology expenditure. Efficiency challenge has not been applied to expected Section 6 schemes

Figure 3-16 SA Water proposed and our recommended gross post-efficiency capex (\$FY23 M)

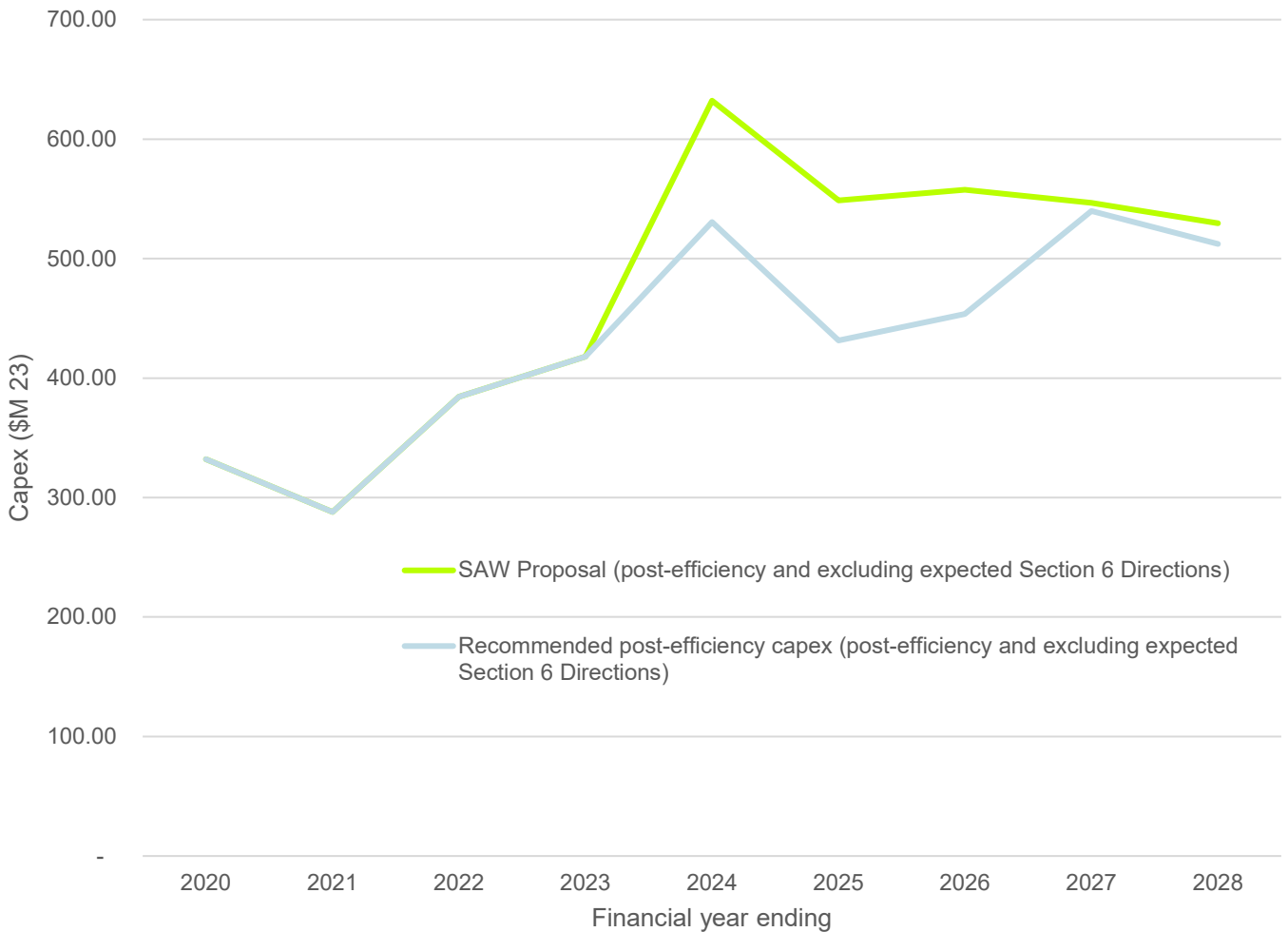


Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: this includes Technology expenditure



Figure 3-17 SA Water proposed and our recommended gross post-efficiency capex- excluding expected Section 6 Direction projects (\$M 23)



Source: 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: this excludes the Metro North and TTG projects but includes Technology expenditure

3.4.1 Capex delivery scenarios

This assessment has focused on prudence and efficiency of expenditure without significant consideration of SA Water’s ability to deliver the scale of spend and the external factors which might affect the overall size of expenditure such as the rate of new development, labour and supply chain constraints etc. Many of the external factors in particular are inherently difficult to project forward with confidence.

We consider that there is significant uncertainty related to external factors (growth and labour market) as well as internal factors (SA Water’s systems and focus) and have set out a number of delivery scenarios below.



HIGH case capex

- Internal: SA Water is very focused on project development and delivery, and fully integrates the lessons learned from RD20. Its new program management approach is effective.
- External: very strong new development (growth). Labour/supply chain issues do not limit delivery. Cost escalation increases input costs.

MEDIUM case capex

- Internal: incremental improvements from RD20 and some significant projects ready to ramp up delivery early in the period.
- External: limited impacts of labour/supply chain constraints.

LOW case capex

- Internal: no significant improvement from RD20, project development and delivery delays continue AND/OR
- External: tight labour/construction market in SA constrains procurement and delivery.

We consider that the recommended capex set out above is in line with the medium case scenario as it does not take account of significant external limiting factors or drivers in either direction. We consider below the reasons to consider the alternative Low and High cases.

3.4.1.1 Reasons to consider a Low case scenario

There are a number of factors pointing towards a Low case scenario. These include:

Speed of SA Water's project development and delivery

As we have noted above, many projects have been significantly delayed and SA Water has underspent against its Determination in all three years of RD20 for which we have actuals (as opposed to the FY24 forecast). Similarly, at the SA Government level, on average over the past five years actual capital expenditure has been 12% less than budgeted⁵⁸.

Infrastructure market demand and capacity

Infrastructure Australia's Infrastructure Market Capacity 2022 Report concludes that the infrastructure "market is arguably at capacity, so project slippage is now expected" with both demand and supply side risks increasing:

- *Demand-driven risks have increased over the last 12 months: ... Demand for major public infrastructure works has increased by \$15 billion since 2021, equivalent to 6.7% growth....*
- *Supply side risks have surged in 2021—22: The global economy continues to battle significant disruption to supply chains caused by the COVID-19 pandemic, volatile demand and more recently, the war in Ukraine. These factors are causing delays and cost escalations for imported items. Onshore, severe labour shortages present the greatest risk to capacity, according to industry.*

⁵⁸ Report of the Auditor-General: Report 10 of 2023 State finances and related matters, Government of South Australia Auditor General's Department, November 2023.

Reflecting concerns about market capacity, Standard & Poor’s credit opinion report (as reported by the South Australian Auditor-General’s Department)⁵⁹ assumes that market capacity constraints will mean that the South Australian Government State will only spend 80% of its capital program budget.

Ex post review

The risks of adopting a Low case may be mitigated by the potential for upward adjustments to be made ex-post if these assumptions are exceeded.

Assumptions underlying the Low case scenarios

We have outlined two Low case scenarios:

Low case (1) Underspend compared to medium case

The first scenario is based on assumed percentage underspends relative to the medium case. These assumptions are set out below.

Table 3-31 Assumed percentage underspends for Low case (1)

Capex scenario	2025	2026	2027	2028	RD24 total
% reduction applied to the Medium case	-25%	-12%	-12%	0%	11%
Explanation	Average underspend in FY17 and 21 (year 1 of last two RDs ⁶⁰) reflecting market pressures and slow project starts	Average SA state underspend	Average SA state underspend	Assumed that projects with delayed start are delivering in the final year	Average impact (calculated)

Low case (2) Maintain recent delivery capacity

Low case (2) assumes that SA Water’s delivery capacity remains at the current level and therefore assumes the same overall level of spend as in the last three years (FY22 to FY24). We have deliberately excluded FY21 because of the impacts of Covid and based FY24 on our recommended spend. This average level of spend has been reprofiled to reflect a back ended spend profile as has been seen in the last two regulatory periods.⁶¹

⁵⁹ As quoted in the Report of the Auditor-General: Report 10 of 2023 State finances and related matters.

⁶⁰ SA Water underspent by 14% in FY17 and 37% in FY21.

⁶¹ Assuming a simple adjustment of -10% in FY25, 0% in FY26 and 27 and +10% in FY28.



3.4.1.2 Reasons to consider a High case scenario

Factors pointing towards a High case scenario include:

Major projects

Much of the proposed expenditure in RD24 relates to major projects, some of which are already spending (Tea Tree Gully) or reasonably advanced (Eyre Peninsula Desalination). This may make it easier to advance quickly to the delivery stage. Some of these projects are high profile and therefore likely to receive significant management focus (noting too that there may be a countervailing pressure with greater interest and scrutiny potentially delaying some decisions).

Infrastructure pipeline post 2024

Infrastructure Australia's Infrastructure Market Capacity 2022 Report indicates that the national Infrastructure pipeline may peak in 2024. If correct, this may free up capacity for delivery of the RD24 capital program at a useful time for SA Water's delivery. Furthermore, our understanding is that higher interest rates in Australia may potentially weigh on domestic demand growth (including the construction sector) and open up, to some degree, spare capacity in the labour market over coming years.

Cost escalation

The corollary of the argument about limited market capacity is that there may be significant real terms construction cost increases. If this is the case, it may lead delivery cost to increase above expectations.

Assumptions underlying the High case scenario

We have assumed that the High case scenario consists of the full (post-efficiency) amount requested by SA Water in its RBP. This has been back-ended to reflect the current early status of many of the projects and the potential for a gradual easing of the construction market constraints after 2024⁶².

The alternative capex scenarios are set out below.

Table 3-32 Alternative capex scenarios (\$M23)

Capex scenario	2025	2026	2027	2028	RD24 total
High case	601.7	637.1	707.8	884.8	2,831.4
Medium case	593.6	615.8	702.0	674.5	2,586.0
Low case 1- underspend	474.9	541.9	617.8	674.5	2,309.1
Low case 2- recent capacity	418.0	464.5	464.5	510.9	1,857.9

Source: AtkinsRealis analysis and projections and 20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033).xlsx

Note: this table presents gross post-efficient capex including Technology

⁶² Assuming a simple adjustment to average proposed spend of -15% in FY25, -10% in FY26, 0% in FY27 and +25% in FY28.

3.5 Capital contributions

SA Water has assumed it receives total capital contributions of \$10.1M (or \$2.5M p.a.) over the RD24 period: \$7.0M to water and \$3.1M to wastewater. As noted in Section 3.2.2.1, these appear to be an underestimate compared with the proposed growth schemes. SA Water's RFI response (number 155) suggests that in RD20 SA Water received average capital contributions of over \$20M per annum, of which nearly \$15M p.a. were developer contributions and mains extension & contributions.

It therefore appears that the capital contributions included in the RBP are significant underestimates. SA Water has agreed to revisit its capital contribution assumptions in its submission after the Draft Determination. We would expect these to be at least as large as those received in RD20 given the growth schemes envisaged. We further note that, when considering the scenarios above, the capital contributions could be expected to be higher under the High case – if growth comes to fruition. On the other hand, if growth does not come to fruition, in the Low case capital contributions could potentially be expected to be lower.

4. Recommended improvements

We have found that SA Water has a number of significant strengths comprising:

- a strong procurement system and supplier relationships.
- that it puts significant effort into understanding and benchmarking its suppliers' overheads and margins.
- that it has recognised limitations observed during RD20 in relation to cost estimation and has an improvement plan in place.
- that it has used modelling as a decision-support, rather than as a decision-making tool, and its Board has appeared to take ownership of the level of expenditure and risk in its proposal for RD24.
- that it has applied an efficiency challenge to its proposed expenditure.
- that it has challenged itself by not requesting significant increases in 'sustain' expenditure (outside of large projects).

However, as with all utilities, there are a number of areas of potential improvements. These include:

- **Costing:** we consider it would be useful for SA Water to start to measure and therefore improve its cost estimation accuracy performance and develop an empirical approach to contingency allowance based on outturn costs. We also consider that it may be useful to develop a more refined classification of cost estimates to better separate the confidence in the estimate (i.e. maturity of scope, unit costs and risk understanding) from what it is being used for. For example, we saw an example of a rough cost estimate treated as Class 2 because it is being used for optioneering (e.g. Fingers Point Outfall).
- **Empirical asset health:** the current focus of renewals planning and modelling is largely on condition grade with a weaker link to performance data. We consider it would be useful to make more explicit the link to performance (e.g. trends in breakdown frequencies) as a more empirical indicator of the effectiveness (and effects) of decision making. We consider it would be useful to carry out more regular empirical reporting of overall asset health with factors such as work order numbers, expenditure, assets out of use time etc.
- **Project development and decision making.** We consider that SA Water would benefit from more robust early project scoping, optioneering and decision-making.
 - The business cases presented had been prepared specifically for the RBP. They were reasonably good at outlining the drivers and alignment for the project. They were not strong in setting out the scope definition (what is it and why?), addressing the 'why now', delivery uncertainties and risks and delivery approach questions.
 - We consider that business cases should be more routinely used for all significant advanced expenditure decisions, be robust and clearly set out the objectives and reasons for why investment is required now and a strong justification for the timing, chosen solution and delivery approach.
 - The current widespread use of MCA with limited justification for criteria, weightings and scores leaves the process vulnerable to subjectivity. We consider that a stronger decision-making framework is required. For example, a decision criterion which selects the solution which meets the objective at lowest whole life cost unless there is a very good reason not to do this.

These changes should help SA Water make better decisions earlier (including 'don't spend' decisions).

- **Value engineering (VE) throughout project and program development:** VE should cover all phases of project development from defining project goals and drivers to scope definition and on to alternative construction techniques. We have seen evidence of efficiencies identified at the later stages of this but have seen little evidence of strong full scope value engineering (i.e. challenging the project goals and areas of scope which are



not necessary or are 'nice to have' to meet stakeholder requests). Many of the projects we reviewed saw significant scope creep with few examples of the opposite effect.

- **Procurement:** in general, we find that SA Water has a good and reasonably mature approach to procurement. However, we consider there remains further efficiency to be made. The two main levers which we think could be used for this are:
 - Greater use of mini-competition within frameworks. We note that SA Water is considering this.
 - Benchmarking of full outturn costs (not just contractor overheads, margins etc) to other utilities costs to identify areas of relative inefficiency which can then be focused on.



APPENDICES



Appendix A. Capex tables



A.1 RD20 variance

Table A-1 Programs with greatest variance from RD20 Determination assumptions (\$FY23 M)

Program	Driver	Forecast RD20 spend	RD20 Gross Capex Allowance	Variance Forecast Outturn v Allowance	Comment
A0014 Growth Water Networks	Enable Growth	221.4	58.1	163.2	The variance is mainly driven by the inclusion of \$145.0M Kangaroo Island Desalination in this line, noting that \$29.7M was allowed for this project under “A0028 - Water Quality Treatment Plant“, but no spend was allocated to that program
A0012 Water Security	External Responsibilities	91.6	15.6	76.1	The variance appears to be due to \$79.6M of Eyre Peninsula Desalination capex which is reported under this program in outturn expenditure but was under “A0015 - Growth Water Treatment Plants” in the RD20 allowance
A0029 Growth Wastewater Networks	Enable Growth	111.6	60.5	51.0	This variance appears to be due to the inclusion of \$59.6M of Tea Tree Gully works in this program which was not included in the RD20 allowance.
A0038 Trunk Mains Wastewater Network	Sustain Services	34.0	0.0	34.0	There was no RD20 allowance for a line with this title which is why it appears to be an overspend. However, when combined with reticulation mains under A0039 there has been an underspend compared to the RD20 allowance assumption.



Program	Driver	Forecast RD20 spend	RD20 Gross Capex Allowance	Variance Forecast Outturn v Allowance	Comment
A0022 Structures Water Networks	Sustain Services	86.5	56.8	29.6	SA Water has explained that 'increased tank maintenance has been required to prevent water sources from becoming contaminated by corrosion by-products or compromised through structural failures' ⁶³
A0030 Growth Wastewater Treatment Plants	Enable Growth	78.4	52.3	26.1	This variance is due to the greater cost of Bolivar WWTP Capacity Growth Upgrade due to higher complexity than anticipated
A0026 Trunk Mains Water Network	Sustain Services	66.7	41.2	25.5	Most of this variance appears to be due to South Road TM Stage 1 expenditure of \$25.1M compared to the \$6.3M assumed in the RD20 allowance.
A0023 System Planning Tools	Enable Growth	22.7	0.6	22.1	The variance is due to the inclusion of MFP program costs and capital planning expenditure in this line which were not explicitly included for in the allowance for this program.
A0050 Major and Minor Plant Water	Sustain Services	20.7	37.5	(16.7)	This appears to be due to lower minor plant expenditure than anticipated at RD20

⁶³ Page 228 of SA Water's RBP



Program	Driver	Forecast RD20 spend	RD20 Gross Capex Allowance	Variance Forecast Outturn v Allowance	Comment
A0054 - Mandated growth - Wastewater	Enable Growth	0.0	16.8	(16.8)	No expenditure has been allocated to this program name during RD20. However, we note that there has been higher growth spend than assumed under both A0029 and A0030 above.
A0046 WHS Improvement	External Responsibilities	40.7	66.7	(26.0)	SA Water has explained that this was primarily a result of budget reallocation and that did not compromise the safety of personnel as risks were continued to be mitigated by operational measures ⁶⁴
A0031 Improve Environmental Performance	External Responsibilities	49.1	94.7	(45.5)	The variance appears to be partly due to lower NAIS capex (\$13.2M forecast compared to \$25.9M allowance) but also across a number of other projects e.g. the \$1.9M forecast for smart networks compared to the \$6.5M assumed.
A0009 Major Pipelines Water Network	Sustain Services	50.0	101.9	(51.9)	This is due to a number of factors including delays to the Morgan to Whyalla No 1 project (\$14.0M underspend) but also schemes (Eyre Cowell Retic Main Replacement) which appear not to have been allocated to this program.

⁶⁴ Ref SA Water document '161- Response to RFI (A3224178)'

Program	Driver	Forecast RD20 spend	RD20 Gross Capex Allowance	Variance Forecast Outturn v Allowance	Comment
A0003 Dam Safety	External Responsibilities	66.3	118.9	(52.7)	This is mainly due to the \$67.9M lower spend on Mount Bold counterbalanced by \$11.2M spend on Baroota.
A0028 Water Quality Treatment Plant	Improve Service	94.1	189.0	(94.8)	\$28.0M of this variance is simply caused by the allocation of Kangaroo Island Desalination being allocated to A0014 instead of this line. Spend on this program was also deferred following lessons learned from Myponga pilot
A0039 Reticulation Mains Wastewater Network	Sustain Services	0.3	98.2	(97.9)	The apparent underspend appears to be partly due to the separation of the spend into A0038 Trunk Mains Wastewater Network see above.
A0015 Growth Water Treatment Plants	External Responsibilities	29.1	127.1	(98.1)	This is largely due to reclassification of Eyre Peninsula Desalination which has been reported as A0012 Water Security rather than this line as assumed in the RD20 allowance.

Source: analysis of spreadsheets: “Just for records - SAW RD20 capex by project as per August 2020 following determination” and “20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033)”.

Only variances greater than \$15M have been included.



A.2 RD20 deferred programs

Table A-2 Analysis of deferred programs (\$23 M)

Program	Service Type	Driver	Total deferral	Forecast RD20 spend	RD20 Gross Capex Allowance	Variance Forecast Outturn v Allowance	Comment
IMPROVE SERVICE							
A0027 Water Quality Network	Water	Improve Service	49.3	29.8	33.2	(3.4)	The forecast spend is close to the RD20 assumption so it not clear to what extent this is a deferral as opposed to reversion back to RD20 allowances.
A0028 Water Quality Treatment Plant	Water	Improve Service	41.0	94.1	189.0	(94.8)	Deferral of spend following lessons learned from Myponga pilot appears reasonable to us. We comment further in Section 3.2.3.1.1.
EXTERNAL RESPONSIBILITIES							



Program	Service Type	Driver	Total deferral	Forecast RD20 spend	RD20 Gross Capex Allowance	Variance Forecast Outturn v Allowance	Comment
A0012 Water Security	Water	External Responsibilities	13.6	91.6	15.6	76.1	Adjusting for \$79.6M of Eyre Peninsula Desalination expenditure this appears to be in line with the RD20 allowance. It is therefore unclear to what extent this is a deferral as opposed to reversion back to RD20 allowances.
A0031 Improve Environmental Performance	Wastewater	External Responsibilities	8.9	49.1	94.7	(45.5)	Much of this does appear to be lower spend compared to the RD20 assumptions.
A0003 Dam Safety	Water	External Responsibilities	8.1	50.0	101.9	(51.9)	Spend is much lower in this program generally because of delays to Mount Bold.
GROWTH							



Program	Service Type	Driver	Total deferral	Forecast RD20 spend	RD20 Gross Capex Allowance	Variance Forecast Outturn v Allowance	Comment
A0030 Growth Wastewater Treatment Plants	Wastewater	Enable Growth	13.5	66.7	41.2	25.5	Whilst there may have been some deferral expenditure is still significantly greater than the RD20 allowance.
A0014 Growth Water Networks	Water	Enable Growth	8.6	221.4	58.1	163.2	Whilst there may have been some deferral expenditure is still significantly greater than the RD20 allowance.
SUSTAIN							
A0038 Trunk Mains Wastewater Network	Wastewater	Sustain Services	42.6	34.0	N/a	34.0	This code was not listed in the RD20 allowance. May have been part of "Reticulation Mains Wastewater Network" in the RD20 allowance model
A0021 Structures Water Treatment Plants	Water	Sustain Services	29.5	6.7	6.2	0.5	Not commented on separately as part of the Sustain program deferral
A0022 Structures Water Networks	Water	Sustain Services	36.0	86.5	56.8	29.6	



Program	Service Type	Driver	Total deferral	Forecast RD20 spend	RD20 Gross Capex Allowance	Variance Forecast Outturn v Allowance	Comment
A0026 Trunk Mains Water Network	Water	Sustain Services	26.2	78.4	52.3	26.1	
A0009 Major Pipelines Water Network	Water	Sustain Services	24.6	66.3	118.9	(52.7)	
A0017 Mech and Elect Water Networks	Water	Sustain Services	19.8	33.6	44.7	(11.1)	
A0007 Structures Major Pipelines	Water	Sustain Services	14.4	57.6	57.0	0.6	
A0001 Cathodic Protection System Management	Water	Sustain Services	13.0	13.3	13.4	(0.0)	
A0002 Structures Wastewater Treatment Plants	Wastewater	Sustain Services	11.3	70.1	58.2	11.9	
A0039 Reticulation Mains Wastewater Network	Wastewater	Sustain Services	10.7	29.1	127.1	(98.1)	
A0032 Mech and Elect Wastewater Networks	Wastewater	Sustain Services	7.6	13.6	19.1	(5.5)	



Program	Service Type	Driver	Total deferral	Forecast RD20 spend	RD20 Gross Capex Allowance	Variance Forecast Outturn v Allowance	Comment
A0016 Mech and Elect Water Treatment Plants	Water	Sustain Services	7.0	47.8	51.3	(3.5)	
A0005 Mech and Elect Major Pipelines	Water	Sustain Services	6.9	42.4	53.8	(11.4)	
TOTAL			392.5	1182.1	1192.4	(10.4)	

Analysis of spreadsheets: “Just for records - SAW RD20 capex by project as per August 2020 following determination” and “20230921 - SAWRD24 - RD24063 Ex-post capex linked to forecast ex-ante capex (A3147244)-ESCOSA (A3167033)”.



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