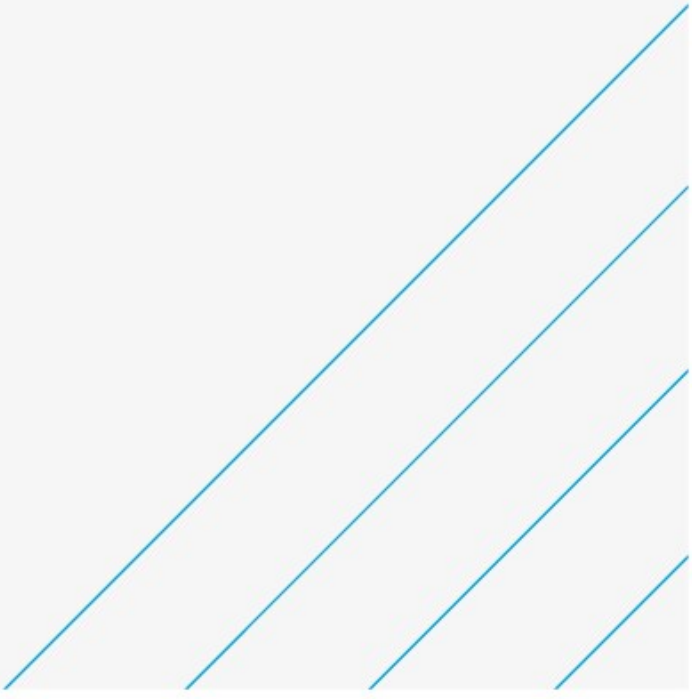
Expenditure review of WaterNSW Rural Bulk Water Services and Corporate Cost Allocation

Final Report

IPART

19 February 2021

5200693/014



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Glossary

Acronym	Definition
ACCC	Australian Competition and Consumer Commission
AIR	Annual Information Return
ANCOLD	Australian National Committee on Large Dams
ARK	Archiving and Record Keeping System
BOM	Bureau of Meteorology
BRC or DBBRC	Dumaresq-Barwon Border Rivers Commission
BSI	Business Systems and Information
Capex	Capital Expenditure
CALOSS	unplanned water delivery Capability Loss
CARMS	Computer Aided River Management System
CBD	Central Business District
CEO	Chief Executive Officer
CIMS	Consolidation of Information Management Systems
CSR	Capture, Store and Release
COVID-19	Coronavirus Disease of 2019
CPI	Consumer Price Index
DAR	Development Asset Register
DPI	NSW Department of Primary Industries
DPIE	NSW Department of Planning, Industry and Environment
DRS	Daily Returns System
DSC	NSW Dam Safety Committee
ELT	Executive Leadership Team
EPA	Environment Protection Authority
EPAR	External Project Assurance Review
ERC	NSW Expenditure Review Committee
ERP	Enterprise Resource Planning
FTE	Full Time Equivalent
GIS	Geographical Information System
GS	Greater Sydney
HR	Human Resources
ICT	Information Communications Technology
IPART	Independent Pricing and Regulatory Tribunal
ISO	International Organisation for Standardisation
IT	Information Technology
iWAS	Internet Water Accounting System

Acronym	Definition
MCA	Multi-Criteria Analysis
MDBA	Murray Darling Basin Authority
MFP	Multi-Factor Productivity
MLD	Megalitres per Day
MPE	Materials, Plant and Equipment
NPV	Net Present Value
NRAR	Natural Resources Access Regulator
NSW	New South Wales
O&M	Operating and Maintenance
Ofwat	Water Services Regulatory Authority, England and Wales
Opex	Operational Expenditure
p.a.	Per annum
P_{50}	50th Percentile
P_{80}	90th Percentile
PRA	Portfolio Risk Assessment
RAB	Regulated Asset Base
RACS	Risk Assurance and Compliance System
RFI	Request for Information
RFP	Request for Proposals
RV	Rural Valleys
SAMP	Strategic Asset Management Plan
SCA	Sydney Catchment Authority
SCADA	System Control and Data Acquisition
SIR	Special Information Return
SIS	Salt Interception Schemes
SOC Act	State Owned Corporations Act 1989
SW	State Water
WAMC	Water Administration Ministerial Corporation
WAO	Water Applications Online
WCIR	Commonwealth Government's Water Charge (Infrastructure) Rules 2010
WAS	Water Accounting System
WFP	Water Filtration Plant
WLS	Water Licensing System
WMS	Water Modelling System
WNSW	WaterNSW
WSAA	Water Services Association of Australia

Executive Summary

Areas where WaterNSW does well

This review has identified a number of areas where WaterNSW has performed well and/or made real improvements. These include:

- WaterNSW has successfully integrated disparate legacy systems and has implemented an improved financial management system. This has involved rationalisation and harmonisation of some existing systems, retirement of others and implementation of some new ones. The centrepiece has been the implementation of CIMS, an Enterprise Resource Planning system, completed in April 2019, a significant achievement.
- These improvements have helped WaterNSW to successfully increase the proportion of expenditure which is booked directly to activities rather than to overheads, reducing the amount of indirect expenditure which needs to be allocated.
- WaterNSW has made progressive improvements in the alignment of its asset class strategy documents with its asset management objectives which should help to improve consistency and efficiency of asset planning.
- WaterNSW has improved its cost estimating processes to better reflect site-specific conditions, and the findings of its project validation processes. This has improved confidence in scheme cost estimates for some renewals' projects, especially for minor works.
- WaterNSW has improved the integration of financial planning with delivery, allowing for more robust cash flow estimates and efficiency targets to be developed at the project level.
- Improvements have been made in procurement and a new delivery partner has been engaged since 2019. This should help to achieve efficiencies in capital delivery.
- Revenue collection performance is very good. This is a reflection of the powerful tools and levers that WaterNSW has at its disposal in terms of suspending or withdrawing licences.
- The number of customer complaints WaterNSW receives is very low and the numbers unresolved or still open at year-end is negligible.

Areas of potential improvement

We have also noted a number of areas where we consider WaterNSW could make significant improvements, these include:

- Customers
    - Customer focus. WaterNSW does not appear to be a customer-focused organisation. Customers do not figure highly in the pricing submission and are rarely mentioned in the justifications provided for proposed activities. In our experience well-managed organisations challenge themselves to demonstrate that what they are doing is efficient and in the best interests of their customers. They take account of customer views and impacts routinely, not just to support regulatory submission, but in all decision-making.
    - Customer service. Whilst WaterNSW receives few complaints, there is significant potential for improvement in both the level and transparency of customer service performance. At present WaterNSW does not publish any customer KPIs on its website and only publishes complaint numbers in its annual report. We strongly recommend that there is transparency of all the customer metrics in order to improve accountability and drive future improvements in this area.
- Efficiency focus
    - In general, we found there was limited evidence of efficiency drive. It was not a significant feature of the presentations and documents provided. Significant efficiencies were not incorporated into the pricing submission and there was resistance to the concept of catch-up efficiency, i.e. the notion that WaterNSW could reduce customer bills by becoming as committed to efficiency as some other utilities already are.
- Rigour and business cases

  - We have found there is room for significantly improved rigour in governance, business cases, and justification for when (not just whether) expenditure needs to take place and that it is efficient and effective. A significant number of expenditure items proposed for the next Determination did not have business cases.
- Procurement, capital program cost estimates and contingency
  - The improvements made in this area, such as appointment of a new delivery partner, have not been factored into the full capital program. Evidence has shown that collaborative models, if well managed, can deliver significant efficiencies.
  - At portfolio level the expenditure proposals appear risk averse and there does not appear to be an appropriate balancing of risk and contingency across the capital program.
- Asset management
  - Asset health and the linkages between risk and performance are developing. Expanding this to cover all asset classes will be beneficial if WaterNSW uses them to inform its expenditure proposals and any efficiencies to be achieved.
  - As WaterNSW Consolidation of Information Management Systems (CIMS) matures, it is expected to continue to pursue opportunities to make its asset management system more robust and comprehensive. Importantly, however, there is a need to demonstrate how the asset management initiatives are linked to expenditure proposals and the benefits or efficiencies that are expected to be realised from them.
- ICT corporate costs
  - We consider that it would be useful for ICT corporate costs to be presented as a combined capex and opex submission rather than focusing on ICT capex given the potential trade-offs between capex and opex and the impact of that future capital expenditure has on opex in the long-term both in terms of efficiencies and long-term commitments for licences and support.
  - Benefits, especially relating to efficiencies, delivered by ICT investments are set out in business cases but the approach to tracking and demonstrating their achievement needs to be mainstreamed more effectively. At times there is not a clear line of sight between many of the benefits highlighted by ICT investments and the efficiencies being presented by WaterNSW, or it cannot be robustly demonstrated that efficiencies have been realised as exemplified by the CIMS implementation.
  - There is potential for horizon scanning, collaboration and partnering on areas of emerging or unproven technology which may be happening, but this was not demonstrated at any time by WaterNSW as occurring.
  - The impact of ICT investments should lead to demonstrable improvements in Customer and Other KPIs which WaterNSW can be monitored against and therefore held accountable, noting the comments above about the level and transparency of customer metrics.
- Operational expenditure cost management and efficiency
  - We found that there is limited ownership of Determination cost performance especially at individual valley level, the level at which prices are set. WaterNSW was not able to produce documents showing that cost variance within individual valleys, or at Rural Valleys level were subject to routine and robust internal interrogation, challenge and management action. Clearer internal accountability for performance of each regulated business and valley (for the Rural Valleys Determination) with clear P&L-style ownership and accountability should help to improve efficiency. In its response to our Draft Report, WaterNSW identified a number of initiatives which we consider are good examples of the kinds of changes which we think will be helpful in driving better cost control and therefore efficiency in the next Determination period.
  - We found that there is generally a lack of business/operational or other plans to demonstrate that the current levels of operational activity, expenditure or ways of working are the most efficient and effective. For example, it was not possible for WaterNSW to easily demonstrate that the current level of and approach to routine maintenance is appropriate.
  - We consider that WaterNSW can significantly further increase direct costing. For example, currently less than 10% of Business Systems and Information (BSI) operating expenditure is

coded as a direct cost. This suggests that there is potential for inefficiencies to be distributed across regulated businesses. With the new Financial Management System having the ability to record costs with greater granularity, there appears to be little reason not to code a greater proportion of operating expenditure as a direct cost.

- We think there is potential efficiency to be achieved by having stronger management focus on cost performance, including alignment of incentives, embedding genuine challenge into budgeting processes and governance of initiatives, such as hardwiring the savings associated with an initiative directly into future budgets.
- Corporate business units such as BSI provide services directly to the operating business units such as Water Operations. There is a clear opportunity for the BSI business unit to provide and cost services to other parts of the business based on some form of service agreement. This should focus activities on what is important and effective and drive internal efficiencies. This would also increase significantly direct cost recording and reduce the extent of overhead smeared across the business.
- Whilst unit labour costs have increased during the current Determination, rather than mitigating this through productivity gains, additional FTEs have been brought into the business. This runs counter to our experience at other utilities where real increases in wages are linked to, or offset by, productivity gains.

Significant expenditure items

We summarise below our findings related to a number of the key expenditure items.

WaterNSW has proposed $71.6m of capital expenditure in the future four year determination period for the **fish passage offset program**. We are supportive of the driver for the expenditure and see how it could be beneficial to the environment. However, we have not been provided a business case to support any of the schemes proposed.

WaterNSW has proposed constructing eleven schemes, of which two are pilots. We consider piloting to be sensible. Given the lack of business cases and scheme development we have recommended an expenditure allowance for implementing the two pilot schemes and for developing the business cases and detailed design for the remaining nine schemes. This will allow time for learning lessons from the pilots, for planning and design for the remaining schemes. This should yield more efficient outcomes for customers in the long term.

In the future Determination period, corporate capex is dominated by the **WAVE Program**, which brings together the Operational Technology, Analytics and Water Market including Customer Relationship Management capabilities under one umbrella. This accounts for ~60% of total ICT capital expenditure across WaterNSW.

We have recommended supporting the proposed expenditure. However, as noted above, we do consider that the efficiencies and other benefits which WAVE is expected to generate should be tracked and embedded in future expenditure reviews.

We support the increase in **dam safety compliance** expenditure proposed between its June 2020 and October 2020 submissions. Whilst we consider that there is significant uncertainty over the costs required to meet new regulatory standards, we have not recommended any significant adjustments to this expenditure.

Corporate cost allocation

Our review of corporate cost allocation found that:

- There is an opportunity to reduce the value of costs which need to be allocated from both corporate and overheads through greater direct costing to appropriate activity codes.
- Cost allocation should be based on IPART guidance which clearly requires the causality principle to be applied. The method needs to be clearer, more transparent, simplified and quality controlled so that it can be readily understood by regulators, customer groups and other interested parties.
- The TOTEX method for corporate cost allocation is not consistent with the IPART guidance. Other water utilities including Sydney Water, water companies in England and Wales and in Abu Dhabi use total direct operating expenditure as a basis for allocation.
- The Cost Allocation Manual should be redrafted to clearly identify cost objects and drivers consistent with the IPART Guide. The method should be based on direct operating costs or surrogate such as salaries or other relevant drivers to present a transparent and simplified process. A granular approach

is needed at corporate business unit level. This is important in explaining to regulators and customer groups. In addition, it should demonstrate to external clients such as government the basis of the corporate cost uplift rather than rely on a nominal value uplifts.

The current capitalisation method does not appear to be cost reflective and results in a likely overstatement of capitalised corporate expenditure. Alternative methods which are more representative of the cost drivers need to be tested. The benefit of the direct cost allocation methodology is that corporate overheads are fairly distributed across regulated and unregulated businesses and customers are not seen to subsidise non-regulated activities. There are, however, implications for other Determinations and a need to consider how these changes are phased in using a fair approach. There is never a perfect time to phase in the new methodology, but it is necessary to apply a fair and reasonable process for customers but recognising the impact of these changes on WaterNSW.

The impact of the analysis based on current operating expenditure forecasts is a significant variance in the allocation of corporate expenditure with reductions in Rural Valleys (-$4.9m) and Greater Sydney ($3.2m) and increases in WAMC ($2.1m), Broken Hill pipeline ($2.1m) and non-core activities ($4.0m) over the period 2022 to 2025. These values may change over time as forecasts of direct operating expenditure and the level of corporate costs are updated.

To meet the objective of applying a clear, accurate and auditable method of allocating expenditure to the regulated businesses giving confidence to regulators that customers are only paying for reasonable and efficient costs related to their service. We recommend a number of actions:

1. Update the Cost Allocation Manual;
2. Continue to achieve greater penetration of direct costing of activities across the business;
3. Review the method for capitalisation of overheads including a test of the direct cost method;
4. Allocate post-capitalisation corporate expenditure to regulated businesses using the total operating cost methodology;
5. Include non-core businesses in the allocation method to provide an equitable split of corporate costs across core and non-core activities;
6. Allocate overheads (pooled costs) for operational business units within each operational unit;
7. Use direct operating costs to allocate Rural Valley costs to individual valleys; and
8. Proportion corporate capital expenditure to businesses at project level within the business plan stage.

Output measures

WaterNSW has not proposed any output measures for the future period. We have recommended new output measures for the future Determination period.

We have attempted to express these measures in terms that are as close to outcomes as possible at this stage. In future reviews, as the maturity of WaterNSW's measures of customer experience and underlying asset risk improve, we recommend that these measures become increasingly outcomes-based wherever possible. This should help to improve the focus on delivering outcomes for customers by providing the flexibility to allow for better solutions to be developed during the Determination period.

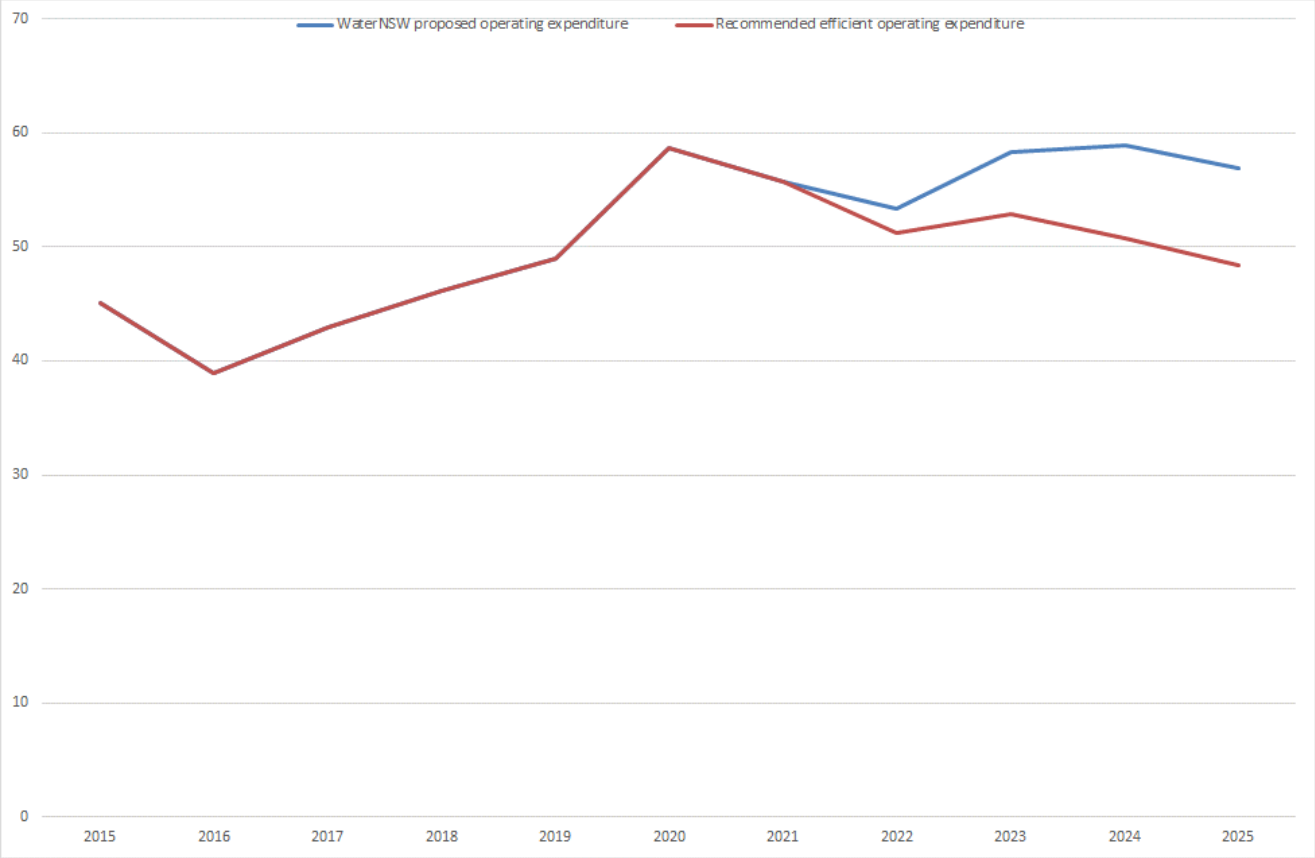
One key change since the last Determination is that, in addition to technical outputs such as works completion, we have recommended a composite customer measure based on the "Skyline" composite measure.

Recommended efficient expenditure

We have recommended efficient operating and capital expenditure based on a review of WaterNSW's proposed expenditure items, the improvement areas set out above, and an assessment of the level of continuing efficiency.

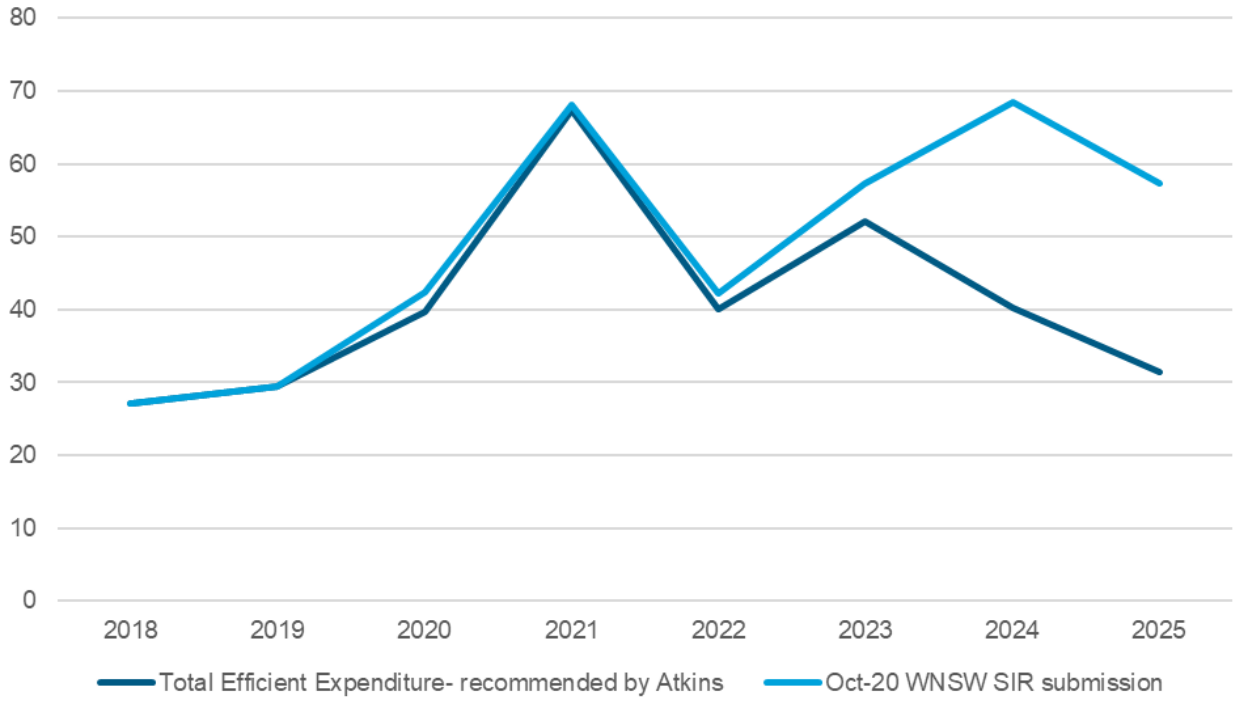
The recommended expenditure is summarised below. We note that, even after the adjustments and efficiencies applied, recommended efficient operating expenditure up to FY24 remains higher than the pre-FY20 levels. Similarly, the recommended user share of efficient capex is similar to pre-FY21 levels.

Figure 0-1 Recommended efficient operating expenditure ($M 20/21)



Source: "Opex" tab in WaterNSW's October 2020 AIR/SIR and Atkins/Cardno analysis

Figure 0-2 Efficient capital expenditure (user share) ($M 20/21)



1. Introduction

1.1. Background

The Independent Pricing and Regulatory Tribunal (IPART) is the independent pricing regulator in New South Wales established under the Independent Pricing and Regulatory Tribunal Act 1992. IPART acts as a pricing regulator for water, public transport, local government, as well as the licence administrator of water, electricity and gas. Pricing for these services are through independent decision and advice of external reviewers, which sets prices that reflect the efficient cost of delivering a utility's monopoly services.

IPART is currently reviewing the prices that the WaterNSW (WaterNSW) can charge for its monopoly rural bulk water services from 1 July 2021. In August 2020 IPART appointed Atkins supported by Cardno to undertake a review of WaterNSW's expenditure to inform its price review. In parallel to this review IPART have also appointed Atkins to undertake a detailed review of WaterNSW's corporate costs allocation across its business units and price determinations.

The findings of this report form an important component of the overall price review process as set out in the IPART Issues Paper (Sept 20). The conclusions relating to efficient expenditure in the 2017 Determination period inform what IPART includes in WaterNSW's Rural Valleys opening Regulated Asset Base value. The conclusions relating to efficient operating and capital expenditure in the 2021 Determination period assist the Tribunal's assessment of what are justified requirements to be included in the 'building block' model for determining future prices.

Review objectives and scope

The objective for the expenditure review is to provide an opinion to IPART on the efficient level of historical and proposed operating and capital and expenditure required by WaterNSW to deliver its rural bulk water services. Historical expenditure is that incurred in the time since the 2017 Determination (1 July 2017 to 30 June 2021) and proposed expenditure is that which is proposed for the period from 1 July 2021 to 30 June 2025.

To meet the objectives, the scope of works required to be undertaken is comprised of the following three tasks:

- Task 1 - a strategic review of WaterNSW's long-term investment plans (10 to 20 years) and asset management systems and practices.
- Task 2 - a detailed review of WaterNSW's historical and forecast operating and capital expenditures for efficiency.
- Task 3 - a review of WaterNSW's performance against past output measures and to propose new output measures for the next determination period if appropriate.

For the review of WaterNSW's corporate costs, the scope of works required to be undertaken is comprised of the following two tasks:

- Task 1 - a detailed review of WaterNSW's corporate operating and capital costs for efficiency.
- Task 2 - a review of how WaterNSW's efficient corporate costs should be allocated between its business units and functions.

In parallel Atkins are reviewing the Murray Darling Basin Authority (MDBA) and Dumaresq-Barwon Border Rivers Commission (BRC) costs which are subject to a separate report.

1.2. Terms of reference

The detailed Terms of Reference for this review are included in Appendix E.

1.3. Price base and cost data

The financial information used for this review is based on the Annual Information Return and Special Information (AIR/SIR) data submitted by WaterNSW in June 2020 and then updated in October 2020. WaterNSW provided AIR/SIRs updated for 2019/20 actual data and a number of additional expenditure items in October 2020. It then requested a number of supplementary expenditure items in its response to our Draft

Report in December 2020[1]. This report is based on the October 2020 AIR/SIR submission, supplemented by a review of the additional expenditure items requested by WaterNSW.

Within the AIR/SIR, historical costs are recorded on a nominal basis. IPART has requested WaterNSW to provide forecasts costs in a real price base of 2020/21. For our analysis and within this report, we have sought to present all historical and forecast costs in a consistent, real price base of 2020/21. This allows for better comparison of the underlying trends and drivers of costs over time. To achieve a consistent price base, inflation indices supplied by IPART have been applied to historical costs. The indices applied to convert all costs to a real 2020/21 price base are summarised below.

Table 1-1 Indices used to convert costs to real 2020/21 price base

Period (Inflated)	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Inflation Factor (CPI)	1.90%	2.10%	1.60%	2.10%	2.50%
Compounding Factor (Real 2020/21)	1.086	1.063	1.047	1.025	1.000

Unless otherwise noted, all prices within this report are presented in a real price base of 2020/21.

1.4. Terminology in this report

A number of terms are used within this report which have specific meaning relating to the regulatory process. These terms are detailed in Table 1-2 below.

Table 1-2 Determination period terminology

Term	Usage
2017 Determination	The determination made by IPART which set maximum prices for WAMC's services for the period 1 July 2017 to 30 June 2021.
2017 Determination period or Current Determination period	The period from 1 July 2017 to 30 June 2021 which was the subject of the 2017 Determination
2021 Determination period or Future Determination period	This period covers either the period from 1 July 2021 up to 30 June 2022 (one year determination) OR This period covers the period from 1 July 2021 up to 30 June 2025 (four year determination)
Pricing submission or proposals	The document prepared by WaterNSW that summarise the level of service that they will provide with respect to WaterNSW rural bulk water services for the future determination period, how they will provide this service and the operating and capital expenditure required to do so. The Special Information Return (SIR) submitted to IPART in June 2020 and resubmitted in October 2020 contains the detailed operating and capital expenditure proposals.

WaterNSW has four separate businesses subject to IPART price determinations:

- WaterNSW's Greater Sydney bulk water services;
- WaterNSW rural water bulk water services;
- WaterNSW bulk supply services to Essential Energy (Broken Hill); and
- Water Administration Ministerial Corporation (WAMC) shared services.

[1] "Response to Atkins expenditure review Draft Report for Rural Valleys" dated 4 December 2020

Within this report we refer to WaterNSW's rural bulk water services determination as WaterNSW and the Water Administration Ministerial Corporation (WAMC) shared services determination administered by DPIE as WAMC unless otherwise stated.

1.5. Report structure

- Section 2 outlines our overall expenditure review methodology
- Section 3 describes the regulated business subject to the review and the context in which it operates
- Section 4 reviews the strategic direction and asset management processes
- Section 5 reviews and recommends the efficient level of allowed operating expenditure in the current and future determination periods
- Section 6 reviews and recommends the efficient level of allowed capital expenditure in the current and future determination periods
- Section 7 reviews performance against output measures in the current determination period and recommendations for output measures in the future period
- Section 8 reviews and provides recommendations on WaterNSW corporate cost allocation

2. Review Methodology

2.1. Overview

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

Our review work commenced in August 2020. Our initial task was to review the pricing proposal as well as a small number of reference documents. On this basis and in response to the objectives and scope set by IPART, we prepared an inception report to guide our review. In early September 2020 we made initial information requests and commenced meetings to interview key subject matter experts and business processes owners responsible for planning and delivery of WaterNSW rural bulk water and corporate services. We completed this first round of interviews by 15 September 2020. On the basis of the information received by this time and the discussions at our first round of interviews, we prepared an initial draft report.

The initial draft report helped identify areas for further investigation with WaterNSW to address through a second round of interviews which were held from 6 October 2020. In addition to these meetings, we requested, and received, further documentation on which to base our analysis for this review.

On 16 October WaterNSW responded to IPART's issues paper and provided a supplementary SIR. The supplementary SIR updated expenditure for FY20 actuals and provided additional projected expenditure for FY23 to FY25. It then requested a number of supplementary expenditure items in its response to our Draft Report in December 2020 and provided "fact check" comments on 21 January 2021. This report is based on our review of these documents and responses.

2.2. Recommending efficient expenditure

In arriving at the recommendations in this report, we have applied a three-stage approach to reviewing the efficiency and prudence of expenditure, as summarised in Figure 2-1. This methodology is consistent with that applied for other regulatory reviews across Australia.

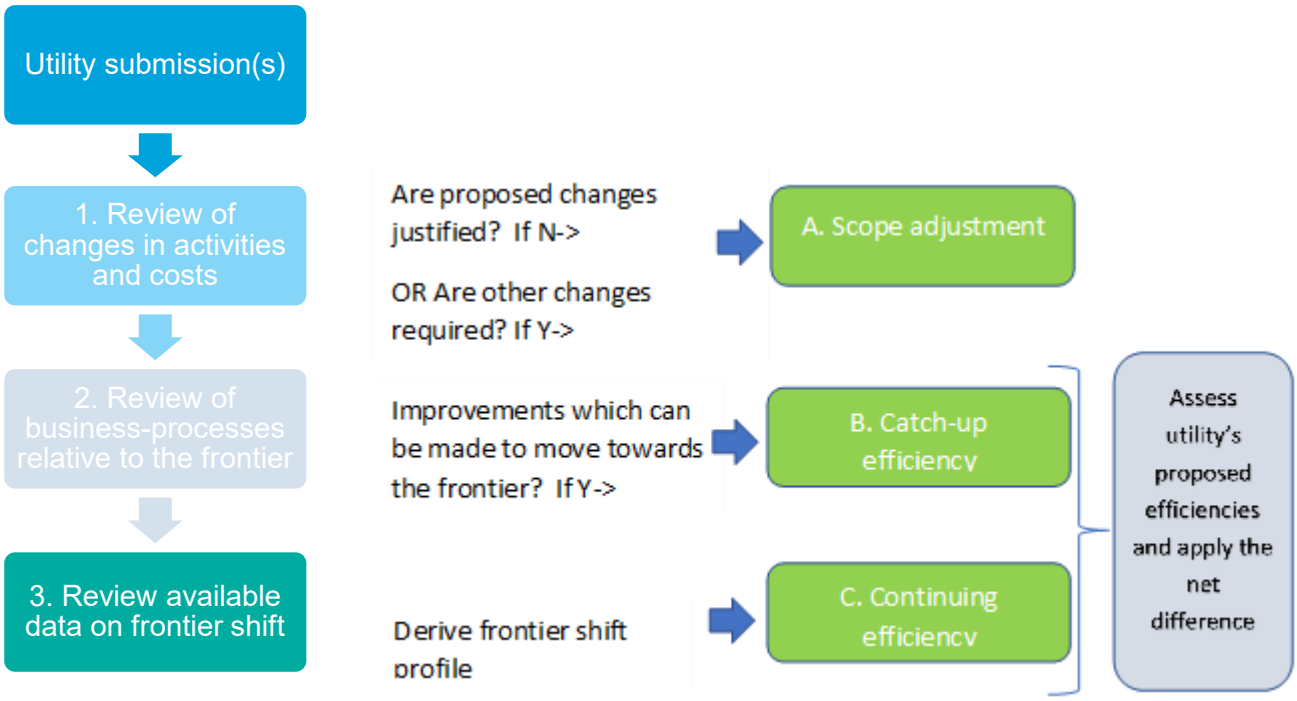


Figure 2-1 Approach to assessing efficiency

1. Review of changes in activities and costs

This step involves identifying inefficiencies within proposed changes to a utility's specific programs and does not apply to base expenditure to avoid double counting with Step 2. These adjustments are clearly distinct from the types of efficiencies identified in Step 2 in that they correct for an imprudent or inefficient proposed change to a utility's activities (and associated costs) rather than the business processes employed by the utility to deliver the utility's services. If the utility's proposed changes in activities (and associated costs) are not efficient, a **scope adjustment** is made.

2. Review of business-processes relative to the frontier

This step identifies the effectiveness of business processes (e.g. decision-making and procurement processes) relative to a benchmark frontier company. Where we identify improvements that can be made relative to the benchmark, a **catch-up adjustment** is made. This encourages the utility to move to the efficiency frontier.

We then recommend a profile or pathway of catch-up efficiency we consider the utility will realistically be able to achieve each year within the next determination period. This is based on experience of how other utilities in a similar position have been able to achieve efficiencies with new business processes, management focus and appropriate incentives. It does not mean that the utility will have arrived at the frontier at the end of the determination period.

3. Review available data on frontier shift

We consider a number of data points such as the efficiency gains of well-performing utilities and broader productivity trends (e.g. multi-factor or total factor productivity). This recognises that in competitive markets firms must innovate to achieve continuing efficiency gains over time.

We compare the total efficiency challenge we derive from steps (2) and (3) with the efficiencies applied by the utility in its own submission. We then apply the net difference as an adjustment to the utility's submission.

2.2.1. Continuing efficiency

The continuing improvement element of efficiency, termed 'Frontier Shift', relates to the increased productivity derived from process innovation and new systems and technology that all well-performing businesses should achieve. We have applied the results from the Australian Productivity Commission Multi-Factor Productivity (MFP) analysis, proposed efficiencies from other water utilities in New South Wales and recent analysis for Ofwat, the water regulator in England and Wales, which has been applied to frontier water companies. We have applied a Frontier Shift of 0.7% per annum cumulating over the Determination period.

In line with the recommendations of the WaterNSW GS and Sydney Water 2020 Determinations, we have not assumed continuing efficiency will reduce expenditure in FY21 because of the COVID-19 response.

2.3. Information sources

The key documents relied upon for the WaterNSW Rural Valleys expenditure review include:

- Annual Information Return and Special Information Return
- WaterNSW 2020, *WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal: Rural Bulk Water Services from 1 July 2021*
- WaterNSW 2020, *Response to the 15 September 2020 IPART Issues Paper on the Review of WaterNSW Rural Bulk Water Prices from 1 July 2021 (16 October 2020)*
- WaterNSW 2020, *Response to Atkins expenditure review Draft Report for Rural Valleys (4 December 2020)*
- WaterNSW 2021, *Atkins Draft Final Response Fact Check (21 January 2021)*
- IPART 2017*, Review of prices for rural bulk water services from 1 July 2017 to 30 June 2021, Final Report*
- Aither 2016, *WaterNSW rural bulk water services expenditure review Final Report*
- IPART 2019, *Rural Water Cost Shares*, Final Report: Water, ISBN 978-1-76049-286-1
- Atkins and Cardno 2020, *WaterNSW Greater Sydney Expenditure and Demand Review Final Report, Addendum and Supplementary Report*

While some of these documents are publicly available online, the majority were directly issued by WaterNSW.

3. Operating context

3.1. Operating environment

WaterNSW is responsible for the management and supply of raw water in NSW across 9 valleys within the Murray Darling Basin and 3 Coastal valleys as well Fish River Water Supply Scheme and the Greater Sydney region. The Greater Sydney area is subject to a separate determination and not part of this expenditure review. WaterNSW owns and operates 42 water supply dams across NSW. In the rural area of operations which is the subject of this expenditure review, WaterNSW owns and operates 20 dams and more than 280 weirs and regulators to deliver water for town and water supplies, industry, irrigation, stock and domestic use, riparian and environmental flows. Figure 3-1 shows WaterNSW area of operations.

Figure 3-1 WaterNSW area of operations

3.2. Legislation

WaterNSW was formed on 1 January 2015 under the WaterNSW Act 2014 (NSW) (WaterNSW Act). WaterNSW assumed the functions of State Water Corporation and Sydney Catchment Authority (SCA). WaterNSW replaced State Water Corporation in Schedule 5 of the State Owned Corporations Act 1989 (NSW) (SOC Act), making WaterNSW a statutory state owned corporation under that Act. WaterNSW has been granted an Operating Licence under section 11 of the Water NSW Act to carry out the functions specified in the licence which include most of the possible functions listed in section 7 of the WaterNSW Act. The current Operating Licence came into effect on 1 July 2017 replacing two separate Operating Licence which reflected the scope of the previous State Water Corporation and SCA businesses.

WaterNSW further increased its scope on 1 July 2016 when the WaterNSW Amendment (Staff Transfers) Act 2016 took effect to facilitate the transfer of employees of the then Department of Primary Industries - Water to WaterNSW. This enabled WaterNSW to carry out functions of the Minister and the Water Administration Ministerial Corporation (WAMC) conferred on WaterNSW under its operating licence in relation to water monitoring and licensing.

3.3. Regulatory requirements

IPART conducts its pricing determination review for WaterNSW's rural bulk water services under two regulatory frameworks:

i. IPART is accredited by the Australian Competition and Consumer Commission (ACCC) to set Water NSW's bulk water prices in the Murray–Darling Basin (MDB) valleys under the Commonwealth Government's *Water Charge (Infrastructure) Rules 2010* (WCIR).
ii. For coastal valleys and some Fish River customers, IPART sets Water NSW's prices under the *Independent Pricing and Regulatory Tribunal Act 1992* (NSW) (the IPART Act). IPART used these same frameworks to set prices in MDB valleys and coastal valleys in 2017.

While many of the requirements are similar under both approaches, there are some key differences:

- The WCIR provides little scope to exclude any historical capital expenditure that may have been inefficient. That is, IPART must include all actual capital expenditure since 2017 in Water NSW's regulatory asset base – regardless of its efficiency.
- The rate of return (the weighted average cost of capital or WACC) used to calculate an appropriate return on assets is different under the two approaches.
- The WCIR requires IPART to set prices so that total revenue from all sources matches the total efficient costs. The IPART Act also aims to recover efficient costs but must also consider a range of other factors when setting prices.

3.4. The regulated business

The regulated business of WaterNSW related to it Rural Bulk Water Services is primarily the supply of bulk water to customers across its 9 MDB rural valleys, 3 coastal valleys and the Fish River Water Scheme.

MDB rural valleys:

- Border
- Gwydir
- Namoi
- Peel
- Lachlan
- Macquarie
- Murray
- Murrumbidgee
- Lowbidgee
- Fish River Water Scheme (Part)

3 Coastal valleys:

- North Coast
- Hunter
- South Coast; and
- Fish River Water Scheme (Part).

NSW's DPIE allocates costs to WaterNSW's rural bulk water determination related to activities and assets for the Murray-Darling Basin Authority (MDBA) and Dumaresq-Barwon Border River Commission (BRC) discussed in more detail in Section 3.7. In the 2017 Determination, IPART set separate prices for licence holders in the

MDBA and BRC valleys to recover the costs of services delivered by the MDBA and BRC. WaterNSW proposes to continue to pass through the costs of the MDBA and BRC and to maintain the structure of the MDBA and BRC charges from the 2017 Determination.

3.5. Other regulated businesses

WaterNSW operates a Greater Sydney business subject to separate regulation and pricing determination. There are also separate regulatory processes applied to the WAMC and Broken Hill pipeline. Corporate and support costs are apportioned across all WaterNSW businesses, including the rural valleys. We review this in detail in Section 8.

3.6. Cost allocation

Due to the nature of its business, operations, and regulatory arrangements, WaterNSW allocates corporate costs between its business units and determinations. We discuss this in more detail below and undertake a deep-dive review of its approach and provide recommendations in Section 8.

Within WaterNSW's rural bulk water determination some (capital) expenditure items are allocated between the valleys. In general, WaterNSW high-level guiding principle is that those (capital) expenditure allocated to valleys are allocated depending on their proportionate RAB value. In some instances, this varies depending on whether there is a clear justification for applying expenditure differently e.g. on which valleys benefit and/or contain assets of a certain type.

We question the consistency and appropriateness of this approach as it is not clear that RAB is an effective measure of, or proxy for, the drivers of this expenditure.

WaterNSW's approach to corporate cost allocation is discussed in detail in Section 8.

3.7. Water sector relationships

3.7.1. Relationships between WaterNSW, WAMC, Murray-Darling Basin Authority and Dumaresq-Barwon Border Rivers Commission

Under the *Water Act 2007* (Commonwealth) and Murray-Darling Basin Agreement, which is Schedule 1 to the *Water Act 2007*, New South Wales is deemed to be a "Basin State" for the purpose of implementing the Murray-Darling Basin Plan and a "Contracting Government" for the purpose of delivering Joint Programs. The Joint Programs can be broadly separated into two main programs – the River Murray Operations Joint Program and the Natural Resource Management Joint Program. While the Murray-Darling Basin Plan is wholly funded by the Australian Government, the Joint Programs are funded in agreed shares by the Contracting Governments. Through water users and the prices determined by IPART, DPIE recovers part of New South Wales' contribution to the Joint Programs, with the amount recovered determined based on "protection of [New South Wales] interests – economically and environmentally – and the integration of the Joint Program with the [New South Wales] policy and legislative framework"[2]. In the 2016 Determination, these Joint Program activities were accepted by IPART as monopoly water management services.

In a similar fashion to its commitments to the Murray-Darling Basin Joint Programs, DPIE also recovers part of New South Wales' contribution to the costs of the Dumaresq-Barwon Border Rivers Commission. The Dumaresq-Barwon Border Rivers Commission is constituted under the *New South Wales-Queensland Border Rivers Agreement*, made on 27 August 1946, and exists to "control and coordinate water available from the rivers around the border of [New South Wales and Queensland]"[3]. The costs of the Dumaresq-Barwon Border Rivers Commission are shared equally between New South Wales and Queensland, with DPIE recovering part of New South Wales' contribution through water users and the prices determined by IPART.

Costs for both MDBA and BRC are allocated by DPIE to both WaterNSW rural bulk water services determination and the WAMC determination. These costs are then passed through to the users of each of WaterNSW's rural bulk water and WAMC services depending on their geographical location. A review of these efficient costs is being undertaken in parallel to this review and is subject to a separate report that will also feed into IPART's pricing determinations.

[2] NSW DPIE 2020, *Pricing proposal*, PUB20/518
[3] NSW DPIE 2020, *Pricing proposal*, PUB20/518

3.8. Organisation, structure and functions

WaterNSW has nine operating departments covering its operational and support functions across all its Greater Sydney, Rural valleys, Broken Hill and WAMC functions. These are summarised in Table 3-1 below.

Table 3-1 WaterNSW Functional structure

Driver	Division	Includes
Operations	Water operations	Operations, modelling
	Water and catchment protection	Source protection, land management, water quality science, catchment protection, monitoring
	Assets	Engineering and dam safety, capability, delivery, asset maintenance and services, construction, security
	Water solutions	Asset strategy, major projects
Corporate and Support	Customer and Community	Customer service, billing, licensing and approvals
	Finance	Finance, commercial services, economic regulation
	Safety, People and Performance	People and Culture, Industrial Relations, Health, Safety and Environment, Change & Continuous improvements, and the Program Management office
	Business Systems & Information	Infrastructure delivery, systems and applications, innovation and architecture, service delivery, information
	Legal and Governance	Customer and risk, legal, community involvement

Source: WaterNSW organisation chart and Atkins analysis

WaterNSW classifies Customer and Community as a Corporate Service. We consider that customer management is an operational function, consistent with other water utilities. The Greater Sydney business has one very large and some small customers; by contrast customer engagement and billing equates to ~30,000 customers in the Rural Valleys. We discuss the impact of this change on the allocation of Corporate costs in Section 8.

4. Strategic Review

4.1. Summary of findings and recommendations

WaterNSW continues to make improvements across its business processes, particularly in its asset management and procurement approaches. We have summarised our key findings and recommendations from our strategic and asset management review in the following paragraphs.

We consider that there is not a strong link between the performance expectations on WaterNSW and how it manages its physical infrastructure to meet these expectations. Although this is largely influenced by constraints outside of WaterNSW's control, we consider that WaterNSW is yet to embed links between what it can control in terms of performance and how it manages its assets across their lifecycle. Improvements in this area should help WaterNSW to better scope, optimise and prioritise expenditure.

We consider that there is an opportunity for WaterNSW to refine and more fully develop its long-term forecast over time. We consider that WaterNSW could better inform its longer-term capital program by ensuring a clear line of sight between investment items and corporate risks and other regulatory drivers over time. There is a need to respond to emerging events, uncertainty and priorities and having one centrally held version of the long-term capital program will assist WaterNSW ability to revaluate emerging risks and make more informed decisions on strategic investment prioritisation.

WaterNSW continues to progress its Asset Class Strategies and has developed the documents for its largest and dominant asset classes with 19 of a total of 35 having been completed. The incompleteness of strategies across all asset classes means that there remain opportunities to improve its understanding of trade-offs between risk, performance and how costs are determined and, in turn, how prudent and efficient expenditure proposals are developed when making judgements over the entire asset base.

As the consolidated CIMS matures, WaterNSW is expected to continue to pursue opportunities to make its asset management system more robust and comprehensive. This will be achieved through a combination of reviewing and refining processes and procedures, as well as improving the quality of asset data and analytical capabilities.

The PowerPlan software tool is used by WaterNSW to identify and assess candidates for its asset renewals, based on assessing the asset risks and planning interventions to cost-effectively address these risks. The process is maturing and allows WaterNSW to develop its renewals program based on asset condition and performance data, while also accounting for risk and costs.

WaterNSW is developing in its approach to measuring its assets health and performance but at present this does not appear to be applied consistently across its various asset classes. The Asset Health reports focuses on condition and does not appear readily linked to risk and criticality in its current form. We consider that including risk as a measure of performance, linked to asset health and consequence across all of its asset classes would improve WaterNSW's overall understanding of its asset performance, which can then be used going forward to support its future expenditure proposals.

WaterNSW had a process in place in 2019 for bottom-up estimates that it was applying across projects but recognised there was disconnect when the estimating was outsourced, which resulted in additional work to follow-up and ensure that the estimates were correct. However, this is a significant improvement from 2016, when many of the candidate projects in the capital program were nor costed using a bottom-up estimation process. All candidate projects are now linked back to onsite rates and risk-based contingencies, whereas WaterNSW did not have anything nearly as sophisticated in the last expenditure review of the rural business. We understand that a project controls improvement initiative currently underway is considering revised approaches to contingency management at the program level which should help to achieve efficiencies over the determination period.

A new Maintain Capability Program delivery model was developed by WaterNSW following industry engagement to maximise industry capability and capacity and to deliver work more effectively and efficiently. The Maintain Capability Program delivery model includes an Engineering Design Partner, two Construction Partners and specialist service providers. The model is a partnership-based model that covers program management, project management, design, and construction management services. However, there is uncertainty over the quantification of the efficiencies that might be able to be delivered through this new delivery model, particularly at a valley level.

4.2. Scope of review

We are required to undertake a strategic review of the utility's long-term investment planning and its asset management systems and practices. In undertaking this task, we are asked to provide advice on:

(a) Whether the long-term capital investment strategy is the most efficient, and whether processes supporting this including option analysis, procurement processes, customer engagement practices, whole of life cycle planning and assessment of capital and operating expenditure trade-offs are best-practice and therefore likely to result in efficient investment decisions.

(b) The key assumptions that are driving expenditure (eg, asset replacements, licensed volumetric entitlements and extractions forecasts, environmental regulatory requirements, licensing standards, customer service standards and preferences), including comments on whether these assumptions are reasonable and how they have been considered and tested by the utility.

(c) The robustness of systems for linking asset management decisions with current and future levels of service and performance requirements, including customer preferences, service standards and environmental outcomes.

(d) The way in which WaterNSW manages the risks associated with asset failure or underperformance.

(e) Any particular concerns or issues relating to WaterNSW's strategic processes for determining and prioritising future infrastructure expenditure and asset management decisions.

4.3. Performance

WaterNSW's operating licence 2017-2022[4] defines two key areas which its performance standards are measured:

1. Water Supplied Performance Standards:
    - Supply Water Quality Performance Standard (Clause 4.2.2) – requires that WaterNSW must manage the quality of water supplied to its Customers in accordance with its Water Quality Management System
    - Supply Service Interruption Performance Standard (Clause 4.2.3) – requires that WaterNSW must manage service interruptions in accordance with the Asset Management System required under clause 5.1.1.
2. Capture, Store and Release (CSR) Water Performance Standards:
    - Water Delivery Performance Standard A and B
    - Water Service Interruptions Performance Standard
    - Water Account Processing Performance Standard A, B and C

WaterNSW is required to establish customer supply agreements arrangements (other than Sydney Water which is covered by its Greater Sydney obligations) which include:

- the standard of water quality Supplied by WaterNSW;
- the continuity of the water Supplied by WaterNSW (that is, provisions relating to interruptions, disconnections and reconnections to Supply);

Findings from the most recent operational licence audit found that WaterNSW reported that raw water supplied for treatment from 1 July 2019 to 30 June 2020 was 100% compliant with Australian Drinking Water Guidelines for health related characteristics. Performance against raw water supply agreements was 98.28% (internal target 95%) and 87.87% against operational targets (internal target 85%). Performance against Critical Control Points was 98.28% overall for the financial year (internal target 95%).

[4] https://www.waternsw.com.au/__data/assets/pdf_file/0004/126607/July-2020-WaterNSW-Operating-Licence.pdf

Performance requirements for WaterNSW are therefore most relevant to the quality and quantity of water supplied to its customers. Outside of this, the performance requirements are generally qualitative and relate to business processes rather than the service provided by WaterNSW. Water quality is primarily a function of the catchments from which water is collected.

There are no measures to confirm whether WaterNSW has met its qualitative obligations; some form of risk measure could be developed as a basis for performance assessment.

For the quantity and continuity of water supplied, the bigger picture relates to long term rainfall which is outside of WaterNSW's control. Long term supply and drought response is currently managed under the Metropolitan Water Plan.

WaterNSW prepares an annual Asset Health report to provide assurance that its assets and asset related risks are being managed effectively to the Board Sub-committee on Assets. Asset health is used by WaterNSW as a crucial measure in determining whether assets can perform their desired function ("capability") when needed ("reliability"), whether the maintenance plan is effective, and whether asset related risks across the portfolio are being managed consistent with the Asset Objectives, and Asset Management Policy. The report includes

- A distribution of total number of facilities, itemised by their criticalities
- A health distribution profile of the various asset classes and a brief on the actions taken to retain an optimal distribution, itemised by their criticalities and valleys
- An Asset Health profile described by asset class and valley that identifies the trends in average remaining life (asset consumption) over recent years using asset condition as a proxy
- A brief providing assurance that adequate asset capability has been maintained, restored or is in the process of renewal/refurbishment
- A list of asset related failures and a brief description on the emanating types of risk exposures and remedies undertaken
- Water delivery capability loss events and their magnitude (average Mega litres/ day) including any insights gained from the same.

The Asset Health "Heat Map" is used to summarise the Average % Remaining Life of high criticality assets (criticality 4 and 5). For the end of FY20, the heat map shows that generally the asset classes that have been scored are mostly in 'Good' health, based on an average estimate of 60-80% remaining life. Comparison of the asset health over the last five years indicates that there has been a general improvement across the reported asset classes over this time. However, one major weakness to the WaterNSW's reporting on asset health is that the only 11 of its 35 asset classes are represented. In addition, by using an average health score for each asset class, the focus is not on the assets in poorer health and the link between renewal/replacement interventions and the asset in poor health is not clear. As such, this means that the asset performance is not well linked to investment/expenditure. We note that for some asset classes, e.g. trashracks/baulks, hoists and platforms, there has been very little, if any, movement in the high criticality assets rated as 'Very Poor' in at least the last three years. Although assets rated as 'Poor' will deteriorate to 'Very Poor' over time, this suggests that the renewals for these asset classes has not been sufficient to maintain asset health in recent years.

We consider that there is not a strong link between the performance expectations on WaterNSW and how it is able to manage its physical infrastructure to meet these expectations. While a large contributor to this is that there are constraints outside of WaterNSW's control, we consider that WaterNSW is yet to embed links between what it can control in terms of performance and how it manages its assets across their lifecycle. Improvements in this area should help WaterNSW to better scope, optimise and prioritise expenditure.

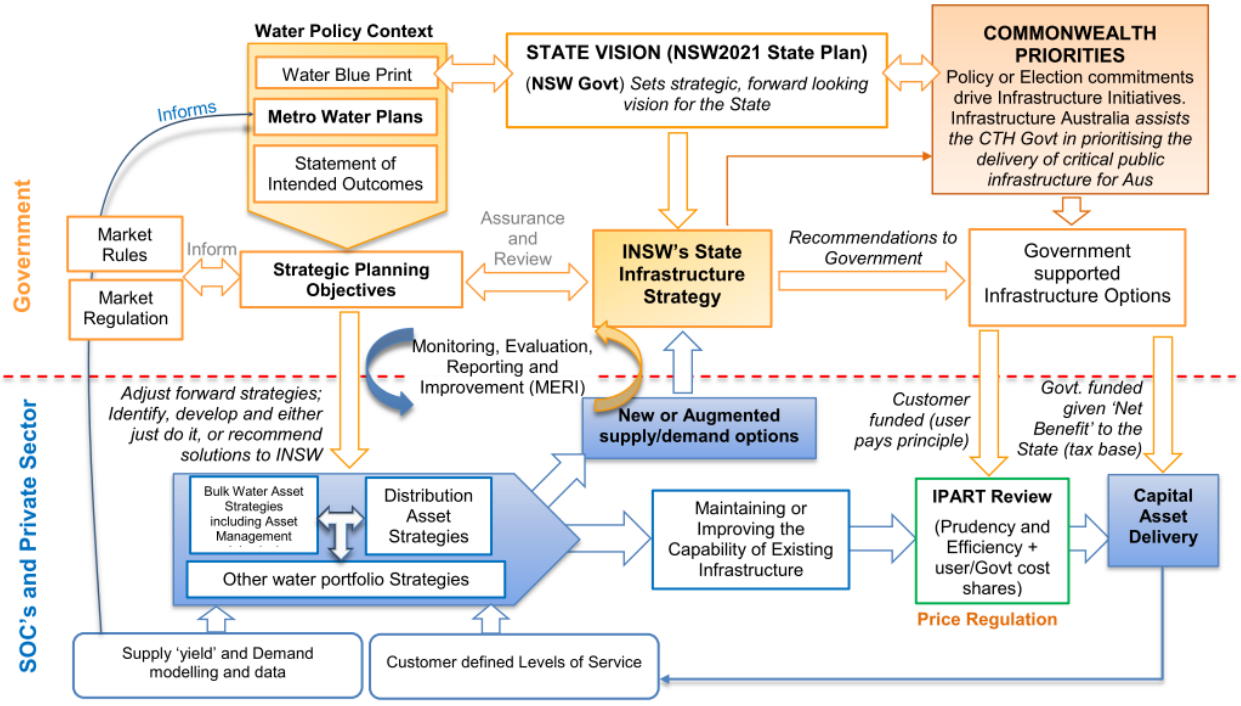
4.4. Long term investment plan

WaterNSW has developed a Capital Investment Strategy for 2019 to 2023 for the purpose of supporting delivery of the asset management objectives set out in the Strategic Asset Management Plan "by guiding capital investment planning and decisions". The Capital Investment Strategy includes a 20-year Capital Investment Plan. This is WaterNSW's long term investment plan to meet the needs of customers and meet its regulatory

obligations. The Capital Investment Strategy also includes a 10-year Capital Investment Plan which is reviewed annually and used as the basis for WaterNSW's State of Corporate Investment, budgeting and regulatory submission.

The Capital Investment Strategy includes Figure 4-1 which depicts the institutional arrangements and participants that influence WaterNSW's long term planning. In particular, this shows the relationship between WaterNSW and State Government policy. While this figure includes both WaterNSW's Greater Sydney and rural water businesses, it shows the range of considerations that WaterNSW needs to account for in long term planning. An important area where these institutional arrangements have influenced WaterNSW's regulatory submission is in its response to the drought.

Figure 4-1 Institutional arrangements for long-term planning



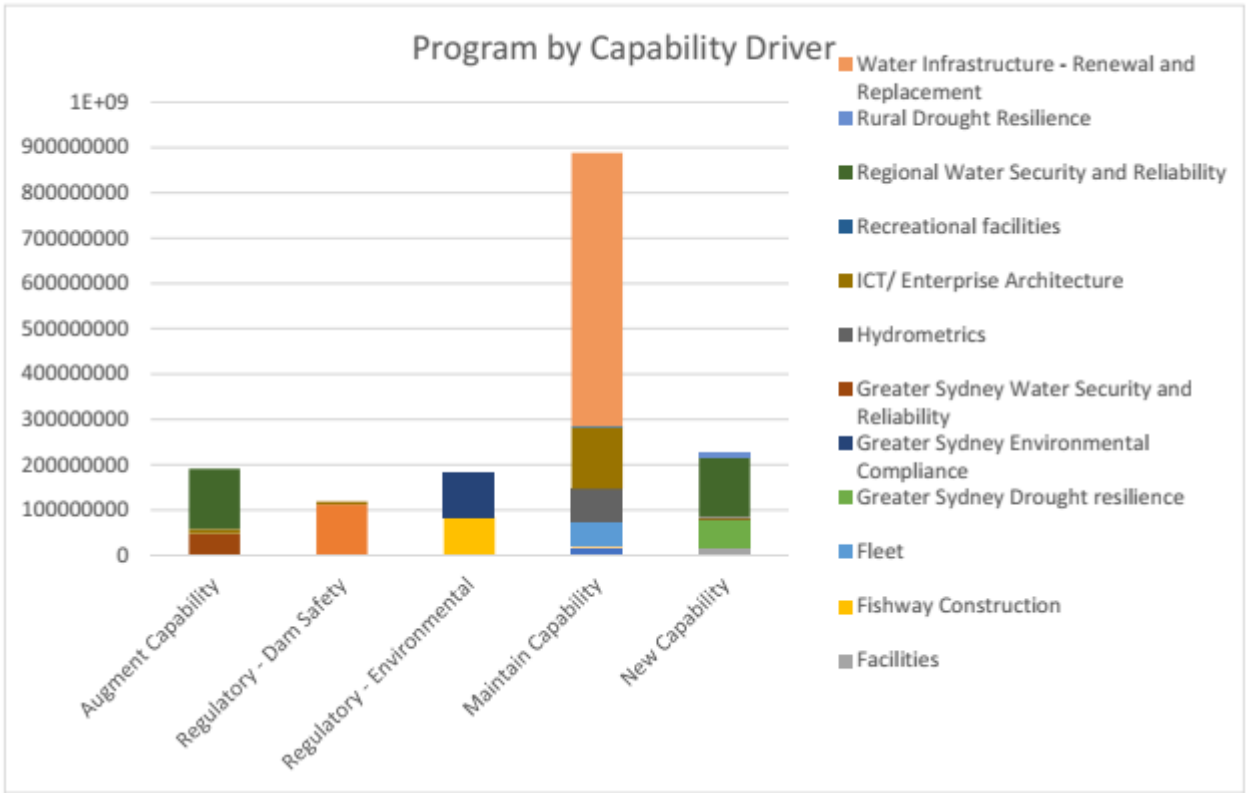
Source: WaterNSW Capital Investment Strategy FY 2019 to 2023

WaterNSW classifies capital investment into the following four categories:

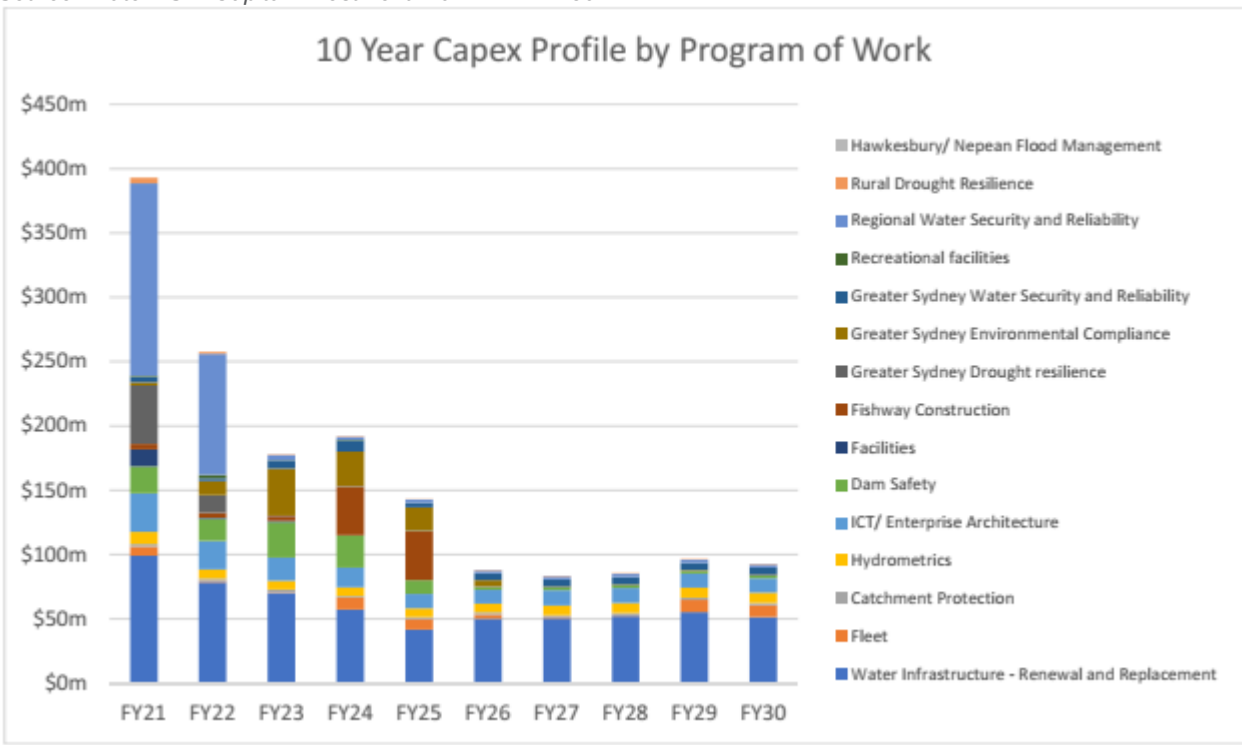
- Maintaining Capability;
- Augmenting Capability;
- New Capability/Solutions;
- Regulatory Compliance.

The 10-year Capital Investment Plan is shown in Figure 4-2.

Figure 4-2 10-year Capital Investment Plan



Source: WaterNSW Capital Investment Plan FY21-FY30



The 10-year Capital Investment Plan has the following features:

- The first four (and five) years of the 10-year program are much larger than the last half of the program. The last half of the program averages just under $100 million per annum. The first half of the program

ranges from $450 million to just under $150 million per year. While this is in part due to expenditure for water security and reliability, almost all categories drop away in the second half of the program.

- Water Security and Reliability dominates the first four years of the program but drops away in 2024 and there is very little expenditure for this program in the last five years

We challenged WaterNSW regarding the inconsistent expenditure profile between the first and second half of the 10-year program WaterNSW responded that the program was front loaded due to a backlog of asset renewal needs. WaterNSW also advised that projects and programs are only included in the Capital Investment Plan when endorsed.

While we acknowledge these factors, we also consider that the inconsistency in the program is contributed to by:

- The second half of the program being less developed than the first half and may increase when further developed. Individual items within a long term program will always be at different levels of development and approval. Excluding items that aren't endorsed undermines the value of a long term forecast.
- WaterNSW has not considered fully whether there the benefits in levelling expenditure between the first and second half of the program (e.g. increased utilisation of resources) outweigh the risks associated with not acting sooner.

We consider that there is an opportunity for WaterNSW to refine and more fully develop this long-term forecast over time. This is important to inform long term planning and can be used to monitor and inform the development and approval process. The 10-year plan is the aggregation of bottom up programs and projects. Therefore, improvement of the program is likely to require greater scoping of the 5 to10-year program (while balancing uncertainty) by extending forecasts for the shorter-term projects and programs. There is likely also benefit in top-down checks by driver and for other factors such as deliverability and procurement efficiency.

We consider that WaterNSW could better inform its longer term capital program by ensuring a clear line of sight between investment items and corporate risks and other regulatory drivers over time. There is a need to respond to emerging events, uncertainty and priorities and having one centrally held version of the long term capital program will assist WaterNSW ability to revaluate emerging risks and make more informed decisions on strategic investment prioritisation.

4.5. Asset management practices and processes

Our scope for this area of review is to review:

- *The key assumptions that are driving expenditure (eg, asset replacements, licensed volumetric entitlements and extractions forecasts, environmental regulatory requirements, licensing standards, customer service standards and preferences), including comments on whether these assumptions are reasonable and how they have been considered and tested by the utility.*
- *The robustness of systems for linking asset management decisions with current and future levels of service and performance requirements, including customer preferences, service standards and environmental outcomes.*
- *The way in which WaterNSW manages the risks associated with asset failure or underperformance.*
- *Any particular concerns or issues relating to WaterNSW's strategic processes for determining and prioritising future infrastructure expenditure and asset management decisions.*

4.5.1. Asset management overview

Under its Operating Licence, WaterNSW is required to maintain an asset management system for carrying out its functions authorised under the licence that is consistent with the Australian Standard AS ISO 55001:2014 Asset Management – Management systems – Requirements.

Although the asset management system had been certified in 2017, the 2018 Operating Licence audit identified that WaterNSW was non-compliant against two clauses related to maintaining and implementing an asset management system. WaterNSW was non-compliant with the requirements of clause 5.1.1, which required it to

have an asset management system at all times for the purpose of carrying out its functions, due to the management systems being scoped with reference to WaterNSW's physical assets rather than its functions and due to a lack of documented outcomes for various expectations of stakeholders.

A non-compliance (non-material) rating was also assigned to WaterNSW's performance against clause 5.1.2, relating to fully implementing the asset management system, due to the absence of some asset class planning documents and other more minor matters.

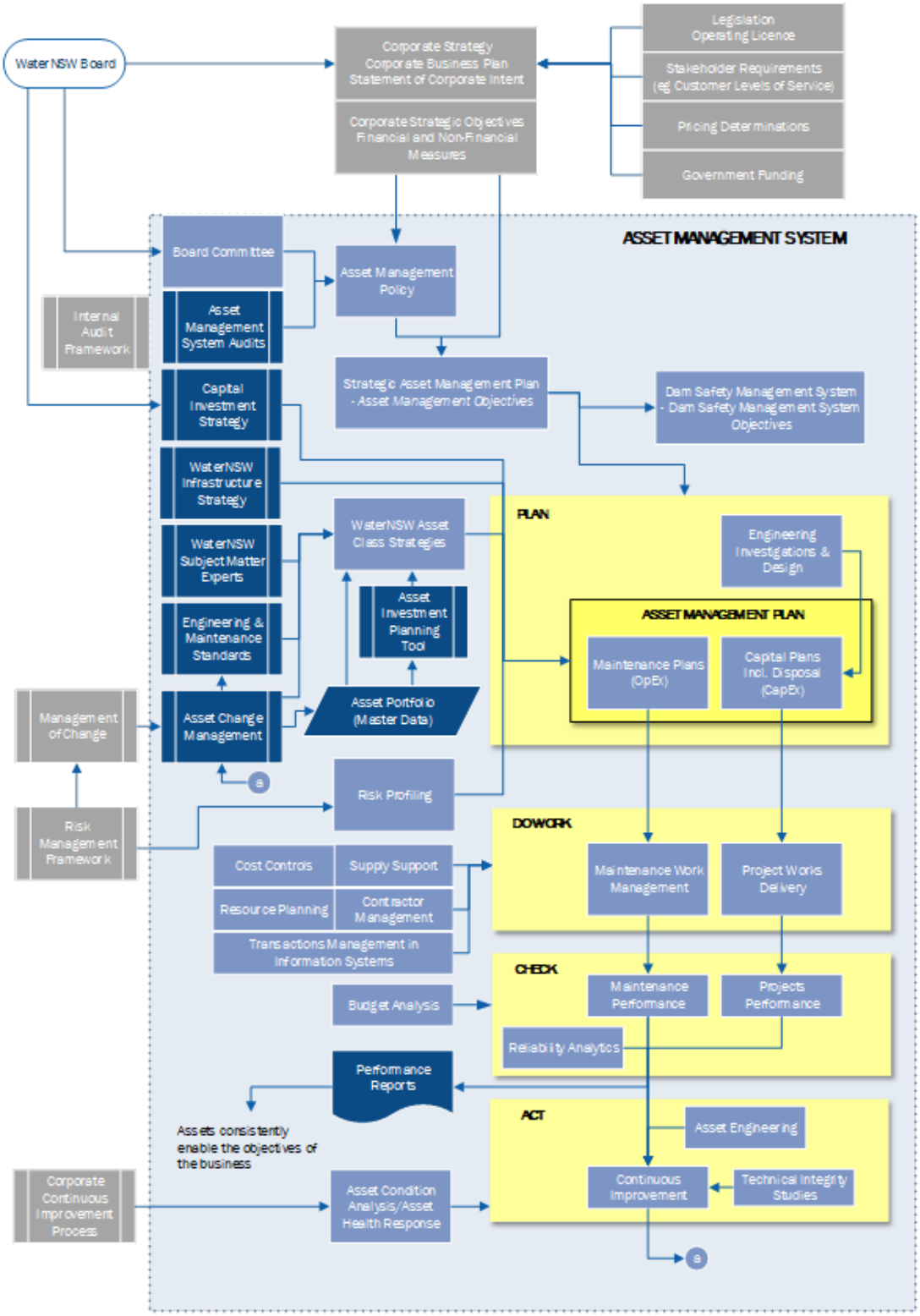
WaterNSW responded to these findings by undertaking a third-party review of its asset management system which identified 25 improvement initiatives.

The WaterNSW's asset management system was re-certified to ISO55001 for a further 3 years with no non-conformances identified in 2019. In addition, the 2019 operating licence audit considered that WaterNSW had improved its performance in relation to the maintenance and implementation of the AMS.

One immediate outcome of the third-party asset management review that WaterNSW undertook following its 2018 non-compliances was the revision of its Strategic Asset Management Plan (SAMP). WaterNSW's SAMP essentially acts as a system manual in that its structure is consistent with the requirements of the ISO55001:2014 standard and, therefore, it provides a reference for how the elements of the standard are addressed.

Figure 4-3 provides a detailed overview of WaterNSW's asset management system framework.

Figure 4-3 WaterNSW's asset management system framework



Source: WaterNSW Asset Management System

Figure 4-4 provides the top level elements of the framework, including how stakeholders influence and provide information into the WaterNSW's asset management system.

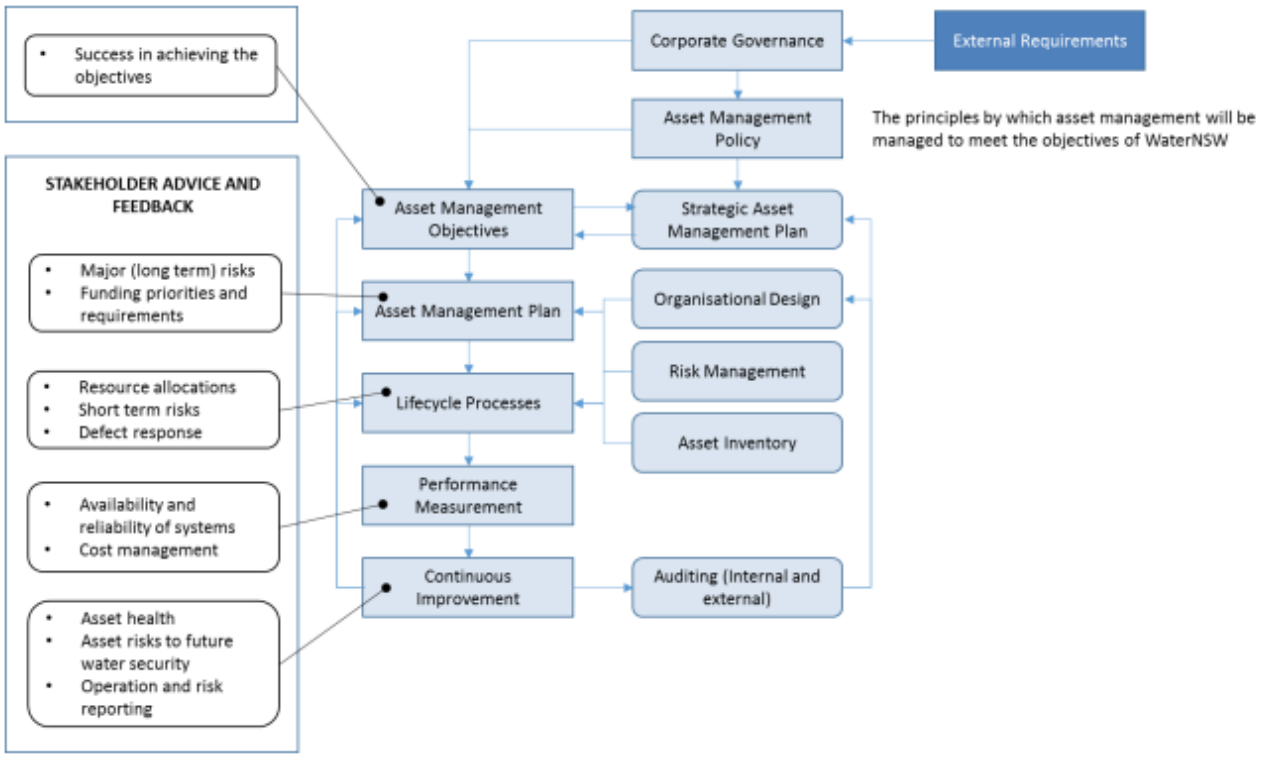


Figure 4-4 Overview of WaterNSW asset management system

Figure 4-5 provides the asset management system document framework that WaterNSW uses to specify and govern its system. Stakeholders are informed of these documents through the SAMP.

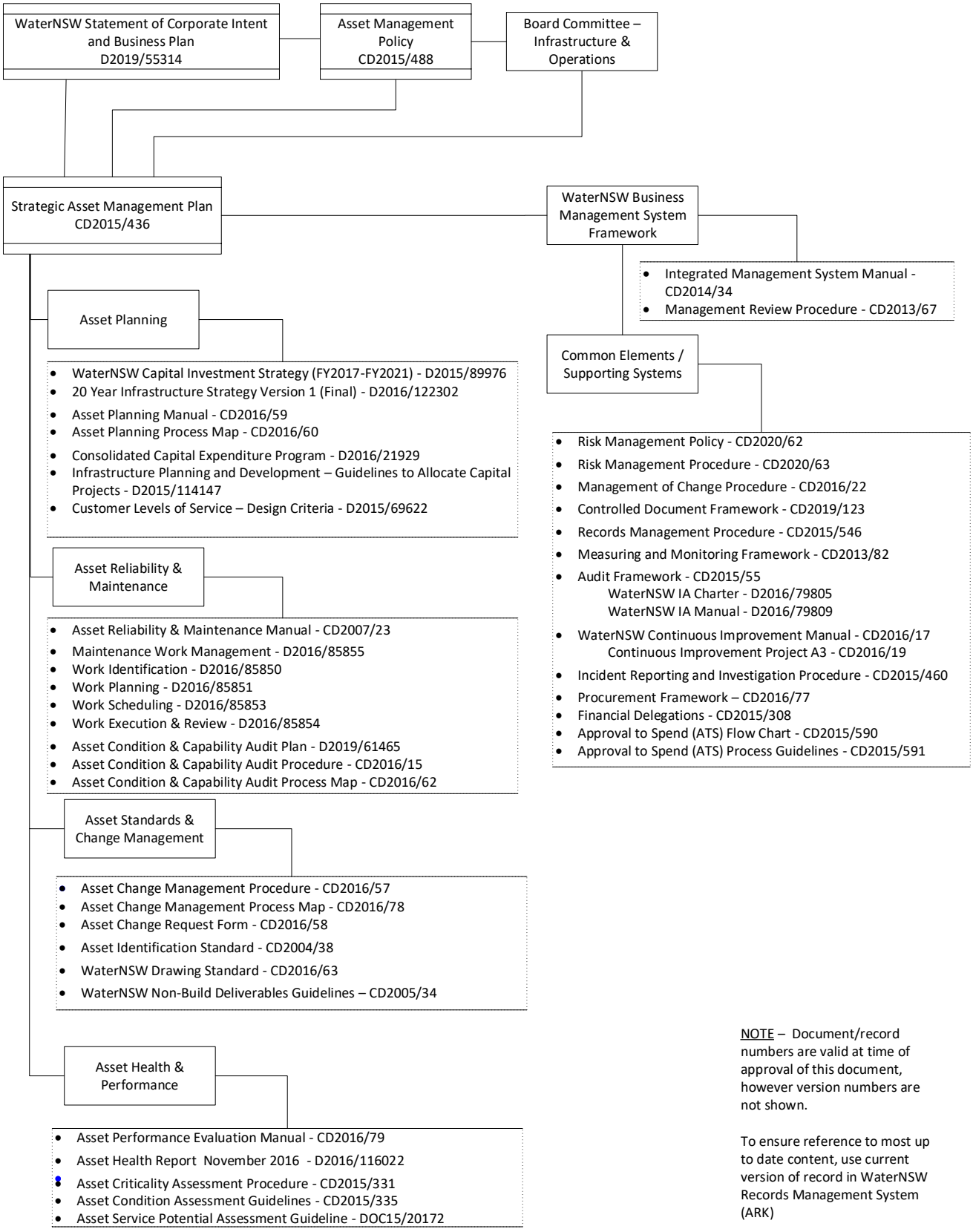


Figure 4-5 WaterNSW's asset management system reference document framework

In addition to the revision of its SAMP, other asset management improvements that WaterNSW has delivered recently or is in the process of delivering include:

- Progressive improvements in the alignment of the asset class strategy documents with the asset management objectives
- Improvements on project validation processes to allow better consideration of bespoke elements and site specific constrictions, complemented by improvements in the estimating processes
- Bottom-up estimating practices integrated with project validation to allow for more confident renewals costs
- Improved integration of planning and delivery teams, allowing for more robust cash flow estimates and efficiency targets to be developed at the project level

These improvements have generally been identified since the WaterNSW Greater Sydney expenditure review was completed in late 2019. WaterNSW considers that these improvements have been able to be rapidly implemented as they did not require much to support them and generally relied on a change in approach rather than requiring sophisticated solutions or systems.

In addition, WaterNSW has replaced and consolidated its legacy administrative systems with CIMS based on commercial enterprise resource planning (ERP) technology. In parallel, it also carried out a comprehensive review and implemented significant improvements to the asset hierarchies and maintenance plans. This was undertaken to ensure that the asset management system is fully implemented in accordance with WaterNSW's operating licence requirements following the 2018 operating licence audit non-compliance.

The implementation of a consolidated computerised maintenance management system as a component of CIMS enabled the replacement of legacy spreadsheets with more modern and comprehensive asset planning tools and planning and prioritisation software. This subsequently allowed WaterNSW to expand and improve the quality of its asset database. Data inconsistencies between the AMS and the program of works were identified and rectified.

As the consolidated CIMS matures, WaterNSW is expected to continue to pursue opportunities to make its asset management system more robust and comprehensive. This will be achieved through a combination of reviewing and refining processes and procedures as well as improving the quality of asset data and analytical capabilities.

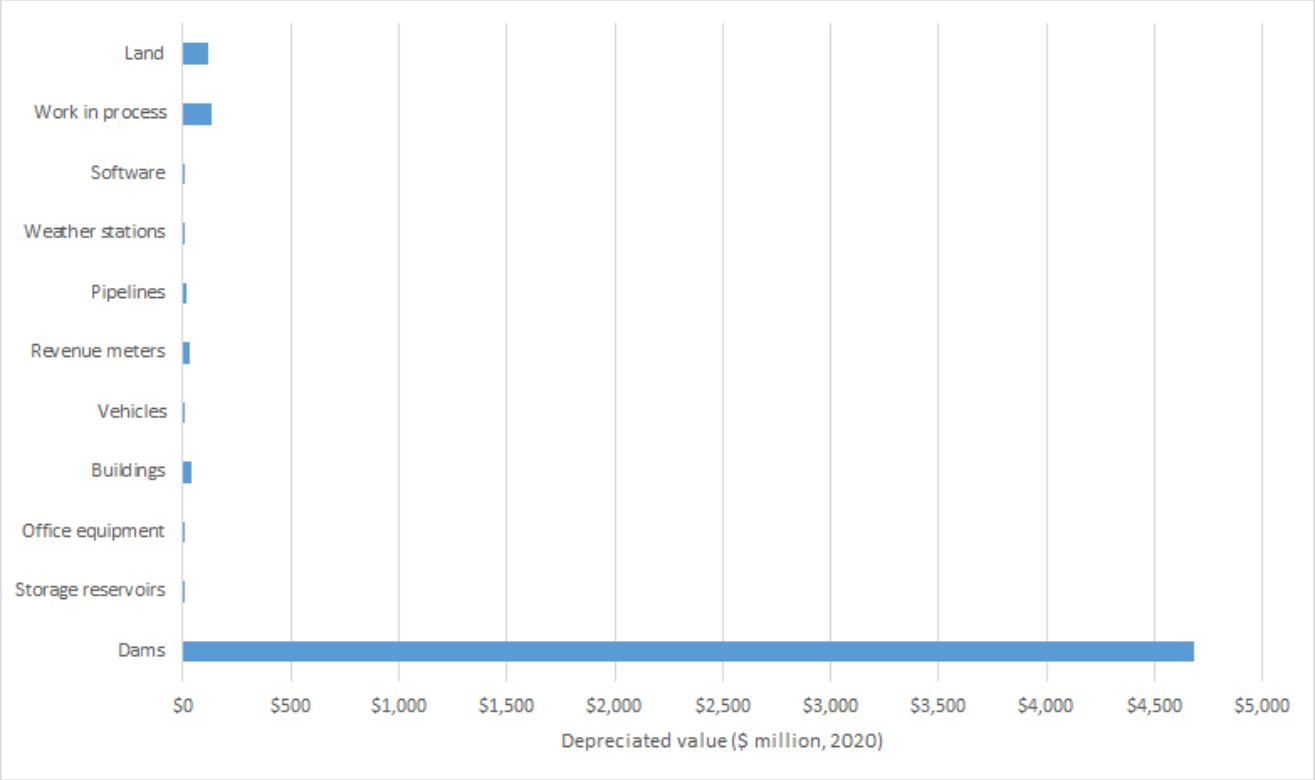
4.5.2. Asset base

WaterNSW's asset base is across four regions within New South Wales: North, South, Central and Greater Sydney. This review relates to WaterNSW's rural business and only the assets in the North, South and Central regions. The major assets within the rural area of Water NSW's operations are:

- 20 dams
- More than 280 weirs
- Fish River Water Supply Scheme
- River Water Supply Scheme assets

Figure 4-6 shows the depreciated value of WaterNSW's rural business assets by class. Dams are the largest asset class (by depreciated value) at $4.644 billion by a considerable margin. The total depreciated value of the rural business asset base is $5.046 billion, and the replacement value is $5.189 billion.

Figure 4-6 Depreciated replacement cost of WaterNSW assets



Source: WaterNSW AIR

4.5.3. Asset management objectives and planning

Under an ISO55001:2014 approach to asset management, WaterNSW is required to:

(i) Understand the requirements and expectations of stakeholders (ISO55001:2014, Clause 4.2). Stakeholders typically include customers, customer representative groups, environmental regulators, safety regulators etc. Expectations should include legislation, regulations, service standards, customer desires and willingness to pay, contracts, etc.

(ii) Define asset management objectives (Clause 6.2.1) which support the corporate objectives and reflect the stakeholder requirements

(iii) WaterNSW then needs to undertake planning (Clause 6.2.2) to achieve the asset management objectives

(iv) Determine and document the method and criteria for decision making and prioritising activities and resources to achieve its asset management plan(s) and asset management objectives (Clause 6.2.2)

Appendix D of the SAMP provides a table that demonstrates the alignment between the Asset Management Objectives, Corporate Objectives and the Asset Management Policy. The Asset Management Objectives are further defined in WaterNSW's Asset Management Objectives and Measures document.

The eleven asset management objectives that have been defined by WaterNSW to support its corporate objectives and guide its asset management policy principles as shown in Table 4-1.

Table 4-1 WaterNSW asset management objectives

	Asset Management Objectives	Corporate Objectives		AM Policy Principles
		Strategic Priority	Overall Objective	
1	Health & safety implications are considered in asset management activities	**Be Safe4Life**	*Achieve our safety-first commitment to zero harm (employees, contractors and the public) through decisions, behaviours and leadership actions that embed and continually improve our safety performance*	• *Invest in the workforce to ensure it is resourced and suitably skilled for the productive and efficient delivery of asset management* • *Capture, store and release water in an effective, efficient, safe and financially responsible manner*
2	Maintain and improve the Asset Management System to support evolving business requirements	**Improve Organisational Performance**	*Improve organisational performance by embedding a mindset of 'real-world' continuous improvement in all that we do, by embracing new ideas from national and global benchmarking research and by creating effective internal customer delivery chains that are commercial and meet evolving customer needs and shareholder requirements*	• *Develop and maintain an Asset Management System that complements and supports our business in accordance with ISO55001 and which maximises the net worth of the State's investment in WaterNSW* • *Apply the Asset Management System to all physical assets* • *Address performance of the asset portfolio and Asset Management System in consideration of relevant industry standards and benchmarks*
3	People are engaged and developed with the appropriate competencies, experience and behaviours to meet present and future asset management requirements	**Develop Our People and the Effectiveness of Our Team**	*Create the high-performance business we want to be by investing in and developing the competencies and leadership capabilities of our people, and by uniting them into one engaged and effective team that takes personal accountability for outcomes*	• *Invest in the workforce to ensure it is resourced and suitably skilled* • *Develop recognised Centres of Excellence*
4	Provide raw water supply infrastructure solution options to address identified risks & opportunities for current and future demands	**Provide Strategic Solutions**	*Pro-actively collaborate and demonstrate thought leadership so that we anticipate, influence and strategically respond to our changing external environment and paradigms, including the water market and the implementation of the Murray-Darling Basin Plan, and develop*	• *Operate from the principle that assets exist to deliver value for our customers, shareholders and the organisation* • *Optimise asset investment and operational costs using a whole-of-life approach and utilising*

	Asset Management Objectives	Corporate Objectives		AM Policy Principles
		Strategic Priority	Overall Objective	
			innovative solutions that go beyond traditional thinking and span asset, operational, rule change and funding solutions	*suitable life cycle models as appropriate* • *Develop asset management planning processes that facilitate the balancing of performance, risk and cost across the asset portfolio; consistent with the objectives of the corporate risk management framework and potential current and future climate change impacts* • *Ensure asset investment is supported by traceable and transparent decision-making processes, including associated relevant asset information and data analysis*
5	Assets are reliable and maintained to acceptable standards	**Deliver Reliable Performance in a Changing environment**	*Achieve reliable and consistently improving performance and operational strength across all of the company's key functional areas by continuing to build the company's capability, flexibility and resilience.*	• *Address performance of the asset portfolio and Asset Management System in consideration of relevant industry standards and benchmarks* • *Ensure relevant data and information is captured and stored in a common systematic and efficient manner, for the purposes of informed and timely decision making*
6	Work management processes are consistently delivered and monitored			• *Develop asset management planning processes that facilitate the balancing of performance, risk and cost across the asset portfolio; consistent with the objectives of the corporate risk management framework and potential current and future climate change impacts*

	Asset Management Objectives	Corporate Objectives		AM Policy Principles
		Strategic Priority	Overall Objective	
				• *Ensure asset investment is supported by traceable and transparent decision-making processes, including associated relevant asset information and data analysis* • *Address performance of the asset portfolio and Asset Management System in consideration of relevant industry standards and benchmarks*
7	Water Service to customer is delivered in accordance with their requirements			• *Operate from the principle that assets exist to deliver value for our customers, shareholders and the organisation*
8	System is operated and managed in accordance with Design Criteria	**Deliver Reliable Performance in a Changing environment**	*Achieve reliable and consistently improving performance and operational strength across all of the company's key functional areas by continuing to build the company's capability, flexibility and resilience.*	• *Address performance of the asset portfolio and Asset Management System in consideration of relevant industry standards and benchmarks* • *Operate from the principle that assets exist to deliver value for our customers, shareholders and the organisation*
9	Manage and Protect Declared Catchment Areas			• *Address performance of the asset portfolio and Asset Management System in consideration of relevant industry standards and benchmarks*
10	Asset Management Activities are communicated to stakeholder	**Be a Customer Centric Organisation**	*We will focus on activities that prioritise our customers in our decision making and actions so that we improve the value customers receive along with the quality of their experience. Ensure by 2021 more than 70% of our customers rank our service delivery as greater than 7 out of 10*	• *Operate from the principle that assets exist to deliver value for our customers, shareholders and the organisation* • *Ensure asset investment is supported by traceable and transparent decision-making processes, including associated relevant asset*

	Asset Management Objectives	Corporate Objectives		AM Policy Principles
		Strategic Priority	Overall Objective	
				information and data analysis • *Optimise asset investment and operational costs using a whole-of-life approach and utilising suitable life cycle models as appropriate*
11	Management Information Systems and appropriate technologies are maintained and improved to support business requirements	**Support performance through innovation and adoption of new technology**	*Through innovation and adoption of new technology ensure we do things safer, automate routine activity, reduce waste and costs, provide value adding information products to our customers and improve our performance*	• *Develop recognised Centres of Excellence in the development, management and operation of the assets and infrastructure needed to collect, store, transfer and release bulk water* • *Develop and maintain an Asset Management System that complements and supports our business in accordance with ISO55001 and which maximises the net worth of the State's investment in WaterNSW. Address performance of the asset portfolio and Asset Management System in consideration of relevant industry standards and benchmarks, asset criticality, capability and condition.*

Note: the Design Criteria referred to in Objective 8 has specific legislated meaning for WaterNSW's Greater Sydney operations and does not apply to the rural business operations.

Each of WaterNSW's asset management objectives has specific asset management measures that support achieving the objectives.

Table 4-2 provides a sample of these measures for four of the objectives that focuses on WaterNSW's physical asset and service delivery. We note that these measures relate to the process as opposed to an outcome of success or a specific result to report on whether or not the objectives are being achieved, i.e. the process of undertaking asset performance evaluation or the process of preparing an investment plan, not whether asset condition (and risk) should be within acceptable level of whether the investment plan is prudent, efficient and affordable. We consider that there is an opportunity for WaterNSW to better define indicators that reflect whether objectives are being met or not.

Table 4-2 Sample of asset management objectives

Asset Management Objectives	Measurement Reference - what is to be measured	Evidence of Measures
Provide raw water supply infrastructure solution options to address identified risks & opportunities for current and future demands	a. 20-year Infrastructure Strategy Options b. Capital Investment Plan	a. Publication of 20 Year Strategy to Customers (evidence of key documents available on the external website - 20-year plan) b. Overall Measure of Delivery (OMD) metric
Assets are reliable and maintained to acceptable standards	a. Audits (Asset Condition and Capability, Dam Safety) completed against Audit schedule b. External Auditing against Operating Licence c. Asset Performance evaluated in accordance with Asset Performance Evaluation manual d. Asset performance for water quality management	a. Dam Safety Surveillance Audit reports. Asset Condition and Capability Audit reports. b. Annual IPART Audit report c. Asset Health reports d. Water quality incidents due to asset failure
Work management processes are consistently delivered and monitored	a. Routine and Corrective Maintenance completion rate across WaterNSW (with break down into individual valley/clusters)	CMMS / WO reporting
Water Service to customer is delivered in accordance with their requirements	a. Supply interruptions are managed in accordance with individual supply agreements b. Service interruptions are managed within the parameters specified in the WaterNSW operating licence Clause 4.3.4	a. Water Worry Report b. Monthly Capture, Store Release Water performance against Standard report

Source: WaterNSW's Asset Management Objectives and Measures

WaterNSW uses two key planning documents to achieve its asset management objectives, the Asset Management Plan (AMP) and a series of Asset Class Strategies.

WaterNSW has a single asset management plan for all of its operations (Greater Sydney and rural). The focus of the document is the actions that are required, and this has been a change from the previous AMPs that WaterNSW used to develop and which included much more information. As such, the AMP includes a register of the tasks required to achieve the asset management objectives, and this provides details of projects, timescales, and budgets. In effect this makes the asset management plan a work plan covering the operation and maintenance activities and the capital projects required to deliver service from the assets to meet the objectives.

The asset class strategies provide high level strategic direction for each asset class for how the assets within a class should be managed throughout their life cycle to optimise risk, performance and cost. Through the process of determining the risk, performance and cost trade-offs for each asset class, the asset class strategies then provide important input into WaterNSW's expenditure proposals, assisting in prudent and efficient proposals to be developed. In addition, the information in the asset class strategies subsequently feeds into the development of the asset management plan

WaterNSW has now developed 19 asset class strategies, with 16 still to be completed as at October 2020. It approached the development of the documents on a prioritised basis, starting with the most critical classes and those for the predominant assets in the overall portfolio. Asset Class Strategies have been completed for the include the following asset classes:

- Dam Structures
- Weirs - Unregulated
- Fishways
- End of Line Control Valves
- Fish River Pipeline System
- High Voltage Systems - Transformers
- HV Switchgear and Cables
- HV Motors and VSD's
- Tunnels
- Canals
- Bridges
- Roads
- Isolation Valves

Although WaterNSW still has asset class strategies to complete, the focus of the work has now moved onto the technical standards and specifications for delivery to meet the asset management plan tasks and deliver the objectives. We note that the 16 Asset Class Strategies still to be completed include:

- Weirs – Regulated
- Gates (Spillway, Regulators, Control Structures)
- SCADA & Process Control
- Water Treatment Systems
- Information Communication Technology
- Instrumentation - Dam Monitoring and Control

Although WaterNSW continues to progress its Asset Class Strategies, and have developed the documents for its largest and dominant asset classes, the incompleteness of strategies across all asset classes means that the remain some concerns as to how the trade-offs between risk, performance and cost are determined and in turn, how prudent and efficient expenditure proposals are developed when making judgements over the entire asset base. However, we accept that WaterNSW is in the process of bringing together legacy approaches to asset management and it is reasonable to expect this process to take some time. The increasing strategic approach that WaterNSW is taking would be expected to realise efficiencies in the scope and frequency of maintenance and the justification and scoping of capital expenditure in the future.

4.5.4. Risk management and decision-making

WaterNSW's Strategic Asset Management Plan states that it is "committed to…effective risk management for prioritisation of its activities." WaterNSW has a corporate risk management framework in place that is consistent with AS/NZS ISO31000:2018 Risk management – Principles and guidelines.

The framework consists the following components:

- Risk Management Policy
- Risk Appetite Statement
- Risk Management Procedure
- Corporate Risk Management Plan
- Risk Profiles
- Risk assessment and management tools

The Risk Management Procedure describes the processes for assessing risks and responding to them. This includes guidance for assessing the likelihood of risk events and their consequences against the following categories:

- Safety
- Environment

- Compliance
- Finance
- Reputation
- System
- Water
- Customer (internal and external customers)

Risks are rated based on their combined consequence and likelihood as extreme, high, medium or low. WaterNSW's Risk Appetite Statement states that its risk appetite is such that risks with a residual rating of high or extreme are not tolerable and need to be mitigated. In addition, the Risk Mitigation Statement states that proposed risk mitigation measures are subject to cost benefit analysis.

The application of this risk management framework to decision making is described in WaterNSW's Asset Planning Manual. This document describes that risks across the asset portfolio are identified through periodic activities including:

- Dam Safety Audits
- Asset Condition and Capability Audits
- Field Based Condition Assessments
- Requests from field personnel or system operators
- Detailed Asset Reliability Analyses
- Asset Performance Issues/ Failure Data.

The likelihood of risk events is determined based on asset condition, formal likelihood assessments and evaluation of asset failures and performance history. The Asset Criticality Assessment Procedure is used to determine the consequence of a risk event. This approach is in line with many large water utilities in Australia. The Asset Criticality Assessment Procedure employs consequence definitions that are the same as those in the corporate risk management framework although additional criteria are described for dams which are managed in accordance with ANCOLD guidelines.

Asset criticality is scored individually using a 0-5 scale (0 = no risk, 5 = severe) across six different factors:

- Safety
- Capability / Service Delivery
- Environment
- Compliance
- Financial
- Reputation

The highest individual score across the six factors is used as the overall criticality for the asset.

WaterNSW uses the criticality to prioritise both maintenance planning and the asset renewals included in its capital works program. Criticality is a data field/ attribute in WaterNSW's maintenance system and also in its PowerPlan asset investment planning tool.

The criticality of an asset is a factor in the frequency and the type of maintenance undertaken, with the maintenance requirements driven by the asset themselves. More frequent and/or detailed inspections would be expected to be carried out on a more critical asset than a less critical infrastructure. If an asset is not considered to be critical or if there is asset redundancy, the asset may be run to fail. Maintenance backlog is also prioritised based on the criticality of an asset.

Although the criticality of an asset is used to assist in the prioritisation of WaterNSW's renewals and maintenance work, on its own it does not really determine where investments should be made. Instead the combination of criticality and asset condition is used as a more robust decision-making driver for renewals or for increasing maintenance requirements. An asset that has both a high criticality score and a poor condition score would be expected to have a higher priority for an action to address this than an asset that doesn't fulfil both criteria. Local field crew with better knowledge of the assets they maintain are involved in maintenance and renewals discussions to provide input as to how important a particular asset is or whether there are any specific issues with it.

The PowerPlan software tool is used by WaterNSW to identify and assess candidates for its asset renewals, based on assessing the asset risks and planning interventions to cost-effectively address these risks.

Power Plan uses data from the Enterprise Asset Management System to identify the point at which intervention is required based on deterioration curves to look at when an asset may need to be replaced. The Net Present Value and risk cost are the main comparators, and this allows WaterNSW to develop a high-level risk prioritised renewals program. The process is iterative, with more detailed inspections/studies completed on the assets identified for renewal, with this updated information then being used in the next iteration of the development of the program. Intervention costs are typically based on the modern equivalent replacement cost of the asset reduced by a factor to account for WaterNSW's experience that interventions often cost less than replacement, e.g. if refurbishment only is required.

Although the process is maturing, it allows WaterNSW to develop its renewals program based on asset condition and performance data, while also accounting for risk and costs.

4.5.5. Program development and prioritisation

The governance framework for expenditure decisions is based on adhering to the WaterNSW risk, compliance and asset management frameworks. There are clear lines of accountability and assessments proportionate to the value of the expenditure.

WaterNSW's processes for how the business evaluates and governs expenditure are contained within its 'Approval to Spend' Framework. The stated aim of the Framework is to ensure "prudent and efficient decisions that ensure effective delivery of customer and business objectives and are value-for-money". The Approval to Spend Framework is one of four commercial frameworks defined by WaterNSW across the lifecycle of expenditure as shown in Figure 4-7 . We discuss procurement and delivery in more detail in Section 4.5.7.

Figure 4-7 WaterNSW commercial frameworks for expenditure

The approval of expenditure under the framework occurs in line with the WaterNSW Financial Delegations, including approval from Executive Team or the Board as required under the framework.

Under the framework, the requirements that need to be provided in order for an assessment to be made and approved include:

- definition of the need/problem being addressed
- justification, including risk assessment of relevant options
- consultation with stakeholders
- specific requirements for engagement of consultants
- specific direction for asset related procurement
- financial classification, budget and delegation
- documentation (including templates).

Estimated cost savings from approved Approval to Spend business cases are input into budgets and checked off by the Finance Business Partners

The Approval to Spend Framework applies to proposed expenditure over $20,000. The framework defines governance documentation and consultation that is required to be undertaken for approval to be gained. The level of documentation and engagement required varies based on the assessed level of risk, which is in line with good practice.

The Approval to Spend Framework is focused on the processes for progressing and approving individual expenditure items. It does not address how an overall investment program is developed or prioritised other than to note that these are the responsibilities of the Investment Review Committee.

WaterNSW has developed a Capital Investment Strategy for 2019-2023 for the purpose of supporting delivery of the asset management objectives set out in the Strategic Asset Management Plan "by guiding capital investment planning and decisions". The Capital Investment Strategy defines how WaterNSW's capital program is developed including alignment with objectives and drivers.

The Capital Investment Strategy states that WaterNSW "prioritises capital works according to a number of criteria aligning with a general approach to the effective and efficient management of risks and benefits for customers and community". The primary drivers for prioritisation of capital expenditure are detailed as:

- reduction in health and safety related risks to staff, customers and community
- reduction of risk of asset related failure to the organisation, customers and the community
- optimising lifecycle costs including consideration of minimising maintenance costs where appropriate
- reduction of risks associated with non-compliance with regulatory requirements
- maintaining the required levels of service to customers

These drivers are consistent with WaterNSW's approach to risk management.

The Capital Investment Strategy also defines "guiding principles" for the identification, prioritisation and scheduling of capital works. These are:

- all investment is justified against a "do nothing" scenario
- investment analyses consider whether an asset is still needed or whether retirement or disposal are possible options
- a "latest possible intervention" policy has been adopted but is sensitive to asset criticality, regulatory compliance requirements, and life cycle costing considerations
- customer interests are always considered.

We have found that these guiding principles are not always followed extensively throughout all project planning processes. Where appropriate, we have made project or program level adjustments for future capital expenditure where we think that the scope of works can be better scoped, optimised and prioritised.

A review of the priority of projects is carried out against the portfolio per valley. Condition, criticality, useful life and intervention cost data is used to prioritise the projects for inclusion in WaterNSW's Capital Plan. Workshops with field & technical representatives is used to determine the priority of validated projects that have progressed through the capital investment process against the portfolio in that Valley. Pre-workshop, project details are gathered & site verified. WaterNSW has improved the consultative aspects of its capital planning processes and developed a much more systematic and structured approach to working through candidate projects with the its field and technical staff in order to look to identify the most efficient solution. Preferred options are validated and challenged to agree consensus on the correct solution, with the consultation process also assessing the timeframes, whether the project can be deferred and confirming that the cost estimation is robust.

The workshop process sets agreement on criticality rating, service potential/condition & refines cost estimates (e.g. site access variability). Progressive project scoring then allows priorities to be calculated against the Valley's portfolio.

The workshops rely on WaterNSW's risk management procedures for:

- Condition
- Service potential
- Criticality; safety & capability/service delivery

The asset planning team refines the prioritised capital projects list into the capital plan. We note the improvements that WaterNSW is making in this area, although the approach to measuring its assets health and performance does not appear to be applied consistently across its various asset classes.

Within its Annual Asset Health Annual Report 2020, we note that 11 out of 30 asset classes have so far been included so there is some way to go to have a complete suite of asset health reports. The Asset Health reports focuses on condition and does not appear readily linked to risk and criticality in its current form. We consider that including risk as a measure of performance, linked to asset health (condition) and consequence across all of its asset classes would improve WaterNSW overall understanding of its asset performance which can be used going forward to support its future expenditure proposals.

4.5.6. Cost estimating

WaterNSW has a cost estimating framework to guide preparation of cost estimates. The framework is based on three basic components that are linked and inter-dependent:

1. Preparation of base engineering estimates - The framework outlines factors that need to be considered in the preparation of cost estimates such as project life cycle, type of project, estimating process and methodology.
2. Risk assessment - The estimating framework introduces deterministic and probabilistic approach to risk and contingency
3. Desirable level of estimate accuracy at each stage of the Project Delivery Framework.

Risk and contingency allowance is a financial reserve added to each project's estimate to offset uncertain or unpredictable factors relating to the delivery of project objectives. In the WaterNSW context, risk and contingency is split into two parts: Project Risk and Management Reserve.

The project risk is the most likely consequence. This is the most likely scenario that can happen during the execution of the project. The Project Risks amount is the difference between P50 probability and amount of engineering estimate and is generally under the delegation of the Project Manager.

In addition, business cases for capital project expenditure within WaterNSW all appear to include a "Management Reserve" expenditure.

The management reserve is the difference between total maximum residual consequence and most likely consequence, the difference between the P90 and P50 probabilities. This part represents risk consequences that may probably not happen, but WaterNSW considers that it is prudent to allow for it. The management reserve is delegated to the CEO. As the management reserve sits over and above contingency and capitalised business unit overhead amounts, which are also included above the direct capital costs, we consider that it results in WaterNSW taking an overly conservative approach to its cost estimating.

In our review of WaterNSW capital projects, we observed that the estimates included in the Final Business Cases are costed at a P50 taking into consideration some risk components to form the risk based contingent amount. The management reserve was observed to take the estimates to the P90 level. Any variations to the original project contract costs are required to go through a more robust approval process before they are permitted to continue. This may include changes to contracted works due to unknown issues arising on site beyond simple site conditions, or changes to the work scope in order to deliver the originally intended project outcome. In some cases, it also includes some provisional sum items.

WaterNSW's cost estimates are subjected to review and challenge through the process of developing the capital plan.

As commented on in Section 4.5.1, WaterNSW has implemented improvements in its cost estimating processes to develop bottom-up estimating practices that are integrated with project validation processes in order to allow for more robust renewals scheme cost estimates to be prepared.

WaterNSW had process in place for bottom-up estimates in 2019 that it was applying across projects but recognised there was disconnect when the estimating was outsourced which resulted in additional work to follow-up and ensure that the estimates were correct. However, this is a significant change from 2016 when many of the candidate projects in the capital program did not have a bottom-up estimate process. All candidate projects are now linked back to onsite rates and risk-based contingencies, whereas WaterNSW did not have anything nearly as sophisticated in the last expenditure review of the rural business.

We understand that a project controls improvement initiative currently underway is considering revised approaches to contingency management at the program level which should help WaterNSW to achieve efficiencies over the determination period.

4.5.7. Procurement and delivery

WaterNSW is currently going through significant changes to how it procures and delivers its asset renewals and replacements program and has established the Maintain Capability Program to do this.

Previously WaterNSW had a panel of three suppliers to deliver the program of works. However, there were ongoing issues with the delivery model that was in place, with constant contract negotiations taking time to agree and the annual program not being able to be delivered in recent years. Additionally, two of the panel suppliers exited the market, resulting in WaterNSW having to go to the market using tender processes for its renewals and replacement program. As a result, WaterNSW identified that it needed to put in a new

arrangement to deliver its program of works and also ensue that this arrangement aligned to the business's objectives and goals to deliver the works effectively and efficiently.

A new Maintain Capability Program delivery model was developed by WaterNSW following industry engagement to maximise industry capability and capacity and deliver work more effectively. The Maintain Capability Program delivery model includes an Engineering Design Partner, two Construction Partners and specialist service providers. The model is a partnership-based model that covers program management, project management, design, and construction management services. Delivery contractors will be statewide.

WaterNSW sees the benefits of this model as offering better value than was previously being achieved, increasing the certainty in project and program delivery, and providing cost certainty and efficiency.

After starting the development of the delivery model in May 2019 and going through the engagement process between July and October 2019, the transaction and implementation phase started at the start of 2020. At September 2020, WaterNSW considers that it is close to awarding the engineering design partner role and expects them to be engaged soon. Tender exercises were still ongoing with prospective construction partners and the preferred suppliers are not expected to be finalised for another few months

At the current time it is difficult for WaterNSW to quantify the efficiencies that might be able to be delivered through this new delivery model. Efficiencies will depend on the mix of work in the valleys. We have provided more commentary on capital efficiency in the next determination period in Section 6.8.

Although the majority of WaterNSW's renewals and replacement program will be delivered through the new framework, where specialist contractors are required e.g. to carry out pipe coatings work, it will be able to go outside of the partnerships to engage contractors who are best suited to provide specialist services. The Maintain Capability Program partners will also be able to approve sub-contractors and WaterNSW expects to work with them to build-up local supplier capability across the state.

WaterNSW has also progressed through an initial transformation process to improve the administration-related aspects of its procurement. This includes activities related to changing the purchasing module in the finance system and automating accounts payable activities.

4.5.8. Conclusions

WaterNSW has logically based asset management processes in place to support the development of its expenditure proposals.

There continues to be some notable gaps in its processes, for example 16 of the 35 Asset Class Strategies are still to be completed. In addition some of key processes, such as the use of the PowerPlan software tool for planning interventions to address risk and the new procurement model are still reasonably new changes to WaterNSW's asset management practices and are expected to benefit from refinement and improvement over time to drive improved processes for the development of capital projects for inclusion in its forward programs.

5. Operating Expenditure

We are required to review actual operating expenditure incurred over the 2017 Determination period. In undertaking this task, we must:

- Report and comment on the variations in operating expenditure from what was allowed in the 2017 determination, including the extent to which these variations are justified or not.
- Identify and comment on the nature and size of operational savings realised (eg, whether they are permanent or temporary in nature).

We are also required to review the efficiency of forecast operating expenditure for the next Determination period. In undertaking this task, we must:

- Provide recommendations as to the efficiency of WaterNSW's forecast level of operating expenditure and provide an estimate of the level of operating expenditure that is required to efficiently supply the regulated monopoly services from 2021-22 to 2024-25.
- Identify the potential for and recommend efficiency savings to be achieved within the operating expenditure budget and provide evidence and reasoning to support the recommended savings.
- Identify any consequential impacts on capital expenditure (ie increased or reduced costs) based on the assessment of operating expenditure.
- Where appropriate, have regard to productivity benchmarking analysis when identifying potential efficiency saving

5.1. Summary

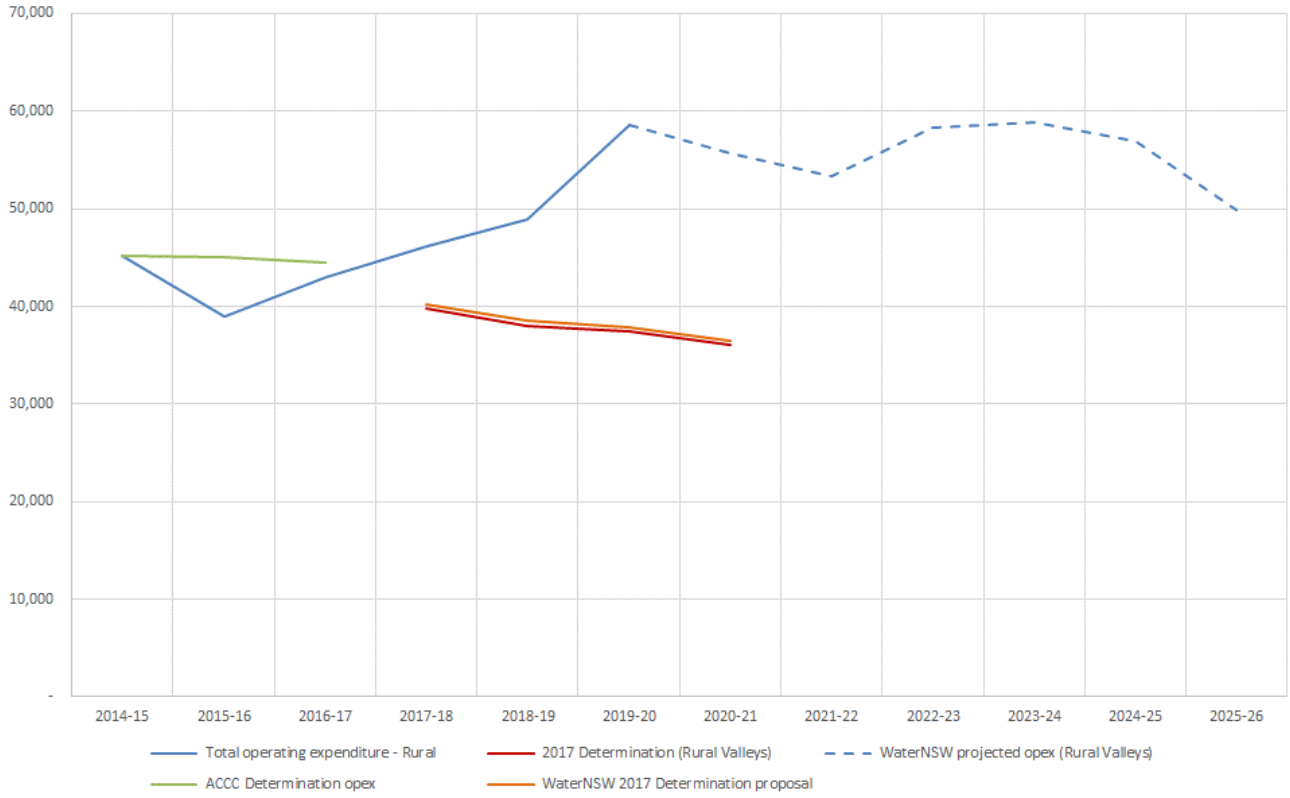
Below we provide a summary of the operating expenditure in the current and future determination periods.

5.1.1. Current determination period

In its submission for the 2017 Determination WaterNSW expected that operating expenditure would continue its reducing trend. IPART largely accepted this proposal.

However, opex has increased significantly during the period rising by 22% or $9.4M p.a. compared to FY17. This has led to 38% or $58.0M total higher expenditure than assumed in the 2017 Determination, with all Valleys seeing higher than expected expenditure.

Figure 5-1 Outturn and proposed expenditure trends ($000)



Source: "Opex" tab in WaterNSW's October 2020 AIR/SIR, Aither 2017 report[5] for ACCC Determination allowance and IPART Determination for 2017 WaterNSW proposal and Determination

WaterNSW's explanations of the variance include:

- Under forecast of costs in the proposal for the 2017 Determination period accounting for $17.3M of overspend. Costs which were not included, or under-forecast include scheduled overtime, land tax liability, flood operations expenditure, actuarial adjustments, short-term incentive payments.
- Staffing and unit labour costs: a new Enterprise Bargaining Agreement (EBA) agreement and Minimum Wage Ruling ($6.7M of overspend) and additional staff ($1.5M) involving 3 additional FTEs for maintenance and 2 FTEs for water delivery in FY21.
- Overhead costs (examined in Section 8), including corporate labour cost increases ($5.0M of overspend) and non-labour ICT overhead costs ($2.7M of overspend) such as software licencing and cloud-based subscription services replacing legacy IT systems.
- Other external drivers ($5.9M of overspend) including drought projects in FY21, higher risk transfer product premiums than expected and higher energy and chemicals costs in Fish River due to higher customer demand volumes.
- Additional travel costs ($1.5M) partly associated with the increased consultation carried out as part of our regional drought strategies.
- There have also been a number of changes in cost treatment including increased capitalisation of overheads which has reduced overhead opex and lead to greater booking to direct project and business units.

We believe there is significant scope for WaterNSW to become more efficient:

- We are not aware of any significant shortfalls in compliance or performance to customers. However, we note that WaterNSW presented little evidence of trends in underlying performance over the period or of efficiency drive to safeguard customer bills. When costs increased, for the reasons discussed above, it

[5] WaterNSW rural bulk water services expenditure review A review of capital and operating expenditure. February 2017

was not clear that the business sought to offset these increases with efficiencies. The net effect is that costs have increased significantly with no obvious benefit to customers.

- Linked to this, we found that there is limited ownership of Determination performance especially at individual valley level, the level at which prices are set. WaterNSW was not able to produce documents showing that cost variance within individual valleys, or at Rural Valleys level were subject to routine and robust internal interrogation, challenge and management action.
- We found that there is generally a lack of business/operational or other plans to demonstrate that the current levels of activity, expenditure or ways of working are the most efficient and effective. It was not possible for WaterNSW to easily demonstrate that the current level of and approach to routine maintenance is appropriate for example.
- Whilst unit labour costs have increased during the current Determination, rather than mitigating this through productivity gains, additional FTEs have been brought into the business. This runs counter to our experience at other utilities where real increases in wages are linked to or offset by productivity gains.

In its response to our Draft Report, WaterNSW stated:

> *WaterNSW provides reporting for each valley spend vs allowance, per activity and review with CAG's (Customer Advisory groups) on a regular basis (see our response to RFI 95, which provides detailed examples of the level of consultation with customers, including detailed presentations on operational activities)*
>
> *Proposed budgets which may affect pricing determinations are discussed.*
>
> *We will be reporting internally more on variance to allowance for each submission, as part of ELT packs.*
>
> *There are several reporting initiatives which were introduced recently:*
>
> *o WaterNSW have developed a robust PowerBi report which tracks actuals vs reg allowance on individual valley and activity level. This report is used on a monthly basis to highlight any risks and opportunities to WaterNSW ELT*
>
> *o WaterNSW have developed internal quarterly review on IPART AIR level, this will allow us to pick up any anomalies and proactively control overspend against the allowances*
>
> *o We also include a total opex and total capex vs allowance summary in the monthly board report.*
>
> *In summary, WaterNSW takes performance against the regulatory allowances very seriously and are monitoring it on a regular (i.e. at least monthly) basis.*

These appear to be excellent changes and initiatives which we welcome. They are good examples of the kinds of changes which we think will be helpful in driving better cost control and therefore efficiency in the next Determination period.

5.1.2. Future determination period

WaterNSW projects an average increase of $4.5M p.a. (9%) for the FY22 to FY25 period compared to the 2017 Determination period. This is mainly driven by increases in salary (+$5.8M p.a.), consultancy (+$2.4M p.a.) and administration (+$1.0M p.a.) costs, partially offset by reductions in overheads (-$3.5M p.a.) and contracts (-$0.9M p.a.).

WaterNSW has not explicitly applied efficiencies to its proposal. It has identified benefits from initiatives such as the Wave program (discussed in more detail in later sections) but has stated that these benefits are expected after the 2021 Determination period.

WaterNSW's pricing submission incorporated a $8.1M bottom-line "efficiency dividend" in FY22 which has been derived as a balancing adjustment to keep revenue requirement constant "after user share balancing".

We asked WaterNSW to provide details of how it intends to achieve this efficiency. Its response indicates that there is no detailed plan for these efficiencies:

> *To date, WaterNSW has not developed a detail business plan on how we intend to achieve the 8.1M efficiency dividend. WaterNSW is looking at reducing cost by developing and implementing a business transformation program aimed at improving organisational efficiency and lowering our operating expenditure.*

The $8.1M dividend has not been applied by WaterNSW to its opex forecasts. We have therefore been able to base our assessment of efficient expenditure on the projected opex without reversing out any efficiencies already applied by WaterNSW.

Scope adjustments

We have applied a number of scope adjustments to non-overhead opex as set out below:

Table 5-1 Scope adjustments applied

ref	Adjustment	Reason	Total opex effect over 21 Determination
1	Accept additional Regulatory FTEs but adjust the impact to reflect allocation of expenditure to different Determinations	Set out in Corporate opex in Section 8.2.1.2. Note that we are recommending $1.4M be allocated to RV compared to $2.1M requested because the cost will be shared between Determinations, but we assume it will start in FY22 (rather than FY23 in the submission).	-$0.7M
2	Remove land tax increases	The justification given is too vague for us to recommend accepting the proposed increase.	-$1.8M
3	Remove Long-term Transformational Strategy	We consider that (a) WaterNSW has not made a strong case that this is a justified, new and material requirement that customers should be asked to pay for and (b) the immediate focus should be improving its focus on efficiency for customers.	-$1.5M
4	Reduce "Environmental Planning and Protection" opex to pre-FY21 levels (note no direct salary costs are included in projected EPP so there is no double-counting with adjustment 5 below)	WaterNSW has not been able to justify the increase in opex in the absence of a clear offsetting reduction in other categories.	-$1.9M
5	Remove increase in direct labour costs after FY20 except for customer support and billing where WaterNSW is facing additional obligations	Increases in labour costs have not been justified. Above inflation increases should be offset by productivity gains	-$3.9M
6	Impact of method change to GS costs	The RV component of the $2M p.a. Customer and Community overheads adjustment set out in Section 8.2.1.1	-$1.2M
7	Change to allocation of Corporate Overheads between Determinations and Valleys	Explained in Section 8.3.5. Based on Option B set out in Table 8-25	-$4.0M assuming it is implemented in FY24 (Note the adjustment would be -$4.9M if implemented from FY22)

In its response to our Draft Report in December 2020, WaterNSW also requested additional opex of $3.75M for Cold Water Pollution mitigation[6].

We would like to be supportive of expenditure which has benefits to customers and to the environment. However, in this case, WaterNSW has not provided a business case or strategy document, it has not demonstrated the appropriateness of scope or timing of the expenditure, how these particular dams have been selected for delivery in this period, and how customers will benefit from the proposed expenditure.

Much as we would like to support expenditure which has benefits to customers and to the environment, we have not therefore been able to recommend an increase in opex for this activity. This recommendation has not been presented as a scope adjustment, as the expenditure has not been included in WaterNSW's projected opex.

Catch-up efficiency

Catch-up efficiency is the improvement required of WaterNSW to achieve the performance of a Frontier Company.

As discussed above we have found limited evidence of operating efficiency drive in the business and consider that there is significant scope for efficiency improvement.

In frontier utilities we observe that management routinely interrogates performance against the Determination(s) and variances over time. They are readily able to provide detailed explanations of variances because they have a relentless focus on cost performance and use variance analysis as part of their routine business-as-usual process.

In WaterNSW we have found that there is limited ownership of the cost performance of the individual regulated businesses, and limited monitoring or focus on performance again the Determination(s) or annual variances. At individual valley-level, this ownership and accountability appears to be even weaker.

When costs have increased, it was not clear that the business sought to offset these increases with efficiencies. The net effect is that costs have increased significantly with no obvious benefit to customers.

WaterNSW does not appear to routinely prepare, challenge and refresh business cases or plans for major opex areas or embed expected savings from initiatives in budgets, as well-run utilities do. When we asked to see business/operational plans for major activities such as routine maintenance and water delivery, for example, WaterNSW directed us to its Statement of Corporate Intent which does not provide detailed plans or evidence of routine management interrogation and challenge.

A significant proportion of the costs allocated to Rural Valleys is currently corporate expenditure, allocated on the basis of totex. This expenditure is driven from the centre and "lands" on the regulated businesses, rather than responding to their demands or requirements.

We have identified a number of areas of potential efficiency improvement, many of which are discussed in further detail in Section 8:

- Greater management focus on cost performance, including alignment of incentives, embedding genuine challenge into budgeting processes and governance of initiatives, such as hardwiring the savings associated with an initiative directly into future budgets.
- Clearer internal accountability for performance of each regulated business and valley (for the Rural Valleys Determination) with clear P&L-style ownership and accountability.
- P&L-style accountability for corporate expenditure and charges to the regulated businesses
- Continued progress in improving procurement, including tracking of benefits

Quantitative benchmarking of WaterNSW's performance against other utilities is difficult given the lack of directly comparable entities. Instead, we have reviewed efficiencies achieved by other utilities at a similar position in their transition towards the efficiency.

We recognise that there are differences between utility operating models, and it is not always straightforward to directly compare organisations operating in different jurisdictions and serving different purposes. However, we consider that core business processes that impact on costs, particularly operating costs should be continually challenged to improve and deliver efficiencies to move towards the efficiency frontier. We use our prior assessments of other utilities to compare how relatively close WaterNSW is to the efficiency frontier and how quickly they may be able to move towards it.

[6] $2.50M in FY22 and $1.25M in FY23

To get a sense of the scale of efficiency which should be achievable, we have reviewed the operating efficiencies achieved by Hunter Water and Sydney Water, when they were at a similarly early stage of efficiency maturity, i.e. in their 2009 and 2012 Determination periods respectively.

This suggests that total efficiency gains of 1.80% and 2.13% p.a. or greater are achievable with appropriate management focus.

In the expenditure review for the WaterNSW's Greater Sydney 2020 determination period we recommended an opex catch-up efficiency of 0.9% p.a. A continuing efficiency of 0.8% p.a. was also applied. This equates to a combined (continuing and catch-up) efficiency challenge of 1.7% p.a. on operating expenditure.

We recommend applying a catch-up efficiency of 1.1 % p.a. to the Rural Valleys Determinations in addition to the continuing efficiency of 0.7% p.a. (i.e. a combined challenge of 1.8% p.a.).

This is slightly higher than we recommended for the Greater Sydney review. This is because the Rural Valleys review has strengthened our view of the lack of 'ownership' of cost performance for the Rural Valley Determinations.

With appropriate management focus, we consider that it should be possible for WaterNSW to outperform this catch-up efficiency, based on the efficiencies achieved by Sydney Water (equivalent to 1.33% p.a. catch-up + 0.8% p.a. continuing efficiency) and our experience elsewhere.

In its response to our Draft Report WaterNSW stated that:

> *WaterNSW does not support the application of catch-up efficiencies and considers that there is no strong theoretical basis for applying such reductions….*

We consider that the application of catch-up efficiencies has significant theoretical and empirical backing. It is an approach which is widely used in economic regulation. We consider that WaterNSW should revisit its position on this and consider what it can do to learn from utilities which have significantly improved their efficiency.

Continuing efficiency

We have applied continuing efficiency of 0.7% p.a. as outlined in Section 2.2.1.

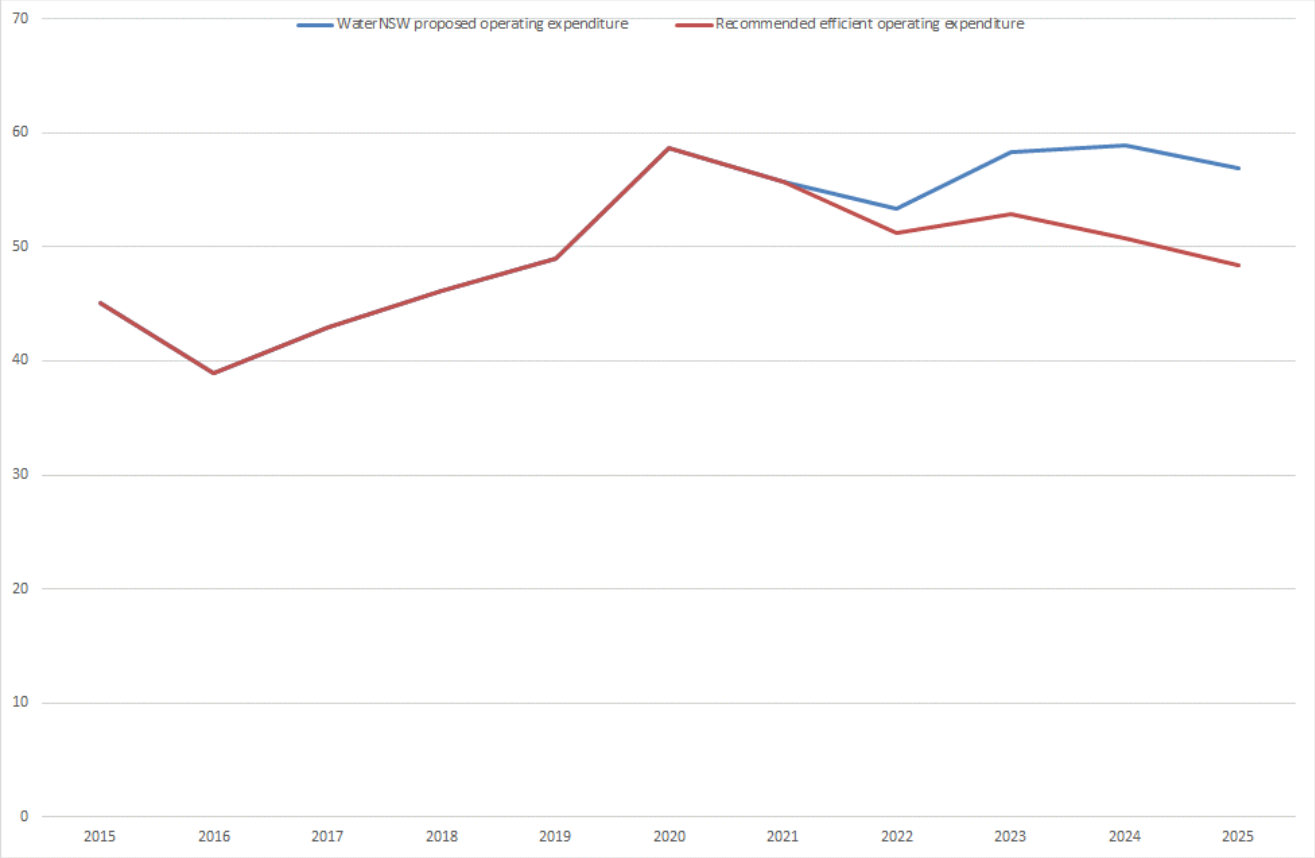
Recommended expenditure

We present below our recommended efficient level of operating expenditure for the 2021 Determination period. All figures quoted include overhead as well as direct costs.

Table 5-2 Recommended efficient opex- all valleys

WATERNSW RURAL BULK WATER PROPOSAL - OPEX - Summary Table- All Valleys				
($M 2020/21) year ending June	2022	2023	2024	2025
Border	1.60	1.69	1.66	1.62
Gwydir	5.17	5.61	6.04	5.90
Namoi	5.16	5.75	6.02	5.78
Peel	1.30	1.40	1.38	1.35
Lachlan	7.55	8.63	8.28	8.04
Macquarie	6.30	7.05	7.62	7.26
Murray	4.23	4.60	4.44	4.27
Murrumbidgee	8.91	9.58	9.50	9.22
Lowbidgee	0.93	0.93	0.96	0.95
North Coast	1.04	1.13	1.12	1.10
Hunter	4.85	5.44	5.31	5.10
South Coast	1.05	1.17	1.11	1.08
Fish River Water Scheme	5.27	5.39	5.49	5.27
Total Operating Expenditure	**53.39**	**58.37**	**58.91**	**56.95**
Atkins/Cardno recommended scope adjustments				
Border	-0.11	-0.16	-0.14	-0.15
Gwydir	-0.46	-0.63	-1.14	-1.23
Namoi	0.03	-0.41	-0.73	-0.71
Peel	0.11	0.04	0.03	0.06
Lachlan	-0.84	-0.63	-1.42	-1.29
Macquarie	0.16	-0.37	-0.91	-0.89
Murray	0.02	-0.14	-0.16	-0.08
Murrumbidgee	0.22	-0.10	-0.02	0.18
Lowbidgee	-0.25	-0.27	-0.19	-0.29
North Coast	0.04	-0.04	-0.04	-0.04
Hunter	0.02	-0.42	-0.29	-0.25
South Coast	-0.12	-0.17	-0.14	-0.17
Fish River Water Scheme	-0.11	-0.22	-0.20	-0.06
Sub Total adjustments	-1.29	-3.50	-5.33	-4.91
Atkins/Cardno recommended efficiency targets				
Continuing Efficiency (%)	0.70%	1.40%	2.09%	2.77%
Continuing Efficiency ($M)	-0.36	-0.77	-1.12	-1.44
Catch-up efficiency (%)	1.10%	2.19%	3.26%	4.33%
Catch-up efficiency ($M)	-0.57	-1.18	-1.71	-2.19
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE				
($M 2020/21) year ending June	2022	2023	2024	2025
Border	1.46	1.48	1.44	1.37
Gwydir	4.63	4.80	4.64	4.34
Namoi	5.10	5.15	5.02	4.72
Peel	1.39	1.39	1.34	1.31
Lachlan	6.60	7.72	6.49	6.28
Macquarie	6.35	6.45	6.36	5.93
Murray	4.18	4.30	4.05	3.90
Murrumbidgee	8.96	9.13	8.98	8.75
Lowbidgee	0.67	0.64	0.72	0.62
North Coast	1.06	1.06	1.02	0.99
Hunter	4.79	4.84	4.76	4.51
South Coast	0.92	0.97	0.92	0.85
Fish River Water Scheme	5.06	4.99	5.01	4.85
Total Efficient Expenditure	51.17	52.92	50.74	48.41

Figure 5-2 Recommended efficient operating expenditure ($M 21/22)



Source: "Opex" tab in WaterNSW's October 2020 AIR/SIR and Atkins/Cardno analysis

5.2. Methodology

In this section, we present the results of our review of the efficiency of WaterNSW's Rural Valleys operating expenditure.

We identify the major cost drivers and explain the variances in the current price path expenditure against the 2017 Determination. We comment on the prudence and efficiency of operating expenditure in the 2017 Determination period which is used to inform our view of future efficiency.

We comment in Section 4 on the strategic management of the business and the structures and systems used to plan and manage expenditure.

We make an assessment of an efficient level of expenditure for the period 2021 to 2025 taking into account our discussions with WaterNSW, documents presented and subsequent answers to questions we raised.

WaterNSW's initial Pricing Proposal outlined expenditure on the assumption of a one year Determination covering 2021-22[7] albeit with expenditure projections to 2024-25. In response to IPART's Issues Paper, WaterNSW provided an updated operating expenditure for 2022-24[8]. This included additional expenditure related to:

- Dam safety levy
- Electrical safety improvement
- Rural bridges program
- Dam safety compliance

[7] WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal. Regulated prices for NSW Rural Bulk Water Services 1 July 2021 to 30 June 2022

[8] "Response to the 15 September 2020 IPART Issues Paper on the Review of WaterNSW Rural Bulk Water Prices from 1 July 2021". WaterNSW, 16 October 2020

- Regulatory team
- Land tax
- Long term transformational strategy

We have based our assessment on this updated total operating expenditure.

We note that WaterNSW has added these expenditure items to the initial submission expenditure without rerunning its overhead allocation processes.

In this section we examine the key drivers for variance in outturn expenditure and for the changes in forecast expenditure, focused on an evaluation of:

(i) Actual expenditure for financial years ending 2018 to 2020;

(ii) The current budget for year ending 2021; and

(iii) The projected costs for the financial years ending 2022 to 2025.

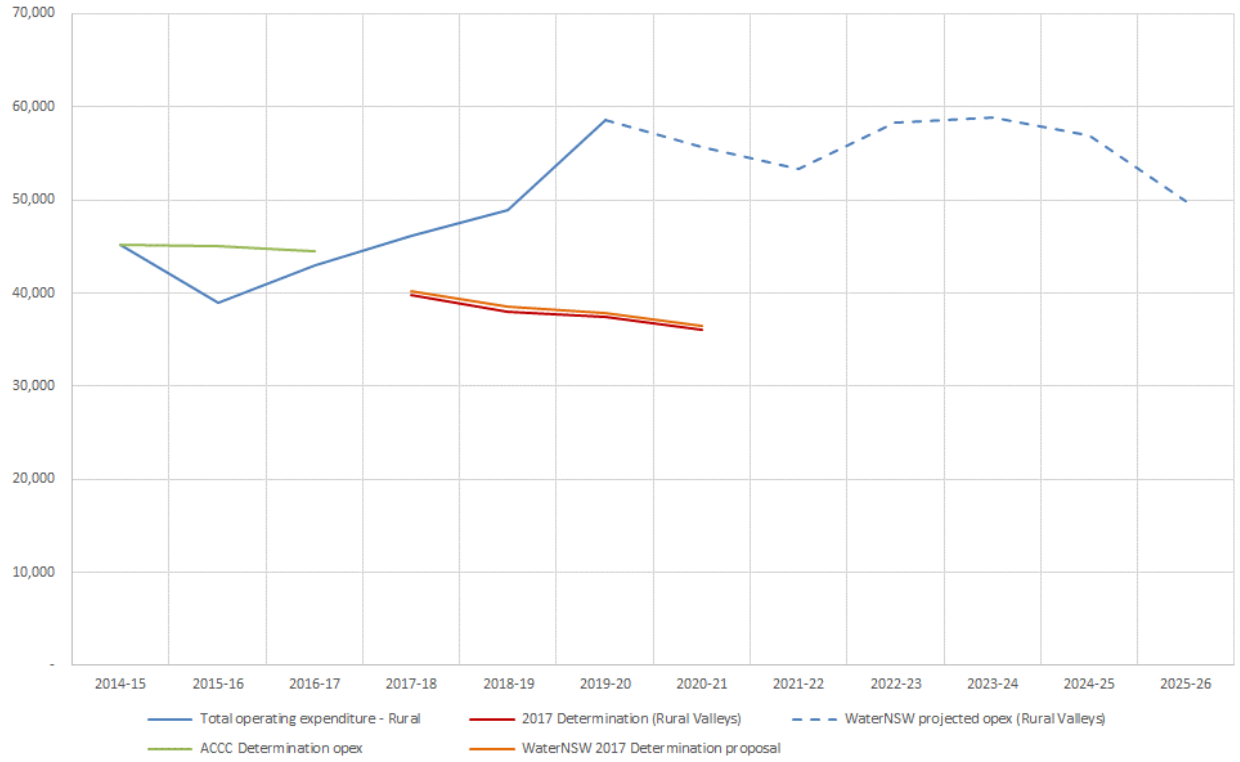
Our overall methodology is explained in Section 2. Corporate costs are covered separately in more detail in Section 8.

5.3. Overview

WaterNSW was created in January 2015 by the merger of Sydney Catchment Authority and the State Water Corporation. Opex was lower than ACCC's allowance from FY15 to FY17. In its submission for the 2017 Determination WaterNSW projected continuing efficiency. IPART largely accepted this proposal as can be seen below. However, expenditure in the 2017 Determination period has significantly exceeded WaterNSW's proposal and the Determination. WaterNSW's explanations for this variance are summarised in its submission and again below.

In the 2021 Determination period WaterNSW expects expenditure to be maintained at approximately the level of recent actuals. We review these proposals below.

Figure 5-3 Outturn and proposed expenditure trends for Rural Valleys ($000)



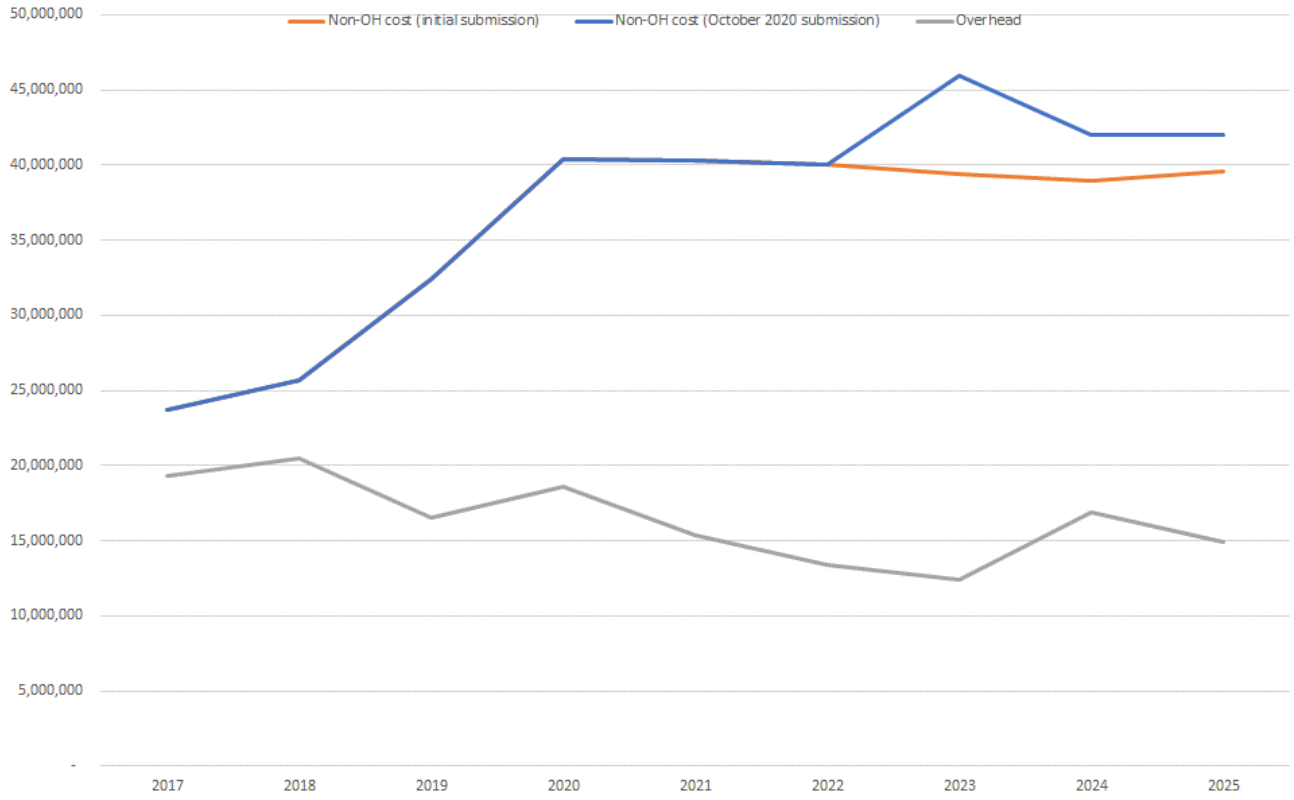
Source: "Opex" tab in WaterNSW's October 2020 AIR/SIR, Aither 2017 report[9] for ACCC Determination allowance and IPART Determination for 2017 WaterNSW proposal and Determination.

[9] WaterNSW rural bulk water services expenditure review A review of capital and operating expenditure. February 2017

This section examines total operating expenditure including corporate overheads. However, the focus is on the non-corporate (or 'non-overhead') opex, as corporate opex, which affects multiple Determinations, is examined in greater detail in Section 8.

The trends in Rural Valleys overhead and non-overhead opex are summarised in the figure below. The non-overhead costs follow a slightly higher growth trend than total expenditure because of reducing overheads, although this is partly because expected staff vacancies have been applied to overhead costs from FY21 onwards, whether they are corporate in nature or not. Note that we treat 'all valleys' or 'direct allocated' costs as non-overhead costs rather than overhead costs. This is consistent with the recommended corporate overhead expenditure in Section 8.

Figure 5-4 Overhead and non-overhead expenditure trends



Source: "Document 215 v2", "RFI 56 IPART Rural Core Opex per year - by Account FY18-27". Overheads based on 'OHD' expenditure in 'Data' tab of "Document 215 v2"

Note: WaterNSW's updated operating expenditure projections in October 2020 only added non-overhead opex in FY23 to FY25 and no change was made to corporate overheads.

5.4. Operating Expenditure in the 2017 Determination period

The consultant must review actual operating expenditure incurred over the 2017 determination period. In undertaking this task, the consultant must:

(a) Report and comment on the variations in operating expenditure from what was allowed in the 2017 determination, including the extent to which these variations are justified or not.

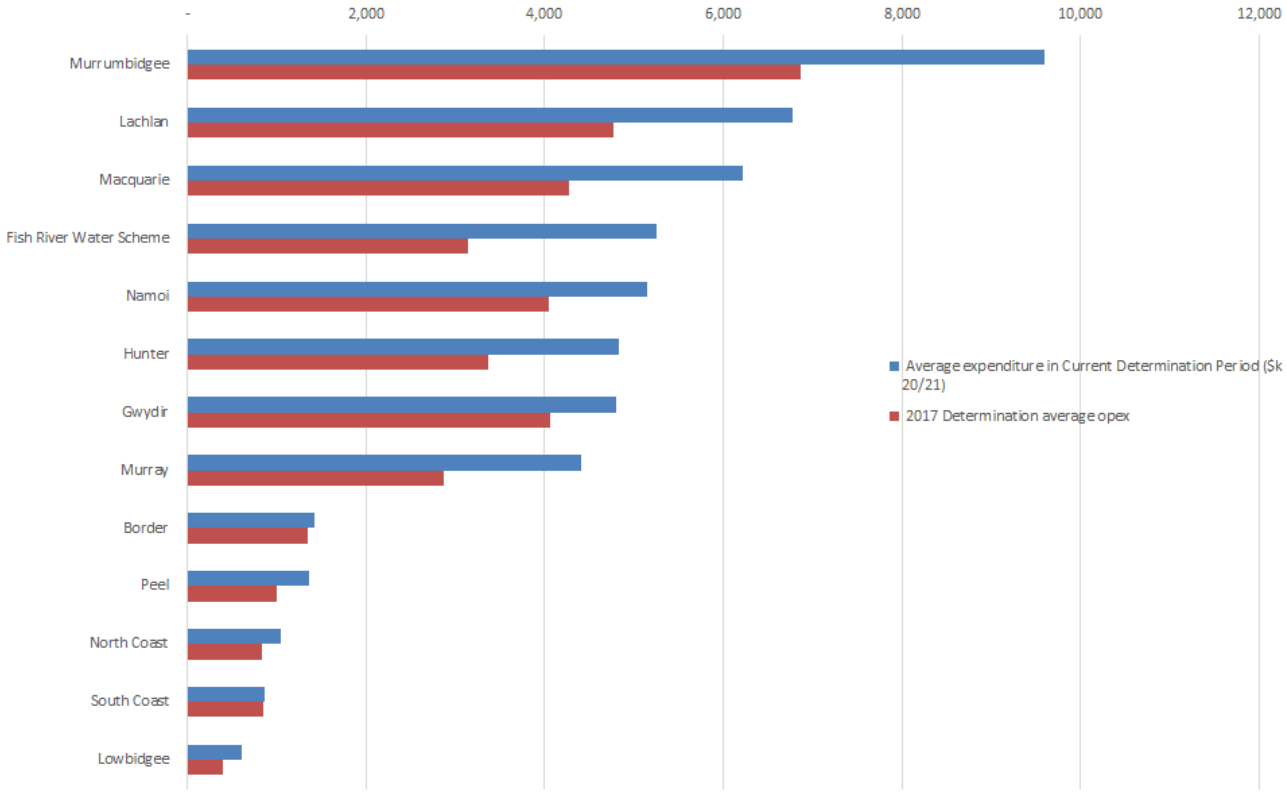
(b) Identify and comment on the nature and size of operational savings realised (eg, whether they are permanent or temporary in nature)

5.4.1. Overview

Operating expenditure has increased significantly during the 2017 Determination period rising by 22% or $9.4M p.a. compared to FY17. Only Lowbidgee, which has a low level of expenditure, has seen a reduction (of -8% or -$52k).

This has led to 38% or $58.0M total higher expenditure than assumed in the 2017 Determination, with all Valleys seeing higher than expected expenditure.

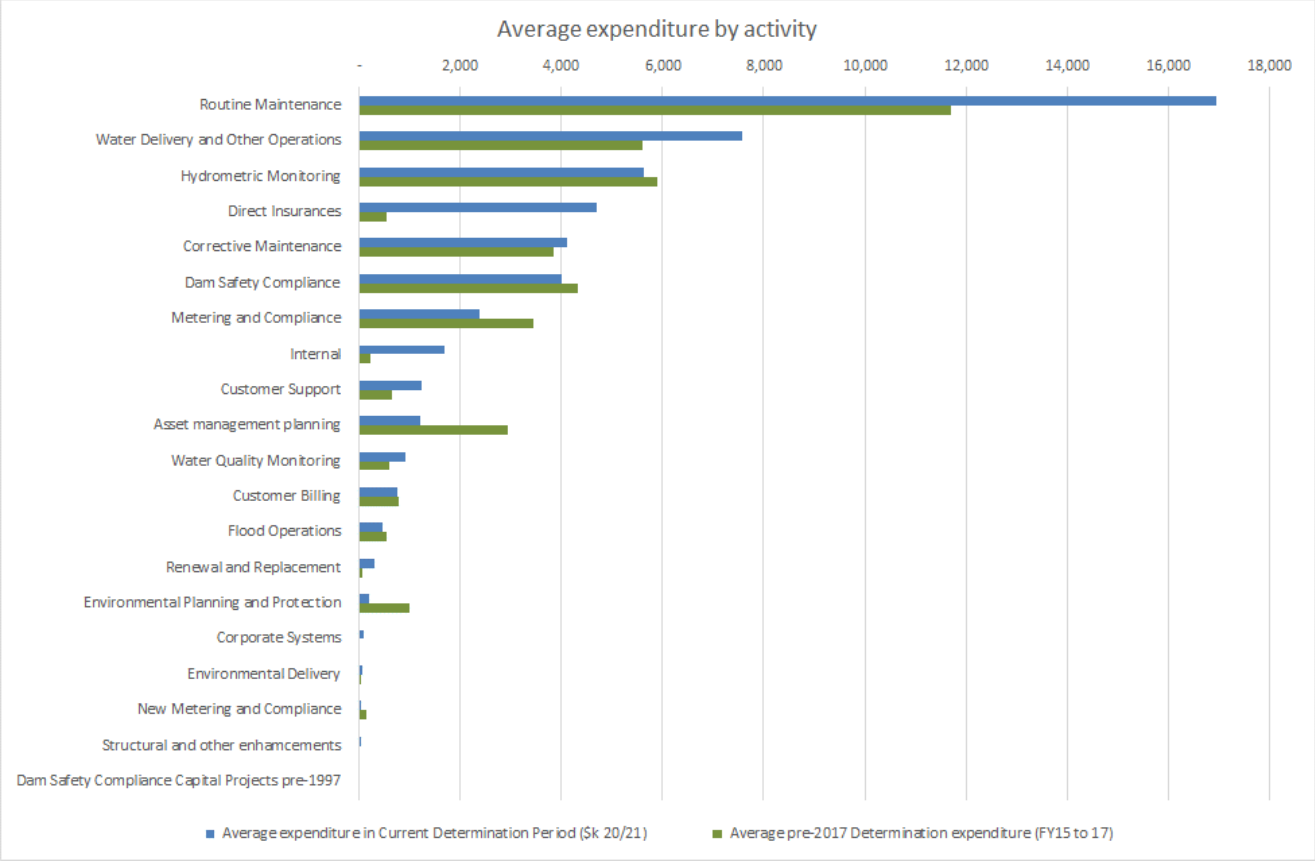
Figure 5-5 Average expenditure compared to the 2017 Determination by Valley ($000_



Source: Analysis of "Opex" tab in WaterNSW's October 2020 AIR/SIR

The largest WaterNSW opex activity areas are summarised below and include routine maintenance (32% of opex), water delivery and other operations (14%), hydrometric monitoring (11%), direct insurances (9%), corrective maintenance (8%), dam safety compliance (8%) and 'metering and compliance' (5%).

Figure 5-6 Largest opex activity areas in the 2017 Determination period



Source: Analysis of "Opex" tab in WaterNSW's October 2020 AIR/SIR

Labour costs are the largest opex cost type, followed by overhead charges. The overhead charges, which are discussed in more detail in Section 8, are themselves mainly labour-related with salaries and staff costs making up more than half of the charge (65% in FY18 and 19).

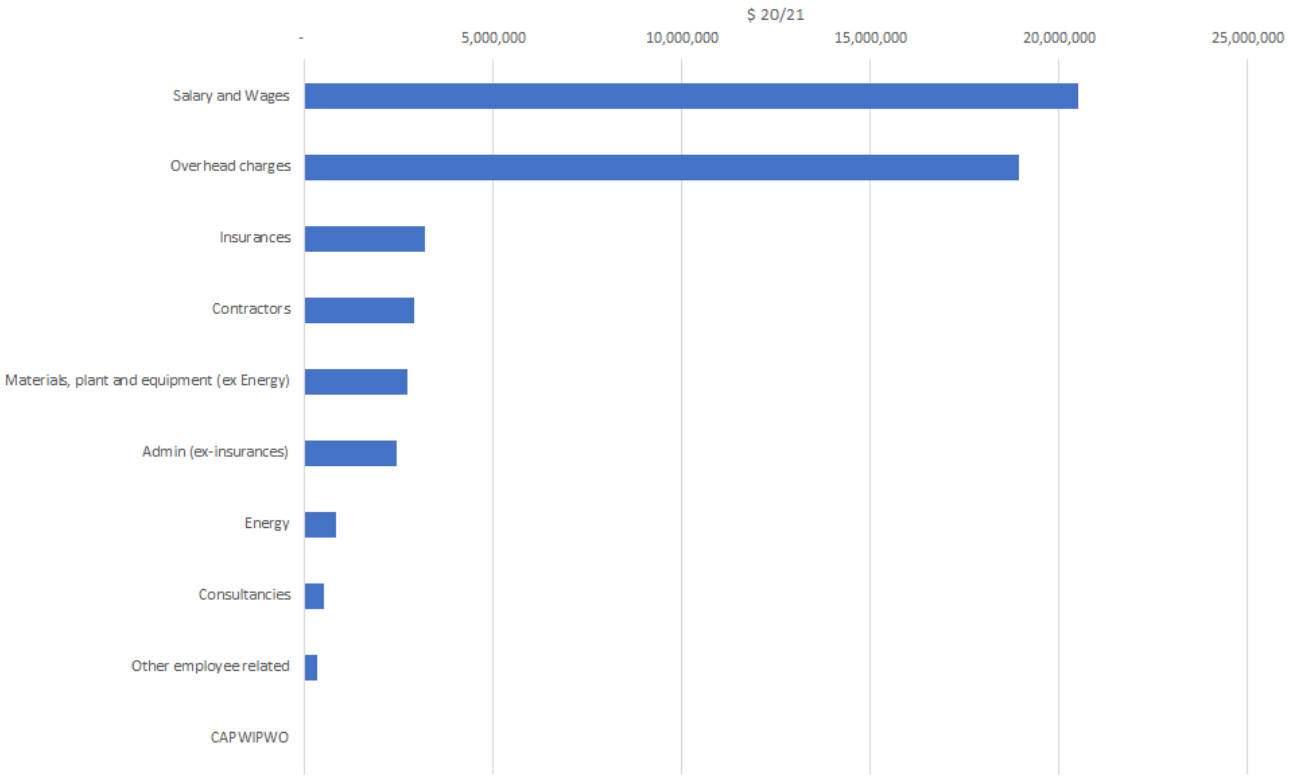
There are a number of other cost types in the $2-3.5M p.a. range including insurances, contractors, materials, plant & equipment and administration.

The largest elements of administration costs relate to land taxes and travel costs. Contractor expenditure includes professional services and "Infrastructure Asset repairs and maintenance".

We queried why "Infrastructure Asset repairs and maintenance" has increased significantly in recent years, from $27k in FY18 to $2.7M in FY20[10]. WaterNSW explained that the total cost of maintaining Government owned meters had been incorrectly allocated to the WAMC determination, when a proportion of this cost should have been allocated to the Rural Valley determination. This miscoding has apparently been rectified from FY20 onwards.

[10] Based on WaterNSW spreadsheet "RFI 56 IPART Rural Core Opex per year - by Account FY18-27.xlsx

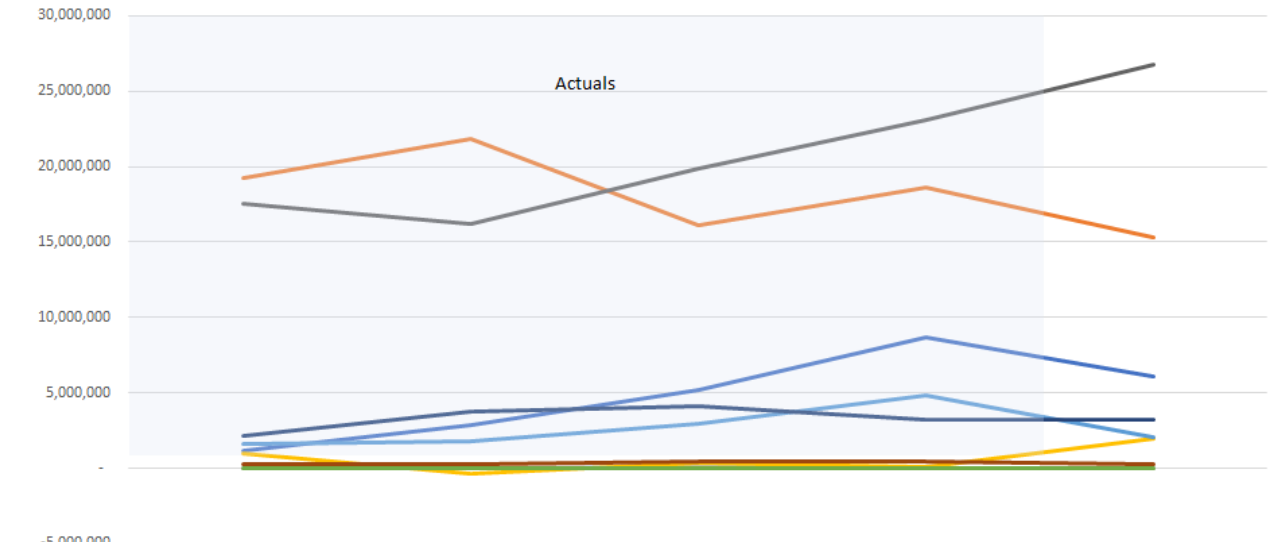
Figure 5-7 Largest opex cost 'types' in the 2017 Determination period (average annual spend)



Source: Analysis of WaterNSW document "RFI 56 IPART Rural Core Opex per year - by Account FY18-27"

The largest change since FY17 is in the 'admin' cost type which has increased by $4.4M p.a. (379%) on average largely as a result of land tax, insurance costs and the Risk Transfer Product (RTP), discussed below. This is followed by $2.5M p.a. increase in salaries (14%), $1.4M p.a. increase in MPE (65%) and $1.2M p.a. increase in contracts (76%). The only cost type seeing a reduction since FY17 is consultants (-$1.0M or 98%).

Figure 5-8 Change in opex cost 'types' in the 2017 Determination period



	2017	2018	2019	2020	2021
ADMIN	1,173,023	2,836,380	5,149,548	8,724,224	6,051,107
CAPOHEAD	19,269,526	21,806,312	16,072,835	18,589,492	15,341,275
CAPWIPWO	-	-	51,909	-	-
CONSULT	1,026,418	-367,667	358,347	82,532	2,004,000
CONTRACT	1,609,065	1,827,883	2,930,317	4,827,570	2,044,302
DISPOSAL	-	-	-	-	-
MPE	2,162,477	3,742,507	4,098,534	3,234,730	3,204,417
OTHEM	247,396	231,844	407,243	417,048	258,727
SALARY	17,505,088	16,165,766	19,857,289	23,074,353	26,786,342

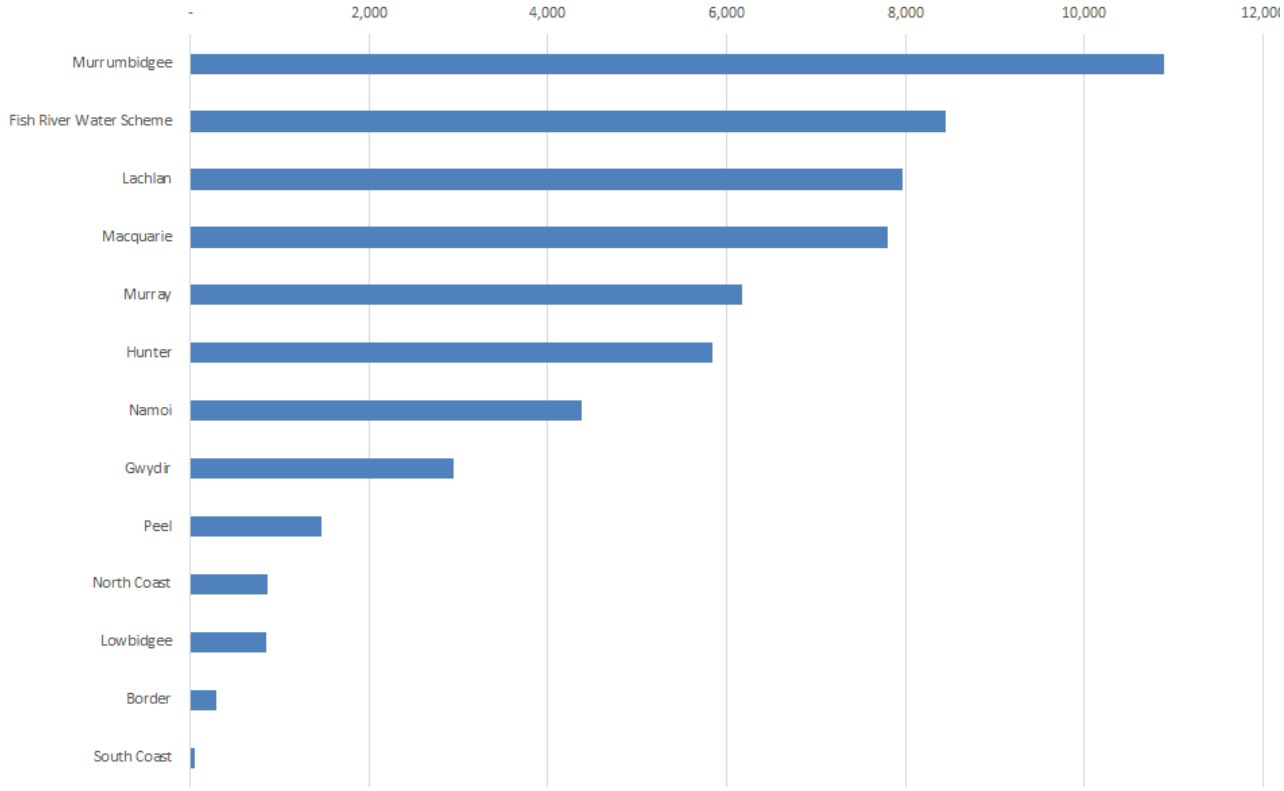
Source: Analysis of WaterNSW document "Document 215 v2"

Note: "Capohead" is understood to be opex overhead allocation, MPE relates to Materials, Plant and Equipment.

5.4.2. Explanation of the variances

There has been overspend against the 2017 Determination assumptions in all valleys. The largest variance in percentage terms is in Fish River (67%) and in absolute terms is Murrumbidgee ($10.9M).

Figure 5-9 Variance against Determination by Valley ($000)



Source: Analysis of "Opex" tab in WaterNSW's October 2020 AIR/SIR

Table 5-3 Variance against Determination by Valley

Valley	Total variance ($000)	as % of Determination
Murrumbidgee	10,891	40%
Fish River Water Scheme	8,450	67%
Lachlan	7,965	42%
Macquarie	7,800	46%
Murray	6,168	54%
Hunter	5,848	43%
Namoi	4,387	27%
Gwydir	2,954	18%
Peel	1,471	37%
North Coast	863	26%
Lowbidgee	846	54%
Border	300	6%
South Coast	58	2%
TOTAL	58,001	38%

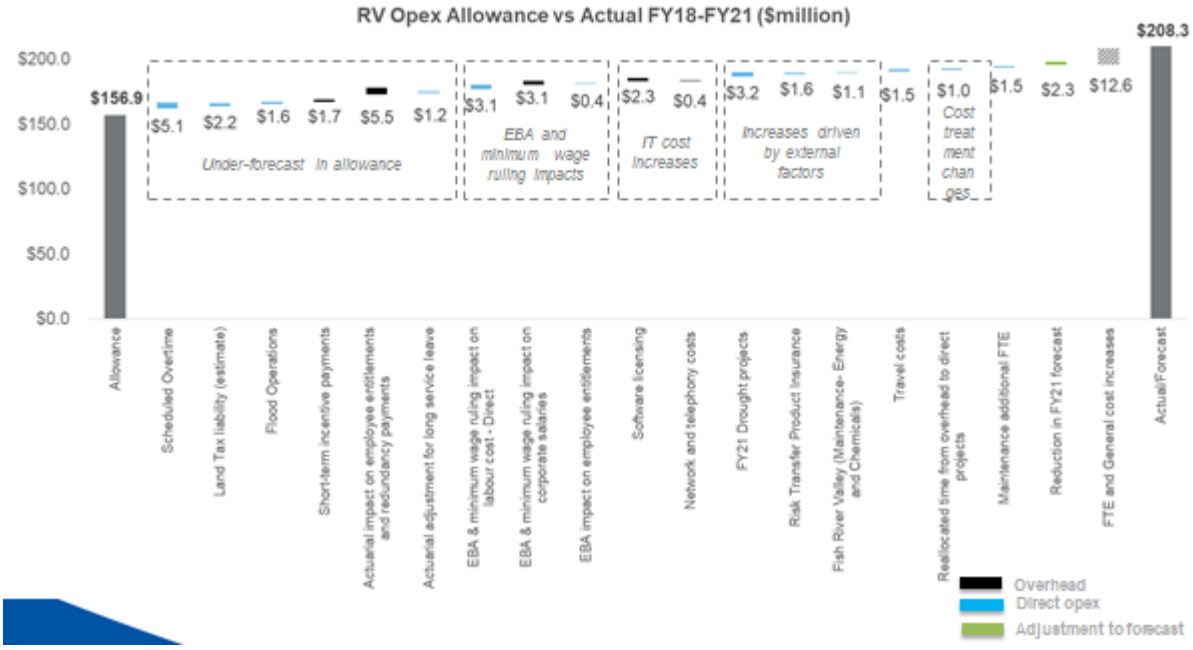
Source: Analysis of "Opex" tab in WaterNSW's October 2020 AIR/SIR

During the review WaterNSW provided a document[11] summarising it's view of the total Rural Valleys variance against the 2017 Determination. WaterNSW's view is that a number of costs were under-forecast in the 2017

[11] WaterNSW document "Review of proposed Rural Valley Opex relative to IPART's 2017 Regulatory Determination, 10 September 2020".

Determination and that there has been overspend in other areas due to a mix of external factors, labour and IT cost increases and cost treatment changes, broken down as follows.

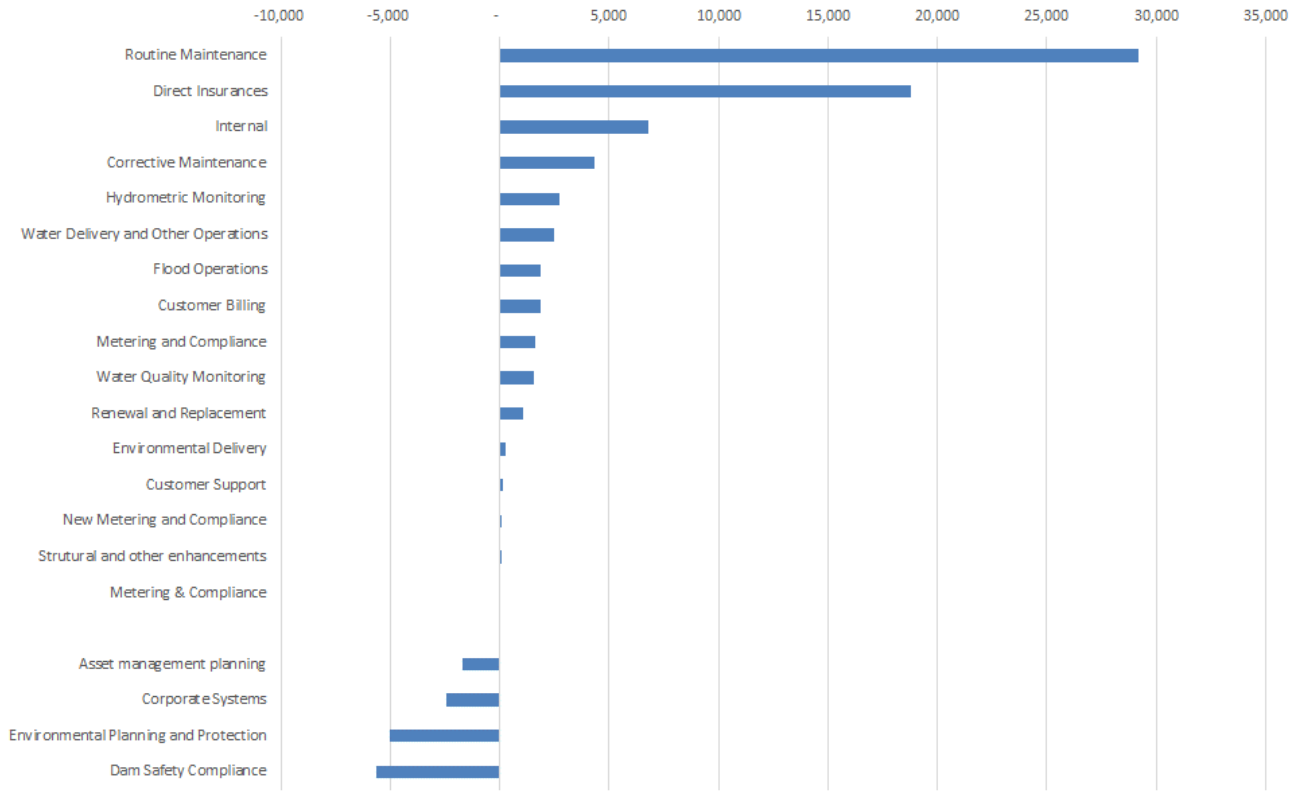
Figure 5-10 WaterNSW explanation of overspend



Source: WaterNSW document "RFI 90 2020 8 09 WaterNSW Step Change Analysis Report"

The SIR provided by WaterNSW provides a breakdown of the variance against the Determination by activity area:

Figure 5-11 WaterNSW breakdown of variance in AIR/SIR ($000)



Source: analysis of 'SIR Opex amended' October 2020 AIR/SIR

Note: WaterNSW has explained in RFI 054 that "internal" here relates to the land tax provision.

WaterNSW's explanations of the variance in the Step Change Analysis Report can be summarised as:

- Under forecast of costs
  - WaterNSW under forecast or did not include several categories of opex in their proposal for the 2017 Determination period, accounting for $17.3M of overspend. Costs which were not included or under-forecast include scheduled overtime, land tax liability, flood operations expenditure, actuarial adjustments, short-term incentive payments.
- Staffing and unit labour costs:
  - A new Enterprise Bargaining Agreement (EBA) agreement and Minimum Wage Ruling which escalated labour costs by more than CPI and introduced a short-term incentive payment for employees ($6.7M of overspend).
  - Additional staff ($1.5M) involving 3 additional FTEs for maintenance and 2 FTEs for water delivery in FY21.
- Overhead costs (examined in Section 8):
  - Corporate labour cost increases ($5.0M of overspend) related to legal, governance and risk labour, ICT workload and HR support.
  - Non-labour ICT overhead costs ($2.7M of overspend) such as software licencing and cloud-based subscription services replacing legacy IT systems.
- Other external drivers ($5.9M of overspend) including drought projects in FY21, the higher RTP premiums than expected and higher energy and chemicals costs in Fish River due to higher customer demand volumes.
- Additional travel costs ($1.5M) partly associated with the increased consultation carried out as part of our regional drought strategies.
- Changes in cost treatment including:

- Increased capitalisation of overheads which has reduced overhead opex.
- Cost allocation changes – a reduction in the proportion of overhead allocated to Rural Valleys because of a change in the basis of allocation from direct salaries to totex. This has apparently mitigated (by $6.0M) the increase in the overhead pool, which would otherwise have led to an increase in Rural Valleys opex of $17.3M.
- Greater booking to direct projects and business units (rather than overheads) enabled by new ICT systems and processes. WaterNSW believes this has increased Rural Valleys opex because maintenance teams have booked more of their time to Rural Valley direct cost codes, which is born entirely by the Rural Valley Determinations rather than overhead codes which are shared across the other WaterNSW Determinations. Similar changes have affected insurance, motor vehicle and energy costs. WaterNSW estimates the impacts as a result of maintenance cost bookings is $1.0M.

In its submission, WaterNSW also provides a number of other explanations for the variance:

- Hydrometric and Water Quality Monitoring were higher than expected because of an increased focus on Water Quality, particularly drinking water compliance, and algae and drought increasing the need for water monitoring.
- Dam Safety Compliance was underspent due to restructuring of the dam safety operating model as a result of a changing regulatory environment and an internal review.

We asked WaterNSW to explain the why valleys such as Fish River (+67%) and Lowbidgee (+54%) have overspent the Determination by so much more than South Coast (+2%) and Border (+6%). The response given[12] was not very illuminating:

> *"up to 10 vacancies in FY18-19 due to the AE&DS restructure;*
>
> *Increase in dam safety resulting due to emerging risk in the Lachlan (Lake Cargelligo), Murray (Lake Pamamaroo),*
>
> *Planned 5-yearly Surveillance inspection (which is a capex) contributed to underspend in opex expenditures in some valleys.*
>
> *For Fish River the main areas of overspend are: MPE (800%) and Overhead 134%. Under MPE - Materials +$1.3m (very small allowance)"*

The level of detail and justification provided suggests that the drivers for variance between valleys had not been considered. It does appear that some of the variance is caused by Energy Australia continuing to draw from Fish River at levels close to its allotment, instead of reducing abstraction as was expected in the 2017 Determination.

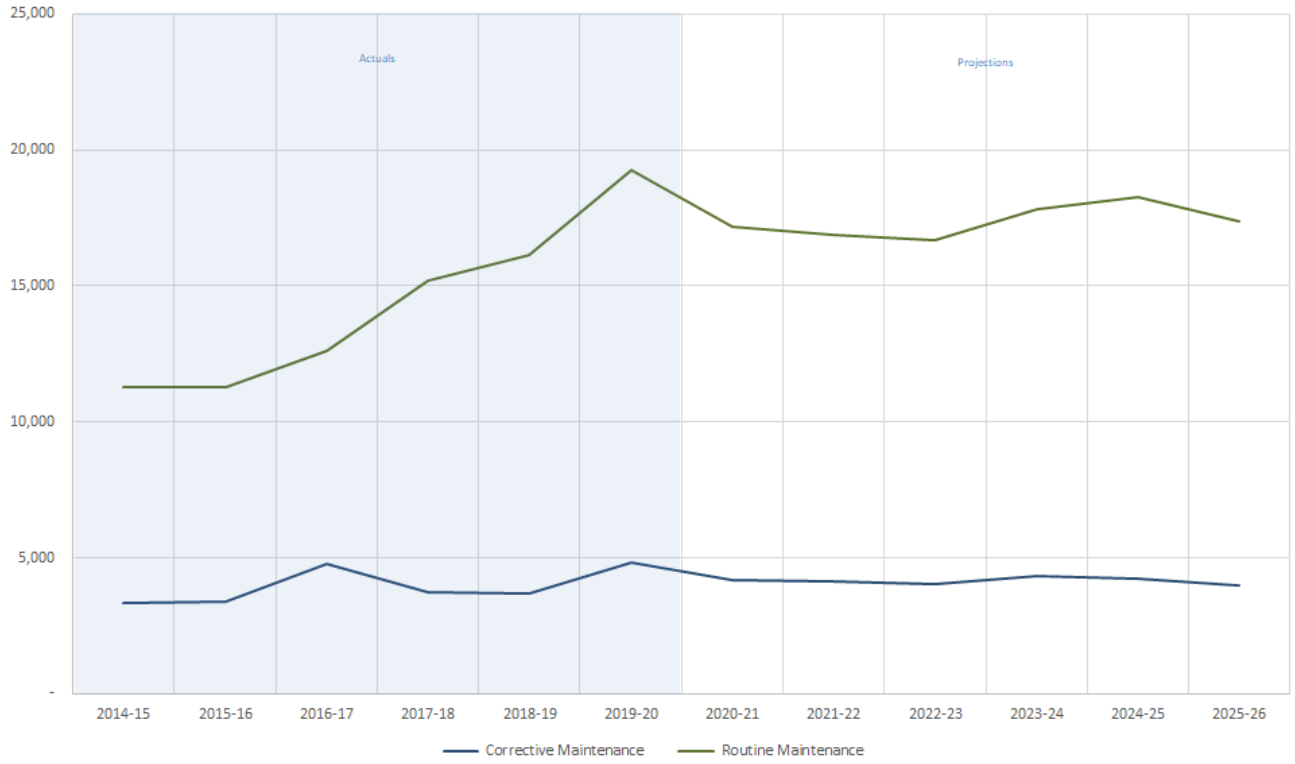
We examine below the major drivers of the total variance: maintenance expenditure, labour costs, land tax and direct insurances. We also examine the impacts of the change in overhead capitalisation rules in 2019.

5.4.2.1. Maintenance costs

Maintenance is the largest component of opex, with routine maintenance making up the largest activity area. Routine maintenance has increased significantly and consistently since FY16. Corrective maintenance has remained within a reasonably consistent band of $3.4M to $4.8M p.a. and is not the source of significant variance against Determination.

[12] See RFI 188

Figure 5-12 Routine and corrective maintenance expenditure trends ($000)



Source: Analysis of "Opex" tab in WaterNSW's October 2020 AIR/SIR

WaterNSW does not have a specific business/operational plan for reactive maintenance[13].

We have requested information on asset performance over time so that we can see what trends may be driving the increase in routine maintenance. We have asked for copies of documents which might demonstrate asset performance or risk levels over time so we can understand risk drivers for increasing expenditure[14]. We have been provided reports for 2019 and 2020 only. It is therefore not possible to identify any asset performance or risk drivers for increasing expenditure.

As well as increases in salary and overhead charges, there has been an increase in MPE expenditure since FY17, with a peak in FY19. This appears[15] to be due to motor vehicle expenses (fuel, repairs and registration) of approximately $0.6M p.a. which were not previously assigned as direct costs to routine maintenance and energy for routine and operational pumping of $0.4 to $0.7M p.a. which were much lower in or not assigned to routine maintenance in FY17. These energy costs relate mostly to Fish River and appear to have been coded to "water delivery and other operations" from FY21 onwards.

It therefore appears likely that much of the apparent increase in routine maintenance MPE expenditure relates to miscoding of energy costs in Fish River, with the rest being direct coding of motor vehicle costs to routine maintenance.

We asked WaterNSW why routine maintenance in FY20 was unusually high, being $3.1M higher than in FY19 and $2.1M higher than projected for FY21 (all figures in $21). WaterNSW has provided an explanation for the $3.4M (nominal i.e. including inflation) variance from FY19 as follows[16]:

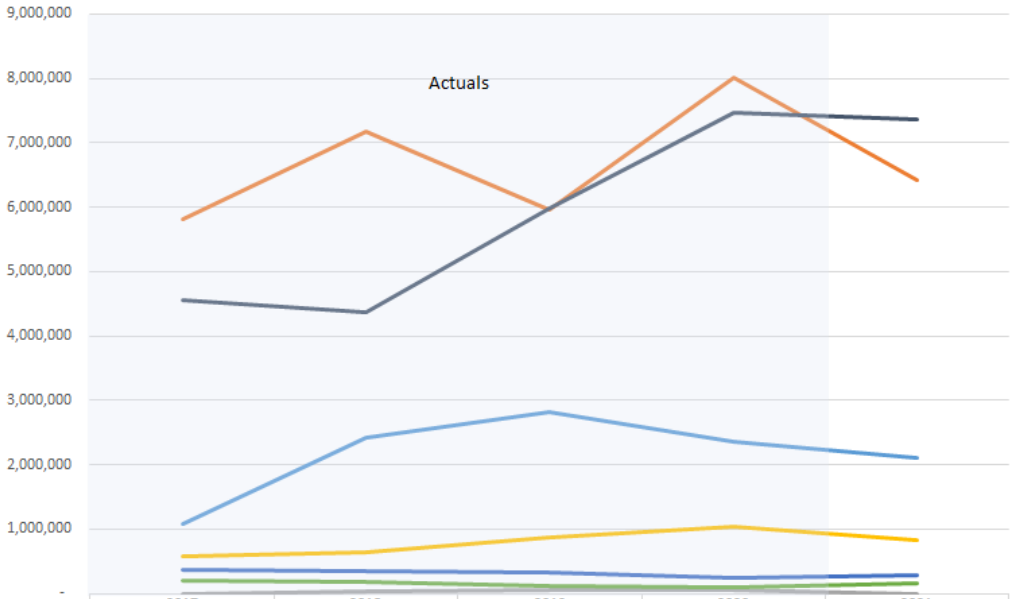
- $2.1M increase in allocated overheads
- $1.5M increase in salary costs, including an increase in overtime, growth of 1-2 FTEs $0.3M for "improved salary costing from FY19" and capturing half of the FY19 bonus as well as full FY20 accrual.

[13] See RFI 35
[14] See RFI 283, 284 and 285
[15] Based on analysis of WaterNSW spreadsheet "Document 215"
[16] Note apparent differences due to rounding

- Net reduction of $0.3M for other costs, especially MPE.

As can be seen below, the main driver for routine maintenance being lower in FY22 is the reduction in expected overheads.

Figure 5-13 Breakdown of routine maintenance expenditure



	2017	2018	2019	2020	2021
ADMIN	361,993	347,978	325,737	235,484	280,609
CAPOHEAD	5,808,129	7,184,908	5,967,129	8,007,621	6,430,082
CONSULT	899	23,436	60,444	62,936	-
CONTRACT	577,096	650,285	861,256	1,034,530	824,500
MPE	1,084,806	2,430,358	2,810,447	2,366,038	2,104,438
OTHER	194,828	174,101	125,831	105,689	156,785
SALARY (net of overhead adjustment in FY18)	4,561,211	4,379,755	5,985,228	7,463,203	7,375,381

Source: Analysis of WaterNSW document "Document 215"

5.4.2.2. Labour costs

Direct labour costs have increased by an average of $4.0 p.a. (23%) in the current Determination period relative to FY17. The increase to the most recent accounts year (FY20) represents a larger increase of $5.6M p.a. (32%) in real terms.

The activity areas with the most significant increases in labour costs from FY17 to FY20[17] are:

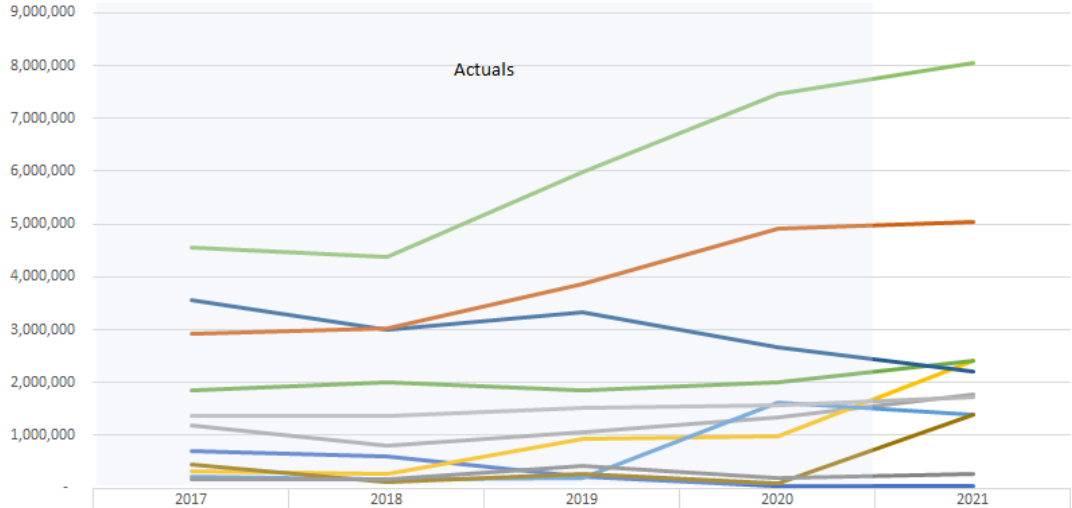
- Routine maintenance +$2.9M p.a. (64%)
- Water delivery and other operations +$2.0M (69%)
- Customer support +$1.4M (656%) and billing $0.7M (211%). We understand that the increase in customer support is exaggerated because prior to FY20 the call centre cost (Project 'AP Call Centre') was incorrectly assigned to customer billing instead of customer support[18]. This error has been corrected from FY20 onwards.

Some activities have seen a reduction in labour costs:

- Asset management planning -$0.7M p.a. (-96%)
- Hydrometric monitoring -$0.9M p.a. (-25%)

[17] in $21 terms based on analysis of WaterNSW spreadsheet "Document 215"
[18] See response RFI 68

Figure 5-14 Labour costs by activity



	2017	2018	2019	2020	2021
Asset management planning	699,591	604,766	230,268	27,082	30,027
Corrective maintenance	1,179,697	811,167	1,072,195	1,339,269	1,772,789
Customer billing	318,631	278,735	932,261	990,390	2,409,126
Customer support	214,684	161,035	201,203	1,623,548	1,381,127
Dam safety compliance	1,860,653	2,012,578	1,858,414	2,009,776	2,416,323
Flood operations	437,655	120,588	274,579	95,516	1,387,439
Hydrometric monitoring	3,557,899	3,001,889	3,327,642	2,658,410	2,218,874
Metering and compliance	1,358,074	1,356,951	1,525,023	1,577,845	1,721,461
Routine maintenance	4,561,211	4,379,755	5,985,228	7,463,203	8,066,844
Water delivery and other operations	2,910,912	3,024,298	3,866,423	4,923,668	5,044,690
Water quality monitoring	176,648	172,189	419,150	200,989	276,343

Source: Analysis of WaterNSW Document 215 v2.

Note: includes activities with expenditure >$250k in at least one year

As set out above, WaterNSW have set out several reasons for the overspend of labour including:

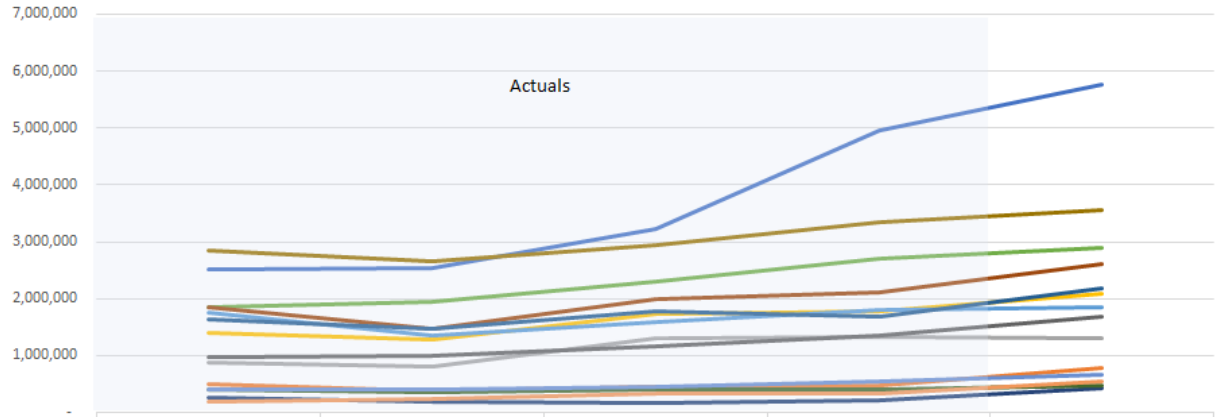
- A new Enterprise Bargaining Agreement (EBA) agreement and Minimum Wage Ruling which escalated labour costs by more than CPI and introduced a short-term incentive payment for employees. WaterNSW estimates the total impact to be $6.7M of overspend over the Determination, of which $3.9M would have been due to above CPI wage increases and $2.4M for variable pay, if the number of FTEs had been held constant[19]. WaterNSW has estimated these impacts based on direct ($3.1M impact) and overhead labour costs allocated to Rural Valleys ($3.1M impact).
- Additional staff involving 3 additional FTEs for maintenance and 2 FTEs for water delivery in FY21 ($1.5M of overspend over the Determination).
- More direct bookings of staff time to activities rather than overheads. We only have an estimate for the impact on maintenance spend, estimated to be $1.0M over the Determination.

Taken together, the numbers provided above account for approximately $1.4M p.a. of the $4.0M p.a. average labour cost increase. Scaling from the effects on maintenance, it is likely that the rest is mainly explained by the effects of more direct time bookings associated with water delivery and the customer support and billing. We comment further on the Customer and Community area in Section 8.

The allocation of the cost increases varies by valley, as would be expected with increased direct labour cost coding. However, the most significant changes are in 'All Valley' labour costs. The increases in 'All Valley' labour costs relate mainly to regional drought management ($0.6M in FY20 and $0.8M in FY21) and increased direct coding of accounts payable (AP) services, such as the AP call centre and billing costs (c $1.7M in FY20 compared to $0.2M in FY17).

[19] Source: WaterNSW document "RFI 90 2020 8 09 WaterNSW Step Change Analysis Report"

Figure 5-15 Labour costs by valley



	2017	2018	2019	2020	2021
All Valleys	2,521,653	2,537,947	3,234,743	4,966,337	5,761,959
Border	488,164	391,906	453,251	487,127	780,259
Fish River	877,814	800,388	1,305,996	1,321,641	1,301,878
Gwydir	1,409,033	1,293,966	1,730,911	1,772,153	2,080,089
Hunter	1,757,001	1,361,568	1,580,102	1,809,479	1,863,818
Lachlan	1,847,587	1,940,421	2,302,985	2,700,307	2,885,869
Lowbidgee	263,950	185,056	177,181	225,547	418,117
Macquarie	1,853,572	1,471,730	1,997,070	2,121,230	2,606,374
Murray	974,531	994,358	1,153,840	1,344,502	1,687,839
Murrumbidgee	2,859,585	2,655,437	2,941,503	3,342,020	3,564,436
Namoi	1,641,507	1,482,561	1,774,473	1,694,251	2,177,067
North Coast	412,258	359,414	412,121	411,682	466,436
Peel	396,191	395,704	462,360	551,786	654,390
South Coast	199,137	242,276	330,754	326,293	537,812

Source: Analysis of WaterNSW Document 215 v2.

5.4.2.3. Land tax

WaterNSW inherited significant land from State Water at the time of the merger in 2015. WaterNSW understand that State Water did not recognise a land tax liability on the basis that it controlled, rather than owned, the land.

WaterNSW has been progressively transferring the land that was previously controlled by State Water so that it is owned by WaterNSW. These transfers have apparently been occurring in tranches starting in FY19. The transfer of lands is expected to be complete by the end of 2021.

WaterNSW now expects to pay land tax on the land that has been transferred. No allowance was made for this cost in WaterNSW's submission for the 2017 Determination. A consultant has been appointed to assess the likely tax liability, but a final assessment was not available at the time of writing.

WaterNSW has allocated the tax liabilities between Determinations pro-rata based on land value. The provision to the Rural Valleys included in WaterNSW's submission is outlined below.

Table 5-4 Land tax in WaterNSW's submission

In $21 000s	2017	2018	2019	2020	2021	2022	2023	2024	2025
Border	-	-	-	26	6	6	6	6	6
Fish River	-	51	27	129	-	-	-	-	-
Gwydir	-	2	2	434	125	125	125	125	125
Hunter	-	-	-	415	179	179	179	179	179
Lachlan	-	3	3	355	153	153	153	153	153
Lowbidgee	-	-	-	-	-	-	-	-	-
Macquarie	-	-	-	775	253	253	253	253	253
Murray	-	6	0	679	153	153	153	153	153
Murrumbidgee	-	0	0	168	132	132	132	132	132
Namoi	-	15	13	491	234	234	234	234	234
North Coast	-	-	-	85	51	51	51	51	51
Peel	-	2	3	76	37	37	37	37	37
South Coast	-	-	-	6	11	11	11	11	11
Total	-	80	48	3,639	1,335	1,335	1,335	1,335	1,335

Analysis of Document 215 v2

5.4.2.4. Direct Insurance

Direct insurance costs have risen significantly since FY17. The main driver for this is the RTP which has cost $2.3M p.a. (in nominal terms) from FY19 to FY21. However, the increase is also due to increased direct coding of insurance related to property and motor vehicles contributing an additional $1.2M p.a. on average between FY19 and 21. At interview, WaterNSW stated that they have not evaluated the overall impact of moving to increased direct coding, i.e. whether the net effect is an increase or reduction in insurance costs borne by the Determination.

The RTP was agreed to in the 2017 Determination as a way to manage revenue volatility as a replacement to the overs and unders mechanism. IPART allowed $1.3M p.a. (equivalent to $1.4M in $21) over three years. The premiums were approximately significantly ($1.0M p.a.) higher than expected and allowed for in the Determination.

The product was the result of a negotiated process with few/no alternative options available in the marketplace. It is apparent from the claims that WaterNSW has made that the product has more than paid for itself within the Determination period.

Table 5-5 Direct insurance costs in WaterNSW's submission

In $21 000s	2017	2018	2019	2020	2021
Insurances - Miscellaneous	-	-	-	1	-
Insurances - Property	-	-	1,070	1,322	876
Insurance - Revenue Volatility	-	-	2,423	2,373	2,315
Insurances - Public Liability	15	1,498	333	304	306
MV Expenses - Comprehensive Insurance	-	-	138	113	125
Workers Comp Insurance	19	-	-	-	-
Insurance - Construction	-	-	1	-	-
Total	34	1,498	3,966	4,112	3,622

Analysis of Document 215 v2

5.4.2.5. Impacts of change in overhead capitalisation rules

WaterNSW implemented a change to capitalisation rules from 2019 which had the effect of significantly increasing the capitalisation of overheads. This change resulted in a reduction of approximately $26.6m in operating expenditure allocated to Rural Valleys and a matching increase in capex. Without this change, opex would have been even higher than the variance observed.

Table 5-6 Effects of change in capitalisation of overheads

In $21M	2017	2018	2019	2020	2021
Total Capitalised Overhead, made up of:	5.1	9.9	27.6	28.9	28.3
1. BU Overhead capitalised	5.1	9.9	8.8	7.3	6.5
2. Corporate Overhead capitalised	-	-	18.8	21.5	21.8
RV Share of Capitalised Overhead	1.8	1.3	7.9	10.5	13.0
Note	Old rules	Old rules	New rules	New rules	New rules
Variance from FY17 & 18 average Capitalised Overhead Level			6.3	8.9	11.4
TOTAL Variance from FY17 & 18 average Capitalised Overhead Level					26.6

Analysis of Document “Copy of MCP and Opex summary (38833)”

While there may be a good accounting reason to make this change, we question whether it is equitable to add these costs to the RAB when allowance had been made for these costs in operating expenditure at the 2017 Determination. **We have therefore identified potential adjustments to reverse equivalent amounts from the RAB in 2019, 2020 and 2021 to reflect this double counting.**

The adjustments have been allocated to individual valleys based on direct salary costs in year and are summarised below.

Table 5-7 Potential RAB reductions by year and valley

In $21M	2017	2018	2019	2020	2021
Border			0.2	0.2	0.4
Fish River			0.5	0.7	0.7
Gwydir			0.7	0.9	1.1
Hunter			0.6	0.9	1.0
Lachlan			0.9	1.3	1.6
Lowbidgee			0.1	0.1	0.2
Macquarie			0.8	1.0	1.4
Murray			0.4	0.7	0.9
Murrumbidgee			1.1	1.7	1.9
Namoi			0.7	0.8	1.2
North Coast			0.2	0.2	0.3
Peel			0.2	0.3	0.4
South Coast			0.1	0.2	0.3
Total			6.3	8.9	11.4

Source: Analysis of Document "Copy of MCP and Opex summary (38833) and Direct salary costs in Document 215 v 2

In its response to our Draft Report, WaterNSW stated:

- *WaterNSW has outlined above that these costs have not been included in the allowance, as we had an increase in overhead costs.*
- *The capitalisation of these costs is in-line with accounting standards, which outlines there must be sufficient nexus to the costs.*
- *We do not support reversing the RAB for the increased capitalisation, as we feel these costs are in support of delivering the total capital program (as outlined above and in the report).*
- *However, if these are removed, then we need a mechanism to recover these costs.*
- *If the corporate overhead capitalisations are to be reversed, we believe Atkins have overstated the Corporate Overhead component.*
- *WaterNSW queries as to whether these proposed reductions are consistent with the Water Charge Rules 2012.*

The capitalisation of overheads is discussed in Section 8. The potential adjustment in this section relates to consistency with the 2017 Determination. It reflects the fact that, at the time of the 2017 Determination, these costs were treated as opex. By changing its capitalisation approach during the Determination period, WaterNSW has moved costs into capex that would, under the assumptions made at the time of the last Determination, have been classified as opex. By doing so, WaterNSW has passed costs and cost risk on to future customers via the RAB. We have identified this potential adjustment to allow the Tribunal to determine if it should be applied. We have not made the adjustment to the capex discussed in Section 6.

5.5. Efficient Expenditure in the 2017 Determination period

Our view of efficient expenditure in the 2017 Determination period is related to the extent to which the efficiency has been improved and the effectiveness of performance to customers and compliance with the Licence requirements.

This is the first full four-year Determination period following the formation of WaterNSW. There have been many changes, with continued integration of systems and processes and a move to greater direct coding of costs.

We believe there is significant scope for WaterNSW to become more efficient:

- We are not aware of any significant shortfalls in compliance or performance to customers. However, we note that WaterNSW presented little evidence of trends in underlying performance over the period or of efficiency drive to safeguard customer bills. When costs increased, for the reasons discussed above, it was not clear that the business sought to offset these increases with efficiencies. The net effect is that costs have increased significantly with no obvious benefit to customers.
- Linked to this, we found that there is limited ownership of Determination performance especially at individual valley level, the level at which prices are set. WaterNSW was not able to produce documents showing that cost variance within individual valleys, or at Rural Valleys level were subject to routine and robust internal interrogation, challenge and management action.
- We found that there is generally a lack of business/operational or other plans to demonstrate that the current levels of activity, expenditure or ways of working are the most efficient and effective. It was not possible for WaterNSW to easily demonstrate that the current level of and approach to routine maintenance is appropriate.
- Whilst unit labour costs have increased during the current Determination, rather than mitigating this through productivity gains, additional FTEs have been brought into the business. This runs counter to our experience at other utilities where real increases in wages are linked to or offset by productivity gains.
- We also comment on efficiency of corporate functions in Section 8.

In its response to our Draft Report, WaterNSW stated:

> *WaterNSW provides reporting for each valley spend vs allowance, per activity and review with CAG's (Customer Advisory groups) on a regular basis (see our response to RFI 95, which provides detailed examples of the level of consultation with customers, including detailed presentations on operational activities)*
>
> *Proposed budgets which may affect pricing determinations are discussed.*
>
> *We will be reporting internally more on variance to allowance for each submission, as part of ELT packs.*
>
> *There are several reporting initiatives which were introduced recently:*
>
> - *WaterNSW have developed a robust PowerBi report which tracks actuals vs reg allowance on individual valley and activity level. This report is used on a monthly basis to highlight any risks and opportunities to WaterNSW ELT*
> - *WaterNSW have developed internal quarterly review on IPART AIR level, this will allow us to pick up any anomalies and proactively control overspend against the allowances*
> - *We also include a total opex and total capex vs allowance summary in the monthly board report.*
>
> *In summary, WaterNSW takes performance against the regulatory allowances very seriously and are monitoring it on a regular (i.e. at least monthly) basis.*

These appear to be excellent changes and initiatives which we welcome. They are good examples of the kinds of changes which we think will be helpful in driving better cost control and therefore efficiency in the next Determination period.

5.6. Efficiency of operating expenditure in the 2021 Determination period

We are required to review the efficiency of forecast operating expenditure for 2021-22. In undertaking this task, we must:

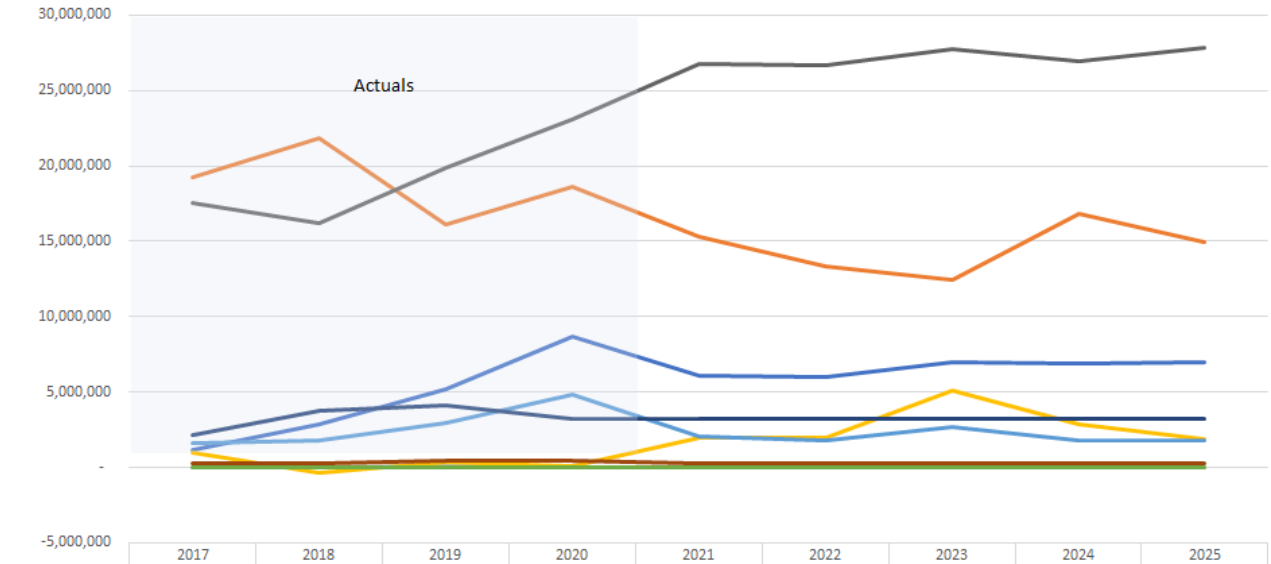
> *(a) Provide recommendations as to the efficiency of WaterNSW's forecast level of operating expenditure and provide an estimate of the level of operating expenditure that is required to efficiently supply the regulated monopoly services in 2021-22.*
>
> *(b) Identify the potential for and recommend efficiency savings to be achieved within the operating expenditure budget and provide evidence and reasoning to support the recommended savings.*
>
> *(c) Identify any consequential impacts on capital expenditure (ie increased or reduced costs) based on the assessment of operating expenditure.*

(d) Where appropriate, have regard to productivity benchmarking analysis when identifying potential efficiency savings

5.6.1. Forecast overview

WaterNSW projects an average increase of $4.5M p.a. (9%) for the FY22 to FY25 period compared to the 2017 Determination period. This is mainly driven by increases in salary (+$5.8M p.a.), consultancy (+$2.4M p.a.) and administration (+$1.0M p.a.) costs, partially offset by reductions in overheads (-$3.5M p.a.) and contracts (-$0.9M p.a.).

Figure 5-16 Forecast opex by cost type



	2017	2018	2019	2020	2021	2022	2023	2024	2025
ADMIN	1,173,023	2,836,380	5,149,548	8,724,224	6,051,107	6,019,068	6,955,968	6,932,488	6,938,070
CAPOHEAD	19,269,526	21,806,312	16,072,835	18,589,492	15,341,275	13,375,114	12,451,663	16,867,225	14,954,926
CAPWIPWO	-	-	51,909	-	-	-	-	-	-
CONSULT	1,026,418	-367,667	358,347	82,532	2,004,000	2,000,000	5,124,490	2,821,010	1,914,000
CONTRACT	1,609,065	1,827,883	2,930,317	4,827,570	2,044,302	1,814,703	2,641,447	1,814,702	1,814,702
DISPOSAL	-	-	-	-	-	-	-	-	-
MPE	2,162,477	3,742,507	4,098,534	3,234,730	3,204,417	3,213,522	3,214,045	3,214,571	3,215,126
OTHEM	247,396	231,844	407,243	417,048	258,727	259,547	259,841	260,136	260,449
SALARY	17,505,088	16,165,766	19,857,289	23,074,353	26,786,342	26,705,095	27,724,681	26,995,293	27,853,082

Source: Analysis of WaterNSW document "Document 215 v2" adjusted to take account of supplementary opex and RTP costs initially accidentally excluded from FY22

WaterNSW's initial submission was based on a single year Determination covering FY22 only. The approach taken by WaterNSW in the initial submission was to keep non-overhead expenditure largely constant at FY20 and FY21 levels with some adjustments to take account of changes such as the unusually high land tax provision in FY20 and the increase in consultancy costs expected in the next period.

In its October 2020 submission it then added a number of supplementary costs in the years FY23 to FY25. These are summarised below:

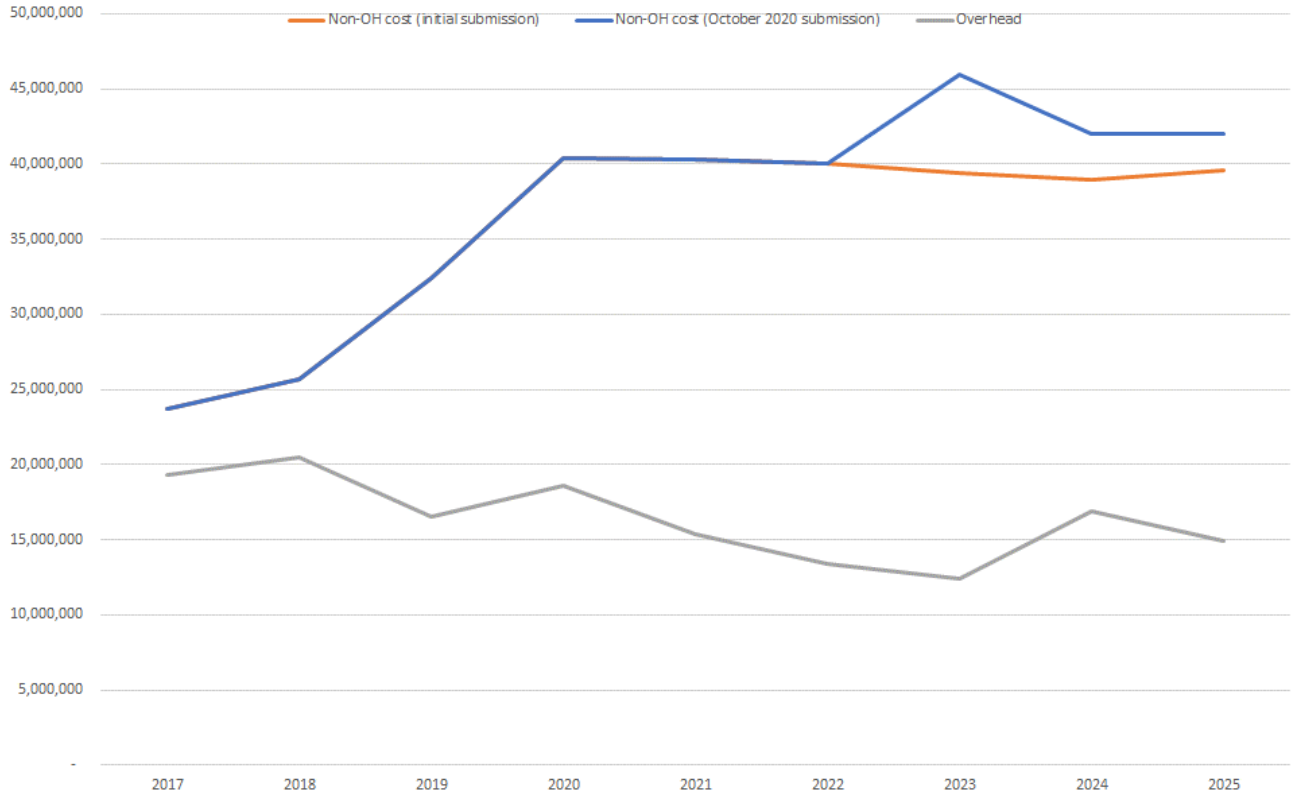
Table 5-8 Changes to opex in WaterNSW October 2020 submission

In $21M	2023	2024	2025	Total	Comment
Licence cost	0.2	0.2	0.2	0.7	Dam Safety Levy
Salaries	0.7	0.7	0.7	2.1	Additional Regulatory FTEs
Administration - land tax	0.6	0.6	0.6	1.8	Administration - land tax
Consulting fees	4.1	1.5	0.9	6.5	Electrical safety improvements, dam and weir safety reviews, long term transformational strategies and "Spillway Chute, Outlet works and OPT testing and surveillance"
Contractors-Construction Work	0.8	-	-	0.8	Lachlan Bridge Removal Program
Total	6.5	3.1	2.4	12.0	

Source: Analysis of Document 215 v 2

The resulting effect is as shown below.

Figure 5-17 Overhead and non-overhead expenditure trends



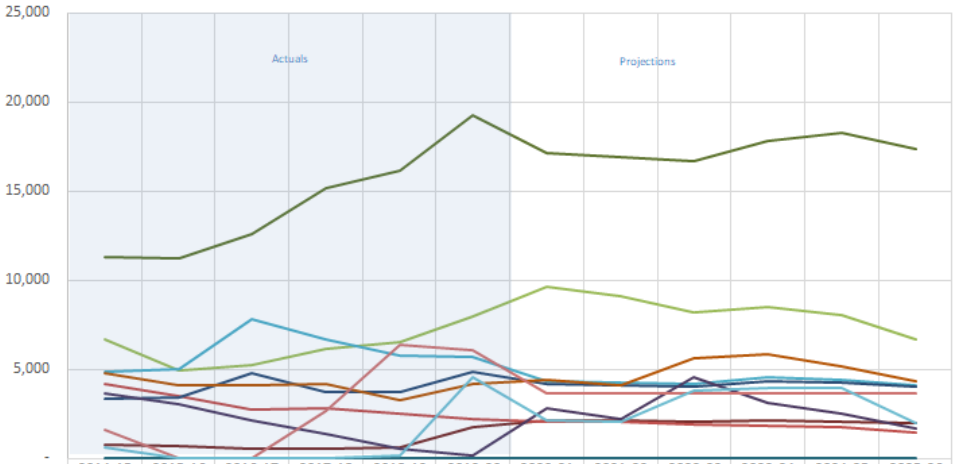
Source: "Document 215 v2", "RFI 56 IPART Rural Core Opex per year - by Account FY18-27". Overheads based on 'OHD' expenditure in 'Data' tab of "Document 215 v2"

We consider that the increase in Regulatory FTEs will fall into the Corporate Overhead costs so have addressed this proposal in Section 8. We examine the other increases in Section 5.6.4 below.

5.6.1.1. Expenditure by activity area

The main increases in spend by activity relate to land tax ('internal' activity cost area) and dam safety planning, with a number of consultancy activities also increasing water delivery costs. Routine maintenance is projected to remain at a level to recent years. Expenditure is expected to reduce for hydrometric monitoring with the end of the drought, and direct insurances. A number of other changes are related to changes to cost allocation.

Figure 5-18 Forecast opex by activity area ($000)



	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
Customer Support	757	683	539	512	578	1,767	2,131	2,095	2,021	2,092	2,045	1,938
Metering and Compliance	4,155	3,466	2,704	2,770	2,468	2,215	2,023	2,067	1,902	1,854	1,708	1,480
Water Delivery and Other Operations	6,662	4,938	5,217	6,164	6,533	7,963	9,642	9,068	8,162	8,492	8,065	6,673
Hydrometric Monitoring	4,834	5,023	7,801	6,670	5,790	5,679	4,335	4,214	4,144	4,534	4,387	4,093
Corrective Maintenance	3,338	3,401	4,764	3,746	3,708	4,832	4,185	4,108	4,048	4,332	4,227	3,998
Routine Maintenance	11,289	11,253	12,596	15,191	16,133	19,274	17,172	16,892	16,674	17,809	18,263	17,390
Asset management planning	3,660	3,041	2,112	1,404	546	158	2,780	2,176	4,532	3,135	2,532	1,704
Dam Safety Compliance Capital Projects pre-1997	-	-	-	-	-	-	-	-	-	-	-	-
Dam Safety Compliance	4,787	4,115	4,070	4,180	3,256	4,196	4,427	4,128	5,618	5,836	5,155	4,327
Direct Insurances	1,611	19	28	2,663	6,402	6,103	3,622	3,622	3,622	3,622	3,622	3,622
Internal	637	-	27	18	120	4,544	2,119	2,054	3,828	3,979	3,907	1,954

Source: Analysis of "Opex" tab in October 2020 AIR/SIR

Note: includes activities with spend of at least $2M p.a. at any point between FY18 and FY25

The main changes are summarised at activity level below.

Table 5-9 Change in opex between current and future (4 year) Determination periods by activity

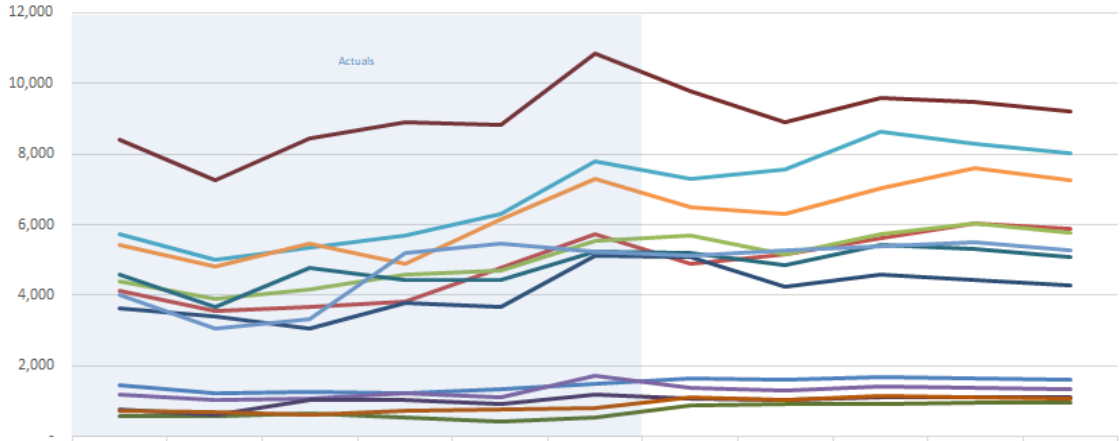
Activity	Change in average opex ($000 20/21 per annum)	Change %	Note
Asset management planning	1,872	153%	Water NSW's response to RFI83 indicates that the apparent increase is due to transferring costs from allocated to direct costs.
Internal	1,742	102%	This relates to land tax costs discussed below.
Dam Safety Compliance	1,170	29%	Page 94 of WaterNSW submission outlines that it considers FY18 and 19 to be underspent "due to the restructure of the business creating vacancies and as a consequence of project delivery deferrals." WaterNSW expects this to reverse "as the team reaches personnel capacity and deferred projects commence. We will also be implementing changes to ensure that we satisfy our new regulatory requirements." WaterNSW has incorporated supplementary opex (such as the Dam Safety Levy and dam safety reviews) in its October 2020 submission as discussed below.
Water Delivery and Other Operations	871	11%	In its response to RFI 104 WaterNSW states that the increase is "due to the consultancies expenditure as highlighted in our response to RFI 204, which has been allocated to the water delivery and other operations category. As per our response to RFI 204, the expenditure is driven by the need undertake the development of drought strategies and studies as well as the integrated bulk water options study."
Customer Support	816	65%	The response to RFI84 explains that the Call Centre cost (Project 'AP Call Centre') opex was incorrectly assigned to the customer billing category, instead of the customer support category, with an overall neutral effect. This error was corrected from FY20 onwards.
Flood Operations	554	120%	WaterNSW response to RFI 190 indicates that this is because this activity was suppressed during the current period because of reallocation of resources to manage the drought.
Direct Insurances	(1,076)	(23%)	This appears to be because overhead costs are not being applied to the direct insurance cost line from FY21 onwards (based on Document 215 and WaterNSW response to the Draft Report) .
Hydrometric Monitoring	(1,299)	(23%)	Assumed to be a ramp down from the unusually high recent costs related to the drought (see the explanation for overspend in the current Determination in previous section).

Note: Table only includes changes greater than $500k per annum.

5.6.1.2. Expenditure by valley

The projected change in expenditure by valley is summarised below. Changes range from a 3% ($0.3M p.a.) reduction in Murrumbidgee to a 56% ($0.3M p.a.) increase in Lowbidgee. WaterNSW has not provided an explanation for the differences between the valleys. However, the reduction in Murrumbidgee appears to be an unusual peak in routine maintenance in FY20 and direct insurance in FY19 and 20 which are projected to return to more normal levels afterwards. The increase in in Lowbidgee is due to a projected increase in routine maintenance in FY21 which is expected to continue.

Figure 5-19 Trends in opex by valley ($000)



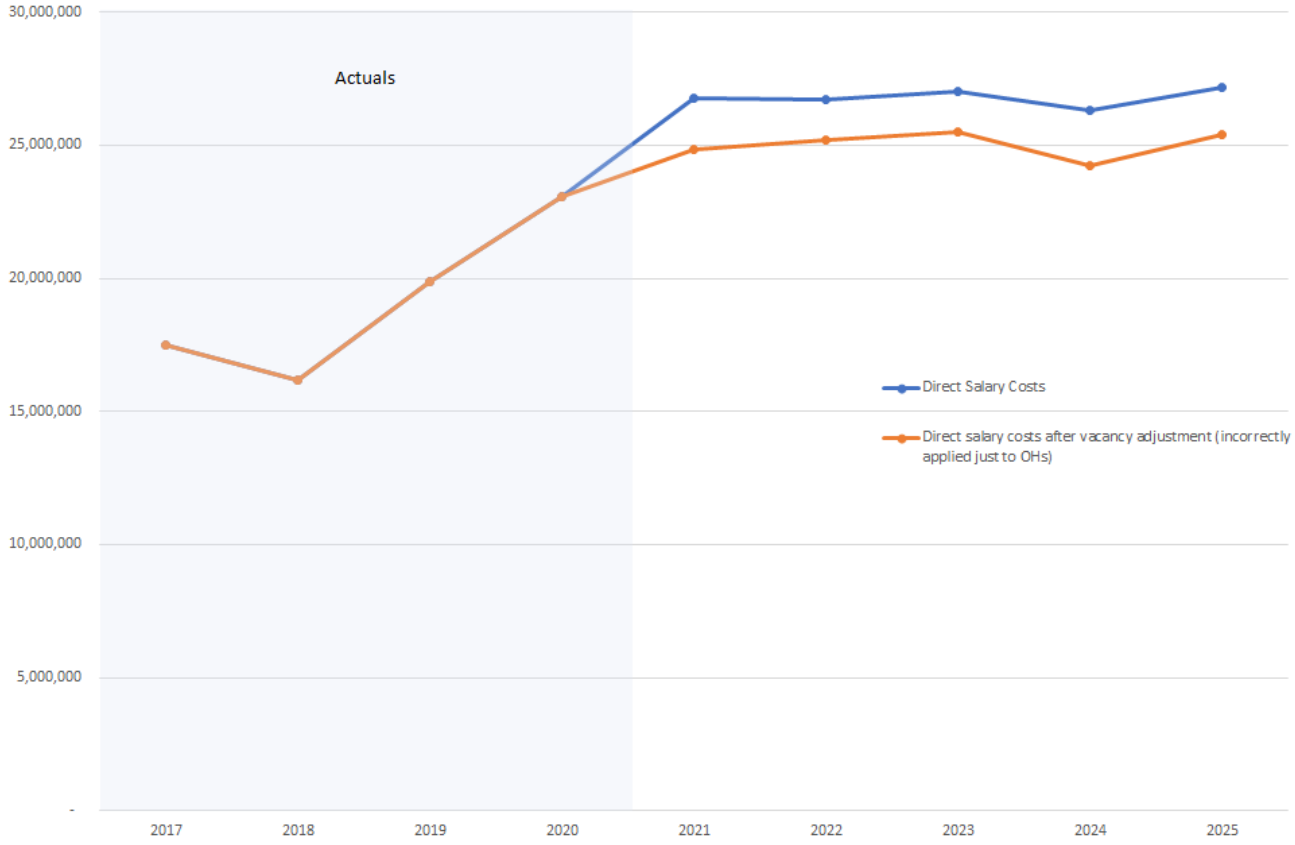
	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Border	1,459	1,239	1,287	1,231	1,341	1,502	1,638	1,601	1,693	1,656	1,618
Gwydir	4,148	3,579	3,692	3,820	4,768	5,723	4,909	5,168	5,608	6,038	5,898
Namoi	4,405	3,901	4,178	4,590	4,722	5,545	5,714	5,161	5,750	6,025	5,782
Peel	1,183	1,052	1,085	1,239	1,128	1,739	1,365	1,305	1,404	1,378	1,348
Lachlan	5,740	5,002	5,354	5,692	6,294	7,805	7,289	7,555	8,634	8,276	8,041
Macquarie	5,416	4,827	5,481	4,891	6,174	7,300	6,504	6,305	7,051	7,621	7,259
Murray	3,648	3,414	3,045	3,786	3,660	5,122	5,096	4,235	4,598	4,442	4,273
Murrumbidgee	8,401	7,273	8,454	8,911	8,815	10,865	9,767	8,907	9,576	9,497	9,225
Lowbidgee	593	596	657	536	431	550	902	931	926	959	950
North Coast	772	621	1,034	1,024	924	1,176	1,087	1,043	1,134	1,115	1,099
Hunter	4,594	3,686	4,784	4,456	4,421	5,250	5,203	4,855	5,443	5,305	5,105
South Coast	741	699	616	750	776	827	1,108	1,053	1,167	1,105	1,078
Fish River Water Scheme	4,029	3,075	3,320	5,214	5,471	5,234	5,108	5,270	5,389	5,489	5,275

Source: Analysis of "Opex" tab in October 2020 AIR/SIR

5.6.2. Labour costs

Direct labour costs are projected to increase from FY20 to FY21 and then remain broadly constant thereafter. WaterNSW has explained that this increase is exaggerated because it has applied an average $2.6M p.a. "vacancy adjustment" in FY21 to FY25 entirely to corporate overheads, despite expecting it to mainly affect direct salary costs (69% of the impact). Labour costs are nonetheless still expected to increase after this adjustment as seen below.

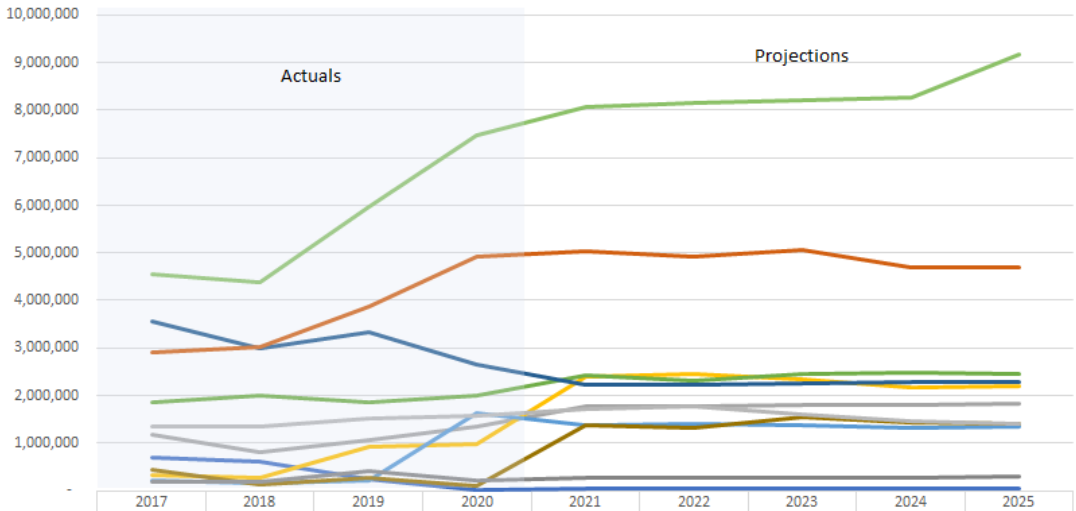
Figure 5-20 Trends in direct labour costs



Source: analysis of Document 215 v2 and '2a Direct Labour Cost analysis (corrected)'

There is some movement of labour costs between activities as shown below. However, mostly they remain at roughly the level of direct labour spend budgeted by WaterNSW for FY21. This means, most notably, that flood operations labour expenditure is projected to increase in FY21 then maintain that level of spend, as resources are moved away from hydrometric monitoring to flood operations. Similarly, customer billing costs are projected to increase in FY21 and maintain that higher level. This is understood to be partly due to a coding issue. Customer billing and support costs are discussed in Section 8.

Figure 5-21 Trends in direct labour costs by activity



	2017	2018	2019	2020	2021	2022	2023	2024	2025
Asset management planning	699,591	604,766	230,268	27,082	30,027	31,678	32,014	32,355	32,635
Corrective maintenance	1,179,697	811,167	1,072,195	1,339,269	1,772,789	1,787,096	1,799,948	1,811,666	1,822,480
Customer billing	318,631	278,735	932,261	990,390	2,409,126	2,441,439	2,338,469	2,173,193	2,188,575
Customer support	214,684	161,035	201,203	1,623,548	1,381,127	1,392,235	1,369,149	1,329,899	1,337,976
Dam safety compliance	1,860,653	2,012,578	1,858,414	2,009,776	2,416,323	2,316,356	2,447,599	2,471,122	2,453,461
Flood operations	437,655	120,588	274,579	95,516	1,387,439	1,314,084	1,548,067	1,419,567	1,392,824
Hydrometric monitoring	3,557,899	3,001,889	3,327,642	2,658,410	2,218,874	2,240,985	2,259,977	2,278,484	2,296,297
Metering and compliance	1,358,074	1,356,951	1,525,023	1,577,845	1,721,461	1,785,601	1,607,824	1,465,315	1,403,292
Routine maintenance	4,561,211	4,379,755	5,985,228	7,463,203	8,066,844	8,141,561	8,207,188	8,266,996	9,172,067
Water delivery and other operations	2,910,912	3,024,298	3,866,423	4,923,668	5,044,690	4,922,792	5,074,052	4,703,971	4,708,591
Water quality monitoring	176,648	172,189	419,150	200,989	276,343	278,901	281,197	283,303	285,268

Source: analysis of Document 215 v2.

Note: only includes activities with expenditure >$250k in at least one year and excludes the effects of the vacancy adjustment

5.6.3. Water Delivery and Other Operations

Water Delivery and Other Operations opex is expected to increase by $0.9M p.a. (11%) on average compared to the 2017 Determination period.

In its response to RFI 104 WaterNSW states that the increase is

> *"due to the consultancies expenditure as highlighted in our response to RFI 204, which has been allocated to the water delivery and other operations category. As per our response to RFI 204, the expenditure is driven by the need undertake the development of drought strategies and studies as well as the integrated bulk water options study."*

Consultancies are indeed the main driver of the increase in "Water Delivery and Other Operations opex" with an increase from zero between FY17 and FY20 to $2.0M p.a. budgeted for FY21 and 22 and $1.1M p.a. average thereafter.

WaterNSW has provided further details as follows[20]:

> *In the current drought, WaterNSW has been directed by the State Government to undertake the development of a number of Regional Drought Response projects, including the Chaffey Dungowan Village pipeline and Macquarie catchment Warren Weir raising. These Regional Drought Response measures and other medium to long-term drought options, has required the Asset Strategy Team to provide additional expertise and continuous development support.*
>
> *Additionally, DPIE will be developing Regional Water Strategies for rural catchments over 2020 and 2021. These adaptive strategies are aimed to provide processes to ensure long-term water security across New South Wales. The Asset Strategy Team will be liaising with, and providing advice to, DPIE on these Regional Water Strategies as the program progresses.*

[20] See RFI 204

With respect to the integrated bulk water options study, this work that this addresses is outlined in the next stage of the work on the Levels of Service. The focus of this work is to prepare the groundwork for stronger regional supply.

The development of options to assess where and what could be developed to address potential underground dams and managed aquifer recharge across all 13 valleys.

The study is part of a process which will develop options that can be included in the regional strategies as DPIEW has identified a need to develop a water and groundwater approach. The Asset Strategy Team will also be liaising and providing advice to DPIE on these Regional Water Strategies as the program progresses.

Particularly west of the divide groundwater recharge and storage is a focus that is in its infancy. The key work here is to develop a framework to assess the benefits of various options and define a set of approaches that could be pursued. It will also allow NSW to catch up with SA and WA in examining this approach.

The Asset Strategy Team's further work with the groundwater recharge Strategy is therefore essential for our customers as well as supporting other Government agencies.

On the basis of what we know of it, we consider that this is expenditure is likely to be prudent.

5.6.4. Supplementary opex requested in October 2020

5.6.4.1. Dam Safety Levy

WaterNSW has requested an additional $0.2M p.a. to cover a dam safety levy starting in FY23. As explained in its October 2020 submission:

Dams Safety NSW has recently proposed an amendment to the Dams Safety Act 2015, which would result in the introduction of a dams' safety levy to be paid by declared dam owners from 1 July 2021. The levy payable would be calculated by reference to a levy unit, and the number of levy units payable would depend on the risk classification of declared dams. Dams Safety NSW is currently consulting with dam owners on the proposal

We understand that the decision to implement the levy has not yet been made and there is uncertainty about the level/method for applying it. On balance, however, we accept that it is more likely than not to be applied and recommend accepting the proposed increase.

5.6.4.2. Lachlan Bridge Removal Program

WaterNSW has requested an additional $0.8M of opex in FY23 associated with Lachlan Bridge Removal. This is part of its proposed Rural Bridges Program.

WaterNSW states:

The removal is required to reduce risks to operational personnel and to ensure public safety. In the interim, measures have been put in place to ensure temporary isolation of the structure can be maintained until the works are scheduled….

This expenditure is required to ensure safe access for WaterNSW personnel, contractors and the public. It is also part of the broader Rural Bridges Program...

In its response to our Draft Report, WaterNSW, explained that

this bridge has been closed and isolated for more than 5 years to public traffic and pedestrians access. However, the bridge is located within few hundred meters from a community and a school that increase the public safety risk as people may bypass the barriers.

We have recommended accepting this increase on the basis of the potential risks to the community.

5.6.4.3. Consulting costs

The additional consulting opex requested by WaterNSW in its October 2020 submission is summarised as follows:

Table 5-10 Additional consulting costs requested

ref	In $21M	2023	2024	2025	Total
1	Electrical Safety Improvements	2.3	-	-	2.3
2	Annual Exceedance Probability of Probable Maximum Precipitation Studies	0.3	0.2	0.0	0.5
3	Dam Safety Review	0.5	0.2	0.0	0.8
4	Risk Mitigation Plan & Options	0.1	-	-	0.1
5	Spillway Chute, Outlet works and OPT testing and surveillance	0.2	0.2	0.1	0.5
6	Weir Safety Review	0.3	0.4	0.2	0.9
7	Long term transformational strategy	0.5	0.5	0.5	1.5
	Total	4.1	1.5	0.9	6.5

Source: Analysis of Document 215 v 2

WaterNSW has identified that it will incur an additional $2.3 million of opex associated with improving electrical safety across Rural Valleys in FY23. It has explained that it was not included in the initial Pricing Proposal submission because it has emerged from electrical asset class strategies which have recently been developed. These strategies have identified gaps in availability of critical electrical asset information and reliable means of hazard identification for electrical distribution assets. We consider it reasonable to allow these expenditures.

WaterNSW has requested $2.8M additional opex for dam safety related consultancies (ref no.s 2 to 6 above). Given that there was no budget in the initial submission for dam safety consultancy[21], and the regulatory and safety drivers, we consider it reasonable to allow these expenditures.

WaterNSW has requested $1.5M additional opex for a Long-term Transformational Strategy, justifying it by stating:

> *WaterNSW is requesting additional funding for the development of a long-term transformational strategy. The project will be aimed at identifying and implementing efficiencies for the WaterNSW business over time.*
>
> *We consider that dedicated funding for such a project will materially improve our ability to reduce costs in the long run. Over time this will provide significant and lasting benefits to our customers.*

We consider that (a) it has not made a strong case that this is a justified, new and material requirement that customers should be asked to pay for and (b) the immediate focus should be improving its focus on efficiency for customers. As such we have not recommended accepting this increase.

5.6.4.4. Land tax

WaterNSW has increased its expected land tax charges by $0.6M p.a. from FY23 to FY25.

In its October 2020 submission WaterNSW states:

> *WaterNSW included in its Pricing Proposal a forecast of its land tax liability over the period. Land tax liability is calculated using Valuer General land valuations. These valuations were unavailable at the time of forming the forecasts in our proposal, and the fair value of land was used as a proxy.*
>
> *In late June 2020, information on our Valuer General land valuation became available to WaterNSW. This has resulted in an increased forecast of our land tax liabilities.*
>
> *WaterNSW is continuing to work with external consultants in relation to its land tax liability*

We consider that this justification is too vague and uncertain for us to recommend accepting the proposed increase.

In its response to our Draft Report, WaterNSW stated:

[21] Based on analysis of Document 215 v2

Whilst Table 1 of the report does not split the estimated tax liability into the determinations, it does show that the total liability is expected to reach $5.8M p.a.from 2020, which aligns with the proposed increase.

WaterNSW will continue to work with IPART and the consultants in the lead-up to the Draft Determination to determine the likely impacts at the valley and determination level.

Given that we have not been given an assessment of the impact on the Rural Valleys, we are not able to recommend this requested increase in projected expenditure.

5.6.5. Cold Water Pollution

In its response to our Draft Report in December 2020, WaterNSW requested additional opex of $3.75M for Cold Water Pollution mitigation[22], stating that:

WaterNSW is subject to regulatory requirements to tackle water pollution challenges in the Gwydir, Murrumbidgee, Lachlan, North Coast and Hunter valleys.

This is a regulatory requirement that addresses water pollution challenges in the respective valley, specifically the improvement for fish habitats to provide long term environmental benefits due to the increased water quality. The study will develop a report for the relevant dam identifying asset solutions to address cold water pollution (CWP) problem.

The options addressing CWP will be identified by specifying the features of the options such as type, sizing and cost. This will also include developing an options assessment framework enabling a sound and evidence-based decision-making process to introduce the preferred CWP mitigation option or combination of options

The details provided in Appendix D of the response document indicate that the expenditure will result in reports for Copeton, Blowering, Carcoar, Toonumbar, Lostock and Keepit Dams *"identifying asset solutions to address cold water pollution (CWP) problem. The options addressing CWP will be identified specifying the features of the options such as type, sizing and cost"*.

We requested internal governance documents and business cases, an explanation as to why they need to be carried out by FY23 and confirmation that no similar studies have been undertaken in the current period.

WaterNSW informed us that there are currently no Business Cases as the internal governance process is currently underway. It was apparently not able to release the 'Cold Water Pollution Mitigation Asset Options Report' as it has not been endorsed.

WaterNSW stated that *"there is effectively some CWP work occurring at sites where funding is available, however these are separate to the projects submitted"*[23].

We would like to be supportive of expenditure which has benefits to customers and to the environment. However, in this case, WaterNSW has not provided a business case or strategy document, it has not demonstrated the appropriateness of scope or timing of the expenditure, how these particular dams have been selected for delivery in this period, and how customers will benefit from the proposed expenditure.

Much as we would like to support expenditure which has benefits to customers and to the environment, we have not therefore been able to recommend an increase in opex for this activity.

5.6.6. Revenue risk

WaterNSW has incorporated $2.3M p.a. in its submission for a revenue risk product, consistent with recent levels of expenditure on the RTP (see Section 5.4.2.4). We understand that IPART is reviewing the approach to revenue risk independent to this report. We have made not recommended any scope adjustments to this element of WaterNSW's submission.

5.6.7. Efficiencies built into the proposal

WaterNSW has not explicitly applied efficiencies to its proposal. It has identified benefits from initiatives such as the Wave program (discussed in more detail in later sections) but has stated that these benefits are expected after the next 2021 Determination period.

[22] $2.50M in FY22 and $1.25M in FY23
[23] 'MEMO 5 v1 Cold Water Pollution enquiries – Grayson'

WaterNSW's pricing submission does incorporate a $8.1M bottom-line "efficiency dividend" in FY22 which has been derived as a balancing adjustment to keep revenue requirement constant "after user share balancing".

We asked WaterNSW to provide details of how it intends to achieve this efficiency. Its response indicates that there is no detailed plan for these efficiencies:

> *To date, WaterNSW has not developed a detail business plan on how we intend to achieve the 8.1M efficiency dividend. WaterNSW is looking at reducing cost by developing and implementing a business transformation program aimed at improving organisational efficiency and lowering our operating expenditure.*

The $8.1M dividend has not been applied by WaterNSW to its opex forecasts. We have therefore been able to base our assessment of efficient expenditure on the projected opex without reversing out any efficiencies already applied by WaterNSW.

5.6.8. Assessment of efficiency

Our approach to assessment of efficiency is summarised in Section 2. Our recommended scope adjustments, catch-up and continuing efficiencies are set out below.

5.6.8.1. Scope adjustments

We have applied a number of scope adjustments to non-overhead opex as set out below:

Table 5-11 Scope adjustments applied

ref	Adjustment	Reason	Total opex effect over 21 Determination	How allocated to valleys	How allocated to activity lines	How affected overheads
1	Accept additional Regulatory FTEs but adjust the impact to reflect allocation of expenditure to different Determinations	Set out in Corporate opex in Section 8.2.1.2. Note that we are recommending $1.4M be allocated to RV compared to $2.1M requested because the cost will be shared between Determinations but we assume it will start in FY22 (rather than FY23 in the submission).	-$0.7M	Unwind allocation in Document 215		No change as part of October 2020 additional opex (no additional OH)
2	Remove land tax increases	Justification challenge set out in Section 5.6.4	-$1.8M	Unwind allocation in Document 215		
3	Remove Long-term Transformational Strategy	Justification challenge set out in Section 5.6.4	-$1.5M	Unwind allocation in Document 215		
4	Reduce "Environmental Planning and Protection" opex to pre-FY21 levels (note no direct salary costs are included in projected EPP so there is no double-	WaterNSW has not been able to justify the increase, stating that it relates to miscoding of Procurement Management and purchasing in the budget (RFI 191). We cannot	-$1.9M	Valley by valley calculation	Only affects EPP	No change made. $ terms reduction in direct opex only

ref	Adjustment	Reason	Total opex effect over 21 Determination	How allocated to valleys	How allocated to activity lines	How affected overheads
	counting with adjustment 5 below)	recommend the increase in the absence of a clear offsetting reduction in other categories				
5	Remove increase in direct labour costs after FY20 except for customer support and billing where WaterNSW is facing additional obligations	Increases in labour costs have not been justified. Above inflation increases should be offset by productivity gains	-$3.9M	Pro-rated on increases in major salary lines: maintenance, dam safety, water delivery, hydrometric monitoring and flood operations		
6	Impact of method change to GS costs	The RV component of the $2M p.a. Customer and Community overheads adjustment set out in Section 8.2.1.1	-$1.2M	Same as (6)	Same as (6)	Purely overhead
7	Change to allocation of Corporate Overheads between Determinations and Valleys	Explained in Section 8.3.5. Based on Option B set out in Table 8-25	-$4.0M assuming it is implemented in FY24 (Note the adjustment would be -$4.9M if implemented from FY22)	Allocated between valleys based on direct opex		Purely overhead

5.6.8.2. Catch-up efficiency

Catch-up efficiency is the improvement required of WaterNSW to achieve the performance of a Frontier Company.

As discussed in Section 5.5 we have found limited evidence of operating efficiency drive in the business and consider that there is significant scope for efficiency improvement.

In frontier utilities we observe that management routinely interrogates performance against the Determination(s) and variances over time. They are readily able to provide detailed explanations of variances because they have a relentless focus on cost performance and use variance analysis as part of their routine business-as-usual process.

In WaterNSW we have found that there is limited ownership of the cost performance of the individual regulated businesses, and limited monitoring or focus on performance again the Determination(s) or annual variances. At individual valley-level, this ownership and accountability appears to be even weaker.

When costs have increased, it was not clear that the business sought to offset these increases with efficiencies. The net effect is that costs have increased significantly with no obvious benefit to customers.

WaterNSW does not appear to routinely prepare, challenge and refresh business cases or plans for major opex areas or embed expected savings from initiatives in budgets, as well-run utilities do. When we asked to see business/operational plans for major activities such as routine maintenance and water delivery, for example, WaterNSW directed us to its Statement of Corporate Intent which does not provide detailed plans or evidence of routine management interrogation and challenge.

A significant proportion of the costs allocated to Rural Valleys is currently corporate expenditure, allocated on the basis of totex (see Section 8). This expenditure is driven from the centre and "lands" on the regulated businesses, rather than responding to their demands or requirements.

We have identified a number of areas of potential efficiency improvement, many of which are discussed in further detail in Section 8:

- Greater management focus on cost performance, including alignment of incentives, embedding genuine challenge into budgeting processes and governance of initiatives, such as hardwiring the savings associated with an initiative directly into future budgets.
- Clearer internal accountability for performance of each regulated business and valley (for the Rural Valleys Determination) with clear P&L-style ownership and accountability.
- P&L-style accountability for corporate expenditure and charges to the regulated businesses
- Continued progress in improving procurement, including tracking of benefits

Quantitative benchmarking of Water NSW's performance against other utilities is difficult given the lack of directly comparable entities. Instead, we have reviewed efficiencies achieved by other utilities at a similar position in their transition towards the efficiency.

We recognise that there are differences between utility operating models and it is not always straightforward to directly compare organisations operating in different jurisdictions and serving different purposes. However, we consider that core business processes that impact on costs, particularly operating costs should be continually challenged to improve and deliver efficiencies to move towards the efficiency frontier. We use our prior assessments of other utilities to compare how relatively close WaterNSW is to the efficiency frontier and how quickly they may be able to move towards it.

To get a sense of the scale of efficiency which should be achievable, we have reviewed the operating efficiencies achieved by Hunter Water and Sydney Water, when they were at a similarly early stage of efficiency maturity, i.e. in their 2009 and 2012 Determination periods respectively.

This suggests that total efficiency gains of 1.80% and 2.13% p.a. or greater are achievable with appropriate management focus. This process and the efficiency gains made are summarised below.

Figure 5-22 Approach to evaluating scale of catch-up efficiency achievable

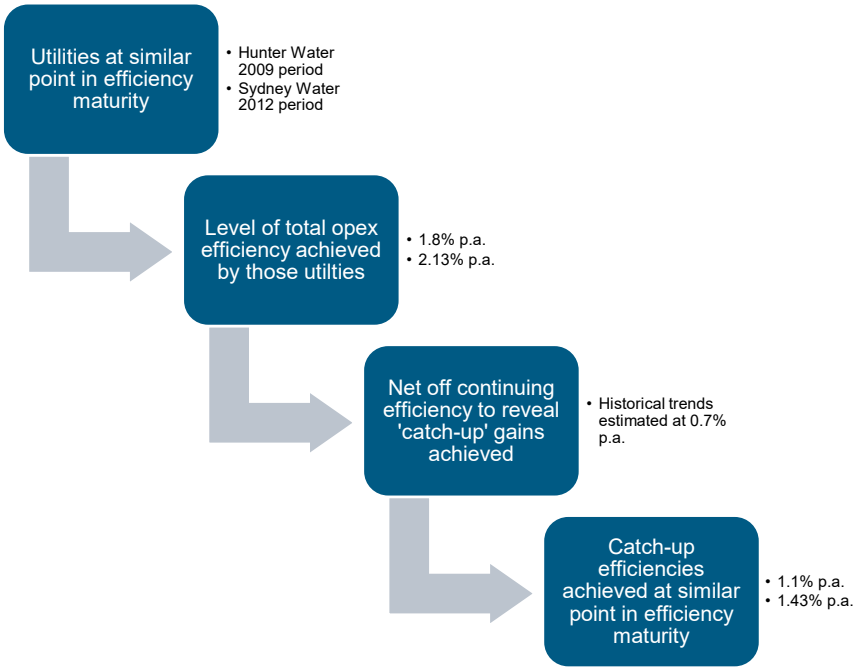


Table 5-12 Examples of operating expenditure efficiencies achieved by utilities

Determination	Start year	In-year catch-up opex efficiency applied in				Continuing efficiency assumed at the time (% p.a.)	Total opex efficiency challenge p.a. (catch-up + continuing)	Conclusion of Ex-Post Review at next Determination
		Year 1	Year 2	Year 3	Year 4			
Hunter Water	2009	1%	1%	1%	1%	0.80%	**1.80%**	**Achieved**
Sydney Water	2012	1.50%	2%	2%	2%	0.25%	**2.13%**	**Overachieved**

Source: Atkins reports for IPART 2016 and 2013

In the expenditure review for the WaterNSW's Greater Sydney 2020 determination period we recommended an opex catch-up efficiency of 0.9% p.a. A continuing efficiency of 0.8% p.a. was also applied. This equates to a combined (continuing and catch-up) efficiency challenge of 1.7% p.a. on operating expenditure.

We recommend applying a catch-up efficiency of 1.1 % p.a. to the Rural Valleys Determinations in addition to the continuing efficiency of 0.7% p.a. (i.e. a combined challenge of 1.8% p.a.). This is slightly higher than we recommended for the Greater Sydney review. This is because the Rural Valleys review has strengthened our view of the lack of 'ownership' of cost performance for the Rural Valley Determinations.

With appropriate management focus, we consider that it should be possible for WaterNSW to outperform this catch-up efficiency, based on the efficiencies achieved by Sydney Water (equivalent to 1.43% p.a. catch-up + 0.7% p.a. continuing efficiency) and our experience elsewhere.

In its response to our Draft Report WaterNSW stated that:

> *WaterNSW does not support the application of catch-up efficiencies and considers that there is no strong theoretical basis for applying such reductions….*
>
> *Atkins states it has not undertaken a detailed benchmarking study that is a prerequisite to establishing an efficient (i.e. Frontier) firm….*
>
> *In addition, we consider that comparing Water NSW with Hunter Water and Sydney Water is not appropriate given the differing business models, services provided, assets (and asset lives), regulations, operating licence conditions and the need to allocate fixed corporate overheads across four IPART determinations.*

The application of catch-up efficiencies has extensive theoretical and empirical backing and is an approach which is widely used in economic regulation. We consider that WaterNSW should revisit its position on this and consider what it can do to learn from utilities which have significantly improved their efficiency.

We do not agree that detailed benchmarking is a prerequisite to establishing the level of catch-up efficiency which can be achieved. We consider that empirical evidence as to the level of catch-up efficiencies achieved by utilities at a similar point in the efficiency journey has as much, and in some cases more, value as quantitative benchmarking. Whilst we recognise that Hunter Water and Sydney Water are different to WaterNSW we consider that there are enough similarities for them to be informative comparators. Nonetheless, we have erred on the side of caution by recommending 1.8% p.a. combined efficiency rather than 2.13% p.a.

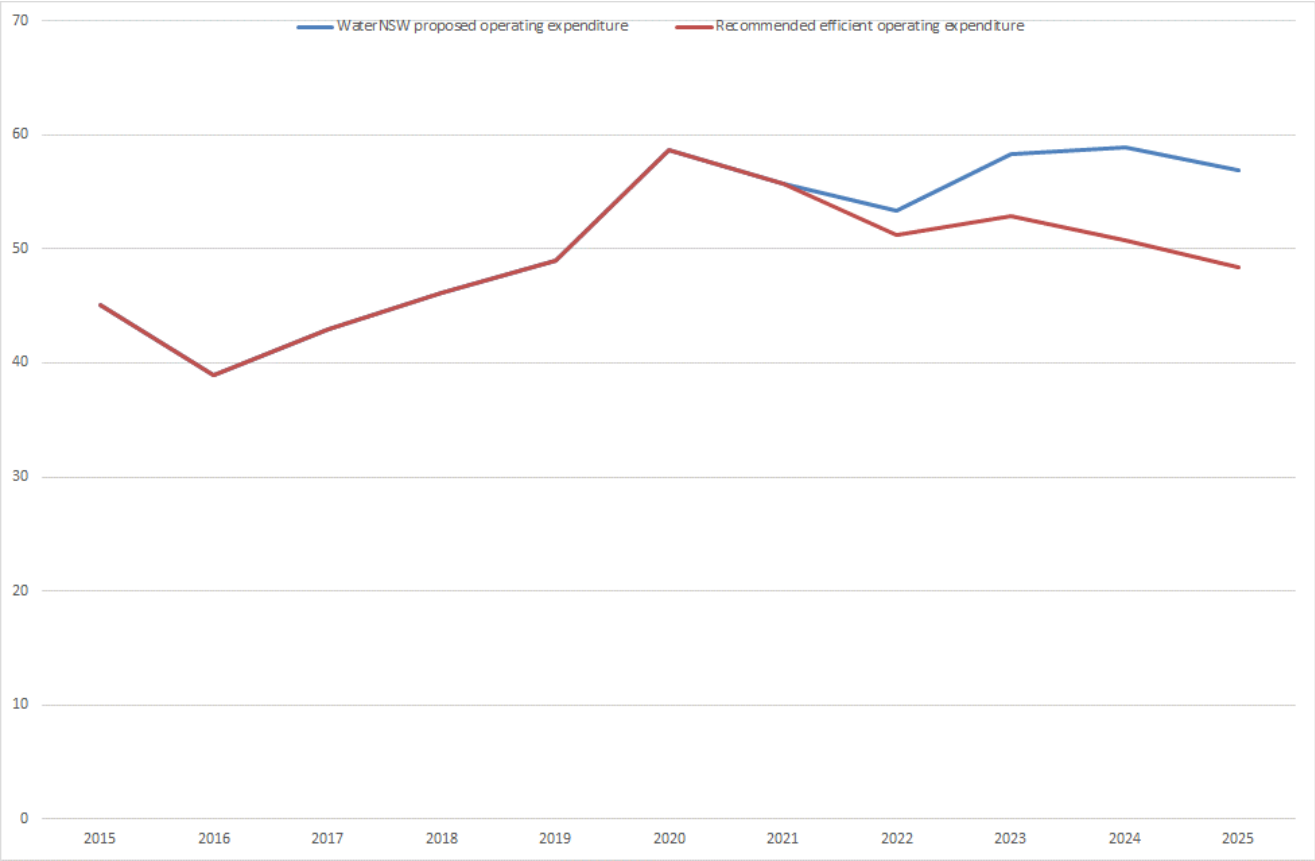
5.6.8.3. Continuing efficiency

We have applied the level of continuing efficiency set out in Section 2.2.1.

5.6.9. Recommended efficient expenditure

We present below our recommended efficient level of operating expenditure for the 2021 Determination period. All figures quoted include overhead as well as direct costs.

Figure 5-23 Recommended efficient operating expenditure ($M 20/21)



Source: "Opex" tab in WaterNSW's October 2020 AIR/SIR and Atkins/Cardno analysis

Table 5-13 Recommended efficient opex- all valleys

WATERNSW RURAL BULK WATER PROPOSAL - OPEX - Summary Table- All Valleys				
($M 2020/21) year ending June	2022	2023	2024	2025
Border	1.60	1.69	1.66	1.62
Gwydir	5.17	5.61	6.04	5.90
Namoi	5.16	5.75	6.02	5.78
Peel	1.30	1.40	1.38	1.35
Lachlan	7.55	8.63	8.28	8.04
Macquarie	6.30	7.05	7.62	7.26
Murray	4.23	4.60	4.44	4.27
Murrumbidgee	8.91	9.58	9.50	9.22
Lowbidgee	0.93	0.93	0.96	0.95
North Coast	1.04	1.13	1.12	1.10
Hunter	4.85	5.44	5.31	5.10
South Coast	1.05	1.17	1.11	1.08
Fish River Water Scheme	5.27	5.39	5.49	5.27
Total Operating Expenditure	**53.39**	**58.37**	**58.91**	**56.95**
Atkins/Cardno recommended scope adjustments				
Border	-0.11	-0.16	-0.14	-0.15
Gwydir	-0.46	-0.63	-1.14	-1.23
Namoi	0.03	-0.41	-0.73	-0.71
Peel	0.11	0.04	0.03	0.06
Lachlan	-0.84	-0.63	-1.42	-1.29
Macquarie	0.16	-0.37	-0.91	-0.89
Murray	0.02	-0.14	-0.16	-0.08
Murrumbidgee	0.22	-0.10	-0.02	0.18
Lowbidgee	-0.25	-0.27	-0.19	-0.29
North Coast	0.04	-0.04	-0.04	-0.04
Hunter	0.02	-0.42	-0.29	-0.25
South Coast	-0.12	-0.17	-0.14	-0.17
Fish River Water Scheme	-0.11	-0.22	-0.20	-0.06
Sub Total adjustments	-1.29	-3.50	-5.33	-4.91
Atkins/Cardno recommended efficiency targets				
Continuing Efficiency (%)	0.70%	1.40%	2.09%	2.77%
Continuing Efficiency ($M)	-0.36	-0.77	-1.12	-1.44
Catch-up efficiency (%)	1.10%	2.19%	3.26%	4.33%
Catch-up efficiency ($M)	-0.57	-1.18	-1.71	-2.19
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE				
($M 2020/21) year ending June	2022	2023	2024	2025
Border	1.46	1.48	1.44	1.37
Gwydir	4.63	4.80	4.64	4.34
Namoi	5.10	5.15	5.02	4.72
Peel	1.39	1.39	1.34	1.31
Lachlan	6.60	7.72	6.49	6.28
Macquarie	6.35	6.45	6.36	5.93
Murray	4.18	4.30	4.05	3.90
Murrumbidgee	8.96	9.13	8.98	8.75
Lowbidgee	0.67	0.64	0.72	0.62
North Coast	1.06	1.06	1.02	0.99
Hunter	4.79	4.84	4.76	4.51
South Coast	0.92	0.97	0.92	0.85
Fish River Water Scheme	5.06	4.99	5.01	4.85
Total Efficient Expenditure	51.17	52.92	50.74	48.41

6. Capital expenditure

We are asked to review WaterNSW's capital program to inform recommendations as to the efficiency of the utility's level of capital expenditure. In undertaking this task, we must:

(a) Assess the reasonableness of the utility's capital expenditure program as a whole, within the context of its long-term plans and the assumptions underlying them, including the scale, scope and planning of the entire capital expenditure program.

That is, the consistency of the utility's proposed 5-year capital expenditure program with its longer term program of capital expenditure, and the implications of and risks associated with the 5-year program for the longer term program.

(b) Undertake a detailed investigation into the outcomes and project planning for a sample of the utility's capital projects above an agreed materiality threshold (to be agreed with IPART, but generally at least 10% of capital projects).

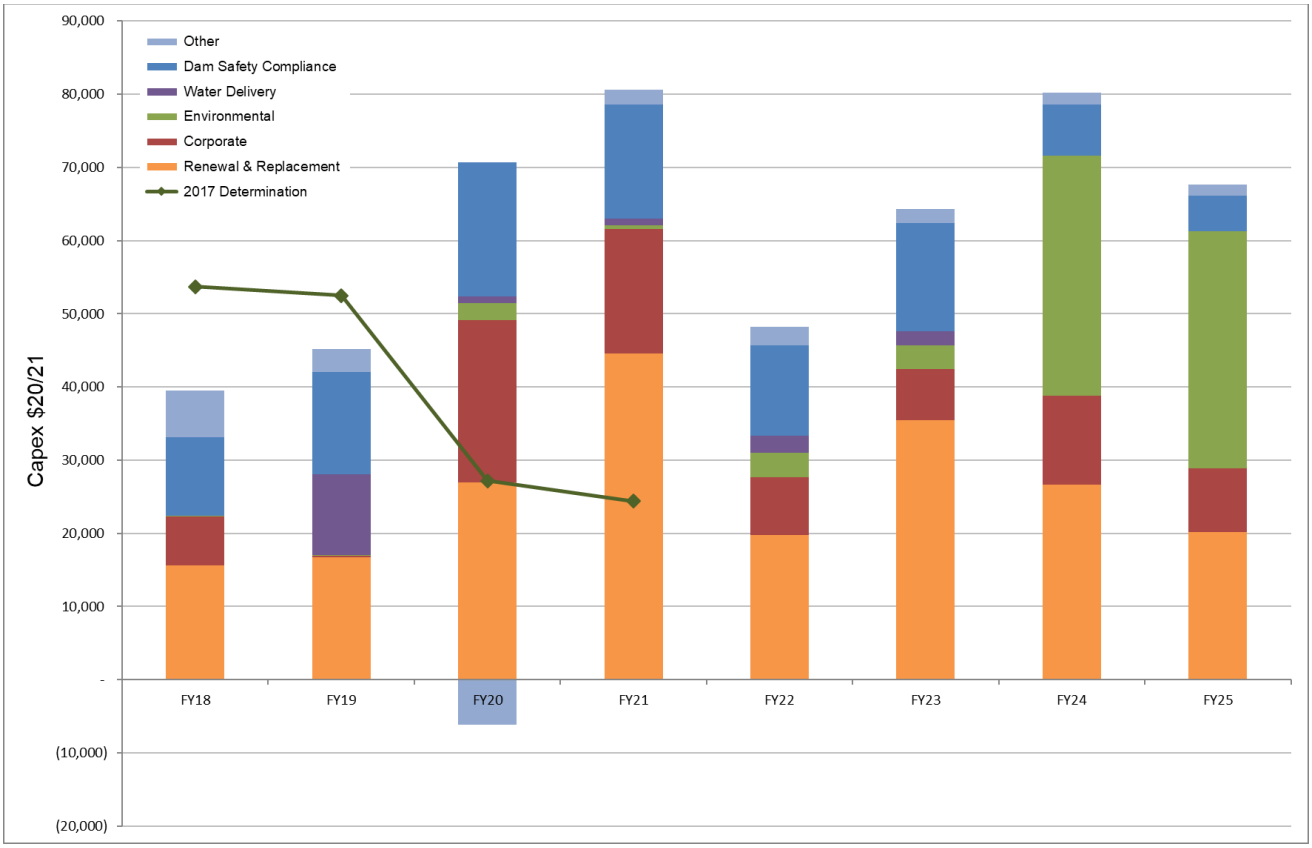
6.1. Summary

Below we provide a synopsis of the capital expenditure in the current and future determination periods.

6.1.1. Current determination period

Capital expenditure reported in the 2017 Determination period includes actuals for 2018, 2019 and 2020; forecast expenditure is included for 2021. WaterNSW is forecasting a total overspend against its 2017 IPART determination of $307m including drought response expenditure. Excluding drought response expenditure WaterNSW project to overspend its determination on capex by $72.1m. This is attributed to the allowance at the last determination being too low and for projects that were not foreseen at the time of the last submission.

Figure 6-1 Capital expenditure by activity excluding drought schemes FY18 to FY25 ($20/21)



Within the current determination period we recommend one significant adjustment to arrive at our recommended level of efficient capital expenditure:

i. We recommend a RAB adjustment of -$21.0m across FY19 to FY21 to reflect the change in capitalisation policy that occurred within the current period for which WaterNSW will have recouped via its operational expenditure allowance. This is to avoid customers paying twice for the same outcomes.

6.1.2. Future determination period

In the current determination period (excluding drought schemes) capital expenditure is an average of $57.4m per annum. WaterNSW has proposed to increase this by 13% to $65.0m average 2021-2025. There is an additional $105m capital expenditure proposed for drought response schemes (as directed by the government).

We recommend a number of specific scope and allocation adjustments to the proposed capital program of which the most significant are:

- Fish passage offset schemes - we recommend expenditure allowance for construction of two pilot schemes, to the satisfactory completion of DPI Fisheries and the development of robust business cases and progression of the detailed design for the remaining nine schemes in the program. We recommend an adjustment within the future period of $53.4m against WaterNSW October 20 SIR submission.
- Lake Cargelligo - $1.3m reduction compared to WaterNSW proposed expenditure in October 20, WaterNSW have identified additional cost savings since its submission.
- Corporate capital expenditure – we recommend a number of adjustments across each of WaterNSW determinations. In aggregate these adjustments result in a recommended reduction of $2.4m on the rural bulk water services four year determination period.
- Reallocation between valleys – we recommend applying an alternative approach to allocating expenditure between each of WaterNSW rural valleys. This moves away from RAB (as proposed by WaterNSW) to direct salary approach which we consider is consistent with how we propose it allocates corporate costs between its businesses and is more cost reflective. Total recommended expenditure at Rural Valleys level does not change.

We then recommend adjustments to reflect catch-up and continuing efficiency. Catch-up reflects the efficiency needed to be achieved over time to catch up with a frontier company. WaterNSW's rural water bulk water services capital expenditure program for the forward period is generally based on bottom up discreet and often unique projects. We have not been provided evidence of a formal approach to internally challenging the capital program expenditure at a whole of program level prior to submission. WaterNSW is making significant and ongoing improvements to its business processes which are opportunities to realise efficiencies and have not been reflected within its expenditure proposals. WaterNSW does not demonstrate strong links between their asset performance and asset health expectations and how it is able to manage its physical infrastructure to meet these expectations. Important business processes such as renewals, forecasting and procurement are improving. These initiatives and opportunities to become more efficient have not been demonstrably reflected within its expenditure proposals. As such we have recommended catch-up efficiencies across four specific areas:

i. Improvements to capital program development, optimisation and prioritisation
ii. Improvements to value engineering
iii. improvements in cost estimating and the management of contingencies,
iv. the impact of new procurement processes and the likely savings from more effective program management.

The continuing improvement element of efficiency relates to the increased productivity derived from process innovation and new systems and technology that all well performing businesses should achieve. Subsequent to a review undertaken by IPART we have applied a continuing efficiency of 0.7% per annum which is similar, but slightly lower than that proposed at our review of WaterNSW Greater Sydney review in 2019.

Our view of efficient capital expenditure by valley is summarised in Table 6-1 below.

Table 6-1 Efficient capital expenditure by valley

Valley	WaterNSW proposed expenditure FY22 to FY25 ($m)	Total recommended adjustment[24] FY22 to FY25 ($m)	Atkins recommended capital expenditure FY22 to FY25 ($m)	User Share FY22 to FY25 ($m)	Government share FY22 to FY25 ($m)
Border	27.11	-0.37	26.74	1.73	25.01
Gwydir	41.53	-22.18	19.35	12.02	7.33
Namoi	28.22	-6.35	21.87	17.55	4.32
Peel	26.66	-1.95	24.71	1.48	23.23
Lachlan	117.50	-30.15	87.35	33.69	53.65
Macquarie	33.96	-12.69	21.28	17.60	3.68
Murray	19.03	0.18	19.21	16.43	2.78
Murrumbidgee	35.39	-0.74	34.65	31.38	3.27
Lowbidgee	5.69	-0.33	5.36	5.05	0.31
North Coast	1.29	0.39	1.68	1.45	0.23
Hunter	9.08	2.55	11.64	10.28	1.36
South Coast	1.08	0.18	1.27	1.10	0.17
Fish River	16.42	-0.62	15.80	14.22	1.58
Total Capital Expenditure	**362.96**	**-72.08**	**290.88**	**163.95**	**126.93**

6.2. Methodology

In this section, we present the results of our review of the efficiency of WaterNSW's Rural Valleys capital expenditure.

We identify the major cost drivers and explain the variances in the current determination period expenditure against the 2017 Determination. We comment on the prudence and efficiency of operating expenditure in the 2017 Determination period which is used to inform our view of future efficiency.

We comment in Section 4 on the strategic management of the business and the structures and systems used to plan and manage expenditure.

We make an assessment of an efficient level of expenditure for the period 2021 to 2025 taking into account our discussions with WaterNSW, documents presented and subsequent answers to questions we raised.

WaterNSW's initial Pricing Proposal submitted in June 2020 outlined expenditure on the assumption of a one year Determination covering 2021-22[25] albeit with expenditure projections to 2024-25. In response to IPART's Issues Paper, WaterNSW provided an updated capital expenditure for 2022-24[26]. This included additional expenditure related to:

- Renewals and Replacement; and
- Dam Safety Compliance

Some other minor expenditure items were reduced.

We have based our assessment on this updated total capital expenditure.

[24] Includes scope, catch-up and continuing efficiency adjustments
[25] WaterNSW Pricing Proposal to the Independent Pricing and Regulatory Tribunal. Regulated prices for NSW Rural Bulk Water Services 1 July 2021 to 30 June 2022
[26] "Response to the 15 September 2020 IPART Issues Paper on the Review of WaterNSW Rural Bulk Water Prices from 1 July 2021". WaterNSW, 16 October 2020

We note that WaterNSW has added these expenditure items to the initial submission expenditure without rerunning its capitalised overhead allocation processes.

Our overall methodology is explained in Section 2. Corporate costs are covered separately in Section 8. In this section we examine the key drivers for variance in outturn expenditure and for the changes in forecast expenditure, focused on an evaluation of:

(i) Actual expenditure for financial years ending 2018 to 2020;

(ii) The current budget for year ending 2021; and

(iii) The projected costs for the financial years ending 2022 to 2025.

6.3. Overview

Within WaterNSW capital expenditure pricing submission there are two separately funded components: user funded, and NSW Government funded expenditure. The vast majority of Government funded expenditure in the 2017 and 2021 determination periods is for drought response schemes which have no user share. There are also some other expenditure items allocated to users and government in accordance with IPARTs rural water costs sharing principles[27] shown Table 6-2 below.

Table 6-2 IPART user share of expenditure by WaterNSW expenditure activity

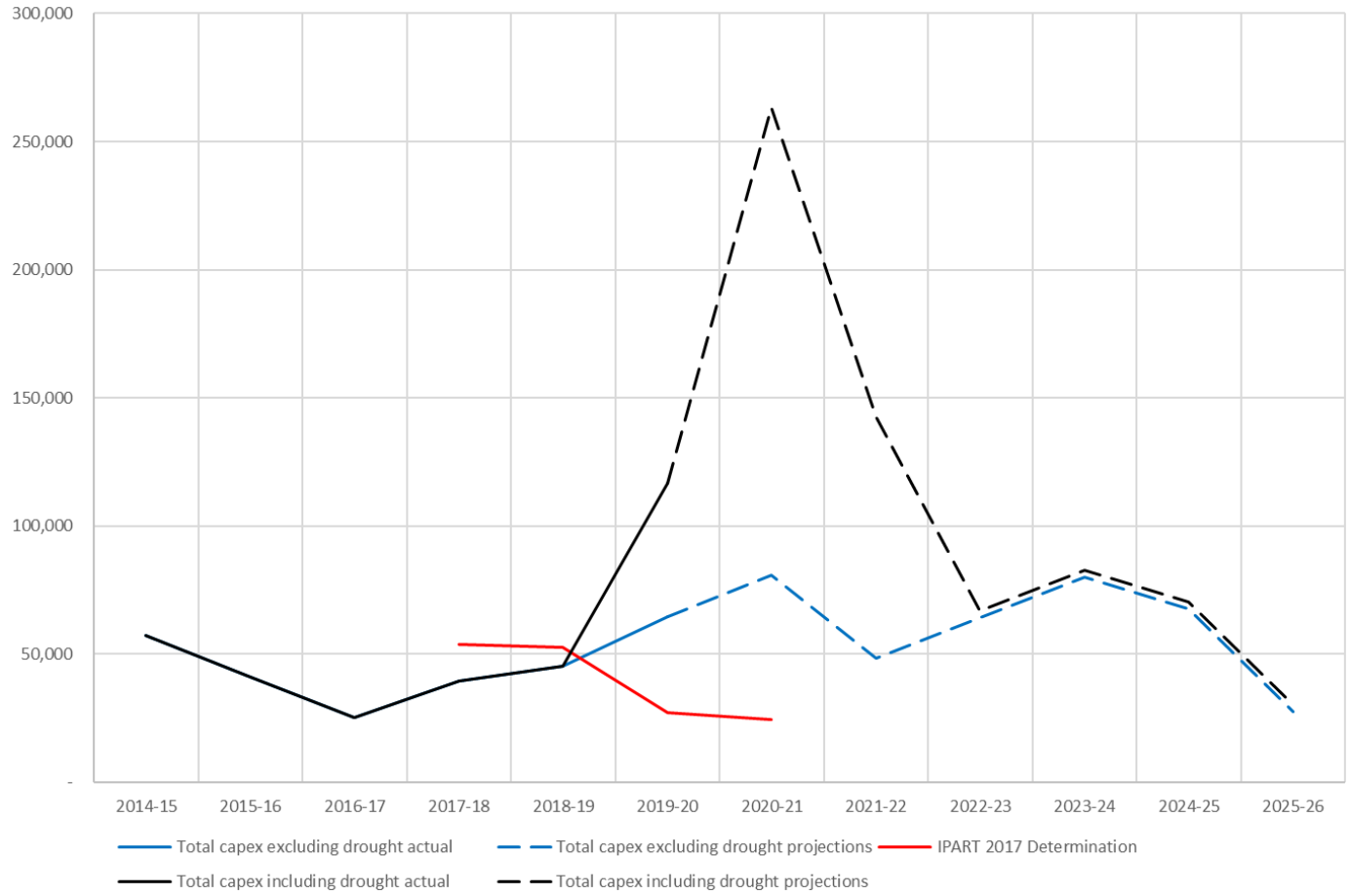
Activity	Historic user share &	Current % User share
Water Delivery & Other Operations	100.0%	95.0%
Flood Operations	50.0%	80.0%
Hydrometric Monitoring	90%	90%
Water Quality Monitoring	50.0%	80.0%
Corrective Maintenance	100.0%	95.0%
Routine Maintenance	100.0%	95.0%
Asset Management Planning	100.0%	95.0%
Dam Safety Compliance	50.0%	80.0%
Environmental Planning & Protection	50.0%	80.0%
Corporate Systems	100.0%	80.0%
Drought projects (3 dams)	N/A (0%)	N/A (0%)
Drought projects (other)	N/A (0%)	N/A (0%)
Renewals and Replacement	90.0%	95.0%
Dam safety compliance on pre 1997 capital projects	0%	0%
Structural and other enhancements	100%	100%
Customer support	100%	100%
Internal corporate projects	100.0%	80.0%

Source: IPARTs rural water costs sharing principles

In order to compare base capital expenditure appropriately between the determination periods and IPART allowances we have separated out capital expenditure for drought response in our analysis. Excluding drought response expenditure in the current determination period WaterNSW project to overspend on capex by 45.7% or $72.1m. We discuss the reasons for this variance in Section 6.4 below.

[27] Rural Water Cost Shares IPART, Feb 2019

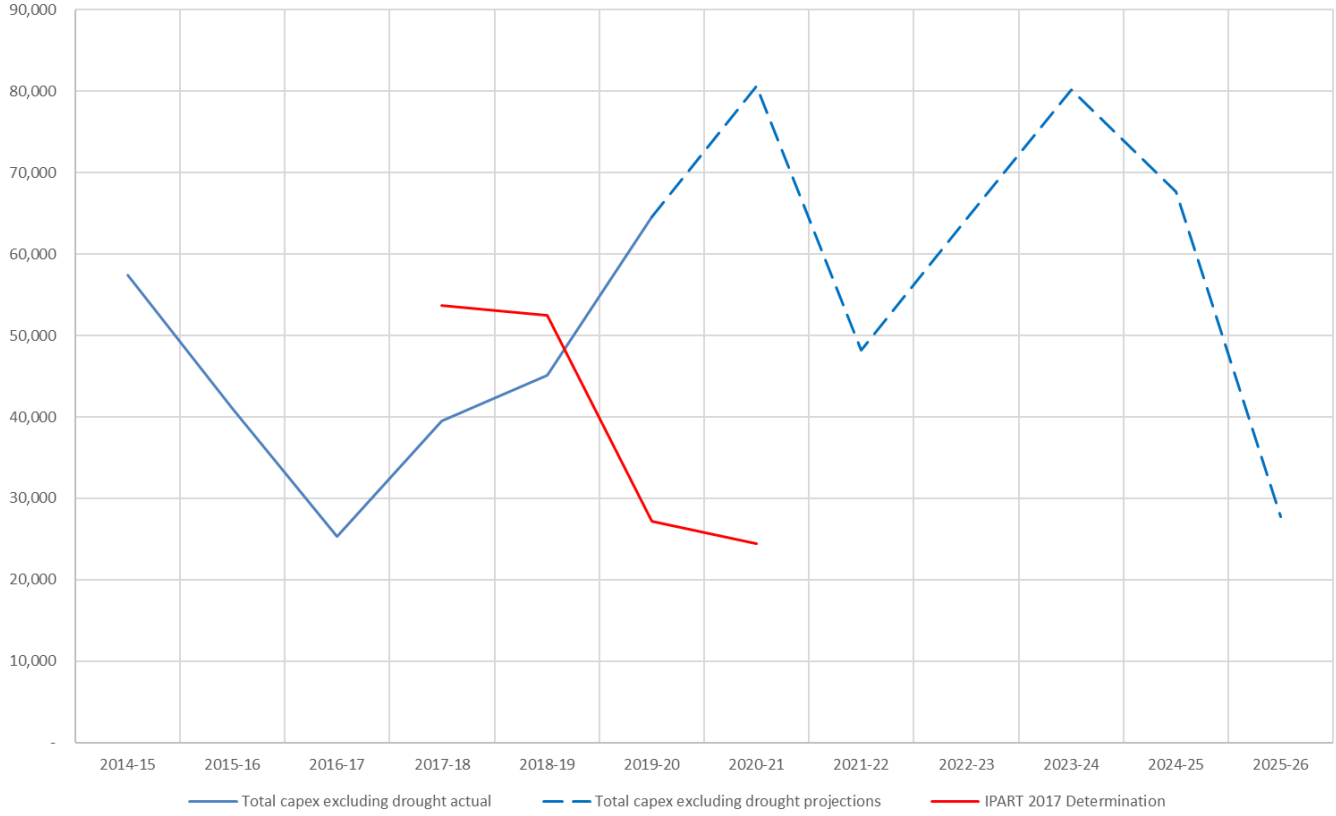
Figure 6-2 Total capital expenditure including drought schemes ($000)



Source: WaterNSW October 2020 SIR submission and Atkins analysis

Capital expenditure on the drought projects dwarfs base capital expenditure.

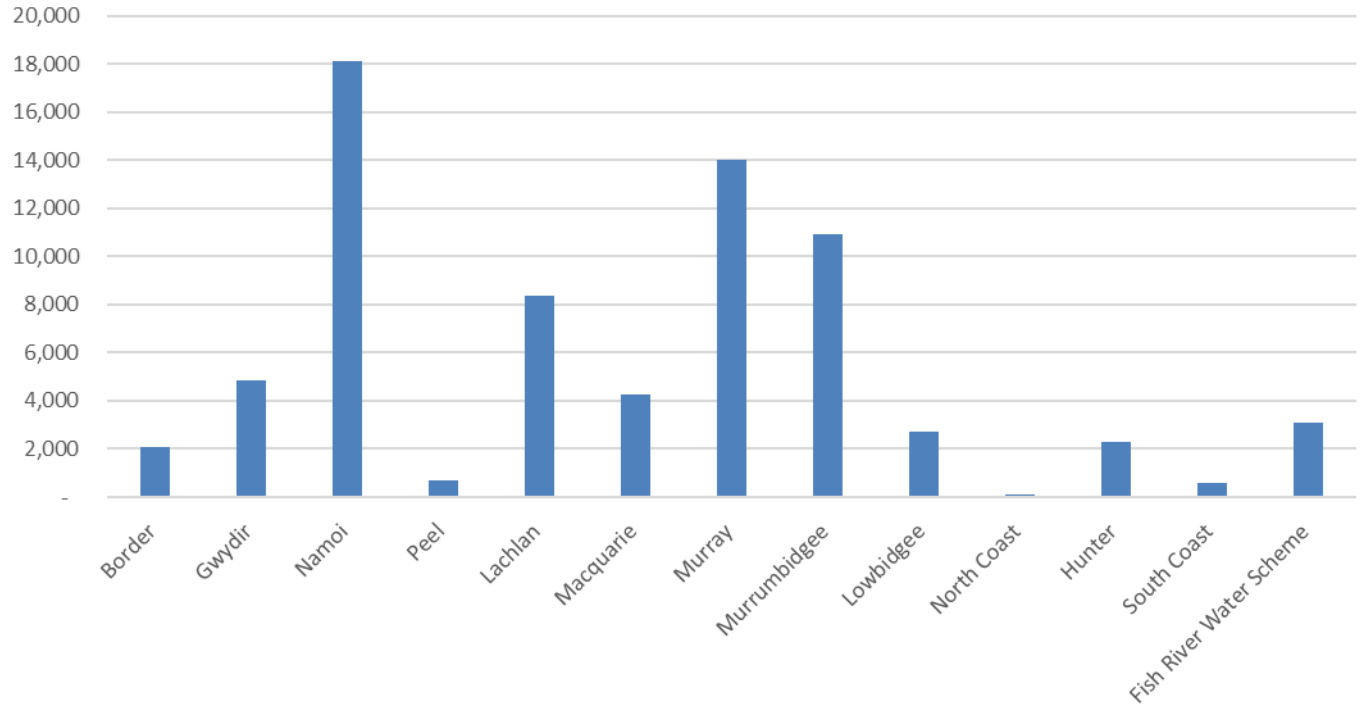
Figure 6-3 Total capital expenditure excluding drought schemes ($000)



Source: WaterNSW October 2020 SIR submission and Atkins analysis

We discuss the reasons for the variance on capex in Section 6.4.

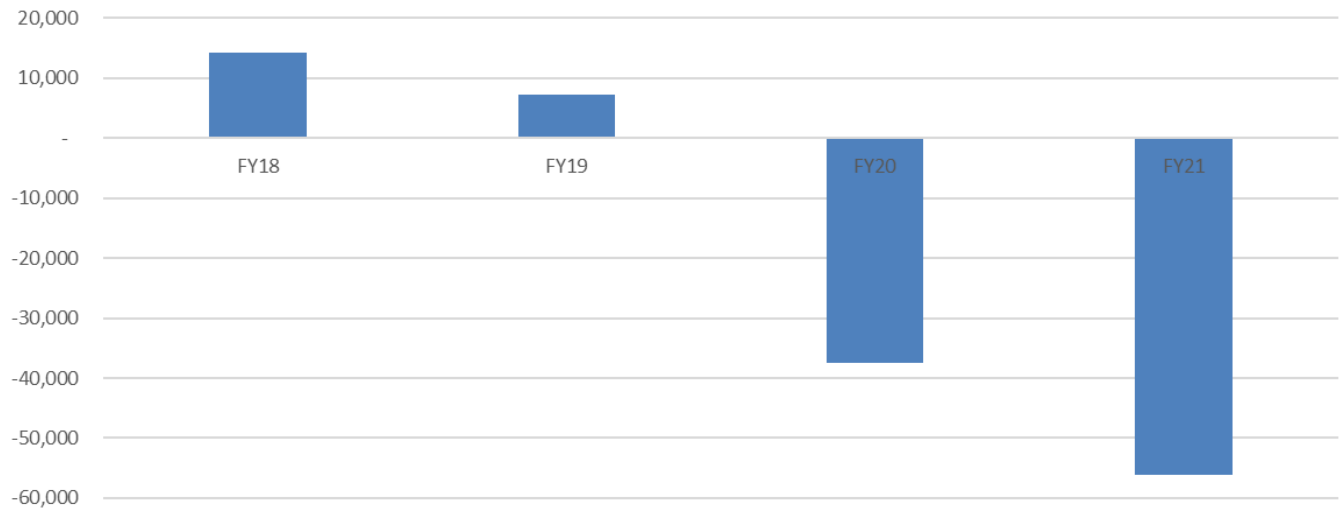
Figure 6-4 Capital expenditure variance against determination by valley, excluding drought schemes ($000)



Source: WaterNSW October 2020 SIR submission and Atkins analysis

Expenditure in almost all valleys (Figure 6-4) exceeded the 2017 regulatory allowance by IPART and in particular only in the last two years of the current determination period (Figure 6-5).

Figure 6-5 Capital expenditure variance against determination by year, excluding drought schemes ($000)

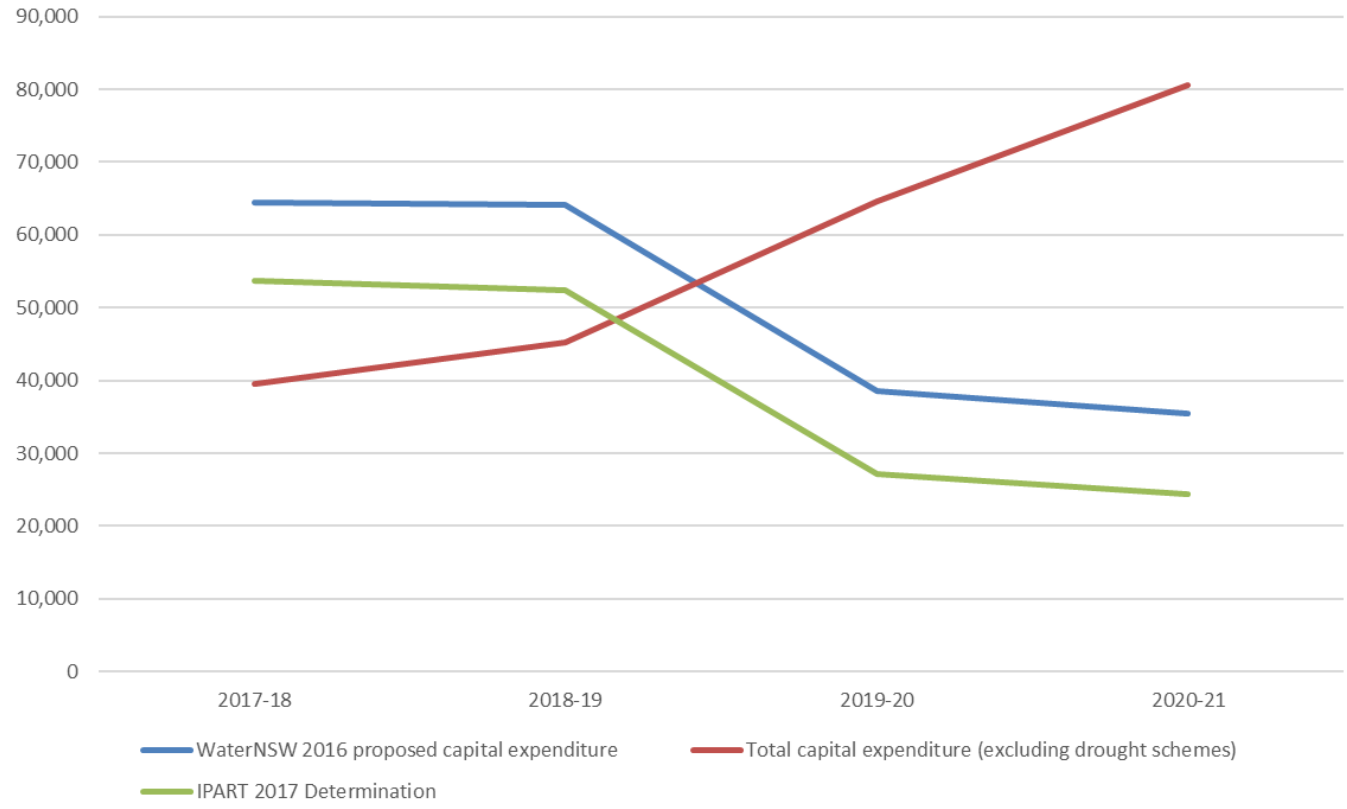


Source: WaterNSW October 2020 SIR submission and Atkins analysis

6.4. Explanation of the variance

In order to compare base capital expenditure appropriately between the determination periods and IPART allowances we have separated out capital expenditure for drought response in our analysis. Excluding drought response expenditure in the current determination period WaterNSW project to overspend on capex by $72.1m.

Figure 6-6 Capital expenditure in the 2017 determination period by year ($000)



Source: WaterNSW October 2020 SIR submission and Atkins analysis

The previous expenditure review to inform IPART's 2017 determination was undertaken by Aither who

> *recommended capital expenditure is less than that of WaterNSW forecast for the current determination period and that which has been proposed for the next determination period.*[28]

For the first two years of the 2017 determination period, WaterNSW had spent less on capex than the determination after this time capital expenditure has far exceeded the determination notwithstanding expenditure on drought schemes.

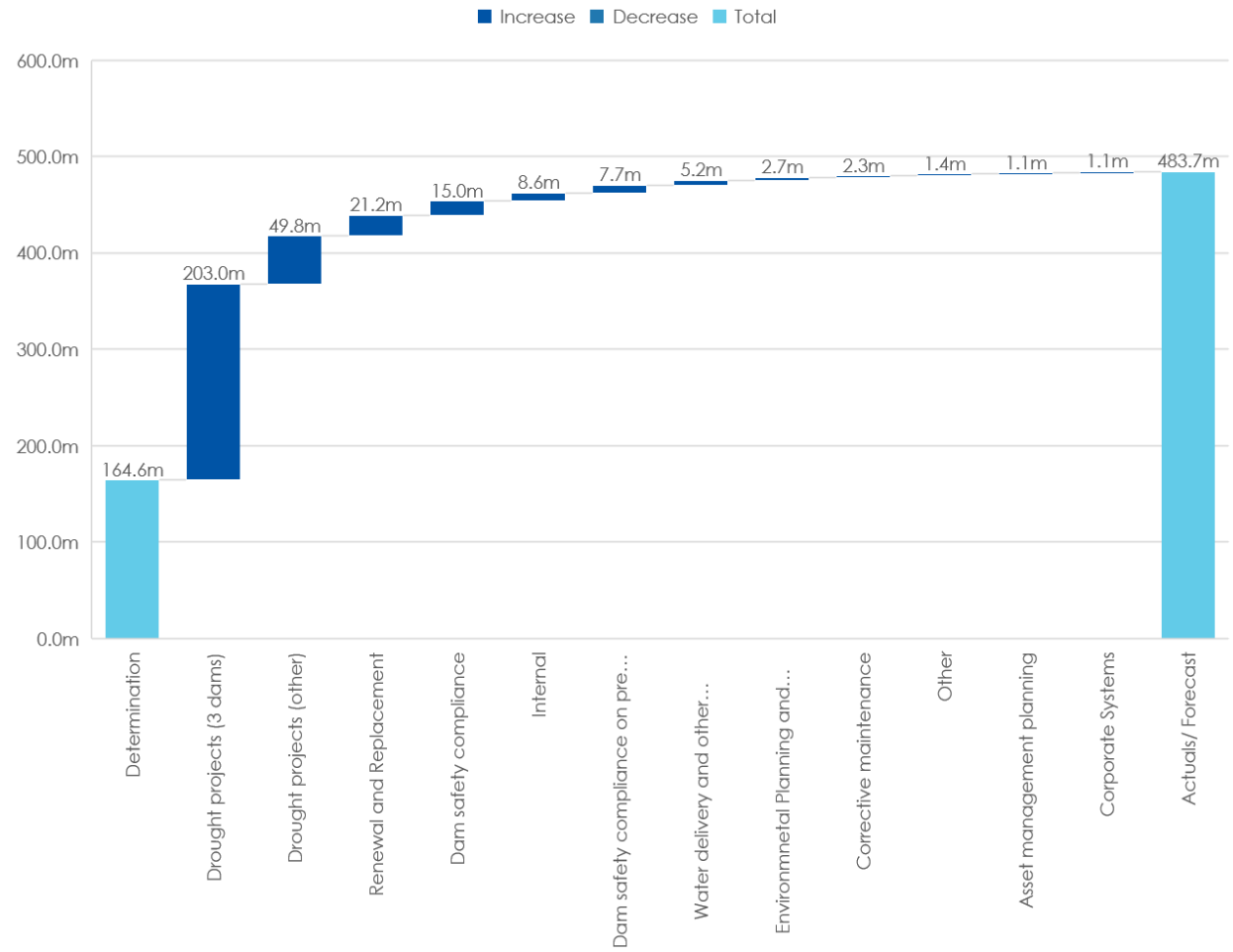
Renewals and replacement saw a variance of $21.2m (nominal) with some rephasing of certain expenditure items although WaterNSW was unable to meet IPART's 2017 determination allowance.

Dam Safety Compliance saw a variance of $15.0. WaterNSW identified the main drivers of this to be two new and emerging significant projects: Lake Cargelligo Dam Safety Upgrade ($1.8m) and Pamamaroo Inlet Regulator Long Term Works ($7.6m). This is thought to be due to recent increased visibility of dam safety risks being identified.

Other drivers for the variance include an increase above the determination for corporate and internal costs as shown in Figure 6-7 however other than this presentation we have not been provided a significant level of detail to understand any systemic reasons for the spending over the allowance.

[28] Aither WaterNSW rural bulk water services expenditure review Final Report, Feb 2017

Figure 6-7 Capital expenditure variances in the 2017 determination period



Source: WaterNSW Capex Variance Presentation

6.5. Allocation of operating costs

IPART requested us to

> *(c) Advise on the appropriateness of the cost allocation method used to allocate operating costs to capital projects.*

This is discussed in detail in Section 8.

6.6. Asset lives

IPART requested us to

> *(d) Review the appropriateness of the asset lives used to calculate regulatory depreciation (or 'return of capital') in the utility's pricing proposal and recommend adjustments where appropriate.*

Note that under the IPART model, projects are assigned to activity and activities are assigned asset lives.

WaterNSW identifies asset lives by activity rather than asset type in its Rural Valley's SIR and AIR submissions to IPART. There are some activities where there is no expenditure identified in the future determination period, as they are historical activity categories. Table 6-3 below summarises WaterNSW asset lives by activity where there is capital expenditure identified within the future determination period.

In our recent previous expenditure review for WaterNSW Greater Sydney determination we made recommendations against each significant asset type category. We recommended IT equipment to have an asset life of 7 years and Dams 200 years. Although the activities are not always directly comparable, we can

draw proxy lines to the broad asset types within each category. i.e. Corporate Systems is a proxy equivalent to IT and Dam Safety Compliance can be a proxy equivalent to Dams.

We consider that there is a greater need to split out expenditure by asset type rather than activity so that appropriate weightings can be applied to assets going forward. Currently there is limited information upon which to base recommendations on actual asset lives particularly on Dam Safety Compliance. We have not been provided details of the expected asset life of the 3 CSSI dams but consider that there ought to be regulatory alignment between any new and existing dams and details of this ought to be considered prior to making any significant changes to Dam Safety Compliance.

We recommend increasing Corporate Systems from 6 to 7 years. We suggest keeping the other asset life categories the same as proposed by WaterNSW, as summarised below.

Table 6-3 Asset lives by activity – Atkins recommendations

Activity with capital expenditure identified in the future determination period	WaterNSW Asset Life	Atkins recommended Asset Life
Water Delivery & Other Operations	6	6
Corrective Maintenance	80	80
Routine Maintenance	80	80
Asset Management Planning	80	80
Dam Safety Compliance	100	100
Environmental Planning & Protection	80	80
Corporate Systems	6	7
Renewals and Replacement	80	80

Source: WaterNSW October 2020 SIR submission and Atkins analysis

6.7. Efficiency of actual capital expenditure over the 2017 determination period

The consultant must review the efficiency of actual and forecast capital expenditure for the 2017 determination period and 2021-22. In undertaking this task, the consultant must for each valley:

a) Report and comment on actual and forecast capital expenditure for each year, including the variations in actual capital expenditure over the 2017 determination period from what was allowed in the 2017 determination.

b) Provide recommendations on the efficient level of the utility's capital expenditure over the 2017 determination period required to supply the regulated monopoly services, and provide evidence and reasoning to support any difference between the utility's actual level of capital expenditure and the consultant's recommendations on the efficient level of capital expenditure for this period.

6.7.1. Renewals and Replacement

Renewals and replacement saw a variance of $21.2m (nominal) between the IPART 2017 determination allowance and actual expenditure. A significant proportion of this was for the replacement of the *Burrinjuck Dam Cableway Upgrade* ($10.6m capex) in Murrumbidgee valley "that was not proposed at the last pricing submission".

We discuss WaterNSW's business processes and approach to asset management in Section 4.5 above. In the following sections we discuss specific capital projects identified for as renewals and replacement it the current determination period.

6.7.1.1. Maintain Capability Program (Lachlan Valley)

The Lachlan Maintain Capability Program (MCP) was initiated in 2017 as part of an overall business renewals program. Full details of the project review are provided in Appendix C.

WaterNSW's Rural Capability Maintenance register identified elements at each of the sites that required further assessment for defects and obvious workplace, health and safety and/or operational issues. Based on the information recorded in the register, Aurecon performed a preliminary assessment of potential projects to validate the issues raised, to perform asset condition assessment and identify potential remediation options. Workshops were held to assess asset component criticality and prioritisation was performed based on stakeholder consensus and using output from WaterNSW's PowerPlan planning tool. Projects to address the issues raised are now in the process of being implemented

The preferred options for each project are detailed in WaterNSW's MCP Rural Tranche 2 Asset Upgrades Final Business Case (D2019/32867). This business case included MCP projects for all of WaterNSW's rural valleys. The expenditure requested in the business case totalled $33.2 million, with the Lachlan Valley making up $7.5 million (22.6%) of the total.

However, a reduced scope of works from the Aurecon list included in the Final Business Case has progressed, together with a reduced project budget. The reduced scope project total was reported by WaterNSW for this project to be in the region of $6.1 million. However, we note that neither of the two project totals that have been presented aligns with the capital expenditure included in WaterNSW's SIR, which totals $5.256 million over two years (2019/20 and 2020/21).

WaterNSW provided the Lachlan Project Change Request document (September 2020) which details the changes to the project cost and items that have been deferred as part of this process from the projects included in the Final Business Case. This document confirmed the list of projects that have been included in the proposed expenditure, with the adjusted MCP budget for Lachlan totalling $6.05 million. This is comprised of a project budget of $5.1 million and corporate overheads of $0.95 million.

WaterNSW also explained that there is no direct linkage between the 2017 determination and the current Lachlan MCP Projects comparison, as provisions were made for the 2017 renewals budget numbers. As a result, it is not possible to reconcile the Lachlan MCP projects proposed in the 2017 determination with the projects that were included in the previous pricing submission. This means that it is not possible to provide any comments on variance from the 2017 determination

However, as the renewals projects have been developed through an external consultancy and as the scope has been reduced from the list of projects that was included in the Final Business Case, we do not consider that there is any scope to make any adjustments to the project.

6.7.1.2. Southern Coatings Project

The detailed Southern Coating Project review is included in Appendix C.

Condition assessment reports were completed for structures in the Southern Valleys, with types of structures inspected including weir superstructures, cranes, working platforms, handrails, valves, and weir/dam gates. The remedial actions from the reports recommended that the protective coatings on affected structures be reinstated, as the underlying steel work of those assets was showing signs of visible corrosion and wear. Such rectification (coating works) involves both surface preparation (sand blasting) and recoating.

Based on the outcomes from the assessment reports, a final business case was prepared to request funding to complete work on a number of structures in Southern NSW, predominantly for assets in the Murray and Murrumbidgee Valleys. The Final Business Case identified the preferred option for repainting a tranche of assets within the Southern Valleys and requested funding of $12.266 million of the $19 million coatings budget for execution of the works, to undertake the Southern NSW Coatings Program.

The objectives of the project were to reinstate key WaterNSW assets to their original condition, by undertaking a remediation of superstructure and gates. These works are expected to be undertaken once in every 25-year life cycle and they require a large capital investment. The yearly patch repair works remain an operating expenditure function.

The project was initially earmarked to be procured through WaterNSW's Maintain Capability Program (MCP) Panel. However, due to the nature of the works and requirement of specialist contractors, WaterNSW identified that an Expression of Interest (EOI) approach would obtain a better value for money outcome. Based on qualifying criteria, WaterNSW identified seven companies to approach to submit EOIs. Four contractors were assessed as having the financial capacity/capability to proceed to the RFT stage.

Similar to most projects delivered by Water NSW, multiple evaluation criteria were considered in assessing tenders. The Evaluation Committee also used both internal and external advisors to provide input on specific issues requiring clarification or specialist understanding. WaterNSW has a number of similar sites across the state and has previous cost data for coatings projects on its structures which provided comparators to the cost estimates provided by the tendering contractors to be assessed.

The preferred contractor was engaged under a lump sum supply and install contract inclusive of an agreed schedule of rates and provisional items, to cover several potential risks to works.

The Business Case proposed that all the works included in the project would be completed by December 2020. However, although the majority of the site-specific coating projects within the overall Southern Coatings program are expected to have been completed by this date, a small number will not be completed until 2021.

WaterNSW expects to deliver the Southern Coatings program approximately $0.5 million under budget.

As the project is nearing completion, we do not consider that any adjustments are required.

6.7.1.3. Burrinjuck Dam Cableway Upgrade (Murrumbidgee valley)

The detailed Southern Coating Project review is included in Appendix C.

This project is aimed to replace the cableway over the Burrinjuck Dam. The cableway ensures that periodic maintenance of the dam wall and spillway can be undertaken efficiently and without the need to bring cranes to the remote site. The cableway is a state recognised 'heritage asset' and so options were limited to replace the cableway in its entirety.

Expenditure for this project was not explicitly identified within the 2017 pricing submission as a discreet capital expenditure line item. Rather it was reportedly included within the Murrumbidgee valley 'Maintaining Capability' expenditure bucket. At that time WaterNSW inform us that $4.5m in nominal costs were included for the refurbishment of the cableway upgrade. Forecast expenditure in the current period is $11.3m this compares to $8m identified in the Final Business Case in September 2017. The total Approval to Spend (ATS) was then increased to $9.566m sometime between September 2017 and June 2019; we have not been provided details for this increase. Nevertheless, there was a project change request initiation in June 2019 subsequent to the major contractor on the project going into receivership. There were some sunk costs and after retendering the project higher tenders were received. This led to the overall increase in costs for the project as proposed in the SIR submitted in June 2020 to $11.3m.

The additional sunk costs variance is identified as:

- Additional Internal ATS - [redacted] – sunk costs to date due to the requirement to manage the termination of the contractor, plus management of the extended Execution period.
- Additional External ATS - [redacted] plus [redacted]

In its October 2020 SIR submission revised its total capital expenditure for this project to $8.2m (breakdown shown in Table 6-4 which we assume is to [redacted] costs which have now been factored into its expenditure proposals. As such we do not propose any additional adjustments over and above those WaterNSW already made between its June and October 2020 submissions.

Table 6-4 Burrinjuck Dam Cableway Upgrade capital expenditure in the current determination period (000k $20/21)

Project line item name	Activity	FY18	FY19	FY20	FY21	Total
BRJK Dam Cableway Upgrade	Renewal and replacement	[redacted]				
Burrinjuck Dam Cableway Upgrade	Renewal and replacement					
MB320003.12 BRJK Dam Cableway Upgrade	Renewal and replacement					
MB320003.15 BRJK Dam Cableway Upgrade	Renewal and replacement					
MB320047.12 Burrinjuck Dam Cableway Upgrade	Renewal and replacement					
MB320047.13 Burrinjuck Dam Cableway Upgrade	Renewal and replacement					
MB320047.15 Burrinjuck Dam Cableway Upgrade	Renewal and replacement					

Project line item name	Activity	FY18	FY19	FY20	FY21	Total
Total proposed expenditure June 2020		[redacted]				

Source: WaterNSW October 2020 SIR submission and Atkins analysis

6.7.1.4. Fish River Pipeline Renewal 2018

The Fish River water supply scheme on the NSW Central Tablelands is unique as the only water supply scheme in eastern Australia to transfer western flowing water east of the Great Dividing Range, mostly by gravity. The scheme draws water from Oberon Dam and Duckmaloi Weir and includes 236 kilometres of pipelines and a tunnel under the Great Dividing Range.

Today the scheme provides water to Wallerawang and Mount Piper power stations, to Oberon and Lithgow councils for domestic and industry use, and to about 230 properties along its route. It also supplements town supplies in the upper Blue Mountains. The scheme was built in three stages:

i. Stage 1 (1943 to 1949)

- A slab and buttress dam is built on the Fish River just south of Oberon, constructed to a height of 21.3 metres but with foundations and buttress bases to allow later raising of the dam wall.
- A 105-kilometre pipeline from Oberon Dam through Wallerawang and Portland to the shale oil works at Glen Davis.
- A 15-kilometre branch pipeline from Wallerawang to Lithgow.
- A pump station and water main to Oberon town reservoir.

ii. Stage 2 (1954 to 1959)

- Raising Oberon Dam wall and outlet tower from 21.3 metres to its full design height of 33.5 metres and building a ski jump spillway into the dam wall.
- A new pipeline from Oberon to Wallerawang to service the new power station.
- A break-pressure tank near Duckmaloi to combine flows from Oberon and the future Duckmaloi Weir and to control pressure in downstream pipeline.
- A small dam at Rydal to ensure reliable supply to the power stations.
- A small reservoir at Lidsdale as an emergency supply and a fire-fighting source for the power station.
- A connection for the future pipeline to the Blue Mountains.

iii. Stage 3 (1961 to 1964)

- A 1.1-kilometre long tunnel at Hampton under the Great Dividing Range, 44 metres under the surface at the range's highest point.
- A 40-kilometre long pipeline connecting the scheme to Cascade Dams at Katoomba.
- A small weir on the Duckmaloi River.

The key pipeline replacement project executed in the current Determination Period (FY18-21) was to replace a 2.8km length of DN914 pipe north of Duckmaloi. The objectives of the project were:

- WHS Risk Reduction - risks associated with hazardous methodology for joint repairs on the pipeline
- Increase service reliability - significantly reduced risks of outages to customers (Sydney Water and Energy Australia)
- Reduce risk of property damage from pipeline breaks

Detailed design and geotechnical investigation undertaken by Department of Public Works. Procurement for Construction was undertaken in September 2016 and the project was completed in FY20. In terms of the expenditure in the current determination period it appears to have been prudent.

6.7.2. Dam Safety Compliance

Asset base

WaterNSW owns and operates 20 declared dams within its rural valleys area as well as 21 in the Greater Sydney area and 300 river structures across the state, these are shown in Figure 6-8 .

Figure 6-8 WaterNSW dams and weirs map

WaterNSW's Rural Valleys all have at least one dam apart from Lowbidgee. The Dams and their respective valleys are show in Table 6-5 below.

Table 6-5 Rural valley dams by valley

Dam Name	Valley
Pindari Dam	Border
Oberon Dam	Fish River
Copeton Dam	Gwydir
Glenbawn Dam	Hunter
Glennies Creek Dam	Hunter
Lostock Dam	Hunter
Carcoar Dam	Lachlan
Wyangala Dam	Lachlan
Burrendong Dam	Macquarie
Windamere Dam	Macquarie
Menindee Lakes	Murray
Blowering Dam	Murrumbidgee
Burrinjuck Dam	Murrumbidgee
Keepit Dam	Namoi
Split Rock Dam	Namoi
Toonumbar Dam	North coast
Chaffey Dam	Peel
Brogo Dam	South Coast

The objectives of WaterNSW Dam Safety compliance program are to:

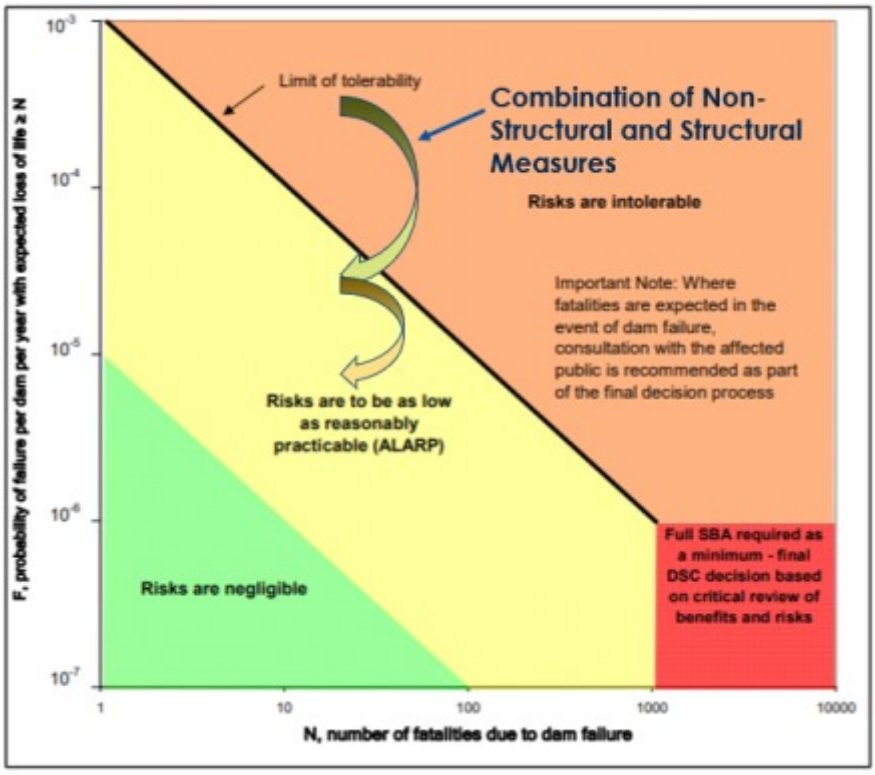
- comply with regulatory and legal requirements;
- protect WaterNSW from charges of negligence in the case of dam failure;
- provide asset stewardship to WaterNSW's dam assets; and
- Protect the public from potential dam failures

Legislation and regulations

Until 2019 the safety of NSW dams has been administered under the Dams Safety Act 1978 and by The NSW Dam Safety Committee (DSC) as the primary regulatory body for dam safety in NSW. The Dams Safety Act 2015 required the establishment of a new regulatory body, Dams Safety NSW, and a new set of regulations, which was passed as the Dam Safety Regulation 2019. Dams Safety NSW makes decisions on how the regulation and standards of dam safety are administered. It has authority for auditing declared dam owners' policies, processes and procedures to check compliance with the requirements of the Dams Safety Regulation 2019. Dams Safety NSW can enforce the regulation through a range of new penalties.

At the last price review and within the 2017 determination period expenditure has been largely driven by ensuring compliance with the previous risk framework of managing risks to be as low as reasonably practicable (ALARP).

Figure 6-9 WaterNSW ALARP Risk management policy framework for Dam safety



Source: ALARP Risk management policy framework for Dam safety

New regulatory requirements of the Dam Safety Regulation 2019 came into force on 1 November 2019 with a two-year transition period granted for owners of declared dams to implement the new regulatory requirements. and Dam Safety Regulation 2019. WaterNSW undertook a detailed review of the impacts resulting from the changes to the regulations. The impacts are tactical and strategic. Dam safety reviews previously were required every 10 to 15 years, but going forward will be a combination of 5 yearly risk reviews and 15 yearly safety reviews.

The PRA was previously classified as operational expenses but this was inconsistent with other similar risk reviews and inspections. WaterNSW has therefore capitalised all expenditure for this work in 2019 for all costs up to this date and will be applied in the future.

Asset class strategy

WaterNSW Dam Safety Management System (DSMS) is the overarching system that consists of a framework, systematic and comprehensive processes, resourcing, methodology, processes and tools to ensure that dam safety risks are properly managed and integrated within WaterNSW's overall asset management and other structural arrangements.

The DSMS was endorsed by the previous regulator NSW Dam Safety Committee in November 2017 and has been used as the basis for the current program of work in FY21 and into FY22. It has yet to be updated for the new Regulations.

In 2002 and 2012, WaterNSW (then State Water) carried out a Portfolio Risk Assessment (PRA) on its portfolio of rural dams. The initial PRA of rural dams in 2002 provided a systematic review of WaterNSW's rural dams with a confident understanding of the risk profile. The outcome was a risk mitigation program by undertaking staged dam safety upgrades which are prioritised to mitigate any intolerable risks. WaterNSW is now at the end of a 10 year ~$320 M capital works 'Dam Safety' program, which has reduced the societal risks at the 7 highest risk rural dams to a tolerable level.

Expenditure

Within the 2017 determination period WaterNSW are forecasting to spend $58.5m capex on its Dam Safety Compliance program. This comprises $42.9m of dam safety capital expenditure attributed to dam safety compliance on pre 1997 capital projects in FY18, FY19 and FY20 and $15.5m on dam safety compliance (>1997) in FY21. The majority (62%) of dam safety compliance capex in the current period has been on the Keepit Dam Safety Upgrades 2 project ($36.5m).

Dam safety expenditure cost sharing

In its pricing submission WaterNSW separates out Dam Safety Compliance expenditure into two separate activity lines: Dam safety compliance on pre 1997 capital projects and Dam Safety Compliance.

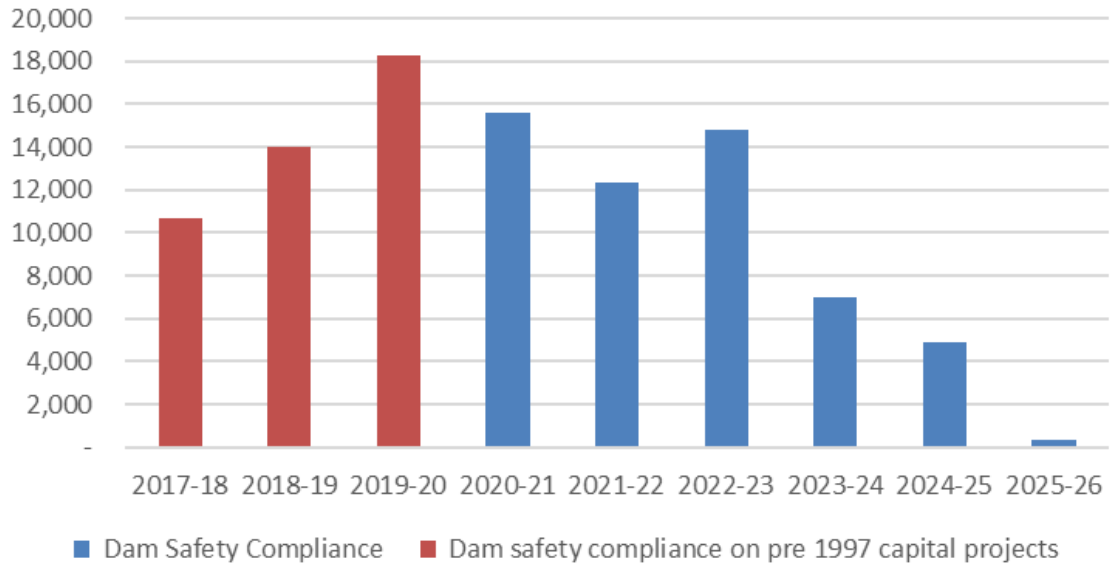
In IPART's 2019 review of rural water cost sharing arrangements29 it is discussed that:

> *In our 2001 review of rural bulk water prices, we [IPART] determined that legacy costs would be those current and future costs attributable to pre-1997 activities and/or the cost of bringing infrastructure to prevailing 1997 standards. The decision to classify legacy costs this way acknowledged that historical activity had meant that dam infrastructure was not up to the safety standards applying when we took on responsibility for setting prices in 1997. Therefore, to set forward-looking prices, we did not include the 'catch-up' expenditure required to reach the prevailing standards and regulations. These costs were defined as legacy costs, as those standards should already have been met. That is, expenditure required to reach standards established at or before 1 July 1997 would be categorised as legacy costs, but expenditure required to maintain those standards, or to meet standards established after that time, would not form part of legacy costs and would be subject to our cost sharing framework. This ensures that rural water customers only pay the share of efficient, forward-looking costs that corresponds to their use of the regulated services.*

Until FY21 all expenditure on Dam safety compliance has been categorised as <1997 compliance. This expenditure is funded by the NSW government; there is no user share. From FY21 onwards WaterNSW have categorised all Dam safety compliance expenditure as having met the 1997 standards and as a result 80% of this expenditure is funded through user charges This is shown in Figure 6-10.

[29] IPART Final Report on rural water costs shares, Feb 2019

Figure 6-10 WaterNSW Dam Safety Compliance capital expenditure (Oct-20 SIR submission)



The key document which underpins on which activity line this expenditure sits is the NSW Dam Safety Committee Annual Report 2007/2008.

> *"The attached extract from the 2007/08 Dam Safety Committee Annual Report identified defects against eight of WaterNSW's 21 Dams. As per the report, deficiencies were at that stage identified against eight of WaterNSW's dams. Of these, 4 dams (Chaffey, Keepit, Hume and Blowering) had dam safety deficiencies that were identified prior to the 1997 'line in the sand' (aligned with the date of the first IPART review of Rural Bulk Water Prices).*
>
> *The remaining 4 dams had deficiencies that were identified after this date (Burrendong, Copeton, Split Rock, and Wyangala) had deficiencies identified after that date. These deficiencies were based predominantly on improved flood modelling. However, given that the Dam Safety Regulations had remained largely unchanged from 1997 given that they were under the same 1978 act, it was agreed with NSW Treasury that the upgrades on these structures could be funded through the same 100% government funded IPART activity.*
>
> *Given the scale of the program, there were multiple discussions held between the former State Water, IPART, NSW Treasury and the Dam Safety Committee to form consensus on appropriate timeframes to address these deficiencies. Consequently, it is difficult to summarise how the program changed over time, however it can be classified into two broad 'phases'. Phase 1 comprised of construction works on Blowering, Burrendong, Chaffey, Copeton, Keepit, Split Rock and Wyangala, and was completed progressively between 2008 and 2015. Following Phase 1 no further works were deemed necessary on Blowering and Split Rock. Phase 2 was progressively implemented between 2013 and 2020, and should acceptably address Chaffey, Burrendong and Keepit (noting that Chaffey was addressed through the Chaffey Augmentation Project). Remaining deficiencies at Wyangala are expected to be addressed through the Dam Raising Project. WaterNSW has included in our forecast further works on Copeton Dam, as included in our FY22 onwards forecast.*

We do not have an opinion either way on whether this expenditure should sit within the *<1997 dam safety compliance* activity (0% user share) or within the *dam safety compliance* activity (80% user share). We have requested the evidence to demonstrate that all of projects required to meet the 1997 "line in the sand" have been completed. As WaterNSW have mentioned that further works on Copeton Dam are to be required to meet the <1997 standards we have made an adjustment for this in our capital expenditure tables.

[we have asked WaterNSW to confirm whether there should be any expenditure in the future period identified as >1997 e.g. Copeton Dam, from their response to us it is unclear whether this expenditure ought to be reallocated].

6.7.2.1. KeepIt Dam Safety Upgrade Stage 2 – Dam Safety Compliance

The Keepit Dam Safety upgrade stage 2 was comprised of three packages required to reduce the risk of failure of the concrete dam to tolerable levels complying with the then NSW Dam Safety Committee and ANCOLD.

The two packages progressed were electrical works (costing $2.5M) and the installation of cable post-tensioned anchors in the dam wall and spillway.

The total spend for this project in the current determination period of FY2017-2020 was $41.9M, with the project continuing past June 2020 to FY 2021 projected to cost another $3.2M, bringing the total actual and projected costs to $45.1M. The draft business case estimate for the Phase 2 – Post-tension works (in 2016) was $32.4M for the post-tensioning anchor works, later approved by the WaterNSW Board at $33.1M in October 2016. It is not clear if the total $45.1M in the SIR includes the $2.5M electrical relocation works package.

The spend increase of $12M was explained by WaterNSW to be due to site conditions experienced during the works, including substantial deep cracking on the dam spillway monolith. These conditions led to detailed investigations, structural analysis and modifications of the design and additional strengthening works, in order to ensure that the design solution would not increase the residual risk status of the dam.

We consider that a prudent solution was selected and implemented based on a review process including the independent panel of experts which ensured its reasonableness and efficiency, making use of industry best practice, and that the modifications and increases in scope were essential for reaching the overall project objectives and benefits.

As only part of the increase of $12M is forecast for expenditure after the current determination period (with the majority of works already completed as of December 2020), we have not recommended any adjustments relating to this project for the expenditure allowance for future determination period.

The project has substantially achieved the outcome measure of reducing the risk presented by the dam.

The NSW Government contributed to the Keepit Dam Safety Upgrade, with the result that the Namoi valley was the only valley where users did not provide the most significant contribution to capital expenditure. Therefore, the total capital expenditure indicated in the SIR submission for this project (Keepit Safety Upgrade stage 2 works) is $45.1M. According to the IPART cost-sharing rules, the Government contribution would have been 100% as this project was classed as pre-1997 dam safety compliance (as one of 4 dams with dam safety deficiencies identified prior to the 1997 line in the sand).

6.7.2.2. Lake Cargelligo - Dam Safety Compliance current and future period

Apart from the design and planning fees of $119k in FY2020, all the capital expenditure for Lake Cargelligo is forecast for the future determination period so a summary of the project is given in the forecast overview in section 6.8 below.

6.7.3. Dams and other drought related expenditure

In response to the current drought in the rural valleys and within the current 2017 determination period WaterNSW was requested by the NSW Government to implement several immediate drought relief projects. WaterNSW was further directed by the NSW Government under section 20P of the State Owned Corporations Act 1989 (SOC Act) to progress three Critical State Significant Infrastructure (CSSI) Regional Priority Dams (The 3 Dams) to provide longer term drought resilience and additional water storage capacity into the future.

The immediate drought relief projects that were identified within the current determination period are:

- Burrendong Deep Storage Access
- Drought Response – Aeration
- Peel Drought Relief Works 2B (Dungowan temporary Weir and Pipeline)
- Narromine to Nyngan pipeline
- Split Rock Deep Water Storage
- Chaffey Dam DSA Investigation
- Warren Weir Raising

The 3 CSSI Dams projects are:

- Wyangala Dam Wall Raising
- Dungowan Dam
- Mole River Dam

Within the current determination period WaterNSW has been directed to:

i. develop final business cases for Wyangala Dam, Dungowan Dam and Mole River Dam projects for investment decisions under the Infrastructure NSW Infrastructure Investor Assurance Framework by July 2021;

ii. deliver some pre-construction activities for Wyangala Dam, Dungowan Dam so they are ready for construction to commence by October 2021; and

iii. deliver an early works package including the replacement of the existing Dungowan Dam to Calala Water Treatment plant pipeline and relocation of the Wyangala Reflections Holiday Park

We requested business cases for the Dams projects in order to understand the expenditure from an efficiency perspective. We were informed by WaterNSW that

"The final version of this document [Wyangala Dam business case for the Infrastructure NSW gateway approval] dated 7th September has been received by WaterNSW, however it is "Sensitive NSW cabinet", hence our unwillingness to release it at this time, until it and the business case have been reviewed by ERC and cabinet.

At present only one [dam project] has been through the INSW gateway review process (Wyangala) and is currently awaiting cabinet approval. As such the document is cabinet-in-confidence. This will also have a bearing on the request for the request for documents pertaining to the INSW gateway review.

Dungowan SBC is still in draft and has not been through any review process as yet. It too will be cabinet-in-confidence as it will require cabinet sign off before progressing further.

Mole River SBC doesn't yet exist. The work we are undertaking will result in a business case being produced next year.

Government directions previously provided show evidence of Government support for WaterNSW to undertake the business cases and preliminary planning for these investments.

The $245m currently approved by the Board is debt funded. Funding arrangements for the full delivery of the projects have yet to be determined and are subject to cabinet approval."

We are unable to comment on the proposed expenditure for these projects as we have not been provided any information to make any assessment from an efficiency perspective.

Portfolio Delivery Management Partner

WaterNSW as an organisation has recognised that it is at capacity in its ability to deliver its current portfolio commitments within the bounds of its traditional project delivery model. WaterNSW has a number of significant infrastructure projects that it going to be responsible for delivering over the coming years across its Rural Valleys, Greater Sydney area and within the Water Grid. These include the three dams project mentioned above, Warragamba Dam Wall Raising and drought resilience projects in Greater Sydney.

In order to be able to deliver its capital program across all its business units, including the three CSSI dam projects over the coming years WaterNSW went out the market to contract a portfolio delivery management partner (PDMP) to embed within its organisation. Initially the scope of the delivery partner was to set up a PMO for delivery of the three dams projects with other projects being looked at to be transferred across into the portfolio. Following an extensive procurement process, WaterNSW appointed WaterSecure (a joint venture between KBR and Aurecon) in May 2020 as its PDMP.

WaterNSW inform us that

"The cost of "WaterSecure" is split into two sections. One is a fixed cost covering the PMO the other are project specific services orders created at WaterNSW's request to provide specific project management services. In the case of the latter the entire cost is borne by the project.

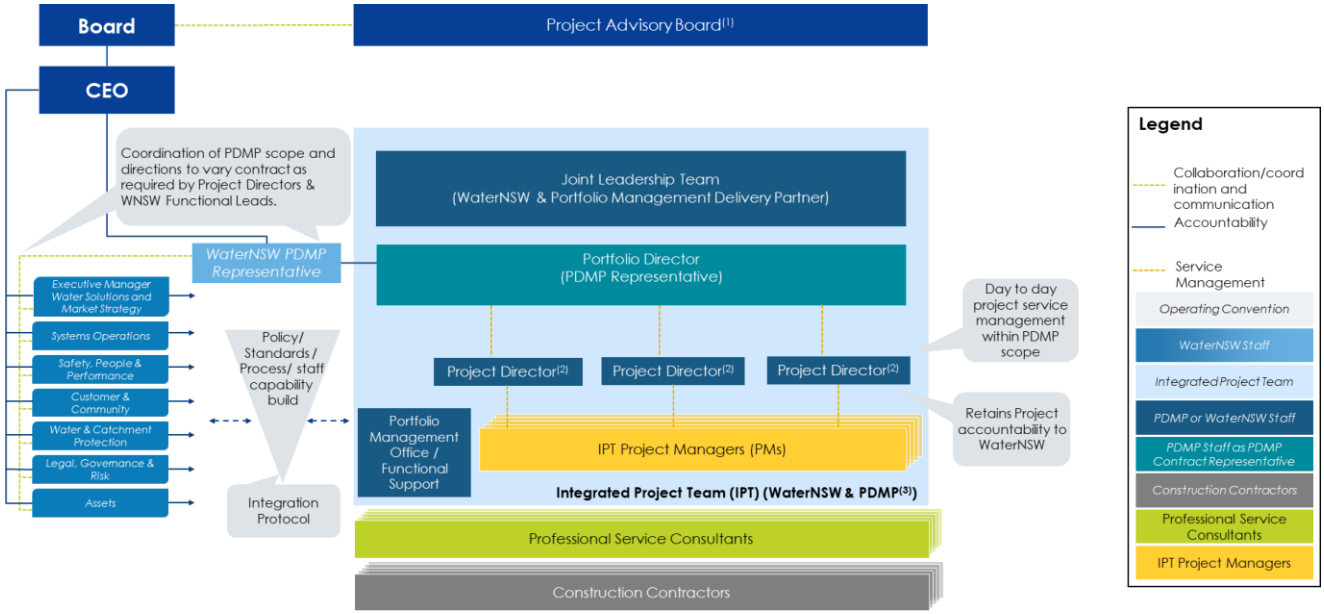
The fixed PMO cost will be proportionally spread across all projects in the portfolio, based on the relative value of approved spend for projects in the portfolio. Initially the portfolio comprises the 3 CSSI dam projects.

Several other projects are in the process of being transitioned into the portfolio these include Western weirs, Wilcannia weir, and 3 projects funded under the Snowy Hydro Legacy fund (these 3 projects and Wilcannia weir are not included in the proposed determination as they are fully Government funded). It is worth noting that with the exception of Wilcannia weir the approved funding of these additional projects is currently limited to development of the strategic business case (SBC) only. No work beyond delivery of the SBC will be undertaken on them unless and until further funding is secured. As a consequence, only active projects within the portfolio will have PMO costs apportioned to them.

If in future other projects are added to the portfolio then the cost apportionment of the PMO will be adjusted accordingly. At this stage the timing of any other sizeable projects transitioning in is unclear."

The procurement of the portfolio delivery manager provides assurance that WaterNSW are attempting, as far as possible to limit the impact that the delivery of the significant drought projects would otherwise have on delivery of the remainder of the 'base' capital program. The organisational structure of how the PDMP function sits within WaterNSW is shown in Figure 6-11.

Figure 6-11 PDMP organisational structure



Within its October 2020 pricing submission WaterNSW allocated PDMP capital expenditure to it FY20 its Corporate systems activity of $2.3m (user share 80%). We consider that this expenditure is almost entirely driven by the 3 CSSI dams projects at this stage so have reallocated this amongst the valleys to the Drought Projects (3 dams) (user share 0%). Overall, this does not alter the recommended expenditure by it does impact on the user share of capital expenditure. We recommended allocating this proportionally by each valley to the Border, Peel and Lachlan valleys where the three drought CSSI projects are being undertaken. Should WaterNSW increase its direct cost allocation to capital projects this will provide a more accurate approach to deciding where these costs sit.

6.7.4. Corporate and IT expenditure

We discuss Corporate and IT expenditure in detail in Section 8. Between its June and October 20 submissions WaterNSW identified an additional $9.4m of corporate expenditure for FY20 in its SIR submission. WaterNSW subsequently informed us that $4m of this was incorrectly allocated to corporate that had been miscoded. We have made an adjustment for this in our recommended capital expenditure tables in the current determination period. Additionally, WaterNSW have proposed to include $2.3m of capex for the PDMP arrangement in FY20, as discussed above we recommended allocating this proportionally by each valley to the Border, Peel and Lachlan valleys where the three projects are being undertaken.

6.8. Efficiency of forecast capital expenditure

Provide recommendations on the efficient level of the utility's capital expenditure over the 2017 determination period required to supply the regulated monopoly services, and provide evidence and reasoning to support any difference between the utility's actual level of capital expenditure and the consultant's recommendations on the efficient level of capital expenditure for this period.

Identify any consequential impacts on operating expenditure (ie, increased or reduced costs) based on the assessment of capital expenditure.

Where appropriate, have regard to productivity benchmarking analysis when identifying potential efficiency savings.

6.8.1. Forecast overview

WaterNSW submitted its original pricing proposal to IPART in June 2020 and proposed a one year determination period. In October 2020 within its response to IPARTs Issues Paper, WaterNSW provided additional information to IPART and us to make an assessment of efficient expenditure over a four year determination period. It should be noted that additional information related to years 2-4 contained within WaterNSW's October 2020 response document has been provided by WaterNSW Management and was not approved at Board Level.

By Activity

Excluding the drought response schemes, capital expenditure on renewals and replacement activities is the most significant expenditure when looking at the proposed expenditure for both a one year (FY22) and four year determination period (FY22 to FY25) as shown in Table 6-6.

Table 6-6 Percentage of proposed capital expenditure as a proportion of the total (FY22 and FY22 to FY25)

	% of total by activity	
Activity	FY22	FY22 to FY25
Renewal & Replacement	41.1%	39.2%
Corporate	16.3%	13.7%
Environmental	6.9%	27.6%
Water Delivery	4.9%	1.6%
Other	5.2%	2.9%
Dam Safety Compliance	25.5%	15.0%

Below we comment on WaterNSW proposed expenditure across each significant activity against a proposed one year and four year determination period as shown in Table 6-9, Figure 6-12 and Figure 6-13 below.

Table 6-7 Proposed capex in the future period against current for both one year and four year determinations ($20/21)

Activity	Total proposed 2021-22 to 2024-25	Total actual 2017-18 to 2020-21	Variance (%)		WaterNSW proposed 2021-22	Average actual 17-21	Variance (%)
Renewal & Replacement	102,054	103,846	(1.7%)		19,800	25,961	(23.7%)
Corporate	35,765	46,078	(22.4%)		7,872	11,520	(31.7%)
Environmental	71,790	3,071	2237.5%		3,312	768	331.3%
Water Delivery	4,278	12,827	(66.6%)		2,384	3,207	(25.7%)
Other	7,548	5,468	38.0%		2,523	1,367	84.6%

Activity	Total proposed 2021-22 to 2024-25	Total actual 2017-18 to 2020-21	Variance (%)		WaterNSW proposed 2021-22	Average actual 17-21	Variance (%)
Dam Safety Compliance	38,943	58,516	(33.4%)		12,300	14,629	(15.9%)
	260,378	229,807			48,192	57,452	

Dam Safety

Within WaterNSW's proposed capital expenditure for the next four year period there is a significant decrease in capital expenditure for dam safety compliance; 33% less than actual expenditure in the current determination period. Since WaterNSW revised its proposed expenditure in October-20 this reduced from 70%. This compares to 16% less than average actuals for the proposed one year determination for FY22 expenditure.

Renewals and Replacement

Within WaterNSW's proposed capital expenditure for the next four year period there is a negligible decrease in Renewals and Replacement of 1.7%. This contrasts to that proposed within the proposed one year determination period for FY22 expenditure at 24% less than current period averages.

Environmental Planning & Protection

There has been limited expenditure of $3.4m for Environmental Planning & Protection in the current period. Expenditure proposed for FY22 increases to $3.3m with $71.8m proposed across the following four years of which the majority is identified for fish passage offset projects.

Water Delivery and Other operations

Expenditure for Water Delivery and other operations reduces significantly between the current and future periods when looking at either a one or four year determination. Although the quantums are relatively small compared to other activity categories.

Other capital expenditure

Proposed capital expenditure on other activities in the future determination period comprises of Corrective and Routine Maintenance and Asset Management Planning.

Corporate

Corporate expenditure is broadly comparable when comparing both a future four year determination period and a one year determination period against average expenditure in the current period.

Figure 6-12 Capex by activity in the current and future determination period (four year FY22 to FY25 determination) ($000)

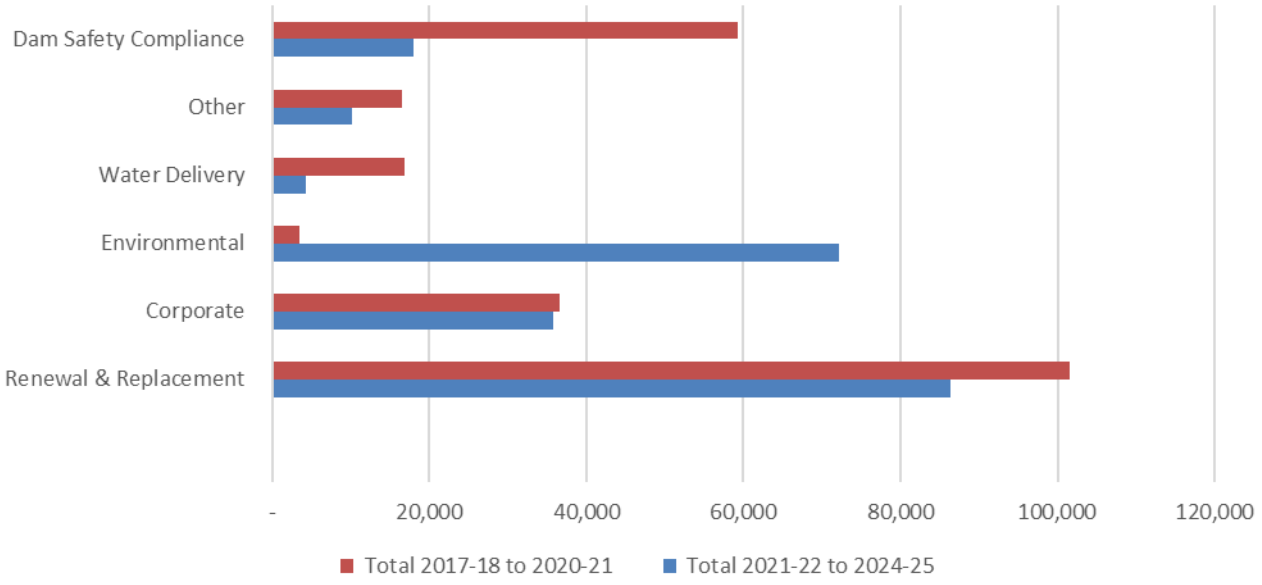
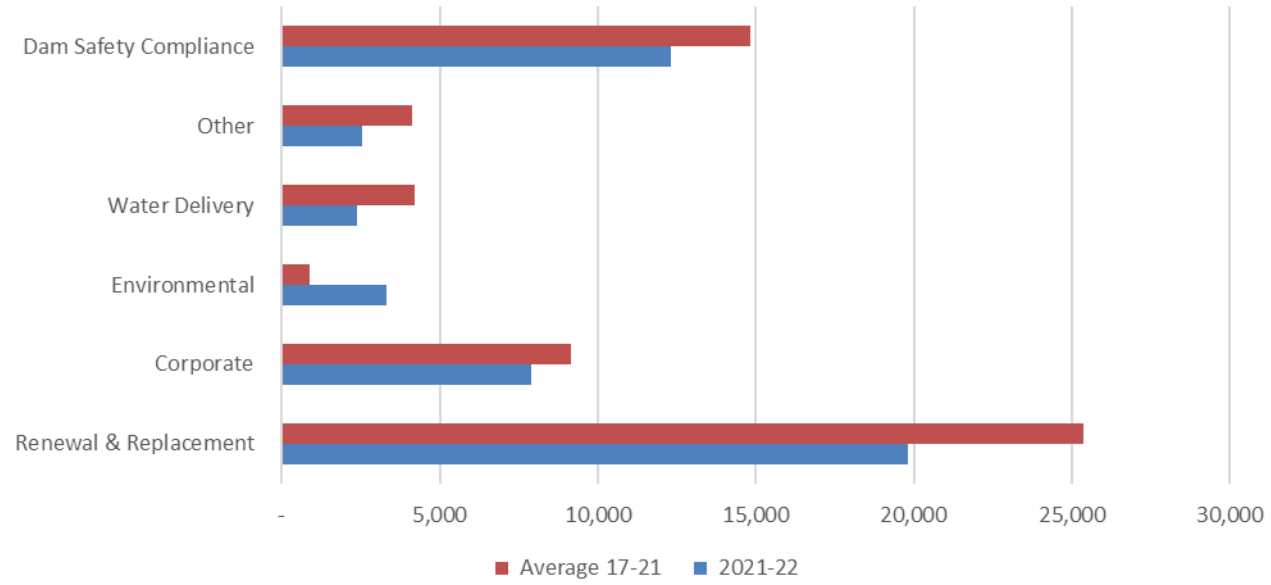


Figure 6-13 Capex by activity in the current and future determination period (one year FY22 determination) ($000)



By Valley

Allocated expenditure items

The proposed capital program in the future determination period consists of both project specific and directly allocated capital expenditure as well as a number of capital expenditure items which are non-project specific and are allocated between each of the rural valleys.

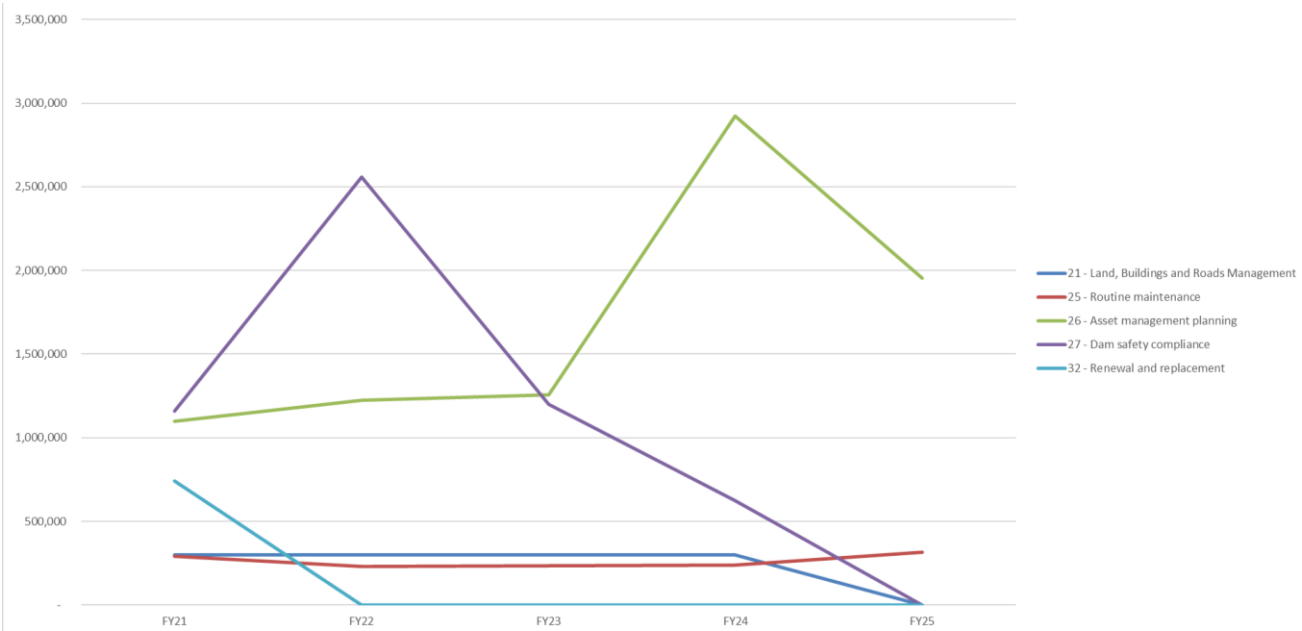
Excluding drought response expenditure, WaterNSW proposed allocated expenditure equates to around $36.3m of the $188m or 21% of total capital expenditure proposed between FY22 and FY25. This includes capitalised overheads, corporate costs and allocated expenditure on other activities.

Corporate costs comprising of ICT, Fleet, Properties is most significant component of these allocated expenditure activities. The Proposed allocated expenditure on other activities totals $4.3m in FY22 and $13.7m FY22 to FY25 and comprises of:

- Land, Buildings and Roads Management ($0.3m FY22 and $0.9m FY22 to FY25);
- Routine maintenance ($0.2m FY22 and $1.0m FY22 to FY25);
- Asset management planning ($1.2m FY22 and $7.4m FY22 to FY25); and
- Dam safety compliance ($2.6m FY22 and $4.3m FY22 to FY25).

Figure 6-14 shows WaterNSW proposed non project specific allocated capital costs excluding corporate costs over the future determination period.

Figure 6-14 WaterNSW proposed non project specific allocated capital costs excluding corporate costs ($20/21)



This appears to be generally on the same basis as the allocated corporate costs which are allocated across each valley proportionally. WaterNSW inform us that this is based on the RAB value in FY19 of each valley. We are informed that Lowbidgee valley does not have any allocated Dam Safety Compliance capital expenditure as it does not have any Dams within that valley.

Table 6-8 Percentage of proposed allocated capital expenditure by valley as a proportion of the total allocated

Valley	Allocation % where Lowbidgee is allocated	Allocation % where Lowbidgee is not allocated
Border	1.00%	1.01%
Fish River	10.00%	10.10%
Gwydir	14.00%	14.14%
Hunter	2.00%	2.02%
Lachlan	13.00%	13.13%
Lowbidgee	1.00%	
Macquarie	10.00%	10.10%
Murrumbidgee	15.00%	15.15%
Murray	5.00%	5.05%
North Coast	1.00%	1.01%
Namoi	22.00%	22.22%
Peel	5.00%	5.05%
South Coast	1.00%	1.01%

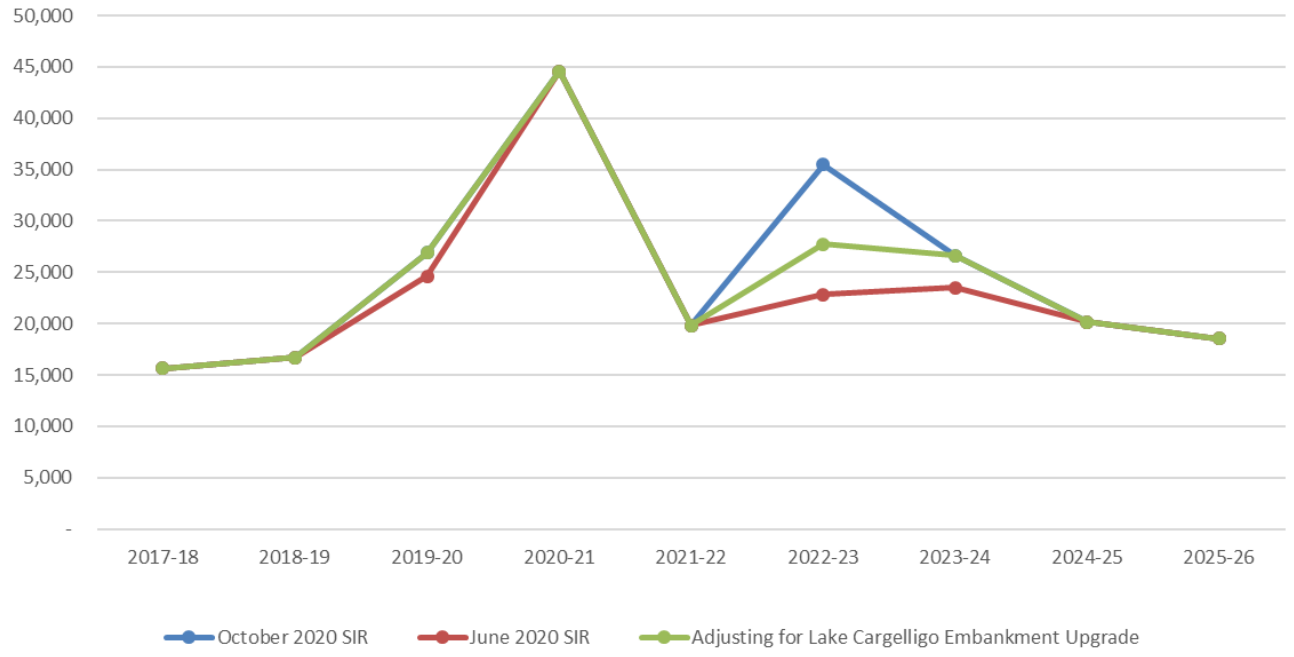
6.8.2. Significant cost areas

In the following sections we comment on each of the most significant areas and activities of capital expenditure.

6.8.3. Renewals and Replacement

WaterNSW propose that renewals and replacement expenditure in FY22 is to reduce from $25.3m annual average (in the current determination period) to $19.8m with an additional $1.3m for routine and corrective maintenance identified in the WaterNSW 2020 pricing submission.

Figure 6-15 WaterNSW proposed renewals and replacement expenditure ($000)



Renewals provision capitalised overheads

Renewals provisions – WaterNSW have proposed expenditure of $78.1m in renewals provisions for the future Four year determination period, 19% of this, $14.8m is identified as capitalised overheads i.e. not direct costs.

Renewal and replacement capital expenditure efficiency targets methodology

WaterNSW has developed efficiency targets for its Rural Valleys renewals and replacement capital projects. The development and application of these efficiencies is outlined in 'Development and Implementation of Efficiency Targets - Rural Asset Renewals and Replacement Capex - FY22'. Any capital expenditure efficiency savings for the out years to FY25 have not yet been provided by WaterNSW.

The development and implementation of the efficiency targets is based on WaterNSW's new procurement model for asset renewals and replacement, which is a delivery model including a single design /engineering services partner and two construction partners.

Based on this procurement model, WaterNSW identified and evaluated potential project level efficiencies in four different areas:

- Engineering/ Design
- Works Packaging
- Purchasing Efficiency
- Local Contracting

The basis and expectations for efficiencies that WaterNSW considered could be achieved through each four of these areas is as follows.

Engineering/ Design - With the on-boarding of an engineering design partner, WaterNSW expects to realise efficiencies in the design process, including in a more integrated application of design standards, and leveraging off common elements across the portfolio.

Works Packaging - Improvements in how renewals and replacement projects are packaged for delivery are expected to result in efficiencies in mobilisation, construction management and other related costs.

Purchasing Efficiency - As a result of improved coordination for the procurement of goods and services, WaterNSW expects to achieve a level of efficiency from improved leverage of purchasing power.

Local Contracting - One of the principles of the construction partner delivery model that WaterNSW has implemented calls for the use of local contractors. As a result, costs associated with the accommodation of construction personnel have been identified as an opportunity for achieving project savings.

WaterNSW developed its target efficiencies in a joint consultative process between key stakeholders.

Target efficiencies were developed against each of the above aspects of project delivery, with targets set based upon the likely efficiency for several project "categories". This process allowed targets to be aligned with the discipline and complexity of each project. The efficiency adjustments are made at an individual project level, and there is no other adjustment to consider whole of program level efficiencies. We note that due to WaterNSW's asset base and the differences from a more typical urban utility, that the infrastructure is more bespoke and renewal and replacement program level efficiencies for assets such as reticulation pipework, valves, meters, etc. do not apply in the same way.

In addition, the efficiency targets have been assumed to be realised progressively as the new procurement model is implemented. WaterNSW has assumed that 50% of the overall target efficiency on a project-by-project basis can be achieved in FY22, the first full financial year with the new procurement in place, and then progressively increase over five years, reaching 100% by FY26. This proposed rollout of target efficiencies is shown below in Table 6-11.

WaterNSW has calculated its target efficiencies at the project level at the appropriate level of the work breakdown structure within each project estimate. This has been applied in such a way as to allow for 'line of sight' of pre and post efficiency project estimates. WaterNSW's cashflow model process has applied the appropriate target efficiency for the relevant year of the cashflow for each project. Final project cashflows have been developed in collaboration with the delivery team incorporating the efficiency targets.

WaterNSW's basis for the calculation of target efficiencies is summarised in the following table.

Table 6-9 WaterNSW basis of efficiency calculations

Description	Basis of efficiency calculation
Engineering	Cost of Design, ASCON, Engineering Supervision
Mobilisation and Packaging	Total Supply and Labour Costs
Bulk purchasing	Total Supply Costs
Local Content	Reduction labour costs based on hourly rate discount and target local participation. WaterNSW has calculated that there is potential saving of $27.80 per hour using local resources based on the daily accommodation and meal allowance savings that are not required for local labour. The percentage of local participation represents extent of local labour proposed for each work type, based on skill set available in the regions.

As a result, WaterNSW's efficiencies are essentially based on a project-by-project adjustment based on a percentage reduction of the estimated direct costs. The renewals and replacement efficiency targets and calculations do not make any assumptions related to efficiency gains to WaterNSW's own internal costs for each project. There is little evidence of any renewals program level efficiency challenge.

The efficiencies that have been assumed for the four different elements for the different project types is show in Table 6-10.

Table 6-10 WaterNSW's renewals provision project level efficiency assumptions

Description	Design & Engineering	Mobilisation and Packaging	Bulk purchasing	Local Content
Steel Works - WHS Access	[redacted]			
Vegetation Removal				
Buildings				
Engineering				
Upgrade				
Civil Works				
Equipment - Valves				
Concrete Works				
Surface Coating & Lining				
Earthworks				
Electrical & Instrumentation				
Electrical RAC				
Equipment - Rotork				
Monitoring Equipment				
Equipment - Hydraulics				
Equipment				
Steel Works - Trashracks				
Dam Safety				
Road Works				
Fencing				
EQ and Machinery				
Equipment - Gates				
Equipment - Cranes				
Pipeworks				
Duplication				
Steel Works				
Excluded				
More info needed to define scope				
SCADA				
Bridges				
Fishway				
Access				
Equipment - Rotork and Gate				
Study - Water Supply Strategy				
Study - Options & Assessment				

Description	Design & Engineering	Mobilisation and Packaging	Bulk purchasing	Local Content
Dam Rising	[redacted]			
Decommissioning				
In Execution				
Completed				

As noted above, WaterNSW has assumed that 50% of the target efficiencies will be achieved in FY22, with the progressive rollout over the following four years allowing 100% to be achieved by FY26. The target efficiency rollout over the five year period that has been adopted by WaterNSW is provided in the following table.

Table 6-11 Efficiency rollout targets

FY22	FY23	FY24	FY25	FY26
[redacted]				

Based on the assumed efficiencies and their application to the different renewals and replacement projects in FY22, WaterNSW has calculated the following capital expenditure savings in each valley. For FY22, these estimated savings total $1.515 million and $2.5 million cumulatively to FY25. These savings have been incorporated into the capital expenditure included in WaterNSW's submission.

Table 6-12 Savings per valley for asset renewals and replacements in FY22-FY25

Valley	FY22 $ Savings	FY23 $ Savings	FY24 $ Savings	FY25 $ Savings
Border	[redacted]			
Namoi				
Peel				
Gwydir				
Lachlan				
Lowbidgee				
Macquarie				
Murray				
Murrumbidgee				
North Coast				
South Coast				
Hunter				
Fish River				
Total				

Conclusions

WaterNSW's new procurement model for asset renewals and replacement has been developed to ensure efficient and reliable delivery of 'business as usual' water infrastructure capital investment. Based on the implementation of this new model, WaterNSW has developed a methodology to calculate potential cost savings that could be made for each project. The savings have been estimated from potential efficiencies in engineering/design, works packaging, purchasing efficiency and local contracting. Assumed savings for each of these areas have been assumed for different types of projects and applied to WaterNSW's program of renewals and replacements for FY22. As a result, WaterNSW has revised its original estimates down prior to the submission to factor in proposed efficiencies at a project level by more than $1.5 million in FY22 from WaterNSW's original project estimates..

Depending on the type of project, generally savings in the 10-15% of the original project costings have been calculated. This quantum of savings based on the four areas for which efficiencies have been calculated does not appear to be unachievable, particularly if works at a location can be packaged up to minimise mobilisation and management costs, and if local resources can be utilised. Standardisation of design elements for renewals and replacement projects would also be expected to realise some efficiencies over the longer-term. Improved leverage of WaterNSW's purchasing power, given the extent of its operations and the number of assets it owns and operates would also be expected to result in cost savings being achieved.

One areas of weakness is that the initial pre-efficiency cost estimates for WaterNSW's renewals and replacement projects are typically completed as part of the workshopping process to review potential candidate projects for progressing to the capital works program by internal cost estimators. The project costing at this stage of estimates is fairly rudimentary, based on a small number of activities for each project and the estimates built-up from labour, material and design/engineering assumptions, with the labour costs based on an estimate of the number of people and hours required for each task and an average crew cost for each person depending on the type of task. WaterNSW's internal costs and the capitalised overhead cost are calculated based on set percentages of the external cost elements and together are 38% of the estimated contractor cost in the total project estimate, with the capitalised overheads making up 15% of this.

In addition, due to the large number of renewal and replacement projects, WaterNSW does not undertake any more detailed business cases for specific projects or groupings of projects. As such, cost estimates for asset renewal and replacement projects are not subject to the same degree of accuracy scrutiny as if they progressed through WaterNSW's business case process for a new significant asset. Given the rudimentary basis of these initial cost estimates, conservative costing are a possibility, particularly given the required accuracy of the estimates at this stage of a project. Given that overall project savings are generally in the 10-15% range, overestimating the cost estimates by a similar percentage is a real possibility.

WaterNSW's efficiencies are essentially based on a project-by-project adjustment calculated from a percentage reduction of the estimated direct costs. The renewals and replacement efficiency targets and calculations do go some way to demonstrate that WaterNSW have challenged themselves however they not make any assumptions related to gains to WaterNSW's own internal costs for each project, for example, based on the move to the new procurement and delivery model or any additional improvements in its overall asset management processes, in particular linking to asset performance measures.

WaterNSW responded to our Draft Report that *"The analysis of the requirement for additional efficiencies for Capital Program Development does not appear to consider that there is a substantial overlap between the concept as described in the draft report and WaterNSW's own efficiency target categories of 'Engineering' and 'Mobilisation and Packaging'. WaterNSW considers that the targets it has already set in these areas are achievable."*

WaterNSW have proposed to increase its 'renewals provision' expenditure in the future determination period compared to comparable projects in the current period which has not been justified to us by levels of risk and/or performance. Rather than flatlining renewals provisions expenditure in the future determination period we have accepted the case for increasing expenditure and recommended applying catch-up efficiencies to this increased expenditure over and above those identified by WaterNSW. We are therefore satisfied that there is no overlap.

This results in higher recommended expenditure than would have been the case if we had not accepted the increase. We have taken this into consideration in our overall recommendations on catch-up capital efficiency discussed in Section 6.8.8.2.

6.8.3.1. Hunter Renewals Provision (future period)

We reviewed the Hunter Valley Renewals Provision line item in detail and the summary for this is provided in Appendix C. The Hunter Renewals Provision is an ongoing program of works to maintain the capability of existing water infrastructure in the valley. WaterNSW has developed the renewals provision program through its capital renewals program process. WaterNSW has similar Renewals Provision programs in its other valleys across the 2021 Determination Period. The renewals provision programs for each Valley essentially act as an encompassing collection of disparate renewals projects, that uses the allowance for each Valley for funding. Typically, the works are grouped by location, allowing for packaging the projects for each site and looking to realise efficiencies through this approach where possible.

As a result of the large number of items, WaterNSW does not undertake any detailed options analysis for any of the renewals provision projects, with the workshops that it uses to validate and prioritise candidate renewals

projects used to identify the efficient solution. The programs that are developed typically focus more on refurbishment than replacements, meaning that there are limited options. Due to the bespoke nature of WaterNSW's asset base, there is a low level of commonality between assets, meaning that broad options for a solution are not able to be considered. In this respect, WaterNSW's renewals greatly differ from a typical urban water service provider, where renewals programs tend to focus on large scale replacements of common assets, e.g. pipes, valves, meters, etc.

The Hunter renewals provision program, as set out in the SIR, averages $0.985 million per annum in the forward period, starting at $0.096 million in 2021/22 before increasing to 2023/24 then declining to the end of the period. This is an ongoing renewal program for the infrastructure in the Hunter Valley and is not specific to only the 2021 Determination Period.

However, the program included in the Rural Valleys Renewal Plan FY22-FY25 that was provided as part of the review documents shows a higher expenditure for the Hunter Valley than included in the SIR. The four year total proposed spend is $1.56 million higher, at $6.481 million, and averages $1.62 million in each year. The projects that WaterNSW has included in its FY22-FY25 program for the Hunter Renewals Provision take into account efficiency savings that have been calculated using WaterNSW's efficiency target methodology, as outlined in Section 6.8.3. The FY22-F25 calculated efficiency savings total $562,710 for the four financial years (including savings from two projects that are proposed to start but not end in the determination period). This represents an overall saving of 7.1% on the initial cost estimates that have been prepared for each of the Hunter Renewals Provision projects. We do not propose any specific adjustments to this expenditure but have taken these findings into consideration in our overall recommendations on capital efficiency

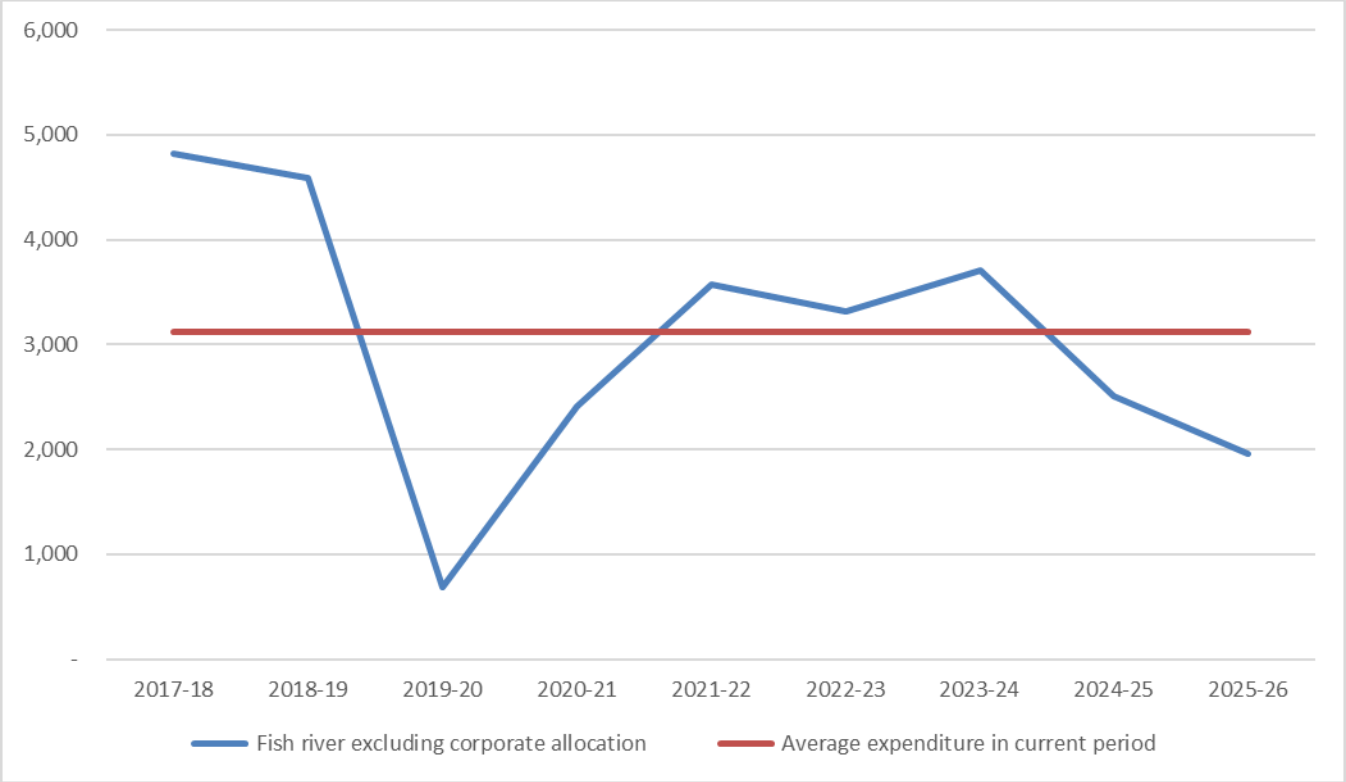
6.8.3.2. Fish River Pipeline Renewals 2018 (future period)

As discussed in 6.7.1.4 in the current determination period WaterNSW undertook a replacement of a specific section of the Fish River pipeline. In the future determination period WaterNSW wholesale pipeline replacement strategy has been deferred in the FY22-25 period. The overall level of expenditure identified in the future period is comparable to the current period (Figure 6-15) but its focus is now on managing issues identified within. WaterNSW review of its Fish River renewals strategy:

1. Existing safety and reliability risks owing to severely corroded valves, with a worker injury from a corroded air valve highlighting the daily risk operational staff face in maintaining these assets. The ICAM investigation report (D2017/37556)3 arising from the Lost Time Injury in 2017 when the air valve failed on operation proposing an air valve replacement program, has since been initiated.
2. Reliability risks due to pressure transients on the system to be managed via hydraulic modelling of the Scheme.
3. Ongoing corrosion of valves and other assets at Oberon dam, with refurbishment of the valves expected to reduce reliability and water quality risks
4. A variety of other failure risks at important nodes of the Scheme, including replacement of the scour and isolation valves at Duckmaloi Weir, for example, with the weir being an alternate source of yield for the Scheme

We note there have been 6 unplanned water delivery capability loss (CALOSS) on the Fish River scheme in the last year with 1 extended duration event. WaterNSW indicate in its Asset Performance and Health Report 2020 that "*incidents attributed to aging assets on Fish River pipeline are considered to be acceptable in light of the risk level and the cost of renewals*." Failures of the pipeline have been identified as medium (3/5) criticality. Additionally, there has been a failure of 5 valves with a high (5/5) criticality within the year which would indicate a greater need to focus on valve replacement over the coming years. There appears to be a focus on number of events rather than the impact of water supply interruptions on customers. We consider that there needs to be a greater emphasis on customer impact that is clearly linked to the asset failures within the Fish River Scheme. We do not propose to make any specific adjustments to WaterNSW proposed capital expenditure for the future period. We have taken these opportunities to improve into consideration in our view of catch-up efficiency and also reflected this within our recommended output measures.

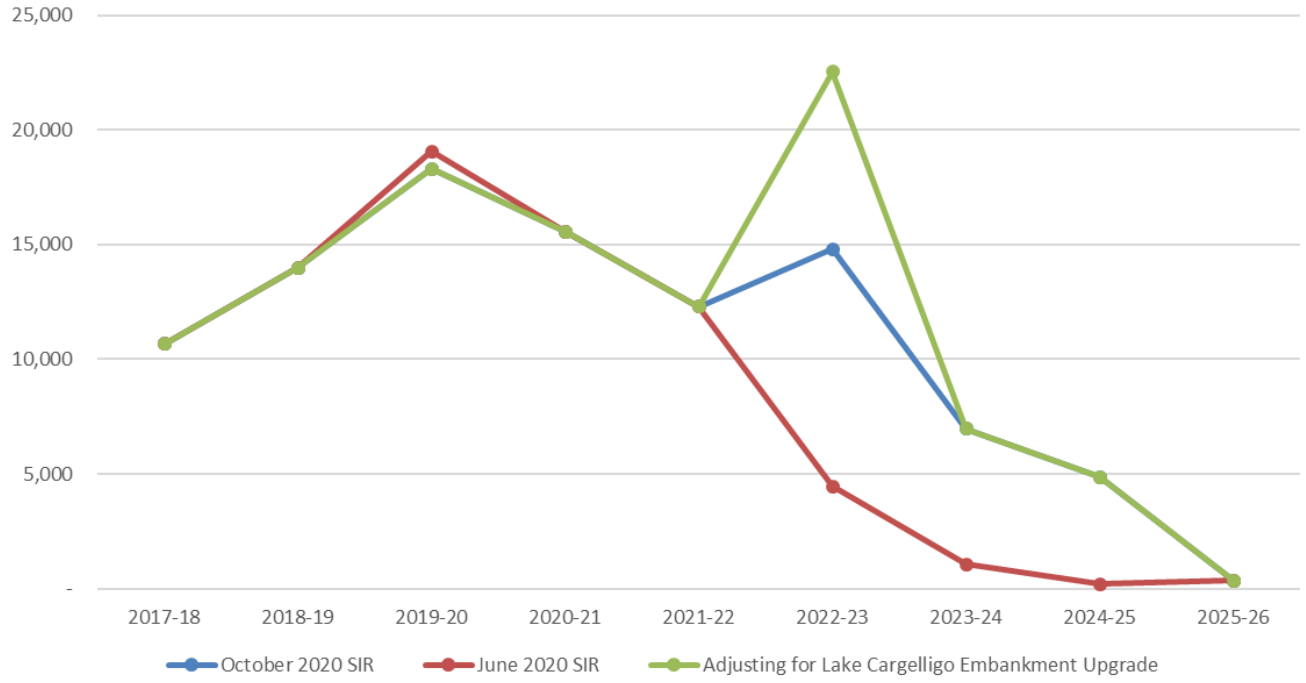
Figure 6-16 Fish river scheme capital expenditure excluding corporate allocation ($000k $20/21)



6.8.4. Dam Safety Compliance

WaterNSW proposed Dam Safety Compliance expenditure in the future determination period is $12.3m in FY22 with an average of $8.9m for the following three years (FY23 to FY25) proposed in its October 2020 which is a substantive increase compared to its June 2020 submission. WaterNSW indicated that due to the two year transition period to comply with the new dam safety regulation from November 2019 (as discussed in Section 6.7.2.) that the expenditure forecasts in the outer years of the future determination period are not based on any comprehensive or approved business cases. It was mentioned that there is no meaningful guidance issued from NSW Dams on what the regulations will mean in practical terms to inform WaterNSW forward capital work program on dam safety compliance. At the current time in can be inferred that WaterNSW have not considered in detail the impact on capital expenditure of the new regulations.

Figure 6-17 WaterNSW Dam Safety Compliance expenditure proposed ($000)



The additional $20.9m capital expenditure for dam safety compliance identified between the June 2020 and October 2020 SIR submissions across the future determination period can be summarised as:

- Copeton - Primary spillway interim scour protection works – increase $0.8m
- Menindee - Pamamaroo Inlet Regulator upgrade works – increase $7m
- Portfolio Risk Assessment Cost updated – increase $3.3m
- Spillway Chute, Outlet works and OPT testing and surveillance – increase $5.5m
- Risk-based Instrumentation and Automation – increase $0.8m
- Risk Mitigation Plan & Options - increase $0.6m
- Dam Safety Review - increase $1.2m
- Lake Cargelligo - Renewal & Replacement Lake Cargelligo Embankment upgrade was previously categorised as Dam Safety in its June 2020 submission, WaterNSW reallocated this $0.9m capex to renewal and replacement and increased expenditure to $8.6m (net increase overall of $7.7m)

Increasing capital expenditure on dam safety compliance between its June 2020 and October 2020 pricing submissions appears to be prudent given that there are new compliance regulations that WaterNSW will be working towards however we have concerns that there is uncertainty over the level of capital expenditure required given the lack of a definitive approved business case supporting the PRA program.

6.8.4.1. Lake Cargelligo Dam Safety Upgrade

Lake Cargelligo is an off-river storage system in the Lachlan Valley, consisting of three embankments. After a series of floods including one in 2016 which caused a dam safety incident, a risk assessment demonstrated the need for upgrade works with design to focus on the most efficient means of risk reduction. These remedial works are to address the risk of failure due to internal erosion, overtopping during flooding and slope instability, thereby bringing the societal risks of all three embankments into the acceptable risk zone, i.e. below the SFAIRP / ALARP threshold line for potential loss of life. The risk reduction works options included 1) addition of a full height filter buttress on the downstream slope of the existing embankment and/or 2) the raising of embankment crests by up to [redacted]

A Preliminary Business Case (PBC) has been provided, where the risk reduction from the combined option (3) was shown to be greater than the sum of the options 1 and 2, and therefore mutually beneficial.

Criteria for assessing options were focused on risk reduction effectiveness, with a multi-criteria analysis scoring method weighted across three risks from embankment failure mechanisms.

The initial cost estimate to undertake the dam safety upgrade works at Lake Cargelligo was approximately [redacted] (as provided in the submission SIR capex table). However, the Preliminary Business Case that followed included estimates that were informed by the recent dam safety risk assessment and operational risk assessment. These resulted in a refinement of the options for the best and most cost-efficient solution to deliver the stated objectives. The refined solution is now estimated to cost [redacted], and so our recommended expenditure allowance aligns with this [redacted]

However, the proposed programme showing completion of the whole works in March 2022 (from starting the detailed design this October) appears to be very short and may be unrealistic. The Capex projections in the SIR, which are showing [redacted] spread into the following year of FY2022/2023 (for the Renewals and replacement embankment upgrade component of the project), are more likely to be achievable. Figure 6-17 above for Dam Safety Compliance proposed expenditure shows the reallocated [redacted], which had been shown as Renewals and Replacement, adjusted to be back in the dam safety compliance expenditure. This is shown in our capital expenditure tables in Section 6.

6.8.5. Environmental protection and other measures (Fish passage offset schemes)

Native fish populations in NSW, particularly West of the Great Dividing Range, have decreased by 90% compared to pre-European levels. One key factor contributing to this has been the barriers to fish migration being installed along rivers and streams. Historically some fish passage schemes have been designed and built within NSW which are not appropriate or effective for native fish species to passage upstream.

Regulatory drivers

DPI Fisheries is the government agency responsible for the management of NSW's fish and aquatic habitat resources and to implement the Fisheries Management (FM) Act 1994. The FM Act 1994 s218 provides that the Minister may order and require a person who constructs alters or modifies a dam, weir or reservoir on a waterway to carry out, within the period specified in the order, such works as may be so specified to enable fish to pass over the dam, weir or reservoir.[30]

The FM Act 1994 S218 is reproduced below:

> *(1) The Minister may, by order in writing, require a person (other than a public authority) who constructs, alters or modifies a dam, weir or reservoir on a waterway to carry out, within the period specified in the order, such works as may be so specified to enable fish to pass through or over the dam, weir or reservoir.*
>
> *(2) The Minister may also, by order in writing, require a person responsible for the management or control of a dam, weir or reservoir to carry out repairs to a fishway or fish by-pass.*
>
> *(3) A person who fails to comply with an order under this section is guilty of an offence.*
>
> *Maximum penalty: In the case of a corporation, 2,000 penalty units or, in any other case, 1,000 penalty units.*
>
> *(4) If a person fails to carry out the work specified in an order under this section within the period so specified, the Minister:*
>
> *(a) may cause the work to be carried out, and*
>
> *(b) may, by proceedings brought in a court of competent jurisdiction, recover from the person as a debt the cost of carrying out the work.*
>
> *(5) A public authority that proposes to construct, alter or modify a dam, weir or reservoir on a waterway (or to approve of any such construction, alteration or modification):*
>
> *(a) must notify the Minister of the proposal, and*

[30] Fisheries Management Act 1994 No 38 s218

(b) must, if the Minister so requests, include as part of the works for the dam, weir or reservoir, or for its alteration or modification, a suitable fishway or fish by-pass.

(5A) This section does not apply to or in respect of any work or waters of a kind exempted from the operation of this section by the regulations.

(5B) A person (other than a public authority) must not construct, alter or modify a dam, weir or reservoir on a waterway unless the person ensures that the Minister is given notice in writing of the proposed works at least 28 days before the commencement of the works.

Maximum penalty: In the case of a corporation, 200 penalty units or in any other case, 100 penalty units.

(5C) Subsection (5B) does not apply in respect of any works approved by a public authority or approved by the Minister administering the Environmental Planning and Assessment Act 1979 under Part 3A or Part 5.1 of that Act.

(6) In this section:

***dam, weir or reservoir** includes a floodgate.*
***waterway** means a river, creek or other flowing stream of water, whether flowing regularly or intermittently, and includes any lagoon or other body of water that is intermittently subject to tidal influence or that intermittently flows into a river, creek or stream.*

Existing assets

In 2009 WaterNSW and DPI agreed to the Dam Safety Upgrades offsets program which applied a trade off in installing fishways at the dams with construction of fishway at priority weirs located lower in the catchment. Trade-offs involve ensuring transferral of fish passage works from the original s218 compliance site to an alternative site or sites assessed as more appropriate. The potential need and use of trade-offs is on a case-by-case basis. In 2009 DPI Fisheries and WaterNSW (formerly State Water) collaboratively agreed to the DSU Fishway Offsets Program (the Program), whereby WaterNSW would forego installing fishways at five (5) dams, and instead construct thirteen (13) fishways at priority weirs located lower in the catchment.

Construction of the Mollee Weir Fishway on the Namoi River was completed in 2014 as an offset as part of the dam safety upgrade works in the headwaters of the River as opposed to constructing fish lifts on the Keepit & Split Rock dams themselves. Throughout the course of the project we are informed that costs for the scheme escalated (from the 2013/2014 estimate of $8.3M to $12.5M) and it was agreed to pause the program in order to develop new whole life cost efficient designs for the schemes.

Eleven (11) of the program sites remain outstanding. Since 2014, the Program has been on hold while WaterNSW and DPI Fisheries investigated measures to achieve the lowest whole-of-life costs for fishway construction and operation.

Cost sharing

Historically capital expenditure for *Environmental protection and other measures* (of which fish passage schemes are the major contributor) were borne 50/50 by users and the government. Since IPART's 2019 cost sharing principles review, capital expenditure on these schemes will be 80% borne by users and 20% by the government.

Schemes proposed by WaterNSW in the future period

Within its June 2020 SIR WaterNSW identified five dams within four valleys where expenditure is proposed for Fish Passage Offset schemes at:

1. Copeton Dam within Gwydir;
2. Keepit Dam within Namoi
3. Spit Rock Dam within Namoi
4. Wyangala Dam within Lachlan; and
5. Burrendong Dam within Macquarie

These comprise of the following 11 sub schemes at various weirs that remain outstanding from the 2009 agreement with DPI Fisheries.

Valley Fishway	Site Name
Gwydir Fishways	Tyreel Weir
	Tyreel Regulator
	Tareelaroi Weir
	Boolooroo Weir
Lachlan Fishways	Lake Brewster Diversion Weir
	Booberoi Weir
	Lake Cargelligo Outlet Regulator
Macquarie Fishways	Gin Gin Weir
	Marebone Break Weir
	Dubbo North Weir
Namoi Fishways	Gunidgera Weir

The WaterNSW Strategic Fishway Implementation Program (SFIP) was finalised in May 2020 which included the development of concept designs for eight DSU Offset fish passages and cost estimations. Preliminary designs for these eight sites, and concept designs for the remaining four DSU offset sites, are planned to be developed in FY21 and FY22. Once designs have been finalised, it is proposed that construction will proceed at two pilot sites to prove the concept for the novel construction methodologies at:

- Gunidgera Weir Fishway – (New Concept for In-gate Fish Lock)
- Tyreel Weir – (New Concept for Gravity channel type fishway with variable baffles)

Upon achievement of proof of concept for these sites, WaterNSW plans to progress to delivery of the remaining offsets.

Copeton Dam offset program

The Copeton Dam offset program included four of the eleven remaining fishways to be delivered under the DSU Fishway Passage Offsets Program. These four sites will be located on the River Gwydir at Tyreel Weir, Tyreel Regulator, Boolooroo Weir and Tareelaroi Weir. Design concepts for these locations were among those assessed and costed by Jacobs as part of their Strategic Fishway Implementation Program (SFIP) report. This report considered different structure types, including fixed crest weirs and gated weirs, as well as a review of earlier fishway designs for the sites that included vertical slot fishways and fish locks with regulator gate modifications. Options for conceptual design were selected for each site and agreed with WaterNSW and the NSW DPI Fisheries. Following this, detailed cost estimations were developed for the selected options and compared with the Mollee fish pass costs.

Lessons learned after the Mollee fish pass project, and the subsequent re-assessment of design concepts, have indicated that cost efficiencies of around 30% could be achieved through adoption of the updated design concepts in the 2020 determination period.

Further details of the Gwydir project review are given in Appendix C (Capital project summaries).

Recommended expenditure

In our Draft Report we noted that WaterNSW have been unable to provide any specific business cases (strategic or otherwise) that have been approved within the organisation to support the proposed $71.6m of capital expenditure in the future four year determination period for the fish passage offset program. This demonstrates that there has so far been a lack of governance over the plans to develop the fish passage offset schemes. WaterNSW have provided concept level cost estimates within the SFIP that have been built up by consultants in support of the detailed program. WaterNSW propose to prove the concept for the novel construction methodologies at two pilot sites of Gunidgera Weir Fishway and Tyreel Weir. Upon achievement of proof of concept for these sites, WaterNSW plans to progress to delivery of the remaining offsets.

In our Draft Report we considered three main options in making our recommendations of expenditure in the future determination period:

i. **Deferring all the proposed expenditure**. Given that WaterNSW has not presented evidence that these schemes are appropriate, feasible and need to be delivered in the next Determination period, we considered not recommending including any of the proposed capital expenditure within the IPART 2021 determination. In most instances where there has been insufficient internal rigour or challenge of the business case, including justification, cost estimates, benefits and timing for the schemes we

recommend deferring all the expenditure. This would imply delaying the expenditure until such time as internal governance processes have been substantively progressed and it can be demonstrated that the timing and quantum of expenditure is justified to deliver the required FM Act 1994 outcomes.

The issue with this option is that it does not allow WaterNSW to make progress in implementing the Fishway Offsets Program.

ii. **Specific adjustments across all schemes within the Fish passage offset program.** We have reviewed the consultants cost estimates used as a basis for the expenditure identified in the SIR submission. We noted that in the consultant's cost estimates report a 40% contingency has applied on top of construction, design and WaterNSW costs, on each and every project within the program. This has been applied directly into WaterNSW's SIR submission. No specific risks or comparable risks from prior projects have been identified to justify the level of contingency applied across the program. There is no business case to justify this number. We note that within the Mollee fish pass project a 12.5% contingency has been applied and this appears to be more reflective of more mature projects within WaterNSW portfolio.

As WaterNSW has not justified the 40% level we could recommend an adjustment to allow for 12.5% contingency instead to reflect the need for WaterNSW to manage and deliver this program efficiently.

The drawback of this option is that the program is at an early stage of development, there appears to be no firm regulatory driver for it to be fully delivered in the next Determination period, and allowing this level of spend would assume an urgency of implementation which does not appear to have been present heretofore.

iii. **Two pilot sites**. WaterNSW propose to prove the concept for the novel construction methodologies at two pilot sites of Gunidgera Weir Fishway and Tyreel Weir. We could suggest deferring the remaining expenditure for the other fish passage offsets until these two schemes have been completed and the concept is proven. Within the expenditure proposals in the SIR submission WaterNSW have based its costs at Gunidgera on a traditional fish lock as they "consider it likely that an in lock fishway will be proven to be unfeasible at Gunidgera". So, although WaterNSW state that to DPI Fisheries they are exploring a new concept design here, this is not reflected within the expenditure proposed in the submission. We would also take this into consideration in our recommended expenditure.

This option would be consistent with the letter written by WaterNSW's CEO to DPI Fisheries dated 7 September 2020 setting out the plan to implement these two pilot schemes, albeit without a committed timeline.

We understand that at the current time there has been no formal Ministerial[31] (as required by s218) order provided to date, nor do there appear to be any robust regulatory incentives for WaterNSW to deliver these schemes within a certain timeframe. Given the significant expenditure proposed by WaterNSW; the lack of evidence of preparedness to deliver these schemes in our Draft Report we decided to recommend option iii). This was on the basis that it would provide WaterNSW the opportunity to prove the concept designs are effective and efficient from a cost perspective. In the meantime, WaterNSW would be able to develop the detailed business cases for the remaining schemes following its internal governance processes. This will help ensure that the remaining schemes are more likely to be delivered efficiently.

In its response to our Draft Report WaterNSW stated that

> *WaterNSW expresses disappointment at the further delays incurred to the nonpilot Fishways and WaterNSW proposes an alternative that would permit some progress on the non-pilot Fishway projects within this pricing determination whilst concurrently minimising cost burdens to the customers.*

WaterNSW proposed an alternative expenditure profile whereby:

> *pilot fishways will be completed mid-calendar year of 2023; Tyreel by end of FY23 and Gunidgera's concept proving period going into the first two months of FY24. Construction of other fishways will be completed in FY24 or FY25 and the commissioning of these fishways will fall into FY26*

For the avoidance of doubt, we are supportive of the fish pass offset schemes and are not proposing to delay the construction of the schemes. We are aware of the overarching regulatory drivers. However, we have not been provided sufficient evidence that WaterNSW has followed its capital project planning processes or governance i.e. a business case has not been progressed for any of the schemes including the pilot schemes. Our IPART expenditure review is required to make an assessment of the efficient level of expenditure required, this relies on the utilities providing evidence to support their expenditure proposals and demonstrate that these

[31] The Hon. Adam John Marshall, MP is the Minister for Agriculture and Western New South Wales, responsible for DPI Fisheries

proposals have been sufficiently scrutinised internally. For example to be able to support all of the proposed expenditure we would want to see evidence that the cost estimates have been challenged, that they are complete, that a procurement strategy has been developed, that wider environmental impacts have been assessed and that timelines for the program and associated expenditure profile have been considered etc. For this particular program no such evidence has been provided. We therefore cannot support all of the proposed expenditure from an efficiency perspective as it would fundamentally undermine our rigorous review process methodology.

Further, WaterNSW comments on our approach to applying a contingency adjustment that

> *it is inappropriate to apply a percentage adjustment to the submission number, when the estimate that this was evaluated against exceeded the submission value, even with the proposed efficiency applied. As such WaterNSW proposes that any specific adjustment to assumed project cost based upon contingency be removed.*

We have updated our recommendations on the contingency adjustment at Gunidgera subsequent to receiving updated outturn cost information for the Mollee fishway scheme which is used as a comparator scheme. While the comparative cost efficiencies are relatively small between Mollee and Gunidgera we acknowledge that it is unlikely that any further significant savings would be achieved given the draft findings from hydrological modelling which is expected to conclude that a 'traditional fish-lock' will be required.

As discussed, we are supportive of the drivers of the fish passage schemes and recognise the need to progress them. As a result, we recommended a capital expenditure allowance to:

i. Construct the two pilot schemes, to the satisfactory completion of DPI Fisheries; and
ii. Develop robust business cases and progress the detailed design for the remaining nine schemes in the program.

Our recommended expenditure and adjustments against WaterNSW October-20 SIR submission are outlined in Table 6-13 below.

Table 6-13 Fish passage offset schemes recommended expenditure

Valley	Project name in SIR	FY20	FY21	FY22	FY23	FY24	FY25	FY22 to FY25
WNSW Proposed Expenditure (as per original SIR)								
Gwydir	CPTN Fish Passage Offsets	[redacted]						
Namoi	KEEP Fish Passage Offsets							
Lachlan	WYGL Fish Passage Offset							
Macquarie	BNDG Fish Passage Offsets							
Total Fish Passage Offsets								
Atkins recommended adjustments								
Gwydir	CPTN Fish Passage Offsets							
Namoi	KEEP Fish Passage Offsets							
Lachlan	WYGL Fish Passage Offset							
Macquarie	BNDG Fish Passage Offsets							
Total Fish Passage Offsets								
Atkins recommended expenditure								
Gwydir	CPTN Fish Passage Offsets							
Namoi	KEEP Fish Passage Offsets							
Lachlan	WYGL Fish Passage Offset							
Macquarie	BNDG Fish Passage Offsets							
Total Fish Passage Offsets		***69,028***	***184,221***	***4,997,610***	***4,730,378***	***1,849,467***	***3,688,267***	***15,265,722***

6.8.6. Three CSSI Dams and other drought related expenditure

Three Dams project funding

WaterNSW is proposing to recover the 'net' costs of these dam projects (i.e. less any grant funding from Government) via the Government RAB for the 2021 Determination period and not through user charges.

As WaterNSW have proposed a one year (2021/22) determination period they have included within their pricing submission only the expenditure that has been agreed to be funded by the NSW Government at the current time. WaterNSW anticipate that there may be additional expenditure required particularly for the three dams that may mean additional user charges are required beyond 2022. WaterNSW have been unable to provide us with any further guidance on this area and how these schemes are to be funded beyond FY25. Within the NSW Government Direction dated 13 May 2020 it is stated that WaterNSW are directed to raise debt finance to fund these costs not funded by way of grant from the NSW Government and to establish a governance framework.

> ***3 Direction***[32]
>
> *The Board of Water NSW is directed to:*
>
> *a) Raise funds through debt to cover the capital expenses to deliver critical drought initiatives contained in Schedule 1.*
>
> *b) Work with the Department of Planning, Industry and Environment and NSW Treasury to recoup non-capital expenses associated with their delivery of initiatives contained in Schedule 1.*
>
> *c) When determining annual dividend payments, take into consideration unrecovered costs associated with the critical drought initiatives contained in Schedule 1, including but not limited to interest and tax expenses.*
>
> *d) Report on delivery of critical drought initiatives contained in Schedule 1 at each meeting of the Drought Interagency Executive Committee meeting, established and chaired by the Department of Planning, Industry and Environment*

Questions remain to be resolved between WaterNSW and the state Government over any renewals or ongoing operational and maintenance costs of these assets into the longer term although it is envisaged that there will be minimal (if any) operational costs required over the next four year determination period.

Within its October 2020 pricing submission WaterNSW allocated PDMP capital expenditure to it FY21 its Corporate systems activity within the Rural Valleys of $0.4m (user share 80%). We consider that this expenditure is almost entirely driven by the 3 CSSI dams projects at this stage so have reallocated this amongst the valleys to the Drought Projects (3 dams) (user share 0%). Overall, this does not alter the recommended expenditure by it does impact on the user share of capital expenditure. We recommended allocating this proportionally by each valley to the Border, Peel and Lachlan valleys where the three drought CSSI projects are being undertaken. Should WaterNSW increase its direct cost allocation to capital projects this will provide a more accurate approach to deciding where these costs sit.

[32] 108 B20 8336 SIGNED Attachment B - Direction to WaterNSW

6.8.7. Corporate and IT expenditure

This is discussed in detail in Section 8.

6.8.8. Assessment of efficiency

Our approach to assessment of efficiency is summarised in Section 2. Our recommended scope adjustments, catch-up and continuing efficiencies are set out below.

6.8.8.1. Scope adjustments

We summarise our recommended scope adjustments to various valleys and project expenditure line items these adjustments are detailed on a valley and activity basis in Appendix A in our recommended capital expenditure tables.

Table 6-14 Summary of capital expenditure scope adjustments

Adjustment	Description
PDMP reallocation from Corporate to Drought project (3 dams)	Within its October 2020 pricing submission WaterNSW allocated PDMP capital expenditure to its FY20 and FY21 Corporate systems activity. Within the Rural Valleys of ($0.4m + $2.3m) (user share 80%). WaterNSW inform us that so far this expenditure is almost entirely driven by the 3 CSSI dams projects at this stage so have reallocated this amongst the valleys to the Drought Projects (3 dams) (user share 0%). Overall, this does not alter the recommended expenditure by it does impact on the user share of capital expenditure. We recommended allocating this proportionally by each valley to the Border, Peel and Lachlan valleys where the three drought CSSI projects are being undertaken.
Corporate Systems FY20 miscoding	We identified that between its June and October 20 submissions WaterNSW allocated and additional $9.4m of corporate capex for FY20 in its SIR submission. WaterNSW subsequently informed us that $4m of this was incorrectly allocated to corporate that had been miscoded. We have reallocated this between the various specific activities.
Fish passage Offsets adjustments	We recommend expenditure allowance for construction of two pilot schemes identified by WaterNSW to advance, to the satisfactory completion of DPI Fisheries. We also recommend an expenditure allowance for the development of robust business cases and progression of the detailed design for the remaining nine schemes in the program. We recommend an adjustment within the future period of -$53.4m against WaterNSW October 20 SIR submission
Lake Cargelligo Embankment upgrade	Reallocation of expenditure from Renewals and Replacement to Dam Safety Compliance and cost savings adjustment
Copeton Dam Spillway investigations reallocation to <1997 dam safety compliance	WaterNSW indicated that further works on Copeton Dam are to be required to meet the <1997 dam safety standards. We have reallocated this expenditure from Dam Safety Compliance to <1997 Dam Safety Compliance.
Rural Valleys expenditure allocation approach from RAB to total direct opex costs	We recommend adjusting the approach taken to allocate costs between its rural valleys from RAB to total direct opex costs. This is consistent with our recommendations for how costs are allocated between WaterNSW separate businesses.
Corporate capex scope and reallocation between determinations	As per our review of corporate costs and corporate allocation discussed in Section 8, we have made three reallocation adjustments for: ICT expenditure; Integrated business systems business case and MCP procurement strategy. The impact on the

Adjustment	Description
	rural valley's determination is a recommended increase of $0.6m p.a. over the
RAB adjustment for RV past overcapitalisation	WaterNSW implemented a change to capitalisation rules from 2019 increasing the capitalisation of overheads. This change resulted in a reduction of approximately $25.9m in operating expenditure allocated to Rural Valleys and a matching increase in capex in the current determination period.

6.8.8.2. Catch-up efficiency

'Catch-up' inefficiency refers to the fact that, because water companies are not operating in a competitive market, they are not compelled, through competitive forces, to be efficient. As such, they may be operating 'behind' the efficiency frontier (either carrying higher costs and/or delivering worse outcomes or performance than would arise in a competitive market). These efficiencies are applied to expenditure proposed in the WaterNSW SIR submission and reflect the impact of recent or new capital planning and procurement initiatives being implemented, in particular in areas where we have not seen evidence of WaterNSW challenging its capital program from an efficiency perspective,

We have applied our judgement to determine the level of catch-up efficiency that could be achieved by WaterNSW based on our assessments of the capital processes and strategic review (Section 4) and the review and analysis of sample projects representative of the capital program as a whole. We also draw on our findings in our Final Report for the Greater Sydney determination expenditure review as the overarching business processes are comparable. We have identified four areas where WaterNSW should be able to make material improvement to its processes to move towards the efficiency frontier utility level over time and deliver material efficiencies over the next Determination period. These are:

1. Improvements to capital program development, optimisation and prioritisation
2. Improvements to value engineering
3. Improvements in cost estimating and the management of contingencies
4. The impact of new procurement processes and the likely savings from more effective program management.

Each of these areas is defined and briefly discussed in the following sections.

We have calibrated capital process catch-up efficiency against utilities that we have previously reviewed in Australia, UK and other jurisdictions. We acknowledge that there is a degree of subjectivity in the analysis, however, the relative subjectivity does provide a good test for utilities to catch up to industry peers. Incentive mechanisms which are assessed (rather than merely initially calibrated) on a relative basis typically provide a sharper incentive than absolute targets, in part because of the greater reputational incentives of being ranked relative to industry peers. Relative mechanisms are seen as more powerful, especially for companies seeking to catch-up industry peers.

We provide a summary below of comparative and relative efficiency challenge recommendations that we have made for IPART for prior price determination reviews.

Table 6-15 Comparative catch up efficiency challenges for previous IPART reviews

Utility Review	Catch-up efficiency applied (cumulative %)			
	Year1	Year2	Year3	Year4
WaterNSW Greater Sydney Review (2020)	2.1	4.1	6.7	7.3
Sydney Water Review (2016)	2.9	5.8	7.2	8.6
Central Coast Council Review (2019)	3.25	7.5	10.75	13
Sydney Water Review (2012)	1.3	4.4	9.6	12

The range of catch-up efficiencies applied to WaterNSW in this review is comparable to that which we recommended for Sydney Water in 2016 and who have demonstrated of achievability of these in both its current and previous determination periods.

Capital Program Development, Optimisation and Prioritisation

Effective capital program development helps to identify synergies, to challenge expenditure and to optimise capital programs by improved targeting of expenditure to areas where it is most required and prioritised according to needs. It usually involves a mixture of culture, incentives, systems and processes. It reflects our view that WaterNSW can improve the way it manages and prioritises expenditure at a program level for delivering optimal outcomes.

We consider there to be scope for efficiency savings via the move from a horizontal project lifecycle delivery structure at the previous pricing submission which has now been made more vertical. Previously, project managers were engaged with the project throughout the whole lifecycle. Subsequent to an internal WaterNSW review it was recognised that separate skill sets were required within different stages of the project lifecycle. This approach is in the process of being rolled out across the capital delivery structure and we consider this to be a move towards a more effective and efficient capital program delivery.

We have not seen evidence that these efficiency savings have been factored into the wider capital expenditure program, so recommend that these efficiencies are applied to a proportion of capital expenditure, that is, expenditure which is not allocated towards significant discreet projects.

As with our review of for Greater Sydney, we recognise that the proposed application of this generic efficiency challenge across the entire capital program is not appropriate due to the significant expenditure proposed on large, discrete infrastructure projects. There is limited opportunity for realising the types of synergies referred to program optimisation when there is such focus on specific projects. WaterNSW identify a significant number of smaller renewals and replacement projects within its 'Renewals Provision' line items across each of its valleys. These 'Renewals Provision' line items make up some 21.8% of its total proposed capital expenditure across its Rural Valleys business.

As discussed in Section 6.8.3, WaterNSW has applied efficiency levers for some of its proposed FY22 renewals program. Although these go some way to demonstrating a bottom-up challenge against each project, the renewals and replacement efficiency targets and calculations do not make any assumptions related to efficiency gains to WaterNSW's own internal costs for each project, based on the move to the new procurement and delivery model or any additional improvements in its overall asset management processes, in particular linking to asset health and performance measures driven through the implementation of its asset class strategies. There is little evidence of any renewals program level efficiency challenge.

We consider there is further opportunity to implement a capital program management system for managing its capital program actual and projected expenditure with a single version of the capital program held centrally. Throughout our review we have been provided numerous spreadsheets with various allocations both between WaterNSW businesses and within its RV valleys. Many of these have contained differing expenditure amounts, activities which are pulled in from other worksheets, and drivers for expenditure which are not mapped consistently. As a result, we have found issues in reconciling between spreadsheets particularly when projects items or expenditure is updated. We consider that there is the opportunity to have a single version of the truth of the capital program against each determination which is managed centrally, and reports can be run from. At present there appears to a disconnect between the expenditure proposals submitted to IPART and the systems supporting this.

To reflect these opportunities, we have applied a gross catch-up efficiency of 0.5% p.a. However, we have applied this to 21.8% of WaterNSW's total capital expenditure (reflecting the component allocated to renewals provision items), yielding a net catch up efficiency of 0.109% p.a. across the whole capital program. We consider this

achievable in the context of a move towards more mature risk-based planning process driven by improved understanding of asset performance across all asset classes and a more centralised capital program management approach.

The efficiency has been applied in a uniform incremental approach over the FY22 to FY25 period, recognising that change can take time and the capital program in the early years is already partially committed.

Value engineering

Moving from the program level to the scheme-specific level, value engineering looks to reduce the cost of delivering capital projects to a given scheme by challenging scope and methods and looking for alternative ways to achieve the outcome required. Value Engineering helps a project to meet the customer's need for cost efficiency within a short timeframe[33]. Large capital projects are often not delivered at the lowest possible cost, nor do they deliver maximum value at any given cost. Systematically identifying opportunities for cost reduction, whilst ensuring they do not have an adverse effect on functionality or performance should be a goal for any utility involved in capital projects and knowing that innovative ideas have been incorporated along the way.[34]

We have seen that WaterNSW has carried out some value engineering, both internally and through challenging its engineering consultants for a number of its major schemes, particularly where costs have exceeded initial expectations. This efficiency allows for value engineering to become more widespread to ensure that capital works are delivered at an efficient cost for customers.

Typically, value engineering delivers at least 10% in lifetime cost savings, with a relative contribution between capex and opex varying depending on the nature of the project. We consider that 0.5% p.a. for capital is achievable throughout the future determination period if WaterNSW moves towards incorporating value engineering processes more readily throughout its capital project planning, particularly for large projects.

Cost estimation and contingency management

WaterNSW's approach to cost estimation is at an early stage of maturity. WaterNSW has a cost estimating framework to guide preparation of cost estimates. It also has unit rates database and has a cost estimator on staff responsible for updating the unit rates database using contract values. The regulatory submission has been based on a mix of internal estimates and external estimates.

There remain opportunities for improvement of its management of contingencies at a whole of capital program level. As projects vary significantly in size and expenditure levels, there may be opportunities to balance contingency throughout the capital program at each pricing submission and expenditure review. We understand that a project controls improvement initiative is currently underway and WaterNSW is considering revised approaches to contingency management at the program level. In line with our recommended catch-up at the Greater Sydney review, we proposed a 2% catch-up across the future four-year determination period.

Procurement

Procurement efficiency involves finding better ways to purchase capitalised goods and services. It can involve packaging of works, incentivisation and contractual arrangements, such as alliancing and partnering.

It is evident that WaterNSW has invested in improving its procurement approach, supporting tools and systems. The current framework appears stricter (i.e. less procurement control with the business) than for comparable agencies. However, this is likely appropriate for WaterNSW's maturing business processes. The improved procurement function should provide greater insight into the overall program and identification of opportunities for efficiencies.

After starting the development of the delivery model in May 2019 and going through the engagement process between July and October 2019, the transaction and implementation phase started at the start of 2020. At September 2020, WaterNSW considers that it is close to awarding the engineering design partner role and expects them to be engaged soon. Tender exercises are still ongoing with prospective construction partners and the preferred suppliers are not expected to be finalised for another few months.

At the current time it is difficult for WaterNSW to quantify the efficiencies that might be able to be delivered through this new delivery model. Efficiencies will depend of mix of work in the valleys. It is noted that WaterNSW has factored in some efficiencies into 'renewals provisions' line items, but we have not been provided evidence that these have been factored into the wider capital program, proposed expenditure in the SIR submissions.

[33] Possibility of Using Value Engineering in Highway Projects (Heralova,2016)
[34] Russell Pell, "value engineering of capital projects", Arthur D. Little, 2015.

A UK Infrastructure Cost Review in 2014[35] looked in detail at evidence of improvements in collaborative behaviours that support better delivery outcomes. It found an average of 15% of annual savings across all sectors over the four year review period, with infrastructure clients in the public and regulated sector perceived by industry to be exhibiting collaborative behaviours that would enable continued and sustained improvements.

We consider that WaterNSW's move towards a more collaborative delivery model has significant efficiencies to be realised that have not been factored into WaterNSW capital expenditure proposals, we have therefore applied an additional procurement efficiency adjustment equal to 3% from 2024 onwards.

Overall Efficiency Recommendation

Our assessment of the level of continuing and catch-up efficiencies achievable in the future determination period is shown in Table 6-16 below.

Table 6-16 Future determination period – Proposed Capital Efficiencies (Source: Atkins/Cardno analysis)

Cumulative efficiency challenge (%)				
	2022	**2023**	**2024**	**2025**
Continuing efficiency at the Frontier	***0.70%***	***1.40%***	***2.09%***	***2.77%***
Catch-up: capital program development, optimisation and prioritisation	0.11%	0.22%	0.33%	0.44%
Catch-up: value engineering	0.50%	1.00%	1.50%	2.00%
Catch-up: cost-estimating	0.50%	1.00%	2.00%	2.00%
Catch-up: procurement	1.00%	2.00%	3.00%	3.00%
Catch-up efficiency	***2.11%***	***4.22%***	***6.83%***	***7.44%***
Total efficiency	**2.81%**	**5.61%**	**8.91%**	**10.21%**

6.8.8.3. Continuing efficiency

The continuing improvement element of efficiency, termed 'Frontier Shift', relates to the increased productivity derived from process innovation and new systems and technology that all well-performing businesses should achieve. We have applied the results from the Australian Productivity Commission Multi-Factor Productivity (MFP) analysis, proposed efficiencies from other water utilities in New South Wales and recent analysis for Ofwat, the water regulator in England and Wales, which has been applied to frontier water companies. We have applied a Frontier Shift of 0.7% per annum cumulating over the Determination period.

In line with the recommendations of the WaterNSW GS and Sydney Water 2020 Determinations, we have not assumed continuing efficiency will reduce expenditure in FY21 because of the COVID-19 response.

6.8.9. Recommended efficient expenditure

Current Determination Period

Table 6-17 provides our recommended expenditure for the current determination period. Additionally to this we recommend a RAB adjustment of $21M across FY19 to FY21 to reflect the change in capitalisation policy as shown in Table 5-7 above. We need to understand in more detail how to apply this RAB adjustment to activities and therefore the impact on the user share component retrospectively.

[35]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/330380/PU1684_-_Infrastructure_cost_review.pdf

Table 6-17 Current determination period – Proposed Capital expenditure

WATERNSW RURAL BULK WATER PROPOSAL - CAPEX -				
($M 2020/21) year ending June	2018	2019	2020	2021
Water Delivery & Other Operations	0.03	10.99	0.90	0.90
Flood Operations	0.00	0.00	0.00	0.06
Hydrometric Monitoring	0.03	0.17	0.20	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00
Corrective Maintenance	1.51	0.33	-1.68	0.18
Routine Maintenance	0.00	0.00	0.08	0.50
Asset Management Planning	4.50	1.09	-5.28	1.10
Dam Safety Compliance	0.00	0.00	0.00	15.55
Environmental Planning & Protection	0.15	0.09	2.34	0.49
Corporate Systems	6.60	0.26	22.21	17.01
Drought projects (3 dams)	0.00	0.00	17.95	178.31
Drought projects (other)	0.00	0.00	34.27	4.46
Renewals and Replacement	15.67	16.69	26.91	44.58
Dam safety compliance on pre 1997 capital projects	10.68	13.99	18.29	0.00
Structural and other enhancements	0.33	1.60	0.53	0.23
Customer support	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.09	0.00
Total capex proposed by WNSW	39.49	45.21	116.82	263.37
Atkins/Cardno recommended adjustments for specific programs or projects				
PDMP reallocation from Corporate			-2.39	-0.44
PDMP reallocation to Drought projects (3 dams)			2.39	0.44
Water Delivery & Other Operations - Corporate Systems FY20 miscoding			1.08	
Flood operations - Corporate Systems FY20 miscoding			0.15	
Hydrometric monitoring - Corporate Systems FY20 miscoding			1.38	
Asset management planning - Corporate Systems FY20 miscoding			0.04	
Dam safety compliance pre1997 - Corporate Systems FY20 miscoding			0.54	
Environmental Planning & Protection - Corporate Systems FY20 miscoding			0.14	
Renewals and Replacement - Corporate Systems FY20 miscoding			0.66	
Corporate Systems - Corporate Systems FY20 miscoding			-4.00	
Fish Passage Offsets				-0.31
Copeton Spillway Investigations reallocation from dam safety compliance				-0.59
Copeton Spillway Investigations reallocation to <1997 dam safety compliance				0.59
Sub Total adjustments	0.00	0.00	0.00	-0.31
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE				
($M 2020/21) year ending June	2018	2019	2020	2021
Water Delivery & Other Operations	0.03	10.99	1.99	0.90
Flood Operations	0.00	0.00	0.15	0.06
Hydrometric Monitoring	0.03	0.17	1.58	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00
Corrective Maintenance	1.51	0.33	-1.68	0.18
Routine Maintenance	0.00	0.00	0.08	0.50
Asset Management Planning	4.50	1.09	-5.24	1.10
Dam Safety Compliance	0.00	0.00	0.00	14.97
Environmental Planning & Protection	0.15	0.09	2.48	0.18
Corporate Systems	6.60	0.26	16.32	16.66
Drought projects (3 dams)	0.00	0.00	19.85	178.66
Drought projects (other)	0.00	0.00	34.27	4.46
Renewals and Replacement	15.67	16.69	27.58	44.58
Dam safety compliance on pre 1997 capital projects	10.68	13.99	18.83	0.59
Structural and other enhancements	0.33	1.60	0.53	0.23
Customer support	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.09	0.00
Total Efficient Expenditure- recommended by Atkins	**39.49**	**45.21**	**116.82**	**263.06**
User Share Capital Expenditure	*27.16*	*29.48*	*39.65*	*67.29*
Government Share Capital Expenditure	*12.32*	*15.73*	*77.18*	*195.77*

Future Determination Period

Table 6-18 provides our recommended expenditure for the future determination period.

Table 6-18 Future determination period – proposed capital expenditure

WATERNSW RURAL BULK WATER PROPOSAL - CAPEX -						
($M 2020/21) year ending June	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	2.38	1.89	0.00	0.00	1.89	4.28
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	1.07	0.67	0.00	0.00	0.67	1.74
Routine Maintenance	0.23	0.24	0.24	0.32	0.79	1.02
Asset Management Planning	1.22	1.04	1.33	1.19	3.56	4.78
Dam Safety Compliance	12.30	14.80	6.98	4.86	26.64	38.94
Environmental Planning & Protection	3.31	3.24	32.86	32.38	68.48	71.79
Corporate Systems	7.87	6.97	12.17	8.75	27.89	35.77
Drought projects (3 dams)	93.06	2.31	2.30	2.28	6.89	99.95
Drought projects (other)	1.43	0.41	0.40	0.40	1.21	2.64
Renewals and Replacement	19.80	35.48	26.61	20.17	82.25	102.05
Dam safety compliance on pre 1997 capital projects	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00
Total capex proposed by WNSW	142.69	67.05	82.88	70.35	220.28	362.96
Atkins/Cardno recommended adjustments for specific programs or projects						
Fish Passage Offsets	1.81	1.49	-31.01	-28.69	-58.21	-56.40
Lake Cargelligo Embankment upgrade reallocation from Renewal and Replacement		-7.72			-7.72	-7.72
Lake Cargelligo Embankment upgrade reallocation to Dam Safety Compliance		7.72			7.72	7.72
Lake Cargelligo Embankment upgrade - business case alignment		-1.28			-1.28	-1.28
Corporate Scope and Reallocation	0.60	0.60	0.60	0.60	1.80	2.40
Copeton Spillway Investigations reallocation from dam safety compliance	-3.58	-1.84			-1.84	-5.43
Copeton Spillway Investigations reallocation to <1997 dam safety compli	3.58	1.84			1.84	5.43
Sub Total adjustments	2.41	0.81	-30.41	-28.09	-57.69	-55.28
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS						
Water Delivery & Other Operations	2.38	1.89	0.00	0.00	1.89	4.28
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	1.07	0.67	0.00	0.00	0.67	1.74
Routine Maintenance	0.23	0.24	0.24	0.32	0.79	1.02
Asset Management Planning	1.23	1.04	1.33	1.19	3.56	4.78
Dam Safety Compliance	8.73	19.40	6.99	4.84	31.24	39.97
Environmental Planning & Protection	5.13	4.73	1.85	3.69	10.27	15.39
Corporate Systems	8.39	7.55	12.75	9.31	29.61	38.00
Drought projects (3 dams)	93.06	2.31	2.30	2.28	6.89	99.95
Drought projects (other)	1.43	0.41	0.40	0.40	1.21	2.64
Renewals and Replacement	19.79	27.76	26.61	20.17	74.53	94.32
Dam safety compliance on pre 1997 capital projects	3.58	1.84	0.00	0.00	1.84	5.43
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00
Total pre-efficiency	145.03	67.83	52.47	42.20	162.50	307.52
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)						
Continuing Efficiency (%)	0.70%	1.40%	2.09%	2.77%		
Continuing Efficiency ($M)	-1.02	-0.95	-1.09	-1.17	-3.21	-4.22
Catch-up efficiency (%)	2.11%	4.22%	6.83%	7.44%		
Catch-up efficiency ($M)	-3.04	-2.82	-3.51	-3.05	-9.38	-12.42
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE						
($M 2020/21) year ending June	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	2.32	1.79	0.00	0.00	1.79	4.11
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	1.04	0.64	0.00	0.00	0.64	1.68
Routine Maintenance	0.22	0.22	0.22	0.29	0.73	0.95
Asset Management Planning	1.19	0.98	1.21	1.07	3.26	4.45
Dam Safety Compliance	8.49	18.33	6.38	4.36	29.06	37.55
Environmental Planning & Protection	4.98	4.47	1.69	3.32	9.47	14.46
Corporate Systems	8.16	7.13	11.64	8.38	27.14	35.30
Drought projects (3 dams)	90.46	2.18	2.10	2.05	6.33	96.79
Drought projects (other)	1.39	0.38	0.37	0.36	1.11	2.50
Renewals and Replacement	19.24	26.21	24.27	18.15	68.64	87.88
Dam safety compliance on pre 1997 capital projects	3.48	1.74	0.00	0.00	1.74	5.22
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00
Total Efficient Expenditure- recommended by Atkins	**140.97**	**64.06**	**47.87**	**37.98**	**149.91**	**290.88**
User Share Capital Expenditure	*40.11*	*52.28*	*40.18*	*31.38*	*123.84*	*163.95*
Government Share Capital Expenditure	*100.86*	*11.78*	*7.69*	*6.60*	*26.07*	*126.93*

Our recommended capital expenditure is summarised in Figure 6-18,Figure 6-19 and Figure 6-20 below

Figure 6-18 Efficient capital expenditure (including drought schemes) ($m20/21)

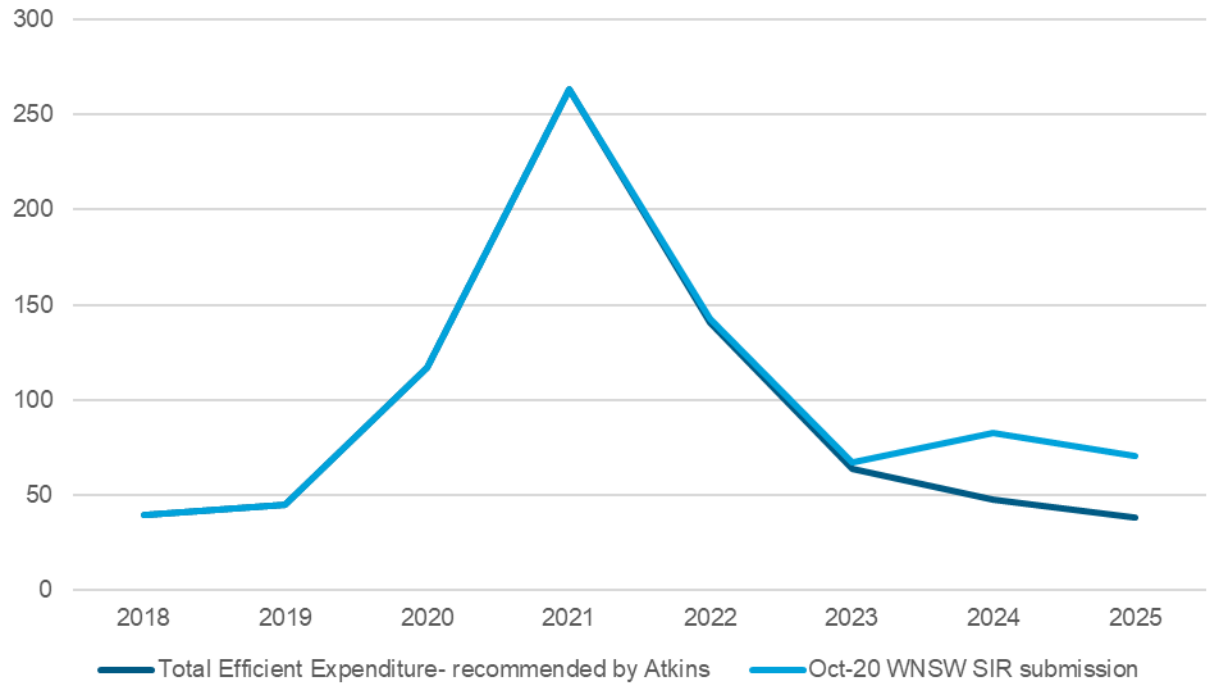


Figure 6-19 Efficient capital expenditure (user share) ($m20/21)

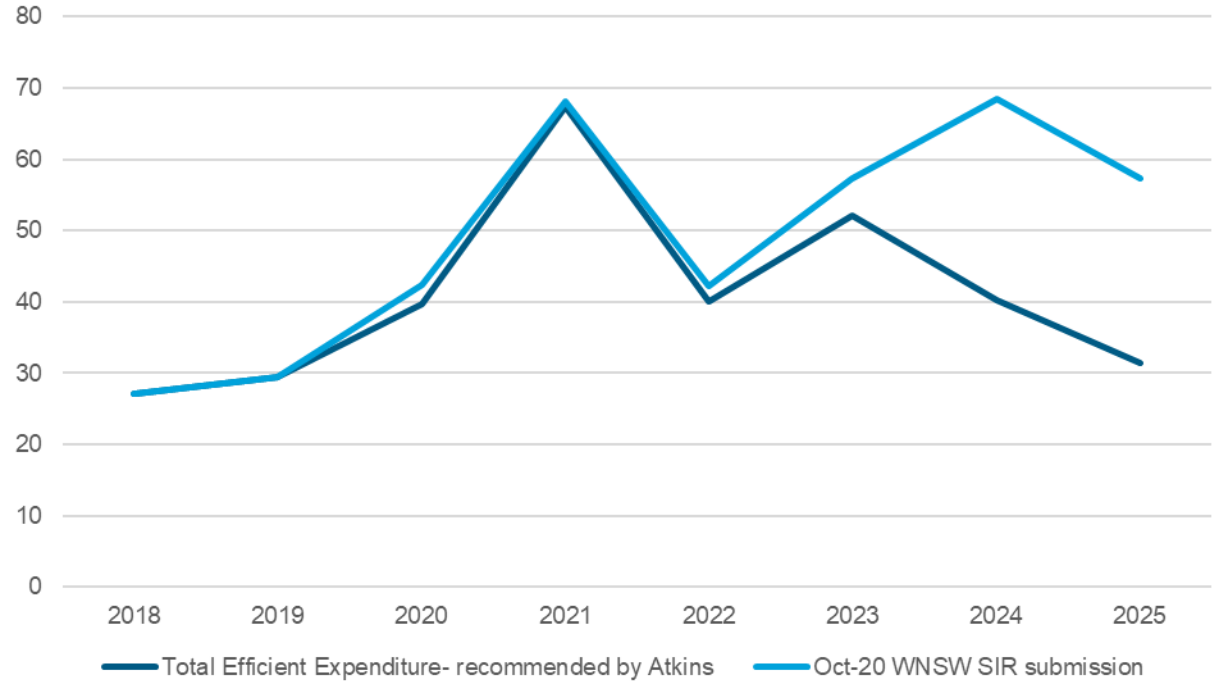
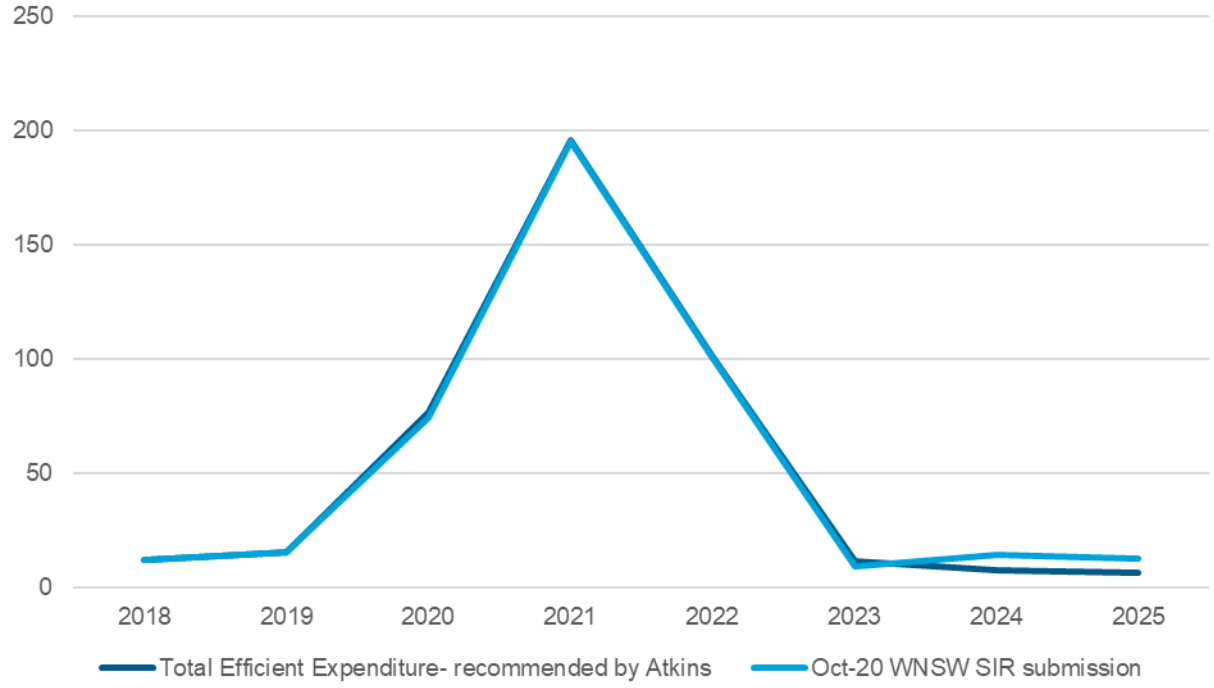


Figure 6-20 Efficient capital expenditure (government share) ($m20/21)



7. Review of output measures

We are required to use any findings from Task 1 or 2 to inform this task. In undertaking this task, we must:

(a) Review WaterNSW's performance against its output measures over the 2017 determination period. Where output measures have not been achieved, provide comment on the reasons for this.

(b) Recommend a set of new output measures for the utility's proposed operating and capital expenditure program, for the 2021 determination period.

7.1. Performance in the 2017 Determination period

The WaterNSW submission Appendix 9 includes tables of activities in the rural valleys to meet outcome measures (or key performance indicators) in the 2017 Determination, for 2017-2018 and 2018-2019. The later of these tables is reproduced here with our comments on the evidence for completion.

Table 7-1 Activity against output measures 2018-19 – Rural Valleys

Project	Output measure	Expected completion	Activity 2018-19	Review comments
Asset renewals and condition	Report on: a) Service orders requiring reactive maintenance, broken down by asset sub-types. b) Number of assets with a criticality rating of 4 or above, broken down by asset sub-types.	Report annually	The Rural Valleys had 2,441 reactive work orders in 2018- 19. The Rural Valleys have 1,361 assets with a criticality of 4 or 5. A breakdown by asset sub types for each of these responses is found in Attachment 1.	WaterNSW transitioned to a new Enterprise Asset Management System in April 2019. This transition included a revision of standard asset classes. Reactive work orders on the legacy system Jul-18 to Apr-19 – 1914 Reactive work orders on the ERP system Apr-19 to Jun-19 – 527
WaterNSW Enterprise Resource Planning (ERP)	Ceased use of legacy information/ERP systems.	1 July 2020	Work is continuing on building suitable solutions for components of legacy applications that were not completed at CIMS go live. Also, data archiving and access processes are also in progress	Some of the original plans were de-scoped and for others it was identified that the existing solution was better than the alternative. CRM and WLS were pushed back and are now deliverables under the WAVE program in the future price path. Overall, we concur it is reasonable to conclude that this output measure has been met.
Regulatory Health and Safety expenditure by valley on 'Renewals – Safety'	WHS risks lowered to As Low As Reasonably Practicable (ALARP), providing a safe working environment for staff, reducing risk to the public, and	30 June 2020	Works were substantively completed to undertake safety improvements on 42 sites in the Murrumbidgee and Lowbidgee Valleys. Planning activities were undertaken on a further	

Project	Output measure	Expected completion	Activity 2018-19	Review comments
	maintaining operability		program of works across rural valleys the 'Rural MCP Program (All Valleys)'. The program comprises of works across 170 sites, approximately 40% of which has health and safety improvement as the primary driver. Additionally, a project has progressed to execution to address 161 inherent hazards with access to survey points at 17 dams across WaterNSW.	
Keepit Dam	Completion of works meeting the stated needs & requirements	30 June 2020	Additional strengthening works outside the original scope are being carried out on the spillway section of the dam, extending the works until December 2020.	Recognised that the works are substantially complete in terms of meeting the original scope.
Keepit Dam safety project	Life safety risk position from Keepit Dam reduced to below Australian National Committee on Large Dams (ANCOLD) Limit of Tolerability for societal risk (ANCOLD Guidelines on Risk Assessment Figure 7.4).	30 June 2020	As above, the benefits will be realised on completion of the project.	Recognised that the works are substantially complete in terms of meeting the original scope.
Future Dam Safety capital works strategy	Following expected changes in dam safety regulations, formulate a medium-term (5-10 year) plan of capital works required.	24 months following confirmation of applicable dam safety regulations in NSW	The new regulations commenced on 1 November 2019. The standards and guidance material that stipulate regulatory requirements below the safety threshold are still to be developed. This is expected to be delivered within a 2- year window starting at the inception of the new regulations. The development of the corporate strategy is dependent on the publication of these requirements and guidelines. When the	The WaterNSW dam engineering team have, since this comment, provided a plan for developing the strategy for meeting the 2-year window. They have been proactive in providing their own interpretations of the new regulations in advance of the further guidance awaited from Dam Safety NSW.

Project	Output measure	Expected completion	Activity 2018-19	Review comments
			standards and guidance material have been gazetted, we will require at least 12 months to develop the strategy i.e. apply the methodology, assess compliance and develop risk mitigation solutions.	

7.2. Recommendations for the 2021 Determination period

WaterNSW has not proposed any output measures within its pricing submission. We have recommended new output measures for the future determination period 2021 – 2025 below. We have attempted to express these measures in terms that are as close to outcomes as possible at this stage. In future reviews, as the maturity of WaterNSW's measures of customer experience and underlying asset risk improve, we recommend that these measures become increasingly outcomes-based wherever possible. This should help to improve the focus on delivering outcomes for customers by providing the flexibility to allow for better solutions to be developed during the determination period.

Table 7-2 New output measures for 2020 - 2025 – Rural Valleys

Project	Output measure	Expected completion	Activity
Lake Cargelligo Embankment upgrade works	Completion of embankment safety works to bring risk assessment into tolerable zone of SFAIRP	FY23	Detailed design and construction of embankment raising and filter works
Fish pass offsets pilot projects	Completion of the Gunidgera and Tyreel Weir fish passage offset schemes to the satisfaction of DPI Fisheries	FY25	Detailed design and construction of the novel fish passage schemes at the two weirs and agreed with DPI Fisheries
Fish pass planning, design, programming	Final business case and detailed designs for the remaining nine fish passage offset schemes, taking account of the lessons learned from the pilot schemes, to the satisfaction of DPI Fisheries	FY25	On the basis of the construction and evaluation of the two pilot fish pass schemes at Gunidgera and Tyreel Weir progress with developing the business cases and detailed design and program for delivery of the remaining nine fish pass schemes in the 2025 determination period to the satisfaction of DPI Fisheries.
Asset renewals and condition	Report on: a) Service orders requiring reactive maintenance, broken down by asset sub-types. b) Number of assets with a criticality rating of 4 or above, broken down by asset sub-types.	Report annually	
Asset Performance and Health	Develop asset risk evaluations across all appropriate asset classes	FY25	This will improve understanding of underlying asset risk and ultimately support future expenditure and investment decisions

Project	Output measure	Expected completion	Activity
Fish river scheme	Develop and implement a customer impact measure (e.g. minutes lost per customer) for water supply interruption events that can be used to measure performance	FY22	This will improve the focus on customer impacts of water supply interruption events rather than only the number of events that take place and drive operational improvements within the scheme. Once baselined this can be used to show performance and impact of events against various asset classes on the scheme.
Implementation of The WAVE Program	Completion of full scope of the programme on budget as per Final Business Case presented to Board 27 May 2020, comprising Operational Technology, Analytics and Water Market components and providing the benefits identified in the business case(s) used to justify the expenditure.	FY24	Program objectives: Service and efficiency improvements by allowing low value tasks to be automated Centralised management of water information by improving access to up-to-date and reliable water information for personnel and customers Consolidation of ICT systems with harmonisation and integration of ICT landscape to drive operational efficiencies and enable improved performance of services through better insights from high integrity data Mitigation of risks through improving integrity and reliability of business processes and data management
Customer measure	Achieve 75% score for “Skyline” composite measure and regularly publish regularly the results	FY25	The measure is based on customer perception from the annual research programme survey and built up from four sub measures: the suitability of services provided, satisfaction with services provided, value for money and quality of relationships. Results should be shared via the principal customer communication channels (e.g. WaterNSW website, annual report).
Cost Allocation Manual	Agreement on an updated Cost Allocation Manual with IPART	Dec-21	To reflect the recommendations of the corporate cost allocation review in Section 8 of this report.

8. Project C – WaterNSW's Corporate Costs

We are required to:

(I) Undertake a detailed review of WaterNSW's corporate capital and operating costs for efficiency; and

(II) Review how WaterNSW's efficient corporate costs should be allocated between its business units and functions

We have based our review on the AIR/ SIR submissions for the Rural Valleys and WAMC covering the period from 2017 to 2025 including the current and 2021 determination periods and supporting documents provided by WaterNSW following information requests which we reference in the report.

8.1. Summary

8.1.1. Findings – Cost Allocation

Objectives

The Cost Allocation Manual (CAM) sets out methods to allocate expenditure to the four regulated business and non-core activities. The objectives are to show that the allocation methods are

- fair and reasonable;
- transparent;
- demonstrate that there is no cross-subsidy across the regulated businesses and non-core activities; and
- comply with the IPART Cost Allocation Guide[36].

While WaterNSW states that there is no requirement for it to prepare a CAM for the WIC Act[37]. Nevertheless, the development and application of the CAM is a fundamental part of the regulatory process as it has a significant cost impact on the regulatory businesses and prices to customers. This is because corporate expenditure forms about 24% of total costs and overheads a further 4%.

The TOTEX methodology

WaterNSW uses TOTEX, the sum of direct operating costs and capital expenditure on maintenance, as a measure for allocating corporate and overhead costs. It states that *TOTEX is a concept that has been widely adopted by regulators and utilities as a regulatory measure of expenditure, TOTEX is a cost concept consistent with regulatory best practice* and that *it is reasonable to expect direct totex to be correlated with indirect and shared costs*.

However, the CAM method does not demonstrate any links between cost drivers in TOTEX and the level of corporate expenditure incurred as required by the IPART Guide. There is no detailed granular analysis of the cost drivers such as FTE numbers or other measures which drive corporate costs.

We found from our experience in regulation across domains that

- TOTEX is used in regulatory assessments as a measure of total costs and applied to econometric modelling and efficiency assessments and not as a cost allocator;
- We are not aware of any other water utility using TOTEX as a cost allocator. We comment in Section 8.3.5.7 on our benchmark analysis to support this comment;
- The IPART Guide states in Appendix B that '*a service's indirect costs are also likely to be highly correlated with its direct costs'*;
- Sydney Water's CAM states that *corporate costs are allocated to Cost Objects based on the proportion of direct operating costs calculated for each Cost Object*.
- Water companies in England and Wales are required to allocate costs across several price controls. They have prepared detailed accounting separation manuals, similar to the cost allocation requirements in NSW. The allocation methods a set at a detailed level with specific cost drivers determined for each

[36] Cost Allocation Guide, IPART March 2018
[37] Water Industry Competition Act, 2006

area of the business. Cost drivers are generally operating costs or specific activities within each area of the business. This granular approach provides clear processes which can be readily reviewed by regulators and auditors. The manuals are approved by the regulator and published on company websites. A good example is Bristol Water[38].

The TOTEX methodology is not appropriate for allocating corporate costs across regulatory businesses. The method is applied at a high level in the business yet is complex in terms of how costs are allocated with certain inclusions and exclusions. A more granular approach is needed with cost drivers identified at business unit level and detailed methods determined for allocation. The method needs to be clearer, more transparent and simplified so that it can be understood by regulators, customer groups and other interested parties.

There is much reliance on spreadsheets for analysis with the difficulties of document control and risk of errors. A corporate system is needed to provide the necessary quality controls.

Alternative Methods of cost allocation

The TOTEX methodology is not cost reflective, capex maintenance is volatile and independent of the level of corporate expenditure. For example. capital expenditure on maintenance was highly variable over the current and 2021 determination periods, from +41% to -25% of the average. The method is not consistent with the IPART Cost Allocation Guidelines in that specific cost drivers are not defined.

We identified cost drivers for corporate and operational costs in Section 8.3.3. From this analysis we found that total direct operating expenditure or salary costs were appropriate and were more robust measures to allocate corporate costs as this comprised labour and associated costs which are closely linked and a clear driver for corporate support activities. There are other drivers for ICT and customer service activities which could be developed.

Cost allocation should be based on IPART guidance which clearly requires the causality principle to be applied; that appropriate cost drivers are used. We noted that Sydney Water identifies cost drivers across its corporate activities and applies relative direct operating expenditure as a method for allocation.

Overhead expenditure

Overhead expenditure is allocated across the regulated businesses and other activities using the same method as corporate. We found that these costs are supervisory or 'pooled' costs which should be allocated within each operating business unit based on the total direct costs for each regulatory business within each unit. These costs should not be conflated with corporate expenditure.

Reducing the allocated value of corporate expenditure

There is an opportunity to reduce the value of allocated costs in both corporate and overheads through greater direct costing to appropriate activity codes. WaterNSW advised that it was implementing greater direct costing through the business driven by the finance team. We support this approach which should reduce the extent of allocated costs and hence any uncertainties of cost allocation. One way to achieve this is to have internal 'service agreements' where corporate functions provide services to operating units. This approach also helps to drive efficiencies through the business.

Customer confidence

Where corporate costs are allocated to regulated businesses and non-core activities, customers need to be confident that the methods are appropriate, and they are being asked to make appropriate contributions.

Non-core expenditure

WaterNSW reports significant non-core expenditure which it defines as 'routine' and 'special' and comprises 22% of total direct operating expenditure. Routine non-core expenditure includes MDBA, BRC and other costs which it includes in the TOTEX methodology; this results in an uplift of some 10% for corporate expenditure. Special non-core expenditure relates to government projects including drought management, water industry reform and Warragamba dam raising. It applies a 10% uplift for corporate costs which it describes as 'incremental'. We have not seen any justification for this level of uplift and whether it meets the cost allocation objectives. However, it is significantly lower than that applied to the regulated businesses which questions whether there is an element of cross-subsidy from customers.

The basis for the 10% uplift, significantly lower than that applied to regulatory businesses, is not demonstrated. The use of an updated CAM is important in explaining and demonstrating to external clients such as government the basis of the corporate cost uplift rather than rely on a nominal value.

[38] Accounting Separation Manual, Bristol Water, 2020

Applying a direct cost methodology

We tested the impact of a direct cost allocation method using the total operating expenditure data provided by WaterNSW. The data is sourced from the operating expenditure in the 'MCP project list' worksheet. These are projected expenditures for all the core and non-core activities and could change over time. We tested the direct cost method to the corporate cost allocation assuming two options:

- Option A: using the direct cost application excluding non-core expenditure. Total operating expenditure for the Rural Valleys, WAMC, Greater Sydney and Broken Hill pipeline businesses is used to allocate total corporate expenditure post capitalisation in document 60.
- Option B: using the direct cost application including non-core expenditure. We have included 'routine' and 'special' non-core expenditure in the analysis. We have applied a 40% reduction in the non-core expenditure to recognise that some elements are capital in nature although not capitalised.

We compared the resulting expenditures from the direct cost methodology with the WaterNSW analysis using the TOTEX methodology. The indicative results shown in Table 8-1 present a significant movement of corporate allocated costs between businesses. Positive values indicate an increase in corporate overhead; negative values show a reduction when comparing the direct operating method with the TOTEX method.

Table 8-1 Impact of Direct Cost method to the allocation of corporate costs

CORPORATE EXPENDITURE ALLOCATION ALL BUSINESSES

Impact of applying the direct cost methodology compared with the current TOTEX approach

$m 2021 Year ending June	2022	2023	2024	2025	Total 2022 2025	Total 2024 2025
OPTION A DIRECT COST ALLOCATION EXCLUDING NON-CORE						
Rural Valley	-0.61	0.31	-2.48	-0.97	-3.75	-3.45
WAMC	0.45	0.57	0.52	1.13	2.67	1.65
Greater Sydney	-0.29	-1.39	1.34	-0.80	-1.14	0.55
Broken Hill	0.45	0.52	0.62	0.64	2.23	1.26
Non-core	0.00	0.00	0.00	0.00	0.00	0.00
OPTION B DIRECT COST ALLOCATION INCLUDING NON-CORE						
Rural Valley	-0.91	0.05	-2.75	-1.26	-4.87	-4.01
WAMC	0.29	0.42	0.38	0.97	2.07	1.36
Greater Sydney	-0.90	-1.88	0.87	-1.33	-3.24	-0.46
Broken Hill	0.42	0.49	0.58	0.61	2.09	1.19
Non-core	1.11	0.92	0.91	1.01	3.95	1.92

Source: Atkins analysis; detailed analysis presented in section 8.3.5

The allocation of corporate overheads to regulated business using direct operating costs has a significant impact with reduced allocation to Rural Valleys and WAMC and increases to Greater Sydney and Broken Hill. When non-core operating costs are included, as option B, these variances generally widen although the impact on Greater Sydney is less This is because the non-core business currently receives a lower overhead cost. The impact of the Option B analysis is to increase corporate costs applied to non-core activities to about 15%.

We recommend that Option B is applied. The reason is that the benefit of this methodology is that corporate overheads are fairly distributed across regulated and unregulated businesses and customers are not seen to subsidise non-regulated activities. There are however implications for other determinations and a need to consider how these changes are phased in using a fair approach. There is never a perfect time to phase in the new methodology but is necessary to apply a fair and reasonable process for customers but recognising the impact of these changes on WaterNSW. We discuss implementation options in Section 8.1.2. below.

Comments from WaterNSW

WaterNSW commented on our draft final report. We have accepted some of the comments and made changes to our analysis and report. There are other comments relevant to our findings where we have not made changes to our recommendations, summarised below:

(i) It is unusual for regulators and its technical consultants to recommend prescriptive wholesale changes to an entities' cost allocation.

Our review follows the IPART 'Scope of Work' where we are required *'to make recommendations on the proportion of total efficient corporate costs allocated to each business*'. We have compared the WaterNSW cost allocation method with the IPART guidance and present our findings in Section 8.3.2.

We note that Sydney Water's CAM has been through a detailed review process including public consultation on the proposals. From our experience, it is not unusual for regulators to be prescriptive on the requirements for cost allocation as this normally has a material impact on customer's bills for the range of services that a monopoly utility provides.

(ii) WaterNSW states that its proposals to allocate overheads by TOTEX is consistent with the IPART cost allocation guidance.

We identified the cost drivers for corporate expenditure which we explain in Section 8.3. These drivers relate to specific activities within disaggregated corporate functions. We found that the CAM does not include a detailed analysis of drivers. The use of TOTEX within the CAM assumes that there is a relationship between the quantum of capital maintenance expenditure and corporate costs. Our analysis in Section 8.3 and Figure 8.11 shows that capital maintenance expenditure is volatile and independent of corporate costs. We concluded that the use of TOTEX is not consistent with the IPART cost allocation guidance.

(iii) In the provision of bulk water services, WaterNSW incurs corporate costs that are triggered by both capital and operating projects. Corporate costs have therefore been allocated using a TOTEX methodology

WaterNSW capitalises a proportion of corporate expenditure prior to the allocation of the residual expenditure to regulatory business units. TOTEX is not a driver for the residual corporate costs as we explain in section 8.3.

Capitalisation of corporate expenditure where the TOTEX methodology is applied.

We found that the current capitalisation method using the TOTEX methodology is not consistent with the IPART cost allocation guidelines. This results in a likely overstatement of capitalised corporate expenditure. The use of a capital expenditure measure is not a direct driver for corporate costs. The MCP capex measure is independent of corporate costs and is volatile. We concluded that further work is needed to develop an appropriate method which is cost reflective of the drivers of corporate costs. We recommend that when WaterNSW revises its Cost Allocation Manual as part of the determination process, it considers alternative methods of capitalisation of corporate expenditure which is more representative of the cost drivers and would be consistent with the IPART guidance while consistent with accounting standards. This review should consider

(i) Including only operational unit overhead expenditure which can be directly costed to capital projects through the timesheet process;

(ii) Extending the application of direct costing by corporate business units to capex or opex drivers so that the value of residual corporate operating expenditure can be reduced to core functions;

(iii) Identifying more granular causal relationships between operating and capital drivers and corporate expenditure within each business function.

Rural Valley costs to individual valleys

We found that the current approach using the RAB (Regulatory Asset Base) is not a driver of the costs being allocated. We propose and have applied a methodology using total operating costs.

Corporate capital expenditure

The allocation of corporate capital projects across the regulated businesses currently uses salaries. Our view is that each capital project should have a clear view of the scope, assets, deliverables and efficiencies at business plan stage to be able to allocate costs to the relevant regulated businesses. This should be established at business plan stage. Proportional allocation of capital costs to drivers is commonly applied in water utilities.

8.1.2. Recommendations – Cost Allocation

We summarise our recommendations for cost allocation in Table 8-2 below. We recognise that some changes are straightforward can be implemented in the short run but other changes may need more time to implement. In some instances, time is needed to extend direct costing and implement new methods and systems. We also recognise that these methods need to be tested and in place in advance of the next determination for Greater Sydney.

The Cost Allocation Manual should be redrafted to clearly identify cost objects and drivers consistent with the IPART Guide. The method should be based on direct operating costs or surrogate such as salaries or other relevant drivers to present a transparent and simplified process. More granular causal relationships should be established between operating drivers and corporate expenditure within each business function.

The manual should demonstrate and ensure no cross subsidy between regulatory and non-core activities. We suggest the document should be reviewed and approved by IPART before placing on the WaterNSW website. The Sydney Water CAM provides a good example to follow.

Table 8-2 summarises the recommended actions including capitalisation of overheads in (3) below. Recommendations for the allocation of costs to rural valleys (7) and corporate capital expenditure (8) have been included within our proposals on efficient operating and capital expenditure in sections 5 and 6 respectively.

Table 8-2 Recommended actions

	Allocation	WaterNSW current method	Proposed method	Ease of change	Timing	Comment
1	Update of the Cost Allocation Manual			Straightforward	December 2021	For IPART to approve
2	Greater penetration of direct costing			Business as usual	June 2022	Reduce value of corporate by greater direct costing
3	Capitalisation of overheads	TOTEX	Need to test direct cost method	Complex -need to involve auditor	July 2024	Reduce corporate by greater direct costing
4	Post-capitalisation corporate expenditure to regulated businesses	TOTEX	Direct total costs	Needs time for new systems and training	Options: July 2021 or 2023	Corporate system may be needed for analysis
5	Overheads to non-core businesses	10% assumed	Include in analysis for (2)	Needs time for new systems and training; may need contract changes	July 2023	Include in direct cost analysis
6	Overheads for operational business units	TOTEX	Apply direct costing to activities	Existing systems in place	July 2022	Extend direct costing within business units
7	Rural Valley costs to valleys	RAB	Direct total opex	Straightforward	July 2021	Include in 2021 Determination
8	Corporate capital expenditure	Salary	Project level at business plan stage	Straightforward	July 2021	Based on scope, deliverables and outcomes. Include in 2021 Determination

Source: Atkins analysis

These recommendations meet the objective of applying a clear, accurate and auditable method of allocating expenditure to the regulated businesses giving confidence to regulators that customers are only paying for reasonable and efficient costs related to their service.

The method of fully implementing an activity-based costing system is that efficiencies which may not have been evident through a relatively high level of overheads may be exposed. This is reflective of potential catch-up efficiencies as the business moves towards the frontier.

Implementation

Implementation of more-reflective method of cost allocation will need to consider preparing a comprehensive Cost Allocation development and application of the business processes, training of staff, testing and ensuring that appropriate systems are in place. With the new FMS accounting system in place, the main focus would be for each business unit to apply activity-based costing. For operating business units, it will be important to examine the options for accounting for supervisory or pool costs and how these are apportioned internally to each regulated business so there are no significant overheads to allocate. For corporate business units, it is important to identify activities that are provided to operating units and those to service the corporate functions.

There is a need to modify the CAM methodology to reflect cost reflective methods but with rolling determinations there is never a good time. The options available are

Option 1: A phased approach implementing the new method from July 2023. This gives time to develop, test and apply the new methodology with associated training. Also, time to address current non-core contracts to reflect any changes to corporate uplifts. This would ensure that the methodology is developed and tested in advance of submissions for the 2024 Greater Sydney determination. The methodology would also inform the Broken Hill pipeline determination in 2022.

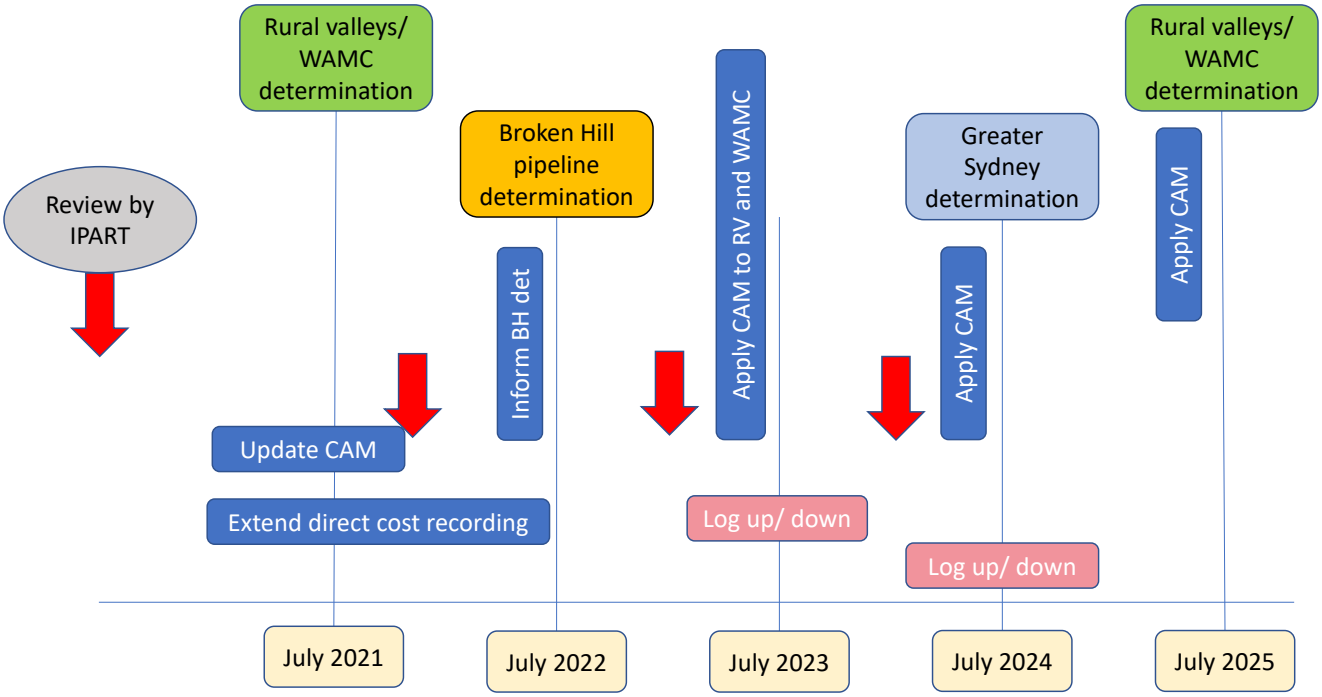
Option 2: Implement changes from July 2021 to deliver benefits to WaterNSW and WAMC customers at the start of the 2021 determination period. This would require some interim assessments until the new CAM is in place.

Option 3: As option 2 but including the non-core expenditure from July 2023, recognising that it would be preferable to have time to renegotiate current and future contracts with revised uplifts.

Our preferred approach is for Option A which provides a reasonable timeline to establish and embed a new methodology, but it means that the full cost savings may not be available for customers unless a retrospective change is made.

A proposed implementation program is shown in Figure 8-1.

Figure 8-1 Implementation program



Source: Atkins analysis

The program minimises the impact on determinations. We suggest that IPART should consider how the impact of these changes in allocation methods on determinations can be addressed within regulatory processes so that WaterNSW does not lose or gain as these changes are applied. Some form of logging up or down as the determinations are applied or there are material changes to the cost impacts assumed in Table 8-1

8.1.3. Findings – Allocation of Corporate Capital Expenditure

This expenditure comprises mainly large ICT projects to deliver new and enhanced systems across the regulated businesses. Some systems are specific to a regulated business and others apply across two or all. Because of the value of some of these projects, there is a risk that a significant level of expenditure may not be allocated to the correct driver with a corresponding impact on cost allocation and charges to customers. We concluded that the current method of allocating capital costs to regulated businesses based on salaries does not relate to cost drivers. We identified the cost drivers based on the scope of work, assets created or replaced, deliverables and efficiencies assumed.

We have reviewed each project with significant expenditure to determine their scope, deliverables, assets and efficiencies and made an assessment of the impact of direct cost allocation at individual project level and collated this for the projects with comprise corporate capital expenditure. Applying this methodology, the corporate capital expenditure proposals should be adjusted to reflect an increase of $4.87m to Rural Valleys, a reduction of $2.96m to WAMC; and a reduction of $2.96m to Greater Sydney.

The assessment of the allocation should be made at business plan stage and form a part of the approval process. This assessment can be made by the project manager based on the relative outputs and benefits the project is intended to deliver. and could be applied over the life of the project provided there were no material variations in scope. Where a project benefits all three businesses then the current method of allocation using salaries reflective of the size of each business may be appropriate. Apportionment using benefits would also be appropriate.

8.1.4. Findings – Efficient Corporate Operating Expenditure

Our role is to recommend a level for efficiency which can be delivered over the 2021 determination period based on the opportunities we have found and the ability of other water utilities to achieve and outperform. It is for WaterNSW to identify the areas of the business to deliver efficiency savings. We consider that WaterNSW is well placed with the resources it has to achieve and out-perform the efficiency targets set. A focus on the bullet points below should enable the business to move much closer to a frontier company.

We have set a level of catch-up efficiency which has been applied to all corporate operating expenditure for Rural Valleys and WAMC which is explained in Section 5.6.5.2. We have also applied a continuing efficiency similar to that applied to the Greater Sydney review earlier in 2020.

We have identified several opportunities for WaterNSW to catch up with frontier companies. This needs a closer view of its structure and working practice including:

- A greater focus of monitoring costs against the three main determinations;
- A greater internal challenge on increasing FTEs and costs to test whether additional obligations can be met through prioritising workload to limit cost increases;
- A program to drive efficiencies across the business units – the finance teams have a key role here;
- A drive for greater direct activity-based costing with a focus on reducing the extent of allocated overheads where there is potential for further efficiencies;
- A closer look at the business structure with a greater focus on service delivery with supporting business units. Some form of service provision arrangements may be appropriate for support from BIS and some functions of people, legal and finance;
- Whether a change to rationalise the business structure would enable the earlier bullet point objectives to be achieved.

The potential efficiency gains are reflected in the catch-up and continuing efficiencies applied to all operating costs. These are set out in Section 5.

8.1.5. Findings – Efficient Corporate Capital Expenditure

For ICT expenditure in the 2021 determination period, we are not proposing any efficiency adjustments for specific projects beyond the efficiency challenges being set for the whole capital program. We have identified some opportunities for future efficiency gains.

- Benefits, especially relating to future efficiencies, delivered by ICT investments are set out in business cases but the approach to tracking and demonstrating their achievement is not clear or effective;
- There is potential for horizon scanning, collaboration and partnering on areas of emerging or unproven technology which may be happening, but this was not demonstrated;
- The impact of ICT investments should lead to demonstrable improvements in customer and other KPIs which WaterNSW can be monitored against and therefore be held accountable;
- ICT corporate costs should be presented as a combined capex and opex submission rather than focusing on ICT capex demonstrating the potential trade-offs between capex and opex both in terms of efficiencies as well as long-term commitments for licences and support.

We have made some adjustments to the efficient level of capital expenditure to reflect the allocation of expenditure on a project basis compared with total salaries used by WaterNSW. We have also made one scope adjustment for WAMC where a proposed significant increase in fleet expenditure in 2024 is not prudent or efficient.

8.1.6. Recommendations – Efficient Corporate Expenditure

Operating expenditure

We have set a level of catch-up efficiency which has been applied to all corporate operating expenditure for Rural Valleys and WAMC which is explained in Section 5.6.5.2. We have also applied a continuing efficiency similar to that applied to the Greater Sydney review earlier in 2020. The efficiency values are shown in Table 8-15. We have proposed some small scope adjustments related to customer service costs and additional regulatory expenditure.

Capital Expenditure

For ICT expenditure in the 2021 determination period, we are not proposing any efficiency adjustments for specific projects beyond the efficiency challenges being set for the whole capital program. We have made some adjustments to the efficient level of capital expenditure to reflect the allocation of expenditure on a project basis compared with total salaries used by WaterNSW. We have also made one scope adjustment for WAMC where a proposed significant increase in fleet expenditure in 2024 is not prudent or efficient.

8.2. Review of corporate costs

Our review of efficient corporate expenditure comments on:

(I) The maturity of WaterNSW's strategic planning and the corporate structures, systems and processes in place;

(II) The key factors driving corporate expenditure including whether these are reasonable and how they have been considered and tested by the utility;

(III) The extent to which WaterNSW's corporate structures and systems represent best practice and the extent to which these impact on expenditure and service delivery across the business units

(IV) Provide recommendations as to the efficiency of WaterNSW's forecast level of corporate operating expenditure and provide annual estimates on the level of corporate operating expenditure that is required; and

(V) Provide recommendations as to the efficiency of WaterNSW's historic and forecast level of corporate capital expenditure between 2016/17 and 2024/25 including any findings on the efficiency and appropriateness of key existing corporate assets.

8.2.1. Operating expenditure

Operating expenditure is reported in the Rural Valleys AIR/SIR by activity and valley; for WAMC operating expenditure is reported by valley. Corporate activities are defined by WaterNSW within the following business units.:

- Customer and Community;
- Safety, People and Performance;
- Legal, Governance and Risk;
- Business Systems and Information;

- Finance and Commercial Services;
- Executive team; and
- WaterNSW (includes defined corporate costs not included in the above activities).

In addition, WaterNSW identifies overhead costs from its operational business units within the corporate analysis; we comment on these costs later in this section.

The Financial Management System is used to capture all general ledger account information including business (by determination), operating and capital expenditure, business segment, responsibility centre, project, valley and activity against defined cost codes.

Expenditure is reported by the above corporate activities, overheads and year for the period 2017 to 2025. Expenditure which meets the capitalisation rules is deducted to derive a net operating expenditure as summarised in Table 8-3.

Table 8-3 Actual and forecast corporate operating expenditure 2017 to 2025

CORPORATE EXPENDITURE REVIEW									
$m 2021 Year ending June	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
OVERHEAD EXPENDITURE AFTER CAPITALISATION									
Pre-capitalisation expenditure	79.74	85.23	94.64	91.11	84.63	81.10	79.84	78.44	78.79
Capitalised expenditure	6.84	11.77	26.41	28.21	28.27	24.10	24.27	23.78	21.82
Net operating expenditure	72.91	73.46	68.23	62.90	56.36	57.00	55.56	54.66	56.98
OVERHEAD EXPENDITURE ANALYSIS									
Customer and Community	6.36	6.83	4.90	4.67	8.53	7.38	7.11	6.86	6.85
Safety, People and Performance	8.42	8.72	8.74	9.22	9.96	9.53	8.72	9.05	9.40
Legal, Governance and Risk	2.47	3.66	4.94	4.60	5.56	5.62	5.59	5.89	6.07
Business Systems and Information	13.41	13.79	15.22	14.28	14.65	15.43	14.92	13.59	14.02
Financial and Commercial Services	18.58	13.87	9.45	7.58	8.33	9.02	8.91	9.15	9.81
Executive	5.11	11.72	7.20	3.89	1.63	1.59	1.55	1.63	1.66
WaterNSW costs	0.36	1.52	4.41	2.34	-8.93	-8.54	-8.46	-8.43	-8.45
Total Corporate	54.72	60.10	54.86	46.58	39.73	40.04	38.34	37.73	39.36
Operational allocated costs	18.19	13.36	10.13	10.07	5.21	5.98	6.03	5.35	5.68
Allocated direct costs	0.00	0.00	3.24	6.25	11.42	10.98	11.19	11.58	11.94

Source: WaterNSW document 60 and Atkins analysis

Capitalised expenditure shows a significant increase from 2019 when new rules were applied. From year 2017, capitalisation represents an average of 30% of gross operating expenditure including the 2021 determination period.

Net average operating expenditure for the period 2019 to 2021, applying the new capitalisation rules was $62.5m/a which reduces to $56.0m/a for the 2021 determination period. WaterNSW has commented that this reduction is in part due to an increasing allocation of costs directly to business units.

The Executive expenditure shows a significant reduction in cost from 2020. WaterNSW advised us that the former Executive team costs have now been directly allocated to operational business units.

There is a 'WaterNSW costs' heading which includes 'gains/losses In FY20', super actuarial adjustments, vacancies and efficiency. This expenditure includes large negative amounts which have a significant impact on total corporate expenditure. We have not been provided with expenditure headings and related expenditure for this item.

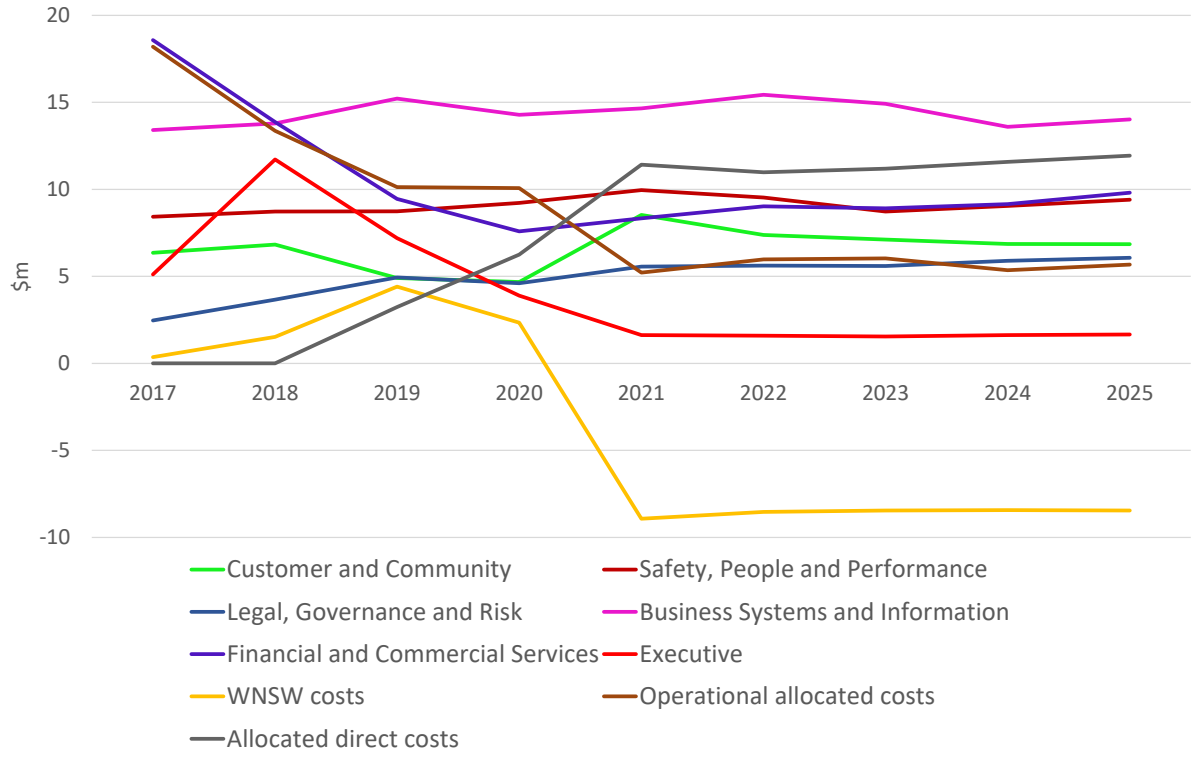
We have challenged why the Customer business unit is considered to be a corporate function. Our view is that this is an operating function directly facing customers. As such, it should 'own' all its costs including overheads which we consider are supervisory costs and should be allocated to regulated businesses within the unit.

The analysis includes Operational Allocated Costs which we understand to include costs in operational divisions. We are unclear why these costs are not coded directly to operational activities. Similarly, 'Allocated Direct Costs'

are included when we would also expect these costs to be allocated to direct costs. [RFI 230 and 2310]. Together, these costs are significant and represent 26% of net corporate and operating expenditure.

The trend in net operating expenditure is shown in Figure 8-2.

Figure 8-2 Trends in corporate operating expenditure 2017 to 2025



Source: WaterNSW document 60 and Atkins analysis

Figure 8-2 shows relatively even trends in expenditure for Safety, People and Performance, for Business Systems and Information and for Customers and Community. There is a reducing then even trend for Finance and Commercial Service although this could be attributable to changes in capitalisation rules. The significant variances relate to a reduction in Operational allocated costs which may be attributable to greater direct cost coding; our view is that this should reduce to zero. In addition, allocated direct costs show a significant increase in the 2021 determination period where the reasons area unclear; again, we do not consider this as overhead expenditure., The Executive shows a significant reduction, explained above as allocating staff costs to operational business units.

We comment below on each of the business units and discuss the opportunities for efficiencies.

8.2.1.1. Customer and Community

Customer & Community (C&C) is the business unit with responsibility for customer service and billing, including digital enablement, industry relations, customer insight and experience, licencing assessments and approvals. While the business unit retains 'community' in the title, education and community engagement functions have been moved to another business unit.

The Executive Manager is responsible for seven areas and a total headcount of about 114 FTEs in 2020, an increase from 113 in 2019. This is forecast to increase to 148 in 2021 reducing to 130 in 2025 (RFI157). The unit delivers services directly to customers across the regulated businesses:

- Rural Valleys: the predominant activity with customer interface with around 41,500 licence holders through water allocation, billing, contact centres and associated field services and metering;
- WAMC: mainly licencing of customer activities in the Rural Valleys; and
- Greater Sydney: predominantly Sydney Water with some local government customers. This is managed by a team of five.

Sydney Water is managed by one of three account managers who are responsible for some 70 more complex agricultural businesses and local councils who take about 80% of the total water delivered. Other business units work with Sydney Water on technical issues.

In terms of performance measures, we asked WaterNSW to provide visibility on both customer metrics (Skyline[39], Reputation and Customer Satisfaction[40]) and debt KPIs (Outstanding Debtors and Payment Plans and Suspensions), which we have re-produced below. These are captured at organisational level and cannot be reported at the more granular level of Rural Valleys, Greater Sydney and WAMC.

Figure 8-3 WaterNSW Customer KPIs and number of complaints (Source: RFI 307)

Complaints continued at a low level during 2019-20. WaterNSW front line employees all undertook training in complaint management during the year. The volume of complaints for the period were consistent with the previous year. WaterNSW reports on its complaint performance monthly and focuses on quick effective resolutions for customers.

The abnormally higher number of complaints in 2017-18 related to a metering issue which impacted a large group of customers. WaterNSW proactively elected to record these as separate complaints.

Customer complaints	2017-18	2018-19	2019-20
Customer complaints outstanding at 1 July	17	147	3
New complaints received	316	82	73
Complaints resolved/closed	186	226	74
Customer complaints outstanding at 30 June	147	3	2

The Customer KPI scores do not indicate high levels of customer satisfaction. To some extent, we understand if these results were from pre- or just after the merger, but one would then expect to see improvements as a result of the substantive investment and associated investment in the current price path. WaterNSW responded that:

> *"We note our 2020 performance as ascertained by independent research is that 59% of customers stated we are meeting or exceed their expectations. We benchmark ourselves against other water agencies as*

[39] Skyline is a Board-endorsed composite measure based on results from our annual research program which spans (1) Suitability of the services WaterNSW provides; (2) value for money for the services WaterNSW provides; (3) the customer service we provide; and (4) quality of relationships with customers.

[40] WaterNSW advised that: *"…the 2018/19 target was set based on the regulatory only customer baseline but then for the 1st round of surveying regulated, unregulated and groundwater customers were included. Regulated customers started at a baseline rating of 6/10 versus we then discovered (inherited) unregulated & groundwater customers were closer to 4/10 baseline when first surveyed by WaterNSW. The targets were subsequently adjusted (Board endorsed) for future years."*

well as other utilities as part of our annual research program. The merger of SCA & State Water is less relevant in historical context when compared to the impact of transfer of functions from DPI Water in 2016. Prior to the transfer of functions WaterNSW baselined its overall performance at circa 60%. Upon the transfer of functions from DPI Water it was determined the baseline score amongst unregulated and ground water customers was significantly lower at circa 40%.

Improvement in these customer metrics is typically a slow and steady process, particularly without the investment in transformational capabilities and technology. Year on year progress is generally limited to incremental improvement through continued focus on process improvement."

On the positive side, the number of complaints received is very low and the numbers unresolved/still open at year end is negligible (the relative spike in 2017/18 was related to one specific issue which is not representative of the wider picture). We were however struck by the lack of visibility of and accountability for these KPIs; none of six metrics included in Figure 8-3 is published on the WaterNSW website or in its annual report, and only complaint numbers are reported in the latter. Both the actual performance and also the visibility of the customer satisfaction metrics would not in our opinion be considered as at the "frontier". We have therefore recommended an Output Measure for the 2020 Determination Period utilising the Skyline composite measure, although we strongly recommend that there is transparency of all the customer metrics in order to improve accountability and drive future improvements in this area.

Figure 8-4 WaterNSW Debt and Collection KPIs

The performance in relation to collection of revenue is very good as captured in the Outstanding Debtors and Payment Plans and Suspensions reporting. This is a reflection of the powerful tools and levers that WaterNSW has at its disposal in terms of suspending or withdrawing licences.

All the staff complete timesheets and utilisation is reported at about 85%. Nearly all costs relate to operations and there is minimal capitalisation. Costs not directly booked to an activity and regulated business are termed an overhead and are included within the cost allocation method. The overhead includes staff training, although this is said to be small, and responding to questions from government and elected representatives.

For the Greater Sydney efficiency review[41] we commented that the Customer & Community function should be an operating business unit and not included as a Corporate function. In our analysis, we tested the impact of excluding this function from Corporate and made a high-level assumption that costs could be allocated 30% to Greater Sydney. We made no specific expenditure adjustment but applied a generic catch-up efficiency to reflect the productive efficiencies that could be made in this area. We commented that '*it would be helpful if WaterNSW allocates its Customer Service costs to each business'.* We understand that some reallocation of costs was carried out following the efficiency review. This is reflected in the table below.

The level of expenditure for the period 2018 to 2025 is shown in Table 8-4 below.

[41] WaterNSW Greater Sydney Efficiency and Demand Review, Atkins 2020

Table 8-4 Customer and Community ALL Businesses total expenditure 2018 to 2025

CUSTOMER AND COMMUNITY BUSINESS UNIT TOTAL EXPENDITURE								
$m 2021 Year ending June	2018	2019	2020	2021	2022	2023	2024	2025
Total expenditure								
Direct expenditure				14.05	14.27	14.16	13.82	13.65
Overhead expenditure	6.90	5.66	4.74	8.53	7.38	7.11	6.86	6.85
Total expenditure	6.90	5.66	4.74	22.58	21.65	21.27	20.68	20.50
Rural Valleys								
Direct expenditure	2.12	2.85	1.72	2.91	2.99	2.87	2.69	2.64
Overhead expenditure	1.84	1.29	1.57	3.97	3.88	3.68	3.48	3.46
Total expenditure	3.96	4.14	3.28	6.88	6.87	6.55	6.17	6.10
WAMC								
Direct expenditure				10.57	10.70	10.71	10.59	10.50
Overhead expenditure	1.82	1.82	0.53	3.16	2.71	2.69	2.66	2.67
Total expenditure	1.82	1.82	0.53	13.73	13.41	13.39	13.25	13.17
Greater Sydney								
Direct expenditure				0.17	0.17	0.17	0.14	0.14
Overhead expenditure	2.65	1.38	2.27	0.87	0.61	0.60	0.59	0.59
Total expenditure	2.65	1.38	2.27	1.04	0.78	0.77	0.73	0.73
Non-core								
Direct expenditure				0.40	0.41	0.41	0.39	0.37
Overhead expenditure	0.51	0.41	0.23	0.53	0.18	0.15	0.14	0.13
Total expenditure	0.51	0.41	0.23	0.93	0.59	0.56	0.53	0.50

Source WaterNSW document 316

Note direct expenditure for 2018 to 2020 to be provided

Expenditure variance

We comment here on the total expenditure and variance over the period from 2018. The allocation of expenditure has changed from 2021 following the Greater Sydney determination in June 2020 with a lower allocation to Greater Sydney and increases on Rural valleys and WAMC. We have therefore considered the total expenditure to understand the reasons for variance. We discuss allocation of costs in Section 8.2 Capital expenditure is not material.

There is a significant increase in total operating expenditure over the period with a forecast increase to $22.58m in 2021 then reducing to $20.5m in 2025.

FTE variance

There is a corresponding increase in the number of FTE's from 113 in 2019 to 125 in 2020 and a forecast 148 in 2021, reducing to 130 by 2025 (RFI 157). This represents an increase of 35 FTEs from the 2019 base and 23 from year 2020. WaterNSW explained that there is an increase in 9.8 FTEs above 2020 to cover additional to current activities and includes

- Impact of Water Reform – an additional 5.8FTEs comprising field and centre staff to manage the anticipated increase in customer contacts. There is also a requirement for customer self-reporting, Water NSW added that

  > *Given the complexity of the subject matter it also takes time for our teams to come up to speed to be able to manage customer enquiries as well as WaterNSW obligations. This activity is only expected to increase;*

- Licencing transformation – an additional 2 FTEs to support this transformation

  > *to ensure that we capitalise on digital investments as well as redesigning work processes to provide a more streamlined efficient service*

- WAVE digital transformation - an additional 2FTE support for WAVE digital transformation and implementation

  > *These roles will support the transition over the coming determination period to a more efficient and customer centric solutions*

Further detail in document *RF!157 - HR Data* shows increases in Field Services, Customer Experience, Water Regulations and Systems and Reporting. We note that this does not explain the full increase in FTE in 2020 and 2021.

(i) These additional FTEs do not fully explain the full increase from 2020 to 2021;

(ii) The additional posts have yet to be approved (RF157);

(iii) We question to what extent can these additional requirements be met from the existing organisation structure through prioritising of current activities.

In addition, the efficiency savings from the CIMS and WAVE business systems do not appear to have been included in the forecast FTEs and related expenditure.

Scope justification

We formed the view that the additional FTEs and related operating expenditure due to increases in scope is not fully justified. Actual average annual expenditure increases from the period 2018 to 2020 to the 2021 determination period with a forecast $22.58m in 2021 and an average annual $21.01m over the 2021 determination period. There is potential for the scope increases to be absorbed in the existing structure by assessing priority activities and that the full staffing proposals have yet to be approved.

This adjustment excludes the efficiency savings to be delivered through the implementation of new business processes and systems.

Overheads

The value of overhead costs is significant, comprising 34% of total business unit costs. This varies from 21% for WAMC, to 57% for Rural Valleys and 80% Greater Sydney, although the total expenditure for Greater Sydney is much smaller.

Table 8-5 shows the overhead element of the total cost disaggregated to be determination-specific, where expenditure has been coded to a regulated business, and allocated where overhead costs have been apportioned.

Table 8-5 Customer and Community overhead expenditure 2018 to 2025

CUSTOMER AND COMMUNITY BUSINESS UNIT OVERHEAD EXPENDITURE					
$m 2021 Year ending June	2021	2022	2023	2024	2025
ALL BUSINESSES					
Determination specific	6.05	5.95	5.75	5.54	5.52
Allocated	2.48	1.43	1.36	1.32	1.33
Total expenditure	8.53	7.38	7.11	6.86	6.85
RURAL VALLEYS					
Determination specific	3.39	3.53	3.36	3.18	3.16
Allocated	0.58	0.35	0.32	0.30	0.30
Total expenditure	3.97	3.88	3.68	3.48	3.46
WAMC					
Determination specific	1.99	2.01	2.00	1.98	1.99
Allocated	1.17	0.70	0.68	0.68	0.68
Total expenditure	3.16	2.71	2.69	2.66	2.67
GREATER SYDNEY					
Determination specific	0.29	0.26	0.27	0.27	0.27
Allocated	0.58	0.35	0.33	0.32	0.32
Total expenditure	0.87	0.61	0.60	0.59	0.59
NON-CORE					
Determination specific	0.37	0.15	0.12	0.11	0.11
Allocated	0.15	0.03	0.03	0.03	0.03
Total expenditure	0.53	0.18	0.15	0.14	0.13

Source WaterNSW document 316

For the Rural Valleys regulated business, determination-specific costs are derived from the Customer and Community operational unit, some $0.44m with the greater part of costs from other operational business units including $1.50m of expenditure is from Maintenance, $0.56m from Water Delivery and $0.37m on Dam Safety; the total overhead from other operational units is $3.53m. We question why activities such as maintenance and dam safety are costed to a Customer overhead.

For WAMC, determination-specific overhead cost form 72% of total overheads which, we understand, are from directly coded activity costs incurred within the Customer operational unit.

WaterNSW has commented that the increase in determination-specific expenditure is as a result of greater direct cost activity coding. Nevertheless, we question why such significant costs are raised from other operational business units.

Greater Sydney overhead costs have been reduced from 2021 following the Greater Sydney determination in 2020. Customer and Community costs in the Determination were an average $1.3m/a, after adjustment for a transpositional error, compared with $0.8m/a in the 2021 determination period.

To ensure a fair balance between determinations, it will be necessary to make a $2.0m deduction to the Rural Valleys and WAMC expenditure proposals. This is because the Greater Sydney determination allowed for $1.3m/a when, using a new allocation, cost for Greater Sydney is shown to reduce to $0.8m/a; a difference of $0.5m/a. We have allocated this adjustment in a 60:40 ratio to Rural Valleys and WAMC.

There is a $1.58m annual average expenditure in Customer and Community which is not coded to any of the determination businesses. WaterNSW has allocated this expenditure across the businesses with 25% to Rural Valleys, 50% to WAMC and 25% to Greater Sydney. This is a nominal allocation with little basis although may have been inferred by the Greater Sydney expenditure review. We suggest the allocation should be based on direct cost for each business because this is more reflective of the relative size of the businesses.

We comment on the allocation of Customer & Community overhead costs to regulated businesses in Section 8.3.

Opportunities for efficiency savings

We found that there are significant opportunities for efficiency savings through

- Closely managing the additional activities within the current establishment through prioritising work activities within current resources. This is a matter of prioritising workloads;
- Taking account of the impact of efficiency reductions from ICT projects such as WAVE and CIMS which is not evident in forecast FTE numbers and expenditure;
- Taking account of the windfall savings from a reduction in the Greater Sydney customer costs following the reallocation after the 2020 determination we have made a scope adjustment for this); and
- Overhead allocation adjustment – there is potential for savings in overhead costs through the implementation of full activity-based costing. Overhead costs are mainly supervision costs and should be allocated within the business unit and not smeared over other units. This focuses attention on cost drivers with potential for further efficiencies.

8.2.1.2. Finance and Commercial Services

This business unit is led by the Chief Financial Officer with five main functional areas comprising Financial Control, Financial Planning and Analysis, Procurement, Property and fleet, and Economic Regulation. The current, year 2000, FTE count is 41.7. A restructure in 2019 had a neutral impact on headcount. The current structure and responsibilities comprise

- Financial Control: 9 FTEs - financial accounting, reporting and analysis, accounts payable;
- Financial Planning: 9 FTEs – commercial assurance and managing the ATS/ business case governance, business partnering with operating units, data modelling and analytics;
- Group procurement: 8 FTEs – to re-establish a central procurement function to deliver improvements in the effectiveness of processes from source to contract. This will be a central procurement operations function as a ‘one stop shop’ to support operating units;
- Property and Fleet: 8 FTEs and an increase of 3 from 2019 – establishing a fleet, plant and logistics function with enhanced asset management; enhanced property and land management function which will free up capacity to manage inspections and planned maintenance;
- Economic Regulation: 3 FTEs – to prepare price determination proposals, manage the determination processes and respond to requirements from IPART. This activity relates to four regulated businesses

– Greater Sydney, Rural Valleys, WAMC and Broken Hill pipeline. in its October submission to IPART, WaterNSW has proposed an additional 3 FTEs.

There are proposals for an additional FTE as a tax accountant to replace an external resource with potential to reduce costs.

Details of the proposed additional economic regulation staff were provided by WaterNSW (document 157 HR data)

(i) Government relations advisor: *We have recently recruited an advisor to provide support from this function. The original plan was for an additional role in Government Relations at the entry/ new graduate level*

(ii) Regulatory role: *in the regulatory team with plans to be confirmed*

(iii) Regulatory and Corporate advisor: *plans to tbc in regulatory team moving forward (the existing team member in a similar role has been seconded to the Minister's Office since beginning of year, so the team is lacking this 1 x FTE)*

The business unit plans to focus on granularity of cost allocation to determinations and analysing submissions. The regulatory team has limited resources to do this. In the October 2020 submission[42] WaterNSW proposed an additional three people in the economic regulation team to augment the existing team to manage the IPART determination and other regulatory processes.

We support the additional FTE's proposed for the regulation team at an estimated cost of $0.71m p.a. As this team will be working on all determinations, we had proposed to allocate this cost equally across the three main determinations: Rural Valleys, WAMC and Greater Sydney.

WaterNSW commented that the regulatory workload was greater in the Rural Valleys business because of the need to engage with customer groups in each valley and suggested that costs should be allocated 50:50 to Rural Valleys and WAMC. We accept this comment although note that there will be additional work in the Greater Sydney Business in preparing for the next determination and that the workload with WAMC is likely to be less than Rural Valleys. We therefore accept the additional cost and that this is allocated 25:50:25 for GS:RV: WAMC respectively provided costs are directly recorded against the relevant cost codes.

The finance function has set out a clear plan to support the business with enhance processes and organisational model changes. In 2019 the new Financial Management System went live. This system allows a more comprehensive approach to activity-based costing, allowing staff to allocate costs directly to activities. During 2020 the new systems have improved data and processes for budgeting and forecasting, capitalising overheads and cost allocation. The new systems should allow the finance function to effectively apply new technology, work closely with the operational business units and provide advice to lever more efficiencies through the business.

The finance team has identified key changes in its future operational model in financial control. Enhancements to financial planning should see them managing the business case governance process, establish business partnering roles to support the business in managing budgets and cost control and greater support from the analytics team.

Group procurement is included in the finance business unit where costs are generally capitalised with direct costs charged to specific projects. It is establishing a procurement excellence function to implement best practice across the business, levering commercial gains and managing risk. This should provide an opportunity to lever efficiencies.

Costs are mainly allocated directly to operating or other business units.

[42] WaterNSW Response to IPART Rural Valleys Issues Paper, October 2020

Table 8-6 Corporate Expenditure - Finance

CORPORATE EXPENDITURE – FINANCE								
$m 2021 Year ending June	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
DIRECT CAPITAL AND OPERATING EXPENDITURE								
Total expenditure	20.06	28.25	38.21	50.72	27.31	27.72	34.5	33.48
Capex as direct expenditure	-0.83	3.68	5.90	22.88	2.28	2.40	9.25	8.08
Opex as direct expenditure	6.87	12.32	21.41	13.18	10.65	10.65	10.66	10.68
Overhead before allocation	14.02	12.25	10.90	14.66	14.38	14.67	14.59	14.72
ALLOCATED EXPENDITURE								
Allocated to capital expenditure	0.14	2.79	3.36	6.33	5.36	5.76	5.44	4.91
Opex residual overhead	13.88	9.46	7.54	8.33	9.02	8.91	9.15	9.81
Percentage capitalised	*-3%*	*23%*	*24%*	*58%*	*28%*	*29%*	*43%*	*39%*

Source: WaterNSW doc 273

Salary expenditure increased from 2018 to 2020 reflecting an increase in capability and scope but continues at a flat rate from 2022. Operating expenditure directly recorded includes revenue volatility insurance and land tax. The increase in 2020 reflects a true-up correction for land tax. Capitalised expenditure shows an increase in 2021 due to expenditure on the South West Corridor Facility.

In summary and on average, only about 42% of operating expenditure, after capitalisation, is directly booked to activity codes. There is scope to increase this proportion, so the extent of cost allocation is reduced.

Expenditure trends are biased by the land tax true-up in 2020. Excluding this adjustment, expenditure in the 2017 determination period is an average $24.4m; forecast expenditure in the 2021 determination period is an average $25.2m.

In summary, the finance team has a key role to play in driving efficiencies through the business. There is scope to reduce the extent of operating expenditure being allocated through more extensive direct cost recording.

Opportunities for efficiency savings

- The business unit has a key role in improving cost control, recording and analysis to drive efficiencies through the business using the newly implemented accounting systems
- There is potential for catchup and continuing efficiencies for example in procurement, fleet and property
- The additional 3 FTEs for the economic regulation team for all determinations is supported. This should allow greater focus on monitoring expenditure against each price determination;
- Overhead expenditure allocated is high; this suggests that there is tendency to harbour inefficiencies. There is a need for greater direct cost booking. For example, where services are provided to operational business units, then direct costs should be coded accordingly. This would seem appropriate for financial planning, group procurement and fleet and property;
- The extent of capitalisation is likely to be overstated; The capitalisation assumptions are discussed in Section 8.3.

8.2.1.3. Legal, Governance and Risk

This business unit is led by the Executive Manager with five main functional areas comprising General Counsel, Risk and Compliance, Audit and Assurance, Company Secretary and Regulator Relationships. Nearly all the senior team have only been in post for about 18 months. The current FTE count is 22.7. The function provides support across the regulated businesses.

The legal function, with a team of nine, responds to external requirements from government and regulators. Internally, it advises other business units on contracts, commercial negotiations, enforcement and prosecution. The function has an increasing involvement with capital projects, advising on contract issues and add value to the process. The risk management function, with a team of five, manages the reporting and audit of operational licence compliance; internally it focuses on development, implementation and monitoring of the company risk register.

The team has increased FTEs from 2016 to 2020 when new roles or vacancies filled to respond to changes to the operating environment, new obligations. The 8.7 increase in FTEs was across legal (3.2), risk (2) and additional roles in risk, internal audit and support the NRAR relationship and support community expectations.

WaterNSW commented that it had under-forecast the resources required for the period from 2016 to 2020, There have been activities in response to the earlier business transfers, response to government policies and frameworks, changes to and new legislation including dam safety and biodiversity conservation and parliamentary inquiries. Internally, it has supported the large capital projects requiring legal, governance and audit support including Warragamba Dam Raising, Broken Hill Pipeline, and Greater Sydney desalination plant, and Burrendong Deep Water Storage.

Table 8-7 Corporate Expenditure – Legal, Governance and Risk

CORPORATE EXPENDITURE -LEGAL. GOVERNANCE AND RISK								
$m 2021 Year ending June	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
DIRECT CAPITAL AND OPERATING EXPENDITURE								
Total expenditure	5.02	7.23	10.65	11.42	10.41	11.12	10.52	10.37
Capex as direct expenditure	0.84	0.07	1.76	0.75	1.11	1.11	1.10	1.10
Opex as direct expenditure	0.48	0.6	1.5	1.7	0.94	1.46	0.62	0.62
Overhead before allocation	3.70	6.56	7.39	8.97	8.36	8.55	8.80	8.65
ALLOCATION OF EXPENDITURE								
Allocated to capital expenditure	0.04	1.61	2.80	3.42	2.74	2.96	2.90	2.59
Opex residual overhead	3.66	4.95	4.59	5.55	5.62	5.59	5.90	6.06
Percentage capitalised	*18%*	*23%*	*43%*	*37%*	*37%*	*37%*	*38%*	*36%*

Source: WaterNSW doc 250

Salary expenditure increased by 75% from 2018 to 2020 and by a further 50% (from 2018) forecast to 2021. Thereafter a level forecast is proposed. These increases are offset by a reduction in consultants and other expenditure is relatively even. The impact of these variances results in an increase of 155% on net operating expenditure post direct cost capitalisation.

The extent of direct cost capitalisation in generally about 10% following new capitalisation rules in 2019.

In summary and on average, only 11.3% of operating expenditure, after direct capitalisation, is booked to activity codes. This implies that most time is an overhead and not booked to any specific work activity.

Opportunity for efficiency savings

- The business unit has mainly corporate functions provided to the central business so appropriate that most of the costs are corporate overheads. However, where services are provided to operational units then the direct costs should be recorded;
- We have a concern about increasing cost trends above the 2018/ 2019 and 2020 base. We suggest there is potential for maintaining expenditure at 2019 level assuming no increase in FTEs as additional drivers could be accommodated in existing structures; This suggests that there is potential for continuing efficiencies;
- Overhead expenditure allocated is high; there is tendency to harbour inefficiencies. There is a need for greater direct cost booking. For example, where services are provided to operational business units, then direct costs should be coded accordingly. This would seem appropriate for areas such as legal advice;
- We consider the extent of capitalisation is overstated; We discuss the capitalisation assumptions in Section 8.3.

8.2.1.4. Safety, People and Performance

This business unit is led by the Executive Manager with five main functional areas comprising People and Culture, Industrial Relations, Health, Safety and Environment, Change & Continuous improvements and the Program Management office (PMO) (for corporate programs). For the 2017 determination period, average annual net expenditure is$9.0m/a and forecast to continue at the same level through the 2021 determination period. The business unit comprises several sections.

- People and Culture: this is the largest section with some 26.7FTEs in 2019 increasing to 31.2 FTEs in 2020 and then reducing to an average 21.4FTEs over the 2021 determination period. Key activities include – attract (recruit), manage (performance management, workforce planning), engage, reward (remuneration strategy, payroll and superannuation) and develop (training and development planning);

- Industrial Relations;1FTE;
- Change Management and Continuous Improvement: 7.1 FTEs increasing to 9FTEs over the 2021 determination period. This input appears significant although it is unclear what efficiencies the section is able to deliver;
- Program Management: 3 FTEs in 2020 increasing to 5 over the 2021 determination period. It is unusual to have a PMO within an HR environment. It covers corporate strategy, IPART submissions and financial forecasting. The costs for this activity are generally capitalised;
- Health, Safety and Environment: 17.7 FTAEs in 2020 with a similar even trend to 2025. Environment activities are in general directly costed to capital or operational projects;
- Leadership and Support: 6 FTEs reducing to 1 FTE after 2020 as the workstream is transferring.

The People and Culture team is relatively new and is working to implement a strategic plan, prepared three years ago with priorities and associated themes. Four critical elements were identified for 2020: engagement, leadership development, operational systems and workforce planning. One reason for carrying a higher headcount than needed is that systems are not in place and manual workarounds are needed.

Workforce planning is an area identified for improvement. The business is now looking for more internal resources with greater retention and progression and less reliance on external support, Turnover has reduced from greater than 10% down to 7%. The workforce plan has yet to be brought together as a strategic document.

There are HR 'business partners' which work with the operational business units to provide support and advice.

The total 65 FTEs in 2020 is an increase of 7.4 FTEs from 2019 and reduces to 53.3 by 2025, mainly as a result of a reduction in headcount in the People and Culture section. There are increases in FTEs for 2020 and 2021 although these do not impact on the 2016 determination period.

About 85% of staff, on an enterprise agreement, complete timesheets. Senior staff work a nominal 40 hours per week. Activities, time and cost are logged to specific account codes or as an overhead.

The business unit expenditure shown in Table 8-8 below shows the extent of direct expenditure mapped to capital and operating cost codes and the allocation of residual overhead cost to capital and operating drivers.

Table 8-8 Corporate Expenditure – Safety, People and Performance

CORPORATE EXPENDITURE - SAFETY, PEOPLE AND PERFORMANCE								
$m 2021 Year ending June	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
DIRECT CAPITAL AND OPERATING EXPENDITURE								
Total expenditure	9.89	14.12	16.20	17.92	16.08	15.34	15.49	15.37
Capex as direct expenditure	0.78	0.24	1.82	0.43	0.36	0.37	0.37	0.37
Opex as direct expenditure	0.3	1.86	0.52	1.84	1.85	1.85	1.85	1.85
Overhead before allocation	8.81	12.02	13.86	15.65	13.87	13.12	13.27	13.15
ALLOCATION OF EXPENDITURE								
Capex as allocated cost	0.09	3.28	4.64	5.68	4.34	4.40	4.23	3.75
Opex residual overhead	8.72	8.74	9.22	9.97	9.53	8.72	9.04	9.40
Percentage capitalised	*9%*	*25%*	*40%*	*34%*	*29%*	*31%*	*30%*	*27%*

Source: WaterNSW document 254

Overhead expenditure, after allowing for direct expenditures, shows an increasing trend from an average (2018 and 2019) $10.41m with a 50% increase in 2021. The average expenditure forecast for the 2021 determination period is 28% above the average for 2018 and 2019. Labour costs comprise some 80% of overhead expenditure before allocation.

Direct expenditure is where time and costs are coded to a specific account string. The level of operating expenditure which is directly costed is low, some 12% to 15% of total operating expenditure. With the high usage of timesheets, it is surprising that the proportion of direct costs could not be greater, using appropriate accounting codes.

The extent of capitalisation using the allocation model is significant, with about one third of total overhead expenditure. We comment in Section 8.2 on the allocation of corporate overheads.

The largest cost increase is in the 'People and Culture section with a 55% increase in labour cost to 2020 from the 2018 and 2019 average base. This does not appear compatible with the increase in FTE numbers. We would expect by 2025, total expenditure should be similar to 2019.

There are some changes in scope over the 2021 determination period including the

Opportunity for efficiency savings

- The business unit is implementing improvements to its processes and new systems which should automate processes currently with manual workaround and deliver catchup efficiencies;
- WaterNSW identified efficiency in People and Culture of –5.7FTEs by 2025. through improved processes which is built into the HR forecast;
- Changes to attract and retain internal placements should improve staff retention and reduce recruitment costs;
- The expenditure profile is not consistent with FTE count – from 2019 to 2025 FTEs reduce by 7.5% whereas expenditure increases by 9%. We question whether the cost increase is justified. There is scope for catch-up efficiency;
- The extent of direct cost booking is low with a corresponding high level of overhead to be allocated. We suggest a greater focus on direct cost booking, particularly for services provided to other business units, so as to reduce the extent of overhead, indicative of possible inefficiencies, which is allocated;

We consider the extent of capitalisation is overstated; We discuss the capitalisation assumptions in Section 8.3.

Business Systems and Information

Business Systems & Information (BSI) is the business unit with responsibility for the provision of all information and communications technology and services required to meet the needs of WaterNSW. The Executive Manager is responsible for nine areas and a total headcount of 83.4 FTEs as of November 2019 restructure. In fact, the headcount has evolved and increased considerably over the current price path as summarised below.

Table 8-9 BSI increase in FTEs over current determination period

Date	Headcount[43]	Operating expenditure	Capital expenditure	Comment
January 2016	32	N/A	N/A	First Org Chart post SWC/SCA merger. Opex/ Capex split not identified.
August 2016	48	N/A	N/A	Org Chart post DPI-w Merger. 15 staff from DPI-w joined the ICT BU Opex/ Capex split not identified.
November 2019	88	60	28	Org Chart at November 2019 restructure

Source: RFI166a Headcounts since 2016

Reports from HR data (document 157) show that the FTE count increases from 74.2 in 2019 to 80 in 2020 and then reducing to 66.5 by 2015.
Individuals responsible for the following areas report to the Executive Manager:

- Strategy Architecture & Governance: 4 FTEs increasing to 6 FTEs from 2021;
- Water & Asset Systems: 20 FTEs in 2020 - activities relate to telecommunications, SCADA telemetry, water solutions and asset systems. All these activities are in direct support of water operations;
- Enterprise Technology: 22 FTEs in 2020 - activities include service and support delivery, infrastructure and data security;
- Corporate & Customer Systems: 18.2 FTEs in 2020 – these activities relate to supporting customer systems, corporate and project systems and associated solutions resolution. The activities appear to be mainly in support of customer systems;

[43] The counts are total positions appearing on the organisation chart, this includes full time, part time, permanent and term positions. The 88 headcount on the November Organisation Chart includes part time roles which translates into 83.4 FTE from a headcount of 88.

- Supporting specialists including CIMS, operational analytics and water systems modernisation assumed to be short term appointments, as shown as casual positions in the organisation chart.

In terms of scale and responsibilities, BSI, although its enterprise technology section supports[44]:

- Over 900 end users.
- Several hundred software applications delivered across internal and external networks (see below for more information on systems and applications);
- 96 locations across metropolitan and regional NSW.

The merger of three entities to establish WaterNSW resulted in a complex and antiquated ICT environment. This required a root and branch assessment and subsequently a programme of transformation to make it fit for purpose for the organisation. It resulted in the development of a four-year Enterprise Architecture roadmap which was approved by the Board in July 2016 and which has dominated the current price path. The roadmap baselined the architecture landscape, defined the strategic intent and created a Business Capability Model which described the services, customers, value chain and required capabilities of WaterNSW. As a result, the digital landscape has transformed significantly since the merger. In terms of the application architecture, this allowed WaterNSW to identify the current state and target state, the highlights of which were:

- Technology landscape was generally good but there was considerable duplication;
- Opportunities to reduce applications from ~450 by at least 40% decrease, including most importantly ~50% equivalent decrease in “core” technologies;
- Telephony technologies that are no longer in the mainstream investment lifecycle and thus unsupported;
- Opportunities to take up emerging technologies so that replacement will not be on a like for like basis but provide enhanced capability;
- Five strategic programs identified: Customer Value, Insightful Information, Improved Productivity, Proactive Planning & Governance, Healthy IT Assets;
- Identification of benefits and risks;
- High level estimates created to provide a funding envelope for the Strategic Roadmap initiatives and provide good visibility on financial impact of pursuing this strategy.

This has involved rationalisation and harmonisation of some existing systems, retirement of others and implementation of some new ones: the centrepiece has been the implementation of CIMS[45], a Microsoft Dynamics Enterprise Resource Planning system, in April 2019.

There are approximately 50 business systems and applications identified by WaterNSW as key and approximately a further 40 also being maintained and employed (the exact numbers are changing as systems have also been retired or replaced). A total of 36 systems are identified as related to the WAVE Program. In Appendix D we capture the key changes in the make-up of the ICT landscape as a result of CIMS as well as summarising the other key WaterNSW systems. This illustrates the volume of tools and applications managed by the BSI business unit and which underpin the day-to-day functioning of WaterNSW.

The level of expenditure for the period 2018 to 2025 is shown in Table 8-10 below.

[44] This is the end user and location breakdown for the whole of WaterNSW not for Greater Sydney.
[45] CIMS simply stands for “Consolidation of Information Management Systems”.

Table 8-10 Corporate Expenditure – Business Systems and Information (ICT)

CORPORATE EXPENDITURE - BUSINESS SYSTEMS AND INFORMATION								
$m 2021 Year ending June	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
DIRECT CAPITAL AND OPERATING EXPENDITURE								
Total expenditure	18.83	21.95	20.39	21.64	21.50	21.16	19.59	21.26
Capex as direct expenditure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Opex as direct expenditure	1.08	1.57	0.70	1.65	1.67	1.68	1.70	3.40
Overhead opex before allocation	17.74	20.37	19.69	19.99	19.83	19.47	17.89	17.86
ALLOCATED EXPENDITURE								
Capex as allocated cost	4.15	5.29	5.48	5.33	4.40	4.55	4.30	3.84
Opex residual overhead	13.59	15.08	14.20	14.65	15.43	14.92	13.59	14.02
Percentage capitalised	*22%*	*24%*	*27%*	*25%*	*20%*	*22%*	*22%*	*18%*

Source: WaterNSW documents 60 and 259

Note table does not show capex as direct expenditure; that is coded to capex projects.

There is a level trend in overhead operating expenditure from $18.76m/a in the 2016 determination period to $19,44m in the 2021 period.

The main areas of operating expenditure over the period 2022 to 2025 comprise

- IT Support: $9.85 m/a average - expenditure is for staff costs (A$3m), telecommunications ($4m), external support and administration;
- Renewals and Renewals: $6.18 m/a - this includes for software maintenance and licencing costs. There is a significant increase from $1.45m/a average for the 2016 determination period. WaterNSW explains that some increases are due to licencing for new systems implemented in the 2016 determination period, some $0.88m, although does not fully explain the $4.9m/a increase between the determination periods;
- Administration: $1.50 m/a- this expenditure relates mainly to internal administrative salaries, for example team leaders and business support officers;
- Data Centre: $0.81 m/a - ongoing maintenance and support for the new data centre. There is a significant increase in expenditure above the 2016 determination period which WaterNSW explains as not a reflection of the actual costs as some expenditure was coded elsewhere.

We note the increase in expenditure on additional licence and maintenance requirements of new systems.

In the current determination period, the ICT split is approximately 60% capex to 40% opex and in the next determination period this is forecast to move to narrow to approximately 55% capex and 45% opex. The levels of expenditure are therefore very similar and hence why it is important to present and assess ICT projects on a totex basis. The onus is on WaterNSW to demonstrate that its optioneering does not contain a capex bias but considers the lowest whole life cost solution. Operating expenditure may relate to direct costs for the implementation of capital projects or to recurrent expenditure associated with staff costs, licences and support for new projects. Capex generally relates to replacement or updating of existing systems or provision of completely new solutions. We recommend therefore at future reviews that WaterNSW presents ICT projects in a totex rather than a capital expenditure section to improve visibility on the costs and decision-making.

Opportunity for efficiency savings

- The business unit is responsible for supporting existing information and data systems for operating business units and the corporate functions. Some new IT systems have recently been implemented, such as CIMS and the FMS which deliver efficiencies in other parts of the business but require additional support offset by earlier support for legacy systems;
- Less than 10% of operating expenditure is coded as a direct cost. The greater part of operating expenditure is considered as an overhead. This suggests that costs are not fully controlled with the potential for inefficiencies being distributed to regulated businesses. With the new Financial Management System with the ability to record costs with greater granularity, there appears to be little reason not to code a substantial proportion of operating expenditure as a direct cost;
- The business provides services direct to the operating business units such as Water Operations and Customer and Community. There is a clear opportunity for the BSI business unit to provide and cost

services to other parts of the business on some form of service agreement. This should focus activities on what is important and effective and drive internal efficiencies. Following this model there is potential for significant catch-up efficiencies. This would also increase significantly direct cost recording and reduce the extent of overhead smeared across the business. Where staff costs relate to supervisory roles then costs should be apportioned within the business unit;

- Operating costs are forecast as level over the period and no evidence for any scope adjustments;
- The expenditure profile is not consistent with FTE count – from 2019 to 2025 FTEs reduce by 7.5% whereas expenditure increases by 9%. The business unit should take greater control of its costs. There is potential for catch-up efficiency;
- The extent of overhead capitalisation overstated. Costs should be capitalised where there is evidence from the direct costing and timesheet process. There may be good reason to capitalise some of the overhead cost, but we would expect these to be at a lower level than shown in the current analysis.

8.2.1.5. Executive team

We note that expenditure for the executive team has reduced significantly from the 2016 determination period to the 2021 period as the cost of staff have been allocated to their respective business units.

8.2.1.6. WaterNSW

This is an additional line in corporate expenditure to include defined corporate costs not included in specific business unit expenditures. In document RFI57, WaterNSW explains that this expenditure line is a negative adjustment for efficiencies in 2021 and continuing through the 2021 regulatory period. It comprises efficiencies from the direct costs of operating units and corporate business units. It shows that direct costs comprise 69% of these efficiency savings.

As the full savings were built into the corporate costs in document 60, understating the level of corporate expenditure, we wrote back this 31% into forecast corporate expenditure to derive a total corporate expenditure for each regulated business applying only corporate efficiencies.

8.2.2. Capital expenditure

Corporate expenditure for all regulated businesses – Greater Sydney, Rural Valleys and WAMC - in the current regulatory period 2021 and in the 2022 determination period extending to 2025 is summarised in Table 8-11.

Table 8-11 Corporate Expenditure – Business Systems and Information (ICT)

CORPORATE CAPITAL EXPENDITURE 2021 PERIOD

$m 2021 Year ending June	2021	2022	2023	2024	2025	Total 2022 to 2025
ICT CAPITAL EXPENDITURE ALL BUSINESSES (Document RFI102)						
Greater Sydney SCADA system enhancement	0.21	0.17	0.17	0.18	0.23	0.749
Greater Sydney Telemetry system enhancement	0.08	0.07	0.07	0.07	0.09	0.300
Plant Scada Upgrade	0.09	0.21	0.24	0.31	0.00	0.766
ICT DR and Data Centre Renewal Project	0.71	0.00	0.00	0.00	0.00	0.000
Rural SCADA system enhancement	0.21	0.17	0.17	0.18	0.23	0.749
Rural Telemetry system enhancement	0.08	0.06	0.06	0.06	0.09	0.273
Communications Strategy & Implementation	0.55	0.47	0.47	0.47	0.36	2.32
Information Technology Support	0.27	0.27	0.27	0.28	0.27	1.36
ICT Renewals and Replacement	1.38	0.82	0.87	0.84	0.42	4.33
ICT Operational Technology Final BC	1.44	1.46	1.47	1.49	0.00	5.86
ICT Business Process Automation - Program Forecasting	0.62	0.48	0.49	0.21	0.22	2.02
ICT Water Market Systems - Program Forecasting	5.54	3.23	3.09	2.59	1.46	15.91
ICT Operational Technology - Program Forecasting	3.08	0.91	0.88	0.81	0.38	6.07
ICT Analytics - Program Forecasting	5.16	2.61	2.17	1.48	1.06	12.48
ICT Data Centre - Program Forecasting	0.80	0.67	0.67	0.67	0.69	3.49
ICT Collaboration - Program Forecasting	0.57	0.48	0.47	0.56	0.52	2.61
ICT Corporate Systems - Program Forecasting	1.75	1.35	1.22	1.04	0.74	6.10
ICT Telecommunications - Program Forecasting	0.79	0.38	0.35	0.40	0.36	2.29

ICT Cyber Security - Program Forecasting	0.79	0.48	0.49	0.50	0.50	2.76
Total Corporate ICT capital expenditure	24.12	14.30	13.64	12.15	7.61	70.43

Source: doc RFI102 and Atkins analysis

We noted some inconsistencies in reported expenditures between documents RFI102 and RFI221 and also the SIR Capex submissions. WaterNSW subsequently provided a reconciliation of document RFI102 to the SIRs.

Table 8-12 shows our reconciliation of corporate capital expenditure with the Rural Valleys SIR.

Table 8-12 Corporate Expenditure – Rural Valleys

CORPORATE EXPENDITURE 2021 PERIOD RURAL VALLEYS

$m 2021 Year ending June	2021	2022	2023	2024	2025	Total 2022 to 2025
WaterNSW PROPOSALS						
ICT capital expenditure	9.43	5.41	5.01	4.67	3.11	18.19
Integrated Business Systems BC	0.62	0.62	0.33	0.33	0.34	2.24
Maintain capability procurement strategy	1.17	1.20	1.24	1.25	1.25	4.93
Other corporate expenditure	1.13	0.06	0.08	0.32	0.20	0.66
Corporate expenditure in SIR(CAPEX2)	12.35	7.27	6.67	6.57	4.89	25.41

Source: doc RFI 102, SIR and Atkins analysis

Expenditure is allocated to the Rural Valleys business based on the proportion of salary costs in each business. We comment in Section 8.2.5 on the allocation of ICT expenditure where we concluded that using total salary costs is not cost reflective of the capital projects being delivered. Our view is that capital expenditure should be allocated based on the scope, delivery and outcomes in terms of efficiencies within each business.

WaterNSW explained that other corporate expenditure included the 'Integrated Business System Business Case' and 'Maintain Capability Procurement Strategy, both being wholly allocated to Rural Valleys. We also comment in Section 8.2.5 that these project costs should be allocated across the regulated businesses. We noted that expenditure for fleet, vessels and lands, building and roads are allocated directly to valleys and do not form part of the corporate expenditure.

We carried out a similar analysis with the WAMC regulated business as shown in Table 8-13.

Table 8-13 Corporate Expenditure – WAMC

CORPORATE EXPENDITURE 2021 PERIOD WAMC

$m 2021 Year ending June	2021	2022	2023	2024	2025	Total 2022 to 2025
WaterNSW PROPOSALS						
ICT capital expenditure	5.16	3.13	2.97	2.61	1.60	10.32
Vehicle procurement	1.18	0.30	0.68	3.21	0.62	5.99
Other corporate expenditure	0.69	0.18	0.20	0.23	0.20	0.81
Corporate expenditure in SIR (CAPEX2)	7.03	3.61	3.86	6.05	2.42	15.93

Source*: doc 102, SIR and Atkins analysis*

The capital expenditure line in the WAMC SIR Capex worksheet specifically defines 'IT systems' although the response to our query in RFI 104 shows lower levels of expenditure. WaterNSW subsequently provided a reconciliation of expenditure to the SIR which included expenditure on vehicle procurement and small expenditures on other relevant items.

Without any explanation for the 'other corporate expenditure' included in the SIRs for Rural Valleys and WAMC, we are not able to confirm whether this level of expenditure is prudent or efficient.

The following sections look at expenditure in the current and future periods and reviews a representative sample of projects applicable to both the Rural Valley and WAMC businesses.

8.2.2.1. Information and Communication Technologies (ICT)

The total Corporate capital expenditure for Rural Valleys including fleet, property, etc. in the current determination is forecast to be $46.078m against a reduced total of $35.765m in the future determination.

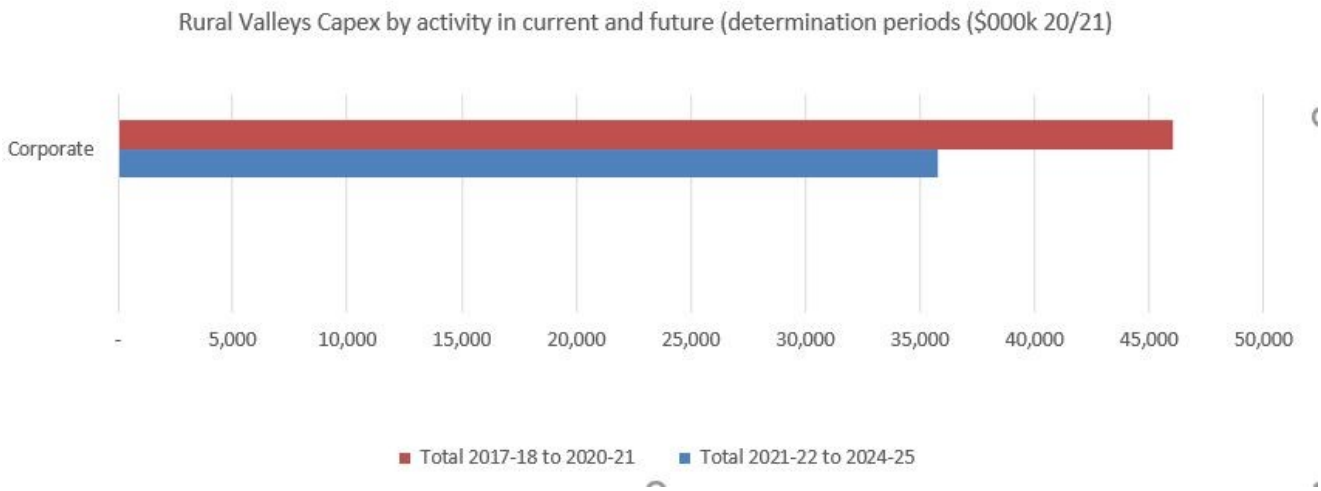
Table 8-14 Corporate Expenditure – Rural Valleys

CORPORATE EXPENDITURE 2021 PERIOD BY ACTIVITY AND EXPENDITURE

$m 2021 Year ending June	2018	2019	2020	2021	2022	2023	2024	2025
Corporate Systems	6,596	259	22,212	17,011	7,872	6,969	12,171	8,752

Source: SIR Capex 2 analysis, October 2020

Figure 8-5 Corporate Expenditure – Rural Valleys (Source: SIR Capex 2 analysis, October 2020)

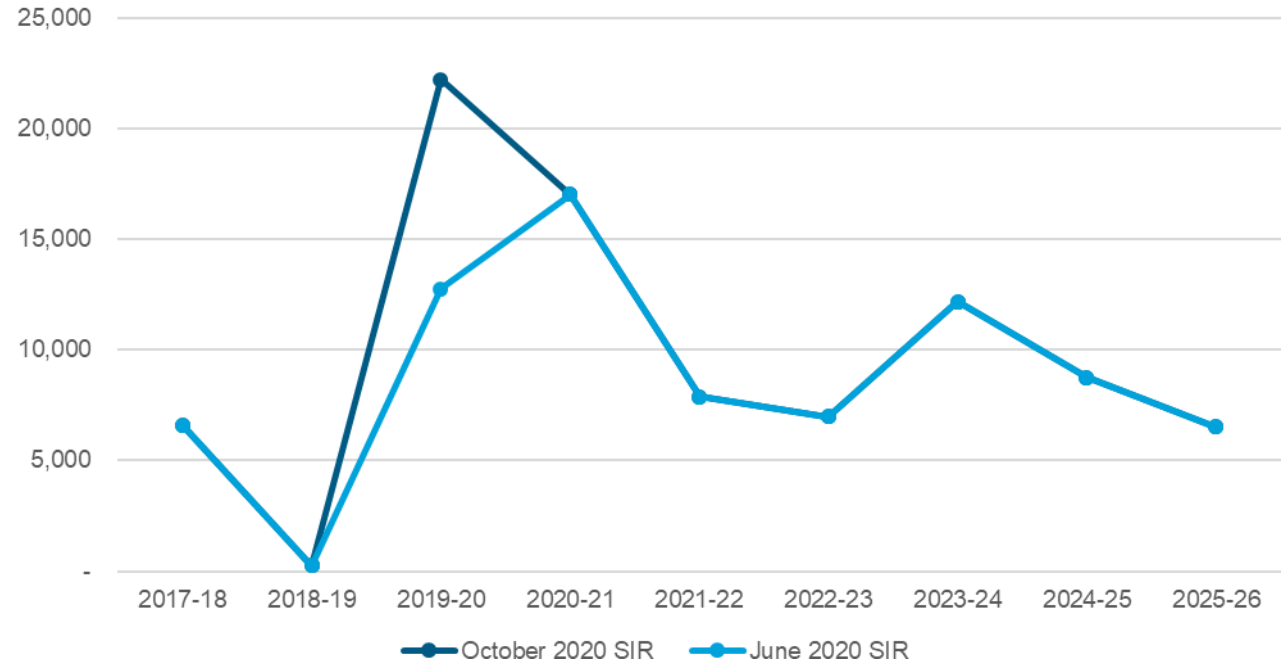


We can also compare the difference in Corporate expenditure between the June and October 2020 SIRs, which was striking, with a difference of $9.5m in 2020. There has been $4m allocated incorrectly and which should have been allocated against a variety of small projects, and there is a further $2.3m for PDMP which we believe should appear under the three dams capital expenditure. The actual increase as a result is in the region of $3m which includes about $2.0m for the Data Centre ICT renewals which was omitted from earlier forecasts.

WaterNSW subsequently explained that the 2020 forecast was developed in March 2020 where there was an underestimate of the likely outturn cost for the full year. The business provided an analysis of the corporate capital variances. WaterNSW explained that the PDMP project was to manage a series of projects including the three dams.

These changes lead us to question the robustness of capital expenditure monitoring and forecasting and the need to improve the reliability and quality control of these processes.

Figure 8-6 Corporate Expenditure Comparison from June to October 2020 – Rural Valleys



Source: SIR Capex 2 analysis, October 2020

The following sections look at expenditure in the current and future periods and reviews a representative sample of projects applicable to both the Rural Valley and WAMC businesses.

Strategic Overview and Project Review

A strategic overview and detailed analysis of a sample of projects can be found in Appendix D - Corporate ICT Expenditure Additional Analysis - for the following projects in both the current and future price paths:

- CIMS;
- DamGuard;
- Data Centre;
- ICT Replacement and Renewals;
- The WAVE Program.

In terms of the major items of ICT expenditure in the current determination, they relate to:

- Corporate Systems (CIMS in practice);
- Renewals;
- Data Centre;
- Analytics.

For the future determination, expenditure is dominated by the WAVE Program, which brings together the Operational Technology, Analytics and Water Market including Customer Relationship Management (CRM) capabilities under one umbrella. This accounts for ~60% of total ICT capital expenditure across WaterNSW.

The level of detail sitting behind the investment being sought is generally high. For the WAVE Program and other areas such as asset renewals or investment in the Data Centre, there is a strong audit trail to justify the need, identify the costs and demonstrate the benefits. For some of more adventurous areas of digital transformation, there was little in the way of utility collaboration and partnering presented to us: there is plenty of good practice and innovative projects being developed both in Australia and internationally for WaterNSW to tap into and which would minimise the risks associated with investment in new capabilities. A reverse example of this is DamGuard, which WaterNSW has developed and for which there has been considerable interest from other States in Australia to purchase. Our detailed analysis of ICT investments is captured in Appendix D. Corporate ICT Expenditure Additional Analysis.

Benefits and efficiencies

One of the drivers of digital expenditure is to deliver benefits including business efficiencies, which are particularly pertinent to this review where they translate into capital or operating expenditure savings or avoided expenditure. WaterNSW recognises as much in its latest strategic document: '*Improved Productivity' is one of the five strategic*

drivers underpinning the ICT program: Aim[s] to reduce inefficiencies and duplication, giving our people the right systems and technologies to support their work".

In our opinion, it is not easy to track the benefits and thus there could be a clearer line of sight to demonstrate if ICT investments successfully achieve what is set out in business cases. Part of the issue is that benefits may not be realised until the next determination period (so efficiencies in the current price path may actually be realised from ICT investments made in the previous determination). Another challenge is that it is generally not the BSI team's responsibility to track those benefits, although from our perspective they should form part of the submission made to justify the ICT investments.

CIMS benefits realisation is a case in point. WaterNSW's review[46] highlighted that:

> "*The financial benefits of the investment in CIMS 1.0 are not straightforward to assess given the significant changes in the business over the period since the original CIMS business case was approved by the Board in 2016. Our analysis suggests that each business area impacted by CIMS has either maintained or grown their FTE over the last three years and we have not been able to identify any Finance (i.e., billing, AR, AP, accounting, procurement), HR, and IT ERP support FTE savings. This in part was due to changes in the business over time e.g., an increased capital and operating programs, compliance/reporting obligations and/or the expected scope of the project being reduced and did not achieve the functionality required to achieve the benefits claimed in the business case."*

While the CIMS implementation has been a success from an operational perspective, the de-scoping of the CRM capability alongside the CIMS report's conclusions on realising efficiencies shows that there is considerable scope for WaterNSW to improve compared with how a frontier company would be delivering efficiencies through its ICT investments. This was summed up by WaterNSW's review that:

> *"A key learning from the CIMS project is that functional deliverables and associated benefits should be undertaken incrementally so that we can avoid the impact of the evolving state of the business over a long term. The Corporate Systems Program operates using this tighter linkage between benefits proposition and realisation. A further key learning is that successful benefits realisation needs to consider in the context of a comprehensive workforce plan that shows the impact of initiatives that both increase and decrease effort (and therefore headcount). The lack of this workforce plan means that it is difficult to explain why headcount has increased over time and to make visible the benefits from various efficiency initiatives. For this reason, Management is focused on development of a workforce plan that is underpinned by planned changes and is dynamic to account for external impacts. The IT Strategy would provide a direct link to the initiatives affecting headcount in that plan."*

Clearly if the efficiencies set out in a business case are not realised, or only partially delivered, this may lead one to conclude that some or all of the expenditure was not prudent hence why this is critical in our view to have visibility on the outcomes of the investments. This learning needs therefore to be translated into improved management of future initiatives, particularly the WAVE Program.

We do recognise that benefits are not only financial. Obsolescence is a key challenge. There is also scope to improve how business cases identify operational outcomes that will be delivered and then track those, such as improving operational performance or customer metrics as measured by WaterNSW's Operating Licence. The WAVE, CIMS and DamGuard are good examples where one would expect there to be metrics on an upward glidepath as a result of the new systems and processes that have been put in place (see also our comments on and recommendation relating to "customer metrics"). Overall, this is an area we believe there is room for improvement to be operating at the "frontier".

Conclusions

For the current price path, we have taken into account the challenges posed by the merger and how effectively the new strategy has been implemented and we concluded in the round that there were no grounds to challenge the prudency and efficiency of the expenditure.

For the future price path, we have considered the business cases to justify the projects and also focused on satisfying ourselves that WaterNSW has the capacity and capability to develop and manage these programs of work. This involved considering its overall strategy and assessing its track record in the current price path. We are not proposing any efficiency adjustments for specific projects beyond the efficiency challenges being set at company level. However, we have identified some areas for improvement.

[46] RFI 57a: WaterNSW CIMS Program Update 18 June 2020 v1.0

- ICT Corporate costs should in our view be presented in the submission to IPART as a combined capex and opex submission rather than focusing on ICT capex given the potential trade-offs between capex and opex depending on which solution is selected and the impact of that future capital expenditure has on opex in the long-term both in terms of efficiencies as well as long-term commitments for licences and support;
- Benefits, especially relating to efficiencies, delivered by ICT investments are set out in business cases but the approach to tracking and demonstrating their achievement needs to be mainstreamed more effectively. In many cases, this will not sit with BSI as their responsibility is for implementation. At times there is not a clear line of sight between many of the benefits highlighted by ICT investments and the efficiencies being presented by WaterNSW, or it cannot be robustly demonstrated that efficiencies have been realised as exemplified by the CIMS implementation;
- There is potential for horizon scanning, collaboration and partnering on areas of emerging or unproven technology which may be happening but this was not demonstrated at any time by WaterNSW as occurring;
- The impact of ICT investments should lead to demonstrable improvements in Customer and Other KPIs which WaterNSW can be monitored against and therefore held accountable.

8.2.2.2. Property

The costs associated with the Property portfolio are dominated by two large items, the office consolidation project at WaterNSW's new headquarters in Parramatta (costs split across all determinations) and the South West Corridor Depot project (Great Sydney only, split across the 2016-20 and 2021-24 determinations).

Sydney Office Consolidation Project – Current Price Path

One of the direct results of the merger was the need to identify a suitable location for the new organisation. While the Business Case was almost neutral in terms of cost benefit analysis, the real driver and benefit is the social capital that has been created by bringing together three organisations, facilitating collaboration and creating an identity for the new business. The costs of the Sydney Office Consolidation Project sit across all the different WaterNSW Determinations as this project benefits the organisation as a whole.

Four options were considered - Campbell Town, Penrith, Australia Square in the Central Business District (CBD) and Parramatta. Ultimately Parramatta was selected as the preferred location and it was at the time the only major construction site in Parramatta although its popularity as a workspace hub has grown significantly in a very short space of time. The building is rated as 5-star for the condition assessment, the highest rating. WaterNSW completed its move in May 2017. A headcount of 350 was originally assumed and we looked into the prudence of this footprint because there is a balance to achieve otherwise there is a risk of having either under capacity and incurring unnecessary costs or over-capacity which may require additional investment to expand the location or seek an alternative. Evidence suggest it has been right sized because some extra capacity has been required but WaterNSW has been able to remove some open areas in order to maximise the space available to meet its needs.

The final outturn costs were very similar to the original business case of $10.5m. There was also a significant discount negotiated with its landlord, the Western Sydney University, which was taken upfront rather than as a reduction on future lease costs thereby reducing significantly the fit-out costs.

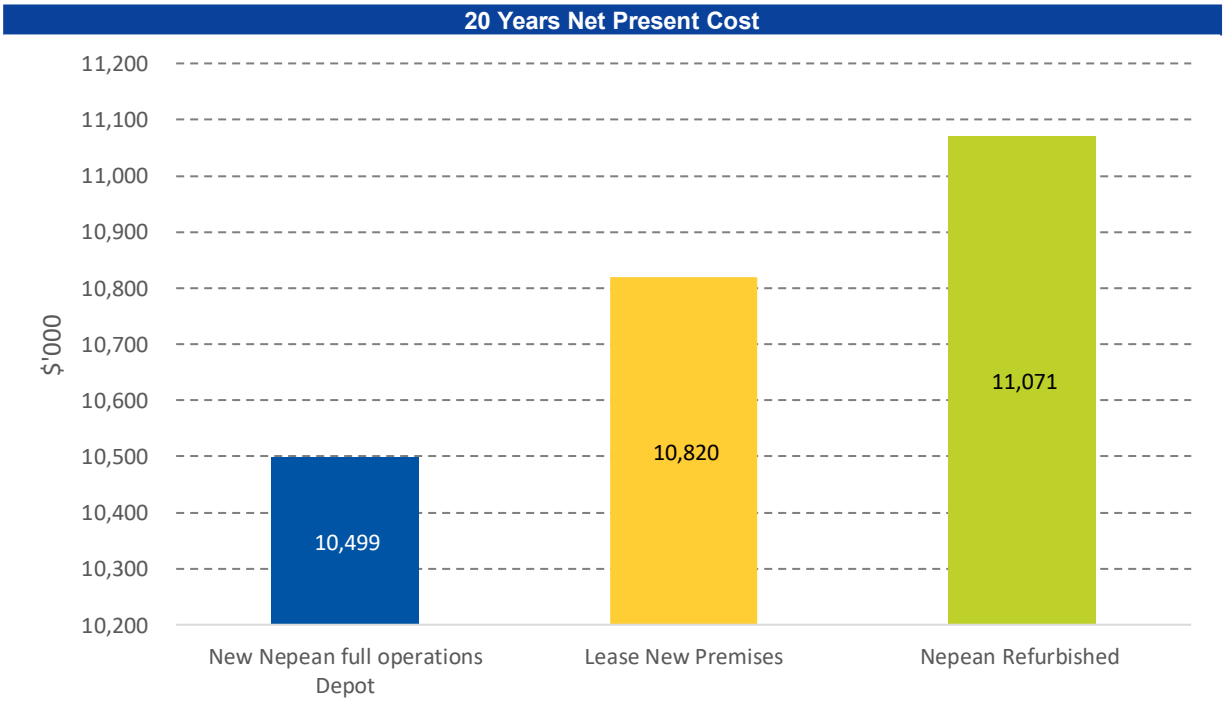
Overall, we believe that the consolidation of the various offices and move to Parramatta appears to have been managed in line with good practice and has been undertaken in a prudent and efficient way.

South West Corridor Depot – Current and Future Price Paths

Following on from establishing its HQ, the next strategic priority identified in the Property program has been focused on providing personnel in the field with office and workshop facilities which are suitably located and satisfactorily equipped to facilitate effective working. This has translated into establishing a centre of operations servicing six dams in the South West corridor by consolidating multiple WaterNSW offices and depots to one location, a project which benefits and so is therefore funded exclusively through the Greater Sydney Determination.

WaterNSW undertook a feasibility study to review the options as well as providing indicative costs. A refurbishment of the current site at Nepean dam was forecast to cost $13m due to the stringent heritage requirements but it would not have had the required capacity; leasing new premises at another location was another option considered but the most advantageous from a financial and operational perspective was a new build at Nepean at a cost of $9m as well as addressing WaterNSW's on-going heritage obligations at Nepean.

Figure 8-7 NPV analysis spreadsheet which concludes that the New Nepean full operations depot is the most cost-effective option



Source: WaterNSW draft business case

In order to cater for the daily depot operations and the staff that will be occupying the site, it has been established that four structures and two open and secure vehicle parking areas will be required:

- Office Building;
- Warehouse Workshop;
- Carport Vehicle Storage;
- Secure Vehicle Storage;
- WaterNSW Secure Open Vehicle Parking;
- Personal Open Vehicle Parking.

One of the reasons that the project can be implemented relatively very swiftly is that WaterNSW has selected a pre-fabricated build for the main office structure which will be built off site and then assembled in Nepean. This will also maximise efficiencies in costs.

8.2.2.3. Fleet

WaterNSW buys rather than leases the vehicles in its fleet. Fleet was a specific output measure for the Greater Sydney 2016 Determination but not for the Rural Valleys or WAMC determinations. In the former, it was stated that WaterNSW should achieve a reduction in vehicle changeovers of at least 4 vehicles on average per year until 2020-21 with the rationale that this would deliver an efficiency gain. In fact, there has been a complete transformation in the approach to fleet management and there has been a resulting step change in investment when compared with the recommended allocation in the previous determination, the forecast outturn and the requirement for the next price path. The new management undertook a thorough review, including considering the option of leasing; the result is that it has been justified to continue the program of capital purchases but the policy decision has modified from renewal every 3 years or 100,000 kilometres to 5 years or 150,000 kilometres from 2018. This impact on the level of expenditure is illustrated below by the figures for the Greater Sydney current and future determinations.

Table 8-15 Fleet expenditure in current and future price paths

	Current Price Path					Future Price Path				
Fleet ($19/20)	**2017**	**2018**	**2019**	**2020**	**Total**	**2021**	**2022**	**2023**	**2024**	**Total**
Recommended expenditure (2015 review)	2180	2799	2223	3034	**10236**					
June SIR expenditure	543	287	2790	2605	**6226**	1465	596	596	600	**3257**
Revised expenditure profile	543	287	2790	2605	**6226**	1465	596	596	920	**3577**

Sources: WaterNSW SIR, 2015 Review by external consultants, RFI response 180

While for the purposes of this review, we find the expenditure to be both prudent and efficient, it does suggest that in the past that there was some inefficiency, with a reluctance to sweat the assets.

We were also satisfied that the method of procurement is efficient. WaterNSW accesses cheaper bulk rates through the purchasing power of the Whole of NSW Government discount structure as well as negotiating an additional rebate with one vendor in the master purchasing agreement. There is also a fleet management provider, the contract of which is tested in the market every three years. Revenue from disposals is per the IPART disposal rules.

There is one exception related to WAMC fleet expenditure. In year 2014, fleet expenditure increases to $3.21m and $2.56m above the trend in annual expenditure. From our review of the fleet management process, we found not reason for this significant increase and have applied an efficient expenditure as the average of years 2023 and 2025 expenditure.

8.2.3. Findings

8.2.3.1. Operating expenditure

Corporate expenditure usually relates to those activities carried out to support the business operations and the core functions to meet statutory and regulatory requirements. The corporate functions normally relate to executive, legal, finance, personnel and information technology activities. WaterNSW terms these corporate business units as

- Executive;
- Legal, governance and risk;
- Finance and commercial services;
- Safety, people and performance; and
- Business systems and Information.

WaterNSW had previously considered the Customer and Community business unit as corporate although this is an operating unit in its own right, managing customer requirements.

The business was formed in 2016 with the merger of the previous Sydney Catchment Authority, the State Water Corporation and parts of DPIE. As such, the organisation is a combination of an operations business supplying bulk water for domestic and irrigation use, an asset manager in the construction and maintenance of assets, an environmental role in conserving the land it owns and regulates and as a regulatory body establishing and monitoring licence requirements.

During the 2016 determination period, the business has developed and implemented some new information systems and processes to enable it to improve its effectiveness and deliver efficiencies. Further ICT improvements are underway to deliver greater effectiveness and efficiencies in the 2021 determination period and beyond. This has taken time, moving from complex legacy systems form the predecessor bodies and developing work-around methods where new systems have yet to be implemented.

During the 2016 determination period, the corporate functions of finance, legal and people have been restructured and many key staff are only recently in post. Strategies and plans have been developed and are being implemented across the business. For example, the finance team with its new FMS system is well placed to drive further efficiencies across the operational business units.

We formed the view that the business is maturing although more time is needed to achieve a frontier performance/ We have compared the development of WaterNSW with other utilities such as Sydney Water and Hunter Water. Both utilities have been through several price determination periods and have been set challenging efficiency targets. Their businesses have evolved over time, with restructuring and innovative working to deliver and outperform the targets set.

There are significant opportunities for WaterNSW to catch up with these frontier companies but this would need a closer view of its structure and working practice including

- A greater focus of monitoring costs against the three main determinations;
- A greater internal challenge on increasing FTEs and costs to test whether additional obligations can be met through prioritising workload to limit cost increases;
- A program to drive efficiencies across the business units – the finance teams have a key role here;
- A drive for greater direct activity-based costing with a focus on reducing the extent of allocated overheads where there is potential for further efficiencies;
- A closer look at the business structure with a greater focus on service delivery with supporting business units. Some form of service provision arrangements may be appropriate for support from BIS and some functions of people, legal and finance;
- Whether a change to rationalise the business structure would enable the earlier bullet point objectives to be achieved.

Our role is to recommend a level for efficiency which can be delivered over the 2021 determination period based on the opportunities we have found and the ability of other water utilities to achieve and outperform. It is for WaterNSW to identify the areas of the business to deliver efficiency savings. We consider that WaterNSW is well placed with the resources it has to achieve and out-perform the efficiency targets set. A focus on the bullet points above should enable the business to move much closer to a frontier company.

We have set a level of catch-up efficiency which has been applied to all corporate operating expenditure for Rural Valleys and WAMC which is explained in Section 5.6.5.2. We have also applied a continuing efficiency similar to that applied to the Greater Sydney review earlier in 2020. The efficiency values are shown in Table 8-16.

Table 8-16 Operating Expenditure Efficiency Assumptions

EFFICIENCY ASSUMPTIONS

	2022	2023	2024	2025
Catchup efficiency	1.10%	1.10%	1.10%	1.10%
Catch-up cumulative	1.10%	2.19%	3.28%	4.33%
Continuing efficiency	0.70%	0.70%	0.70%	0.70%
Continuing cumulative	0.70%	1.40%	2.09%	2.77%

Source: Atkins analysis

8.2.3.2. Corporate capital expenditure in the Current determination period

We have taken into account the challenges posed by the merger and how effectively the new strategy has been implemented and we concluded in the round that there were no grounds to challenge the prudency and efficiency of the expenditure.

Overall, we believe that the consolidation of the various offices and move to Parramatta appears to have been managed in line with good practice and has been undertaken in a prudent and efficient way. We find the fleet expenditure to be both prudent and efficient; however, it does suggest that in the past that there was some inefficiency with a reluctance to sweat the assets.

8.2.3.3. Corporate capital expenditure in the 2021 determination period

Capital expenditure comprises mainly ICT projects where costs are allocated across the regulated businesses. WaterNSW has provided further information on corporate project expenditures which are reconciled with the SIR submissions.

For ICT expenditure in the 2021 determination period, we are not proposing any efficiency adjustments for specific projects beyond the efficiency challenges being set for the whole capital program. We have identified some opportunities for future efficiency gains.

- Benefits, especially relating to future efficiencies, delivered by ICT investments are set out in business cases but the approach to tracking and demonstrating their achievement needs to be clearer and more effectively. At times there is not a clear line of sight between many of the benefits highlighted by ICT investments and the efficiencies being presented by WaterNSW, or it cannot be robustly demonstrated that efficiencies have been realised as exemplified by the CIMS implementation;

- There is potential for horizon scanning, collaboration and partnering on areas of emerging or unproven technology which may be happening but this was not demonstrated at any time by WaterNSW as occurring;
- The impact of ICT investments should lead to demonstrable improvements in Customer and Other KPIs which WaterNSW can be monitored against and therefore held accountable for;
- ICT Corporate costs should in our view be presented in the submission to IPART as a combined capex and opex submission rather than focusing on ICT capex given the potential trade-offs between capex and opex depending on which solution is selected and the impact of that future capital expenditure has on opex in the long-term both in terms of efficiencies as well as long-term commitments for licences and support.

We have made some adjustments to the efficient level of capital expenditure to reflect the allocation of expenditure on a project basis compared with total salaries used by WaterNSW. We discuss these allocation changes in Section 8.2.5.

We have also made one scope adjustment for WAMC where a proposed significant increase in fleet expenditure in 2024 is not prudent or efficient.

8.2.4. Efficient level of expenditure

We are asked to provide recommendations as to the efficiency of WaterNSW's forecast level of corporate operating expenditure and provide annual estimates on the level of corporate operating expenditure that is required; and

Provide recommendations as to the efficiency of WaterNSW's historic and forecast level of corporate capital expenditure between 2016/17 and 2024/25 including any findings on the efficiency and appropriateness of key existing corporate assets.

8.2.4.1. Operating expenditure

The efficient level of expenditure for Rural Valleys is shown in Table 8-17 below.

Table 8-17 Rural Valleys efficient level of expenditure

CORPORATE EXPENDITURE RURAL VALLEYS					
$m 2021 Year ending June	**2021**	**2022**	**2023**	**2024**	**2025**
CORPORATE OPERATING EXPENDITURE BY ACTIVITY					
Pre-capitalisation expenditure	24.52	22.02	21.45	23.94	22.03
Capitalised expenditure	9.61	8.19	8.25	8.08	7.42
Net operating expenditure	14.91	13.83	13.19	15.86	14.62
Customer and Community	3.97	3.88	3.68	3.48	3.46
Safety, People and Performance	3.14	2.49	2.26	3.24	2.84
Legal, Governance and Risk	1.64	1.39	1.37	1.98	1.73
Business Systems and Information	4.60	4.03	3.86	4.85	4.23
Financial and Commercial Services	2.53	2.32	2.28	3.12	2.87
Executive	0.51	0.42	0.40	0.58	0.50
WaterNSW costs	-2.81	-2.23	-2.19	-3.01	-2.55
Total Corporate	13.57	12.30	11.66	14.23	13.08
Operational allocated costs	1.34	1.53	1.54	1.63	1.54
ATKINS SCOPE ADJUSTMENT					
Impact of method change to GS costs	0.00	-0.30	-0.30	-0.30	-0.30
Additional regulation team	0.00	0.36	0.36	0.36	0.36
ATKINS EFFICIENCY ADJUSTMENT					
Catchup efficiency	0.00	0.15	0.29	0.52	0.63

Continuing efficiency	0.00	0.10	0.18	0.32	0.39
ATKINS EFFICIENT LEVEL OF OPERATING EXPENDITURE					
Efficient expenditure	14.91	13.64	12.78	15.08	13.66

Source: RFI60 and Atkins analysis

We have excluded Allocated direct costs as these are addressed in Section 5 Operating Expenditure.

The efficient level of expenditure for WAMC is shown in Table 8-18 below

Table 8-18 WAMC efficient level of expenditure

CORPORATE EXPENDITURE WAMC					
$m 2021 Year ending June	**2021**	**2022**	**2023**	**2024**	**2025**
CORPORATE OPERATING EXPENDITURE					
Pre-capitalisation expenditure	9.58	9.17	9.35	9.21	8.70
Capitalised expenditure	1.40	1.19	1.20	1.17	1.08
Net operating expenditure	8.18	7.98	8.15	8.04	7.62
Customer and Community	3.16	2.71	2.69	2.66	2.67
Safety, People and Performance	1.06	0.99	0.99	1.03	0.87
Legal, Governance and Risk	0.54	0.53	0.58	0.61	0.51
Business Systems and Information	1.56	1.60	1.70	1.54	1.30
Financial and Commercial Services	1.45	1.60	1.65	1.71	1.66
Executive	0.19	0.18	0.19	0.20	0.17
WaterNSW costs	-0.95	-0.89	-0.96	-0.96	-0.78
Total Corporate	7.00	6.72	6.83	6.78	6.40
Operational allocated costs	1.18	1.26	1.32	1.25	1.22
ATKINS SCOPE ADJUSTMENT					
Impact of method change to GS costs	0	-0.20	-0.20	-0.20	-0.20
Additional regulation team		0.18	0.18	0.18	0.18
ATKINS EFFICIENCY ADJUSTMENT					
Catchup efficiency	0.00	0.09	0.18	0.26	0.33
Continuing efficiency	0.00	0.06	0.11	0.16	0.20
ATKINS EFFICIENT LEVEL OF OPERATING EXPENDITURE					
Efficient expenditure	8.18	7.82	7.84	7.59	7.07

Source: RFI60 and Atkins analysis

8.2.4.2. Capital Expenditure

We set out below our findings on the level of efficient expenditure for the Rural Valleys and WAMC regulated businesses. The adjustments for efficient expenditure comprise

(i) A scope adjustment for expenditure which we are not able to map to defined projects and therefore unable to confirm prudent and efficient expenditure;

(ii) An adjustment for catch-up efficiency consistent with other projects in the capital program where the justification is set out in Section 6.8;

(iii) An adjustment for continuing efficiency or Frontier Shift which we explain in Section 6.8.

Table 8-19 Rural Valleys efficient level of corporate expenditure

CORPORATE EXPENDITURE 2021 PERIOD RURAL VALLEYS						
$m 2021 Year ending June	2021	2022	2023	2024	2025	Total 2022 to 2025
WaterNSW EXPENDITURE PROPOSALS						
ICT capital expenditure	9.43	5.41	5.01	4.67	3.11	18.19
Integrated Business Systems BC	0.62	0.62	0.33	0.33	0.34	2.24
Maintain capability procurement strategy	1.17	1.20	1.24	1.25	1.25	4.93
Other corporate expenditure	1.13	0.06	0.08	0.32	0.20	0.66
Corporate expenditure in SIR (CAPEX2)	12.35	7.27	6.67	6.57	4.89	25.41
SCOPE ADJUSTMENT AND REALLOCATION						
ICT expenditure - reallocate	0.00	1.42	1.42	1.42	1.42	5.66
Integrated Business Systems BC - reallocate	0.00	-0.20	-0.20	-0.20	-0.20	-0.79
Maintain capability procurement strategy - reallocate	0.00	-0.62	-0.62	-0.62	-0.62	-2.47
Corporate expenditure in SIR (CAPEX2)	12.35	7.87	7.27	7.17	5.49	27.81
EFFICIENCY ADJUSTMENTS						
Catch-up efficiency	0.00	-0.17	-0.31	-0.49	-0.41	-1.37
Continuing efficiency	0.00	-0.06	-0.11	-0.16	-0.16	-0.49
Efficient level of corporate capital expenditure	12.35	7.65	6.85	6.52	4.92	25.94

Source: Atkins analysis

Table 8-20 WAMC efficient level of corporate expenditure

CORPORATE EXPENDITURE 2021 PERIOD WAMC						
$m 2021 Year ending June	2021	2022	2023	2024	2025	Total 2022 to 2025
WaterNSW PROPOSALS						
ICT capital expenditure	5.16	3.13	2.97	2.61	1.60	10.32
Vehicle procurement	1.18	0.30	0.68	3.21	0.62	5.99
Other corporate expenditure	0.69	0.18	0.20	0.23	0.20	0.81
Corporate expenditure in SIR (CAPEX2)	7.03	3.61	3.86	6.05	2.42	15.93
SCOPE ADJUSTMENT AND REALLOCATION						
ICT expenditure reallocation	0.00	-0.80	-0.80	-0.80	-0.80	-3.22
Integrated Business Systems BC - reallocate	0.00	0.06	0.06	0.06	0.06	0.26
Vehicle procurement	0.00	0.00	0.00	-2.56	0.20	-2.36
Corporate expenditure in SIR (CAPEX2)	7.03	2.87	3.12	2.75	1.88	10.61
EFFICIENCY ADJUSTMENTS						
Catch-up efficiency	0.00	-0.06	-0.13	-0.19	-0.14	-0.52
Continuing efficiency	0.00	-0.02	-0.05	-0.06	-0.05	-0.19
Efficient level of corporate capital expenditure	7.03	2.79	2.94	2.50	1.68	9.91

Source: Atkins analysis

8.3. Review of allocation of corporate costs between businesses

We are required to

- *Undertake a detailed review of WaterNSW's allocation of corporate costs between its business units;*
- *Determine, where appropriate, the driver or drivers of the allocation of corporate costs between business units; and*
- *Comment and make recommendations on the proportion of total efficient corporate costs allocated to each business unit, including capital and operating costs. Also clearly state the method used to allocate costs and the principles on which that method is based.*

8.3.1. WaterNSW businesses

There are four regulated business and other activities undertaken within WaterNSW comprising

(i) Greater Sydney;

(ii) Rural Valleys;

(iii) Water Administration Corporation (WAMC);

(iv) Broken Hill Pipeline; and

(v) Other activities – comprising mainly MDBA (opex) in role of state constructing agency and state-funded government works.

Corporate expenditure, both operating and capital expenditure, is allocated across these businesses applying the Cost Allocation Manual[47]. This applies to three key stages

- capitalisation of an element of corporate and overhead costs;
- allocation of the net operating expenditure to regulated businesses and other activities;
- allocation of Rural Valley expenditures, both capital and operating, to individual valleys.

Allocated costs form about one third of total costs for Rural Valleys and one quarter for Greater Sydney. Cost allocation therefore has a significant impact on the level of cost in each of the regulated businesses

There is a secondary allocation for the Rural Valleys business where Rural Valleys costs from the primary allocation are subsequently proportioned to the twelve valleys and Fish River.

WaterNSW defines 'corporate' costs as those costs within corporate business units that are not directly costed to a defined activity. 'Overhead' costs are those arising from operating business units that are not directly costed to a defined activity.

In addition, WaterNSW has included 'All Valley' operating and capital expenditures for activities and projects not specifically allocated to a regulated business. Operating expenditure in the 2021 determination period is an average $11.4m comprising asset management activities $4.7m (41%), Procurement $1.6m (14%), Dams $1.4m (12%) and surface water $0.9m (8%). These costs are allocated across the regulated businesses using the TOTEX methodology, as applied to corporate and overhead costs. No corporate or overhead allocation is applied as it is assumed that these are 'overhead' activities.

All Valley capital expenditure projects are the same as corporate projects which we discuss in Section 8.2.2.

8.3.2. Cost allocation methodology

Principles

This Cost Allocation Manual (CAM) sets out the cost allocation principles, methodology and associated governance arrangements. The CAM is currently applied from 2019 and will be reviewed at the beginning of each regulatory period.

The principles follow the IPART's Cost Allocation Guide (March 2018)[48] and applicable accounting standards. The fundamental principle is that all expenditure, both operating and capital, must be allocated to the relevant service which causes these costs to be incurred. For WaterNSW expenditure needs to be mapped to the four businesses subject to determinations and other activities, such as MDBA or state funded government works.

[47] Document … Cost Allocation Manual
[48] Cost Allocation Guide, IPART 2016

- Costs directly mapped: Wherever feasible, activities and related costs should be mapped directly to one of the businesses and included in the allowed expenditure for the relevant determination. The activity coding should reflect the type of activity, the location and system. An example is maintenance work which can be allocated to a rural valley or to assets in Greater Sydney. There are benefits in this activity-based approach to analyse data, identify possible inefficiencies and promote more efficient working;
- Causal relationships: Where it may not, currently, be able to identify causal relationships it may be necessary to substitute a close approximation to proportion costs. WaterNSW has developed methodologies to apportion costs which are described below;
- Costs only allocated once*:* Costs, within a service or across services, should only be allocated once to avoid any double counting. Conversely, all costs need to be included;
- Reconciliation with the statutory accounts: A further principle is that total costs apportioned to businesses are reconciled with the total costs within the audited statutory financial accounts;
- Reconciliation with the AIR: we suggest an additional principle to reconcile costs annually with the AIR;
- Update periodically: The CAM document commits WaterNSW to update allocators periodically as technologies or improved allocators become available; this will be as part of the periodic review process (CAM guidance para 3.1.5).

A further principle is that

> *it may not be practicable to identify and measure causal relationships without undue cost and effort. In such cases WaterNSW will adopt a proxy allocator based on the understanding of the nature of the expenditure.*

The implementation of the new Financial Management System in 2019, which includes greater granularity of cost recording at source, provides an opportunity to apply new technology to identify and measure causal relationships in greater detail, without undue cost or effort, and reduce the extent of indirect cost allocation.

Methodology overview

WaterNSW's Financial Management System is used to capture all costs in the business. Each account string in the general ledger comprises eight pieces of information: responsibility centre, project and phase, valley, activity centre, pricing service, business segment, capability (opex or capex) and type of expenditure. Most, but not all, employees complete timesheets to record their time, hence labour cost, to one or more specific account strings. Direct costs are similarly coded to relevant account string. Capital projects may have sub-projects to capture transactions across phases.

Direct costs comprise labour and non-labour elements. Labour costs are derived from hours recorded in the timesheet process and relevant labour rate. Non-labour costs are coded by account string and directly attributed to the appropriate service.

The cost allocation process includes

- identifying and defining the cost object to which costs will be assigned – costs should be allocated to the activity being carried out using the account string. A typical example is a maintenance team working on defined jobs in a specific valley;
- Identifying and classifying cost as direct or indirect – direct costs should be clearly mapped to the activity and service delivered. Indirect costs are defined as those that cannot be attributed to a particular cost object and are allocated across the service based on causal relationships – with the activity-based costing using the account string, then these indirect costs should be mapped to activities and service, even indirect. A good example is a maintenance manager supervising field works. Another example where a manager is supervising hydrometric activities then his or her time can be clearly apportioned between core service areas.

All operating costs are allocated to four business segments comprising

- Core: this segment relates to the regulated businesses of Greater Sydney, Rural Valleys, WAMC and the Broken Hill pipeline. The direct costs are tagged and allocated to each of the rural valleys (RV and WAMC), Greater Sydney and Broken Hill as appropriate;
- Core Plus: this segment comprises supplementary activities not included in the regulatory business. These are externally funded and include costs related to MDBA and the NSW Government;
- Other: this segment represents unregulated business and direct costs are mapped using the account string;

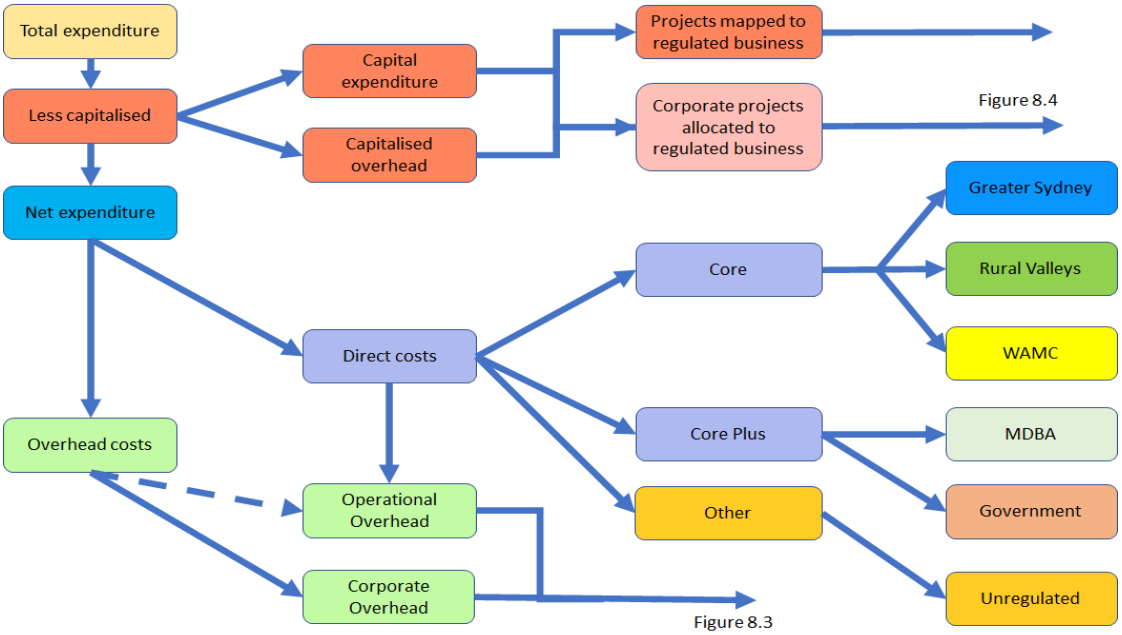
- Overhead: this segment comprises two elements. The overhead costs from operational business units within WaterNSW that are responsible for specific functions and service delivery. There are also corporate overheads which relate to the whole of business functions.

Capital costs are also recorded on the general ledger using the same coding as for operating expenditure. Each project can in general be mapped to specific regulated business activities. There are some projects, determined as corporate capex, relating to support activities – ICT, accommodation and fleet. These costs are apportioned to the regulated businesses.

Overhead costs include overheads from operational business units comprising System Operations, Water Quality and Catchment Protection, Assets, Water Solutions and Allocated Direct Costs such as 'all valley' costs. Operational overheads comprise 24% of total corporate costs in the period 2017 to 2020 but reduce to 15% in the 2021 determination period. The extent of these overhead costs varies across the operational business units. We have considered expenditure from 2020 as earlier years show some inconsistencies in the proportion of overheads to total expenditure. We note that the Water Operations, Assets and Water Solutions show overheads of about 2% of total costs which are not significant. However, the Customer and Community business unit shows overheads greater than 50% and Water Quality and Catchment Management reports 15% to 12% over the 2022 determination period.

The process for the allocation of the overhead segment to core business is shown in Figure 8-8 below.

Figure 8-8 Cost allocation process – first stage



(i) Total expenditure comprises capital and operating costs. Capital project expenditure is recorded against capital project activity codes. This leaves a residual operating expenditure which is a combination of direct and overhead costs;

(ii) A proportion of corporate overhead operating expenditure is capitalised using a TOTEX methodology where

Capitalised overhead {$) = Corporate business unit overheads ($) x MCP (%)

Where MCP (%) = MCP capex/ (MCP capex + opex (excluding overheads))

MCP ($) is defined as capital expenditure on maintenance and dam safety.

Overhead is defined in the CAM as including overhead costs from operational business units with specific functions and service delivery and corporate overheads which relate to 'whole of business' functions. The overhead used in the capitalisation allocation includes only those expense items allowable under accounting standards.

(iii) For operational business units comprising System operations, Water quality, Assets and Water strategy, overheads are capitalised as below

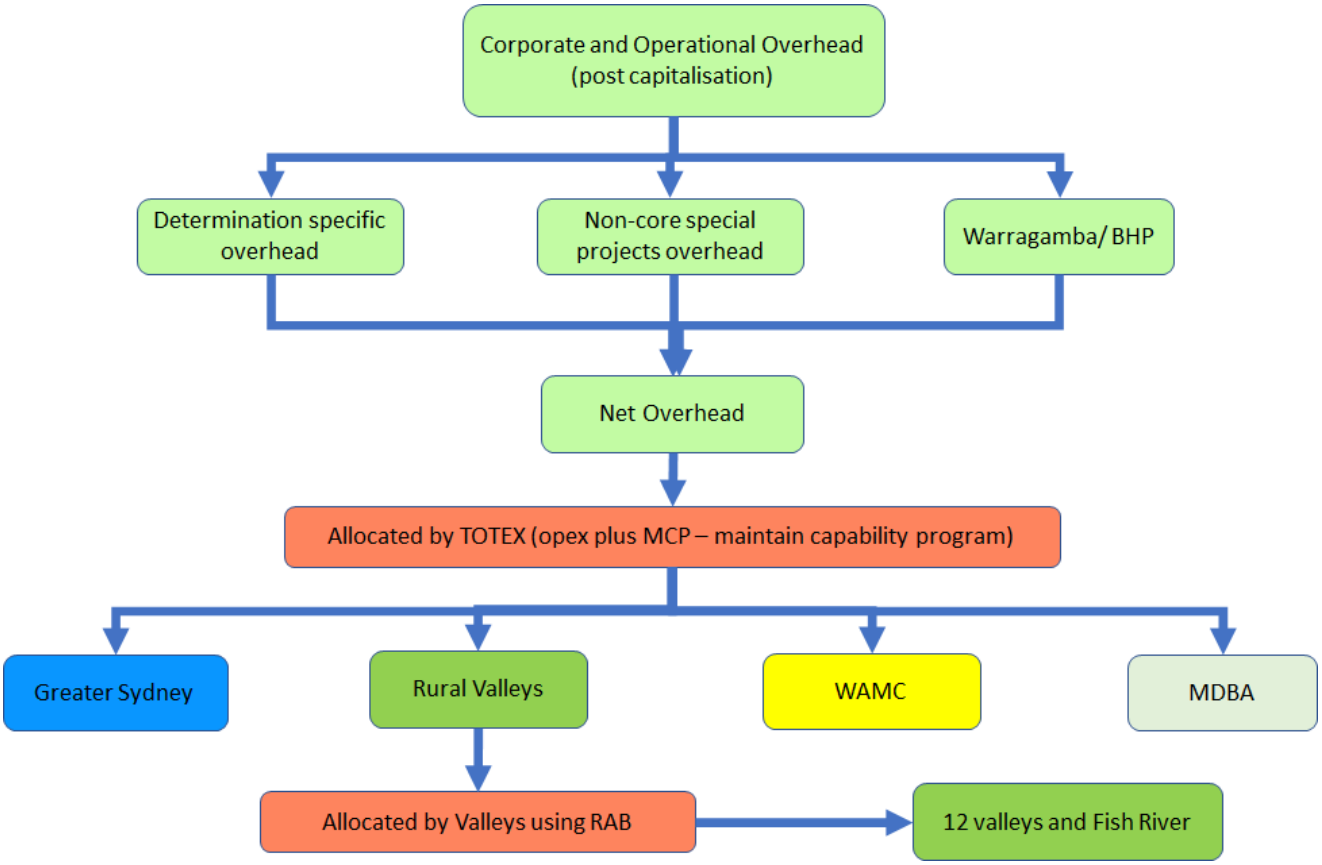
Capitalised overhead {$) = Operational business unit overheads ($) x (Capex/TOTEX (excluding overhead))

Where Capex and TOTEX relate to each operational business unit.

(iv) Core Plus, including MDBA and government promoted projects have a 10% overhead applied. This appears to be a nominal allocation and not consistent with the way that regulatory business unit costs are managed.

(v) The non-capitalised operational and corporate overhead expenditures are then allocated to the core regulated businesses after specific adjustments shown in Figure 8-9.

Figure 8-9 Cost allocation process – second stage: operating expenditure



(vi) Cost elements which are determination-specific or relate to special projects are taken out of the allocation analysis to derive total overhead expenditure for each regulated business. The net overhead expenditure is then allocated to each regulated business using TOTEX; that is

Overhead allocation to regulated business$_n$ (%) = Overhead x (TOTEX business$_n$ / TOTEX whole business

Where TOTEX is MCP capital expenditure plus overheads.

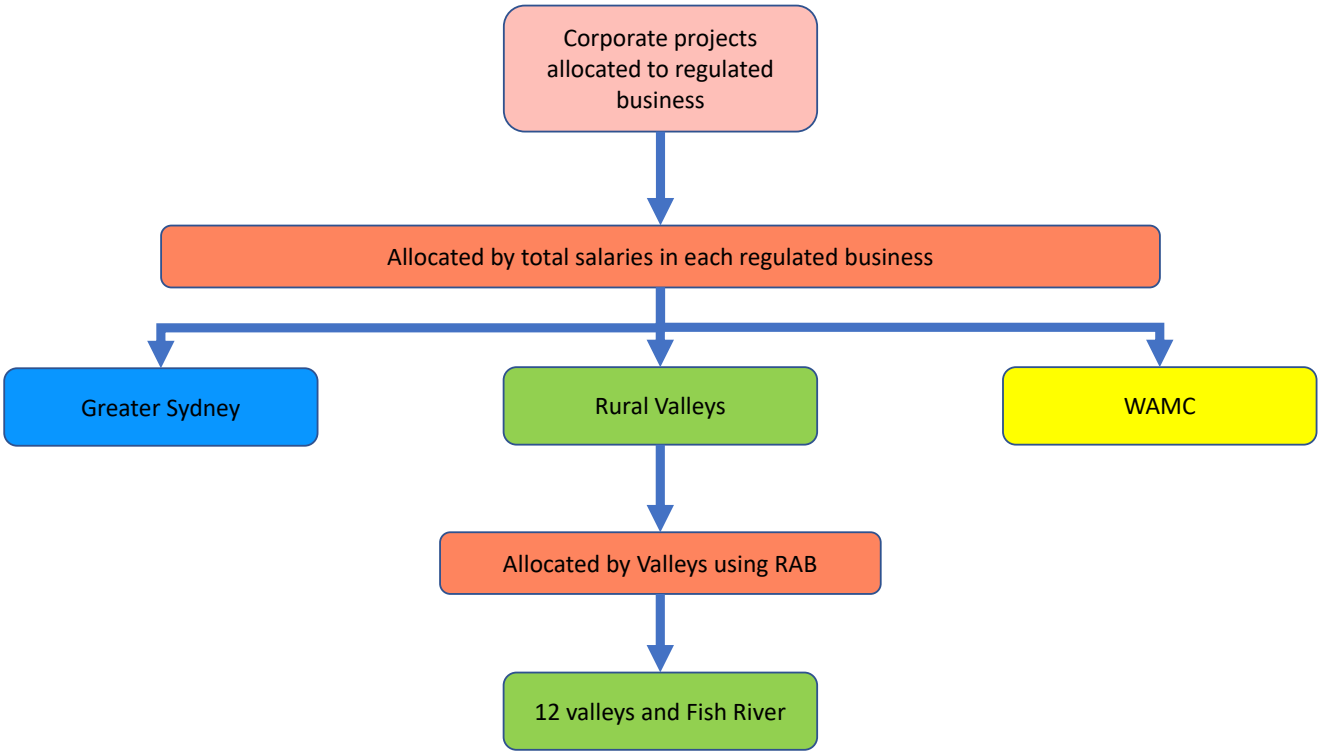
(vii) Non-core overheads such as MDBA receive about 10% of remaining overhead based on the TOTEX analysis. This is fixed and does not form part of the overhead allocation.

(viii) For the Rural Valley business, the overhead allocation to each valley is based on relative RAB values.

Allocation of corporate projects across regulated businesses

Corporate capital expenditure comprises ICT, Dams, Fleet and other minor projects. Expenditure is allocated to regulated businesses using total salary cost for each business following a similar process as for residual operating expenditure overheads described above. For the Rural l Valley business, costs are then allocated to each valley using the relevant RAB (regulated asset base). The process is shown in Figure 8-10 below.

Figure 8-10 Cost allocation process – second stage: capital expenditure



8.3.3. Cost drivers

Operating business units

We have firstly looked at the operating business units to identify outputs and cost drivers used to manage the business. We have included the Customer and Community as an operating business unit as it provides services directly to customers rather than a support unit delivering support services to operational units. In Table 8-21 below we summarise outputs and cost drivers for each business unit. We also comment on the extent of overhead, direct capitalised and overhead capitalised expenditure.

Table 8-21 Operating business unit outputs and cost drivers

Business Unit	Principal Activities	Outputs	Cost Drivers
System Operations	Water delivery Maintenance	Volume delivered Orders delivered Jobs completed and outstanding	Volume delivered Number of systems Water Orders delivered Number of jobs
Water and Catchment Protection	Catchment protection Hydrometric monitoring Water quality monitoring	Completed gaugings Data sampling completeness and timeliness	No of gaugings No of tests
Assets	Asset management Asset delivery Dam Safety	Dam safety activities Preventive jobs complete Unplanned jobs complete Projects delivered	Dam safety monitoring / studies Preventive maintenance - jobs Unplanned maintenance - jobs
Water Solutions	Asset Strategy Government Relations Media/ Communications	Asset strategies delivered Projects delivered	Asset Strategies Major projects (capex)
Customer and Communications	Billing Customer relations Key accounts	Skyline measures	Customer numbers Billing numbers Licencing numbers

Source: Atkins analysis

Corporate business units

We have carried out interviews with all the corporate business units to understand their structure and range of services provided. We comment on our findings in Section 8.1, We have identified, at a high level, those services provided to the operational business units and other services which can be considered as a 'Group' function. The analysis is summarised in Table 8-22 below.

In a frontier business, we would expect operational business units to call on a 'service provision' or 'purchasing' services from corporate business units and accounting for these costs within agreed budgets. While we are not suggesting an internal market should apply to WaterNSW, the concept of 'service provision' is commonly accepted within businesses and could be applied. This implies that these services can and should be direct costs and recorded by account strings; indirect or overhead costs can be reduced. This activity-based approach focuses on cost control with the potential to drive efficiencies through the business.

Table 8-22 Operating Business Unit Services

Business Unit	Services to operational business units	Services to 'Group' functions
Finance and Commercial	Financial planning Procurement Fleet and logistics	Financial control Economic analysis
Safety, People and Performance	Payroll Recruitment Training Environment Program management	Health and Safety Industry Relations
Legal	Business Support Contracts	External relations Risk and Compliance Secretary Audit Enforcement
Business Systems and Information	Water and Asset systems Customer Systems Operational support Operational data	Corporate systems Strategy and architecture Corporate data

Source: Atkins analysis

8.3.4. Comment on cost allocation process

We are asked to comment and make recommendations on the proportion of total efficient corporate costs allocated to each business unit, including capital and operating costs. Our comments take into account compliance with the IPART Cost Allocation Guide[49] and set out our recommendations on the methods appropriate to allocation of costs and the principles on which that method is based.

8.3.4.1. Principles

We agree that the principles proposed by WaterNSW in its CAM continue to be valid. We make some additional comments.

- Cost allocation: an essential element is that wherever feasible and cost-effective, direct causal costs must be used to map costs to the relevant service, regulated business and geographical area. We have noted that the extent of direct costing of activities is low and the level of costs allocated to 'overhead' is significantly greater than we would expect for a frontier company. The use of direct costs provides added certainty and confidence that costs are allocated to the relevant activity and regulated business;
- Allocation of indirect costs: this should only be applied where it is not possible to map activities and related costs to specific business units and regulated businesses using appropriate coding and systems. The extent of allocation should therefore be minimised. The high proportion of unallocated costs suggests that the extent of direct cost allocation using current systems has not been fully applied.

  Indirect costs should be allocated using appropriate measures which may vary across the different business units using the causality principle. That is, costs should be allocated to drivers that cause the costs to be incurred. The allocation should be carried out by a person, in a defined business unit, who understands the nature of the costs and can allocate accordingly, following agreed guidance. This should improve the confidence of the allocation.

8.3.4.2. Direct costs

The implementation of the new Financial Management System (FMS) allows costs, both operating and capital, to be coded to activities and cost strings which define responsibility centre, project and phase, location, activity, regulated business, capability and cost item. This should provide greater granularity in cost allocation and give confidence in the accuracy of cost recording. There is a timesheet system, *Kronos*, in place which should enable all staff time to be recoded against relevant codes. Other costs, for purchases, external services and utilities are coded directly into the FMS system using appropriate codes. Using this process, the extent of indirect costs should be significantly reduced. This provides greater confidence and accuracy to the business, to regulators and to customers.

8.3.4.3. Indirect cost allocation method

WaterNSW has used TOTEX as a method to allocate overhead and corporate costs in order to capitalise and to allocate costs to regulated businesses. The previous method applied up to 2017 was applied only to the Greater Sydney and Rural Valley business proportionate to salaries with no allocation to WAMC. The TOTEX methodology was applied from 2018. In parallel, the incentive to categorise activities to direct costs has reduced the value of allocated costs from $63m in 2017 to $60m in 2019 and averages $58m through the 2022 determination period.

This method may have been appropriate in previous years, when disparate legacy financial systems were not able to report costs consistently and at a granular level because of their varied coding and capability. WaterNSW continue to propose the TOTEX methodology although we question whether

(i) the TOTEX methodology is now, and in the future, appropriate for cost allocation when a new FMS is in place which enables costs to be reported and analysed with greater granularity, giving added confidence and accuracy to the costs included in each determination;

(ii) This approach is not consistent with the IPART guidance where

> *Costs should generally be allocated on the basis of causality. That is costs should be allocated to the cost objects that cause the costs to be incurred.*

(iii) The TOTEX methodology using a measure of capital maintenance and dam maintenance expenditure is independent of many of the operating and corporate functions. For example, maintenance expenditure

49 Cost Allocation Guide, IPART 2018

could halve or double with little material impact on operating costs. The methodology does not meet the IPART guidance;

(iv) Using this methodology, the level of operational and corporate overheads in proportion to total operating expenditure is significantly higher than other utilities. For example, we commented in our report on Greater Sydney that WaterNSW's corporate costs were 32.3% of total operating expenditure compared with 25% for Sydney Water; and

(v) there are more appropriate cost drivers which can be linked to cost objects and services provided.

The TOTEX methodology has shortcomings in that the value of maintenance capital expenditure is independent of the operational activities and costs in each of the regulated businesses. TOTEX is used in other regulatory domains for econometric modelling of business total costs for comparative purposes and price determinations but not usually as the basis for cost allocation because of the independent variables.

For a diverse business such as WaterNSW, the driver for operational and corporate costs is not the level of capital maintenance carried out. We show is 8.3.3 above that the drivers for operational business units relate to measures such as the number of customers, the volume of water delivered or orders fulfilled, and measures of effective catchment protection and water quality management. Using the TOTEX methodology is likely to result in inappropriate cost allocation and charges to customers.

We note that WaterNSW costs are predominantly fixed rather than volume driven so variation in volumes does not have a significant impact on indirect costs and their allocation.

The TOTEX methodology is also used for capitalisation of indirect costs where the same comments as above apply. This approach leads to a relatively high percentage of capitalisation related to direct expenditure.

8.3.4.4. Inefficiency

The high level of indirect costs, operational and corporate, implies a level of inefficiency because these are not specifically mapped to activities and regulated businesses. The implementation of activity-based costing provides an opportunity to for the business to challenge activities and costs and drive efficiencies through the business.

8.3.4.5. Operational business units

These units by definition provide services to customers, the environment or government against defined drivers and output measures as shown in Section 8.2.3. We would expect nearly all activities to be mapped to direct costs, coded to the appropriate account string. Responsible managers should have a good understanding of how their time is managed and book against appropriate direct codes. Where costs are incurred in supervising activities in operational business units. an appropriate method would be to allocate costs based on the proportion of total direct costs to each regulated business within the operating unit although there may be alternative and appropriate methods. We are not able to see any reason why all costs should not be direct costs or 'supervisory costs' which can be allocated to account strings within the business unit. This method would be appropriate as the allocation can be clearly inked to cost drivers.

The Customer and Community business has been classed as a corporate unit and costs allocated across regulated businesses. However, we consider this to be an operational customer-focused unit with all direct costs which can then be mapped to regulatory businesses. Again, we are not able to see any reason why all costs should not be direct costs with a small allocation based on proportionate direct costs.

The need for managers within operational units to direct code all activities places greater responsibility to manage their own costs, within defined budgets rather than using an overhead code which implies an efficiency.

Each operating business unit can then report total operating cost for each of the regulatory businesses. The costs can then be aggregated to provide total operating cost for each regulatory business from the five operating units.

Where staff time and associated costs, using timesheets and cost codes, relate to a capital project the appropriate cost string can capture this as a direct cost and capitalised.

8.3.4.6. Corporate business units

These business units provide service to the operating units and provide core services to the 'group' or corporate business. For example, there are activities such as procurement (in FCS), contract advice and support to large capital projects (in Legal) and program management (in BIS) are currently capitalised with costs mapped to specific projects.

Providing services to operating units

The cost driver principle can be applied where a corporate business unit is providing services direct to operating units, where the direct cost can be clearly identified. This is equivalent to the operating units purchasing services from a support unit, whether it be, for example, BIS services, payroll, training, financial planning advice or legal advice or similar. Direct costs can be identified in the corporate business unit and mapped to the operational unit based on the latter's cost drivers.

Providing services to the 'Group' business

These corporate indirect costs can be allocated to regulated businesses using cost drivers which can be

(i) Input based: allocation is based on the share of the other attributable inputs (e.g., number or cost of direct labour;

(ii) Output based: allocation is based on output indicators such as water volumes or customer numbers;

(iii) Revenue based: allocation is based on revenues or business turnover

Given the relatively differing homogeneity of the three business – Greater Sydney with large bulk water supplies and small numbers of customers, Rural valleys with lower bulk volumes and a relatively higher number of customers and WAMC as a licencing and regulatory business – the output-based and revenue-based is not appropriate. There is little correlation between the cost and potential allocator.

The input-based allocator reflects the varying nature of the businesses where there can be a high degree of correlation between the cost and allocator. There could be a single or multiple allocation method dependent on the nature of the corporate service although a single allocator may simplify the method

- The relative total operating unit expenditure for each of the regulated businesses
- The relative number of FTE's in each operating unit mapped to regulatory business

The IPART guidance comments that *an appropriate allocator is one which is transparent, simple and measurable and where there is a high degree of correlation between the cost and allocator.*

We recommend that an appropriate allocator is the relative total operating unit expenditure for each regulated business. This meets the requirements of transparency – there are clear links to the operating unit costs-, simplicity- the analysis is straightforward - and measurability – where costs can be derived directly from the FMS.

The method assumes that where feasible, corporate costs can be directly allocated to operational units and direct costs can be capitalised where appropriate, thereby reducing the extent of costs to be allocated.

8.3.5. Application of cost allocation

Corporate expenditure, both operating and capital expenditure, is allocated across these businesses applying the Cost Allocation Manual[50]. This applies to three key stages

(i) capitalisation of an element of corporate and overhead costs;

(ii) allocation of the net operating expenditure to regulated businesses and other activities;

(iii) allocation of Rural Valley expenditures, both capital and operating, to individual valleys.

We firstly discuss the TOTEX methodology which WaterNSW uses for stages (i) and (ii).

8.3.5.1. The TOTEX methodology

The TOTEX methodology is used to capitalise elements of corporate and overhead costs and to allocate the net corporate and overhead costs across the regulated businesses and non-core activities. TOTEX is taken as the sum of all operating expenditure, less corporate and overhead costs, and capital expenditure for asset maintenance and dams, termed MCP. The TOTEX methodology as applied to capitalised overhead can be expressed as

Capitalised overhead {$) = Corporate business unit overheads ($) x MCP (%)

Where MCP (%) = MCP capex/ (MCP capex + opex (excluding overheads))

MCP ($) is defined as capital expenditure on maintenance and dam safety.

The TOTEX methodology for allocated overheads to businesses and non-core activities can be expressed as

Allocated overhead {$) = Corporate business unit overheads ($) x MCPx (%)

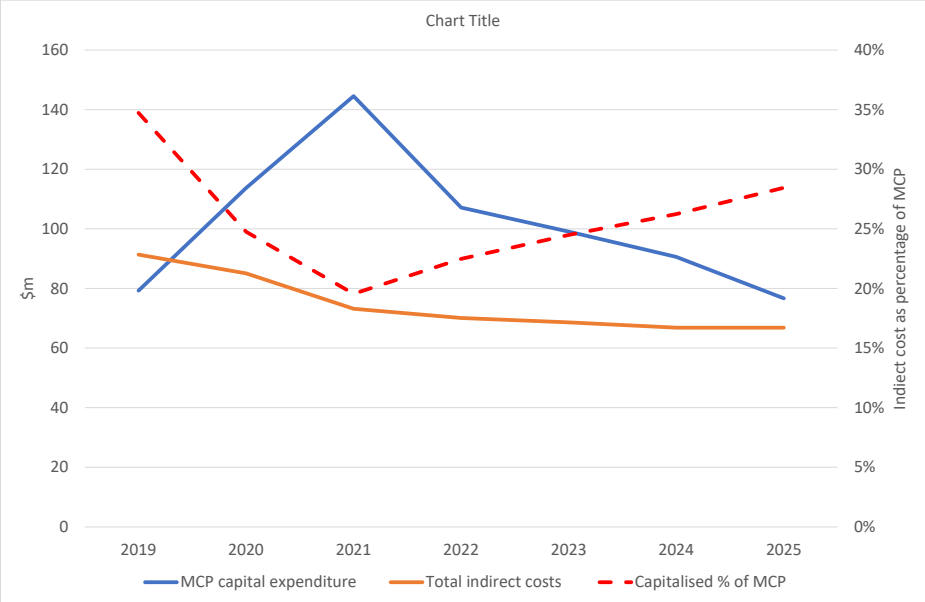
Where MCPx is the capital expenditure relevant to regulated business 'x'

[50] Document … Cost Allocation Manual

The TOTEX method assumes that the driver for corporate operating expenditure is the sum of total operating and capital expenditure. We found that MCP is not a direct driver of corporate expenditure. The scope of a capital project could double or halve, yet the WaterNSW direct project costs might vary only marginally. Figure 8-11 shows the trend in MCP, indirect operating costs and percentage capitalisation. The figure shows that MCP is volatile and is independent of operating expenditure. For example. capital expenditure on maintenance was highly variable over the current and 2021 determination periods, from +41% to -25% of the average.

The TOTEX approach is used in other regulatory domains for econometric modelling of business total costs for comparative purposes and price determinations but not usually as the basis for cost allocation because of the independent variables.

Figure 8-11 Trends in MCP, indirect costs and percentage capitalisation



The IPART guidance applies equally to the allocation of corporate costs for capitalisation and allocation across regulated businesses. For capitalisation, the provisions of AASB116 also apply. This guidance requires the clear identification of cost drivers for allocation of corporate costs.

We conclude that there is no clear evidence that corporate and overhead expenditure is driven by the value of capital expenditure expressed as MCP in that

(i) **The relationship is not demonstrated**: The relationship between indirect operating costs (operating and corporate) and the expenditure on capital maintenance is not demonstrated. Capital expenditure as MCP is volatile as shown in Figure 8-11 and is independent of corporate costs. For example, there is a peak in MCP expenditure in 2021 reducing by nearly half by 2025 whereas indirect costs show a small reduction over the period. There is no evidence of a relationship between the two components;

(ii) **The approach is not consistent with the IPART guidance**: where

> *Costs should generally be allocated on the basis of causality. That is costs should be allocated to the cost objects that causes the costs to be incurred.*

(iii) **The TOTEX methodology is not appropriate when a more granular analysis is available**: The new Financial Management System enables costs to be reported and analysed with greater granularity and allows more robust and cost-reflective allocation methods to be applied.

It is appropriate to use an input-based rather than output or revenue-based method when allocating corporate business units' costs. This is because measures of output are not homogeneous. Revenue methods are not appropriate at this level of the business. Another factor is that the manpower input to projects is not directly linked to the total cost of a project; smaller projects may well have greater management input as a percentage of cost compared with larger projects.

We have considered alternative cost drivers from Section 8.2.3, consistent with the IPART guidance, including FTE numbers for Safety, People and Performance and Business Information Systems. The drivers for Finance could be relative expenditure or number of projects; similarly, for Legal. We concluded that corporate expenditure is driven by the number of people, represented by total employment costs.

We also found that the level of corporate or indirect costs were high in comparison with other water utilities. Increasing the extent of direct costing of staff time using activity-based costing reduces the impact of allocated costs on businesses, provides greater certainty to regulators and customers and enables any inefficiencies in corporate costing to be identified and addressed.

In summary, the CAM method does not demonstrate any links between cost drivers in TOTEX and the level of corporate expenditure incurred as required by the IPART Guide. There is no detailed granular analysis of the cost drivers such as FTE numbers or other measures which drive corporate costs.

We found from our experience in regulation across domains that

- TOTEX is used in regulatory assessments as a measure of total costs and applied to econometric modelling and efficiency assessments and not as a cost allocator;
- We are not aware of any other utility using TOTEX as a cost allocator;
- The IPART Guide states in Appendix B that '*a service's indirect costs are also likely to be highly correlated with its direct costs'*;
- Sydney Water's CAM states that *corporate costs are allocated to Cost Objects based on the proportion of direct operating costs calculated for each Cost Object*.
- Water companies in England and Wales are required to allocate costs across several price controls. They have prepared detailed accounting separation manuals, similar to the cost allocation requirements in NSW. The allocation methods a set at a detailed level with specific cost drivers determined for each area of the business. Cost drivers are generally operating costs or specific activities within each area of the business. This granular approach provides clear processes which can be readily reviewed by regulators and auditors. The manuals are approved by the regulator and published on company websites. A good example is Bristol Water[51].

The TOTEX methodology is not appropriate for allocating corporate costs across regulatory businesses. The method is applied at a high level in the business yet is complex in terms of how costs are allocated with certain inclusions and exclusions. A more granular approach is needed with cost drivers identified at business unit level and detailed methods determined for allocation. The method needs to be clearer, more transparent and simplified so that it can be understood by regulators, customer groups and other interested parties.

There is much reliance on spreadsheets for analysis with the difficulties of document control and risk of errors. A corporate system is needed to provide the necessary quality controls.

8.3.5.2. Capitalisation of corporate and overhead costs

In the IPART pricing methodology, operating expenditure is fixed for each determination period and the utility and its shareholder take the risk of increasing costs or the benefits from outperforming the determined cost. Capital expenditure in the determination period, if confirmed to be efficient and prudent, can be rolled into the Regulated Asset Base (RAB) where customers will continue to pay for the use and consumption of assets. In terms of cost variation, the capex process presents a lower risk to the business than operating expenditure. The converse is that customers face a higher risk of capex variation than opex. The capitalisation policy and method are therefore relevant to meet both accounting and regulatory requirements. In regulatory terms, this means consistency with the IPART cost allocation guidelines and the principles it sets out. In particular that

> *costs should generally be basis of causality. That is the costs should be allocated to the cost objects that cause the costs to be incurred*.

which in turn require cost drivers to be defined.

Both accounting and regulatory requirements emphasise that indirect costs can be included in the capitalisation process *'if it can be demonstrated with documents such as timesheets that costs can be directly attributable to capital projects*. This places the preference to record costs directly against relevant codes wherever possible.

[51] Accounting Separation Manual, Bristol Water, 2020

WaterNSW applied a new capitalisation policy from 2019. In previous years it considered that the level of capitalised overhead was low, at some 3% of capital expenditure. We agree that the earlier approach probably resulted in an unreasonable level of capitalisation.

The new methodology for capitalising indirect costs, (overheads and corporate expenditure, is based on TOTEX. The overhead capitalisation methodology was reviewed by consultants[52], although not specifically on the TOTEX approach. It found that additional business areas and cost items could be included in the capitalisation methodology. Documentation was required to support inclusion of operational costs; similarly, for corporate business units; for example, timesheets. There was a comment

> *there is scope to include some corporate overhead costs in the capitalisation methodology if it can be clearly demonstrated that these costs are incremental to capital projects and a reasonable allocation method is used to estimate the proportion allocable to capital.*

We have not seen any supporting information to suggest that the link between corporate overhead costs is incremental to capital projects. Given the relatively high level of capitalisation resulting from the TOTEX methodology we question whether this is a 'reasonable' allocation.

(i) The consultant's report recommended that

a. *Operating business unit indirect costs can be included in the capitalisation process provided it can be demonstrated, with documentation such as timesheets, that their overhead costs are directly attributable to capital projects and a reasonable basis is used to estimate the portion directly attributable; and*

b. *Corporate business unit indirect costs – although it may be considered less conservative than the existing approach adopted by WaterNSW there is scope to include these costs provided that these are incremental to capital projects and a reasonable allocation basis is used to estimate the proportion applicable to capital. There should be appropriate documentation to support their inclusion.*

We accept that costs can be capitalised where the related activities can be clearly linked to capital projects or programs through the FMS cost coding system or more appropriate rules related to cost drivers. However, using the TOTEX methodology does not appear to be consistent with the capitalisation methods proposed by the consultants.

The capitalisation estimates based on the TOTEX methodology are shown in Table 8-23 below.

Table 8-23 Capitalisation of indirect costs

CAPITALISATION OF INDIRECT COSTS							
$m 2021 Year ending June	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
MCP CALCULATION							
MCP capital expenditure	79.27	113.75	144.57	107.15	99.09	90.62	76.70
Total operating expenditure	168.78	163.21	183.91	173.67	147.97	147.48	150.66
MCP Totex	248.05	276.96	328.48	280.83	247.07	238.10	227.35
MCP %	32%	41%	44%	38%	40%	38%	34%
INDIRECT COSTS							
Total indirect costs	91.36	85.08	73.21	70.12	68.65	66.86	66.85
Corporate overhead	56.05	50.94	49.44	46.43	46.29	46.46	46.48
Operational overhead	23.94	15.89	11.97	13.01	13.10	13.49	13.38
Non-capitalised	11.37	18.24	11.79	10.68	9.26	6.92	6.99
CAPITALISED INDIRECT COSTS							
Corporate	17.91	20.92	21.76	17.64	18.51	17.65	15.80
Operational	9.62	7.24	6.51	6.45	5.76	6.13	6.01
Total capitalised	27.53	28.16	28.27	24.10	24.27	23.78	21.82
Capitalised as % of MCP	35%	25%	20%	22%	24%	26%	28%

Source: WaterNSW MCP worksheet and opex summary

52 WaterNSW Overhead Capitalisation Methodology, Consultants, August 2018

The indirect costs including corporate and operational overheads. Elements of these costs which relate to activities that cannot be capitalised under AASB116 are shown as non-capitalised.

The TOTEX method results in indirect capitalised indirect costs of between 35% and 22% of MCP. The variance in this applied percentage is shown in Figure 8-10. The figure shows a reducing trend in MCP expenditure over the period to 2025 and also a reduction in indirect capitalised costs yet the percentage of the latter is increasing significantly. This indicates that the two measures are independent of each other. This leads us to question the validity of the TOTEX model used.

WaterNSW commented that

> *the pre-capitalisation overhead pool reduces from $3m in 2022 to correlate with a reduction of MCP from 2021 to 2022. We therefore see an appropriate reduction in capitalised corporate overhead from 2021 to 2022 of $4m,*

We noted that MCP reduces by 47% ($67.87m) from 2021 to 2025 when the pre-capitalisation overhead pool reduces by 18% ($6.36m). This shows that the level of pre-capitalised overhead is driven by other factors and independent of MCP and suggests that the MCP is volatile.

WaterNSW provided some comparative data from five energy distribution companies New South Wales and Victoria showing that level of capitalised overheads varied from 11% to 49% of total capital expenditure, while capex formed about half of total expenditure. These companies are focused on electricity distribution and comparisons with the wider functions of WaterNSW are difficult to make.

To meet the requirements of the IPART cost allocation guidance, the allocation should be based on the relevant cost drivers We found that the main cost driver for corporate costs is the number of staff working on capex projects or opex activities, represented by salary or employment costs or total direct costs. For example, there are clear relationships between FTE numbers and corporate services such as ICT and HR.

We found that the current method of capitalisation of corporate expenditure using the TOTEX methodology is not consistent with the IPART cost allocation guidelines and

- Results in a likely overstatement of capitalised corporate expenditure;
- Use of a capital expenditure measure is not a direct driver for corporate costs. The MCP capex measure is independent of corporate costs and is volatile. We concluded that further work is needed to develop an appropriate method which is cost reflective of the drivers of corporate costs.
- There is insufficient evidence to show that corporate costs are incremental to capital projects; and
- There is insufficient clear documentation to support the method

We recommend that when WaterNSW revises its Cost Allocation Manual as part of the determination process, it considers alternative methods of capitalisation of corporate expenditure which is more representative of the cost drivers and would be consistent with the IPART guidance while consistent with accounting standards. This review should consider

(i) Including only operational unit overhead expenditure which can be directly costed to capital projects through the timesheet process;

(ii) Extending the application of direct costing by corporate business units to capex or opex drivers so that the value of residual corporate operating expenditure can be reduced to core functions;

(iii) Developing more granular causal relationships between operating and capital drivers and corporate expenditure within each business function.

8.3.5.3. Allocation of net corporate and overhead costs to regulated businesses

We explained in Section 8.3.5.1 that TOTEX was not appropriate for the allocation of net corporate and overhead costs to regulated businesses and no-core activities.

From our analysis of cost drivers in Section 8.3.3, the most appropriate method to account for costs is through direct costing of all activities to the relevant business and activity. We recognise that full coverage is unlikely to be practical although there is an opportunity to significantly reduce the extent of corporate operating expenditure. WaterNSW has advised that it is working to extend the coverage of direct costing. This is helpful as it will reduce the uncertainties around cost allocation. We also recognise that it will take some time to achieve.

We noted the extent of overhead costs within the operating unit businesses. We consider these to be supervisory costs which should be apportioned at business unit level. Any remaining overhead should be negligible.

We found that corporate expenditure is driven by FTE numbers and therefore employment costs. We requested this information from WaterNSW but has yet to be provided. As a surrogate we used total direct operating costs for each regulated business.

We tested the impact of a direct cost allocation method using the total operating expenditure data provided by WaterNSW. The data is sourced from the operating expenditure in the 'MCP project list' worksheet. These are projected expenditures for all the core and non-core activities and could change over time. We tested the direct cost method to the corporate cost allocation assuming two options:

- Option A: using the direct cost application excluding non-core expenditure. Total operating expenditure for the Rural Valleys, WAMC, Greater Sydney and Broken Hill pipeline businesses is used to allocate total corporate expenditure post capitalisation in document 60.
- Option B: using the direct cost application including non-core expenditure. We have included 'routine' and 'special' non-core expenditure in the analysis. We have applied a 40% reduction in the non-core expenditure to recognise that some elements are capital in nature although not capitalised.

We compared the resulting expenditures from the direct cost methodology with the WaterNSW analysis using the TOTEX methodology.

The results shown in Table 8-24 are indicative and show a significant movement of corporate allocated costs between businesses. Where the variance in corporate expenditure for any business is shown as negative, then expenditure should be reduced. Conversely, where the variance is shown as positive then the corporate cost allocation should increase.

There is an opportunity to reduce the amount of corporate and overhead expenditure though greater direct costing of activities. We have excluded overhead expenditure from this analysis as we propose this allocation is applied within operational business units.

We note that Sydney Water's cost allocation manual that corporate costs form less than 15% of total operating costs. These costs are allocated to cost objects based on the proportion of direct operating costs calculated for each cost object.

Table 8-24 Option A: Cost allocation using total direct cost analysis excluding non-core

CORPORATE EXPENDITURE ALL BUSINESSES					
$m 2021 Year ending June	**2021**	**2022**	**2023**	**2024**	**2025**
WaterNSW OPERATING EXPENDITURE					
Rural Valley	40.78	37.24	36.37	37.67	37.59
WAMC	20.59	20.29	19.94	19.83	19.70
Greater Sydney	76.46	73.93	67.97	66.24	69.87
Broken Hill	3.95	3.92	4.18	4.75	4.56
Non-core	42.13	38.29	19.51	18.99	18.94
Total operating expenditure	183.91	173.67	147.97	147.48	150.66
WaterNSW Corporate allocation by TOTEX					
Rural Valley	10.80	9.33	8.82	11.66	10.39
WAMC	4.65	4.30	4.44	4.31	3.81
Greater Sydney	15.60	17.61	18.45	14.80	18.30
Broken Hill	0.38	0.47	0.53	0.54	0.50
Non-core	3.51	4.08	1.93	1.79	1.75
Total	34.94	35.79	34.17	33.10	34.75
Atkins corporate allocation with non-core unchanged					
Rural Valley	9.04	8.72	9.13	9.18	9.42
WAMC	4.57	4.75	5.01	4.83	4.94
Greater Sydney	16.95	17.32	17.06	16.14	17.50
Broken Hill	0.88	0.92	1.05	1.16	1.14
Non-core	3.51	4.08	1.93	1.79	1.75
Check total	34.94	35.79	34.17	33.10	34.75
Variance in Corporate allocation					
Rural Valley	-1.76	-0.61	0.31	-2.48	-0.97
WAMC	-0.08	0.45	0.57	0.52	1.13
Greater Sydney	1.35	-0.29	-1.39	1.34	-0.80
Broken Hill	0.50	0.45	0.52	0.62	0.64
Non-core	0.00	0.00	0.00	0.00	0.00

Source: WaterNSW MCP and opex summary table; Atkins analysis

Direct operating expenditure includes allocation of All Valley opex to regulated businesses.
Corporate costs are derived from document 60 with WaterNSW adjusted to remove direct cost efficiencies.

The All-Valleys operating expenditure is shown for completeness although these costs are considered as an overhead and do not attract a corporate cost allocation.

The impact of this methodology is to increase the corporate costs applied to Greater Sydney and Broken Hill pipeline with corresponding reductions in the Rural Valley and WAMC businesses. We recognise that applying this methodology has an impact on the Greater Sydney and Broken Hill determinations which should be considered. This method could be applied from FY2022 as systems are in place to apply this analysis.

8.3.5.4. Allocation of costs to non-regulated businesses

WaterNSW has non-core routine projects and non-core specialist projects. Routine projects include the MDBA constructing authority, the Borders River Authority, mining rectification and third-party hydropower. Non-core 'special' projects include Warragamba Dam Raising, Broken Hill Pipeline (fully funded portions), ad-hoc analysis and studies funded by DPI, work for the National Water Infrastructure Development Fund and Hydrometric Services.

For non-core 'routine' projects, corporate and overhead costs use the same TOTEX methodology as core projects and result in a 10.4% allocation.

For 'special' no-core expenditure, the CAM states that

> *Overheads for non-core specialist projects attract 10% of project driven costs as overhead on the basis of incremental cost to the current capacity*.

We have not seen any justification for this level of uplift and whether it meets the cost allocation objectives. The percentage is significantly lower than that applied to the regulated businesses.

WaterNSW has assumed an incremental cost uplift. However, the non-core direct operating expenditure is greater than both Rural Valleys and WAMC in 2021 and 2022 and equal to WAMC in subsequent years. The size of this activity is assumed to drive a significant level of corporate activity. If the value of the non-core activity was significantly less, say less than 5% of total operating expenditure, then there may be good reason for considering an incremental addition of corporate costs. However, non-core comprises a substantial part of the business, some 14% to 24% of total direct expenditure and therefore should receive a fair share of corporate costs.

WaterNSW further explained that some of the 'special' non-core expenditure relates to government projects where capital projects cannot be capitalised and therefore remain as operating expenditure. It provided a list of 'special' projects comprising an average $11.8m/a expenditure which included MDBA renewals (average $4.9m/a and should be in 'routine)), drought and water reform implementation. While recognising that there are some inconsistencies in the special non-core data, we identified, from inspection, those projects that are likely to be capital projects but are not capitalised. We estimated that 40% (adjusted from 35% following comments from WaterNSW) of the total non-core expenditure related to these projects. We applied this adjustment to our analysis in Table 8-25.

A key issue here is that customers should be asked to pay for a reasonable level of corporate overhead and not seen to be subsidising non-core activities. which questions whether there is an element of cross-subsidy from customers. It would appear inconsistent to apply a fixed and lower uplift to these activities compared with uplifts applied to regulated businesses. This would suggest that customers are subsidising the cost of these activities.

(i) The use of an updated CAM is important in explaining and demonstrating to external clients such as government the basis of the corporate cost uplift rather than rely on a nominal value. WaterNSW needs to demonstrate in the updated CAM. The derivation of the 10% uplift for corporate costs and why this is not a cross subsidy from regulated customers; and

(ii) Rules for determining costs as routine and 'special' and why some expenditure should be excluded from the cost allocation process.

In Table 8-25 we have tested the application of the cost allocation method Option B based on direct operating expenditure as applied to corporate overheads across all businesses, regulated and non-core, in a consistent way using the same methodology.

Table 8-25 Option B: Cost allocation using total direct cost analysis including non-core

CORPORATE EXPENDITURE ALL BUSINESSES					
$m 2021 Year ending June	2021	2022	2023	2024	2025
WaterNSW OPERATING EXPENDITURE (INCLUDING ALL VALLEYS)					
Rural Valley	40.78	37.24	36.37	37.67	37.59
WAMC	20.59	20.29	19.94	19.83	19.70
Greater Sydney	76.46	73.93	67.97	66.24	69.87
Broken Hill	3.95	3.92	4.18	4.75	4.56
Non-core	42.13	38.29	19.51	18.99	18.94
Total operating expenditure	183.91	173.67	147.97	147.48	150.66
ADJUSTMENT TO OPERATING EXPENDITURE FOR NON-CORE CAPEX					
Adjustment for capex in on-core	-16.85	-15.31	-7.80	-7.60	-7.58
Revised operating expenditure	167.06	158.36	140.17	139.88	143.08
WaterNSW Corporate allocation by TOTEX					
Rural Valley	10.80	9.33	8.82	11.66	10.39
WAMC	4.65	4.30	4.44	4.31	3.81
Greater Sydney	15.60	17.61	18.45	14.80	18.30
Broken Hill	0.38	0.47	0.53	0.54	0.50
Non-core	3.51	4.08	1.93	1.79	1.75
Total	34.94	35.79	34.17	33.10	34.75
Atkins Corporate allocation by direct costs					
Rural Valley	8.53	8.42	8.87	8.91	9.13
WAMC	4.31	4.59	4.86	4.69	4.78
Greater Sydney	15.99	16.71	16.57	15.67	16.97
Broken Hill	0.83	0.89	1.02	1.12	1.11
Non-core	5.29	5.19	2.85	2.70	2.76
Check total	34.94	35.79	34.17	33.10	34.75
Variance in Corporate allocation					
Rural Valley	-2.27	-0.91	0.05	-2.75	-1.26
WAMC	-0.34	0.29	0.42	0.38	0.97
Greater Sydney	0.39	-0.90	-1.88	0.87	-1.33
Broken Hill	0.45	0.42	0.49	0.58	0.61
Non-core	1.78	1.11	0.92	0.91	1.01

Source: WaterNSW MCP and opex summary table; Atkins analysis
Direct operating expenditure includes allocation of All Valley opex to regulated businesses
The non-core operating expenditure is reduced by 40% (from 35% following comments from WaterNSW) to reflect potential capital expenditure included
Corporate costs are derived from document 60 with WaterNSW adjusted to remove direct cost efficiencies

The impact of this methodology is to increase the corporate costs applied to non-core businesses, increasing from the nominal 10% to about 15% with corresponding reductions in the Rural Valley and WAMC businesses. We recognise that applying this methodology would have an impact on the Greater Sydney and Broken Hill determinations which should be considered. This method could be applied from FY2023 as systems are in place to apply this analysis. The impact of this change in methodology on Greater Sydney expenditure is not material.

We noted from the year 2000 Sydney Water determination that non-core businesses such as water recycling had a corporate cost uplift applied which was consistent with that applied to its regulated businesses.

We recommend that the same approach should be used and corporate overheads should be applied across all businesses, regulated and non-core, in a consistent way using the same methodology.

8.3.5.5. Allocation of Rural Valley costs to individual valleys

The current method of allocating costs using the relative RAB values for capital allocation is not consistent with the IPART guidance where

> *Costs should generally be allocated on the basis of causality. That is costs should be allocated to the cost objects that cause the costs to be incurred.*

The RAB is not necessarily the driver of costs. Our view is that costs should be coded directly to valleys wherever feasible. This gives regulators and customers confidence that the costs incurred are appropriate. Where it is not feasible to map costs directly, an allocation should be linked to an appropriate cost driver. For the Valleys, an input measure is more relevant than an output or turnover measure. An appropriate measure would be the size of each valley business determined by total operating costs.

8.3.5.6. Summary of the direct cost allocation method

A summary of proposed changes to the cost allocation methods is shown in Table 8-26.

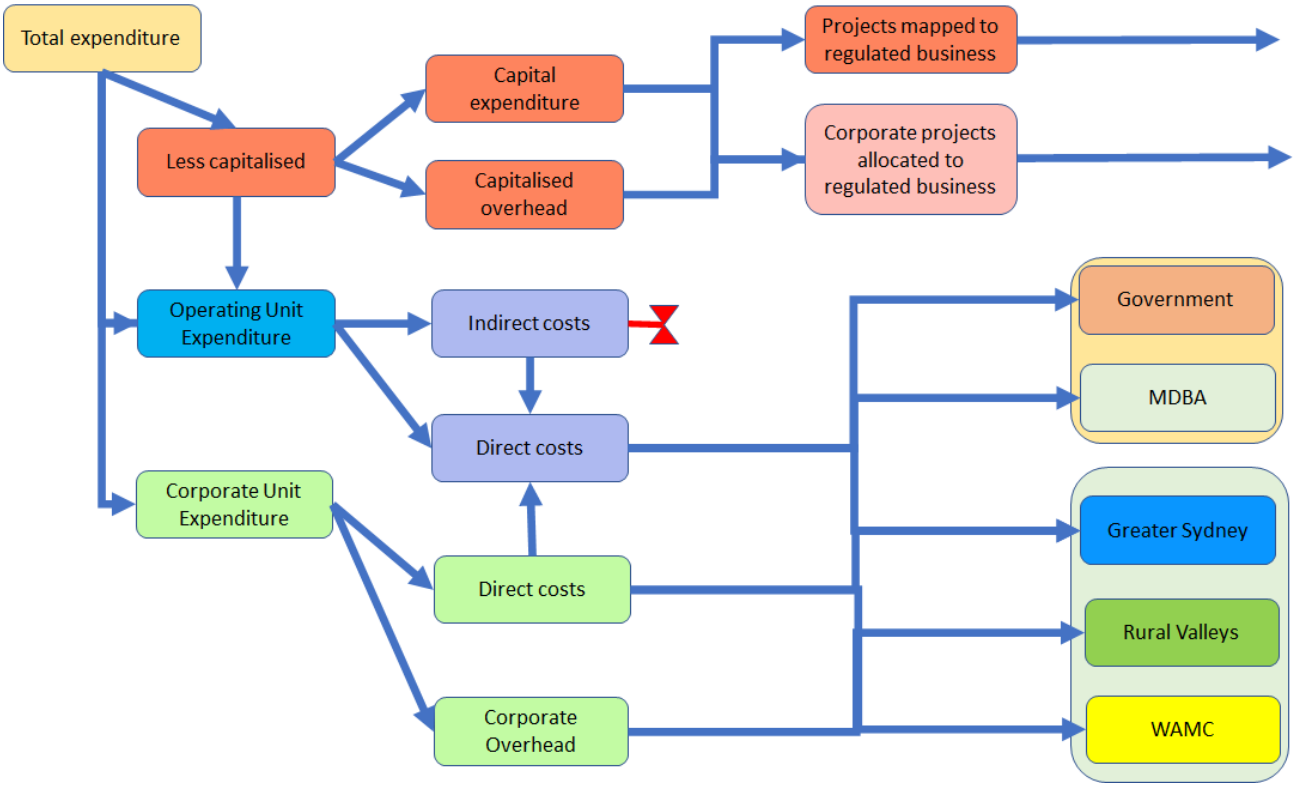
Table 8-26 Summary of changes in allocation methods

Current methods	Proposed methods
Deduct direct capex costs identified from activity coding	No change
Capitalise element of corporate expenditure using direct (evidenced) cost approach- currently direct evidenced amount is low	Increase use of direct (evidenced) cost approach for capitalised element of corporate expenditure so that extent of allocation is reduced Review the capitalisation methodology to be reflective of the relevant cost drivers
Map operational unit direct cost to regulated businesses	No change but greater coverage of direct costing and map direct within business units
Allocate the remaining indirect operating unit costs (overheads) to regulated business using TOTEX methodology	Allocate the remaining indirect operating unit costs (overheads) to regulated businesses using direct operating cost proportions specific to each operational function
Map corporate unit direct cost to regulated business	No change with greater direct cost allocation to operating units and regulated businesses
Allocate corporate indirect cost to regulated business using TOTEX methodology	Allocate corporate indirect costs including non-core business to all regulated and non-core businesses using direct operating cost proportions
For Rural Valleys, allocate operating and capital expenditure using RAB	For Rural Valleys, allocate operating and capital expenditure using direct total opex
Corporate capex projects allocated to business units using salary costs	Allocate costs on the basis of scope, assets, deliverables and efficiency benefits determined at business case stage with amendments only if material changes to scope

Source: Atkins assessment

The approach is shown in Figure 8-12 below.

Figure 8-12 Recommended cost allocation method



8.3.5.7. Benchmarking of cost allocation methods

We reviewed the cost allocation methods applied by other water and energy utilities.

- Sydney Water prepared a Cost Allocation Manual dated May 2019 which has been reviewed and approved by IPART in July 2019. The document sets out a detailed method for allocating costs across its principal activities to meet the requirements of Section 42 of the WIC Act 2006. The method defines costs as direct, pooled and corporate. The document defines corporate costs (less than 15% of total operating costs) which are generally 'headquarters' common costs that are not directly linked to service and are considered as indirect costs. The method states that 'they are allocated to cost objects based on the proportion of direct operating costs calculated for each object'. The document identifies the corporate cost centres, the cost objects and the reasons for the allocation.
- In England and Wales, cost allocation has been applied for over five years as part of accounting separation of regulated activities. Companies publish their accounting separation methods and, as part of its annual regulatory accounts, makes a statement to the effect that accounts have been prepared on the basis of its methods. We reviewed methods prepared by Yorkshire Water, Severn Trent Water and Bristol Water. We noted that these methods are detailed; for each expenditure line, the cost drivers and allocation methods are clearly set out. Corporate costs are allocated on the basis of total direct operating costs.
- Transco who is the bulk electricity and water transmission company in Abu Dhabi, allocates corporate expenditure between the electricity and water businesses using direct operating expenditure. Capital expenditure, which is a significant element of the business, is not used.
- WaterNSW commented that Energex in Queensland has a cost allocation manual approved by the Australian Energy Regulator (AER) based on TOTEX. The AER has also approved a cost allocation manual from Jamena based in Victoria which uses direct cost allocation. We noted that both energy companies took a high-level approach to cost allocation.

We concluded that water utilities are more complex organisations with a wider business drivers and related activities which require a more detailed and granular approach. This is evidenced by the structure of the cost

allocation manuals of Sydney Water and water companies in England and Wales; the latter having operational and regulatory experience for over five years.

8.3.6. Corporate capital cost allocation

Corporate capital projects, listed in Table 8-27 below, and include mainly ICT projects, Fleet, Dams and other projects. The WaterNSW methodology states that all project expenditure has been allocated to the regulated businesses on the basis of total salary costs for each business. The percentage allocations are shown against each project or group of projects. An input-based measure, such as salary or total direct costs reflect the size of each regulated business. Cost allocation using this method is appropriate where the assets and benefits provided are equally distributed across the businesses. In the case of capital corporate projects, it is necessary to define the drivers and scope of work on a project basis to define the relevant cost allocation.

One significant expenditure is for 'Maintain Capability Procurement Strategy' which is 100% allocated to the Rural Valley business.

For some projects, the assets and/or benefits relate to only one or two regulated businesses. WaterNSW has reflected this in some of the allocations made.

ICT Projects cost allocation

We have reviewed the cost allocation of ICT projects against the IPART guidance. This is because the WaterNSW cost allocation methodology is not cost reflective of the scope of work, driver, deliverables and ownership as defined in the WAVE project. We recommend that the cost allocation should be determined for each project with expenditure above a defined de-minimus, say $2m, based on its scope and benefits and agreed with the business plan approval.

This approach applying cost allocation at project level is consistent with the proportional allocation method used by all leading water utilities in apportioning expenditure to the key drivers of base maintenance, growth, new development and quality enhancements.

We have reviewed each ICT project with significant expenditure to estimate the scope and deliverables to each business. For example, the 'Water Market Systems' project is predominantly driven by the Rural Valleys business; the 'Program Forecasting' project is driven by water operations and appears to be applicable to Greater Sydney and Rural Valleys; the 'ICT Analytics' appears to be driven by data requirements from the monitoring team and is applicable to Greater Sydney and Rural Valleys. We then compared our allocation with the WaterNSW proposals in document RFI102. The analysis is shown in Table 8-27 below.

Table 8-27 Corporate expenditure 2021 period by driver and allocation

ALLOCATION OF CORPORATE EXPENDITURE 2021 PERIOD BY KEY PROJECTS

$m 2021 Year ending June	Total 2022 to 2025	GS	RV	WAMC	GS	RV	WAMC	Business unit
ICT CAPITAL EXPENDITURE	WaterNSW ALLOCATION				CAPEX			
WAVE Program - Water Market Systems	10.37	39%	38%	23%	4.04	3.94	2.39	C&C
WAVE Program - OpTech Business Case	4.42	39%	38%	23%	1.72	1.68	1.02	BSI
WAVE Program - Program forecasting	2.99	39%	38%	23%	1.17	1.14	0.69	Operations
WAVE Program - ICT Analytics	7.32	39%	38%	23%	2.85	2.78	1.68	WQ&M
Other ICT projects	22.60	39%	38%	23%	8.81	8.59	5.20	WaterNSW
Total ICT Expenditure in RF102	47.70	39%	38%	23%	18.60	18.12	10.97	BSI
Integrated Business Systems Business Case	1.62	0%	100%	0%	0.00	1.62	0.00	Corporate
Total capital expenditure	**49.32**	38%	40%	22%	**18.60**	**19.74**	**10.97**	
ICT CAPITAL EXPENDITURE	ALLOCATION BY DRIVER				CAPEX			
WAVE Program - Water Market Systems	10.37	0%	80%	20%	0.00	8.30	2.07	C&C
WAVE Program - OpTech Business Case	4.42	33%	51%	16%	1.46	2.25	0.71	BSI
WAVE Program - Program forecasting	2.99	50%	50%	0%	1.49	1.49	0.00	Operations

WAVE Program - ICT Analytics	7.32	60%	40%	0%	4.39	2.93	0.00	WQ&M
Other ICT projects	22.60	39%	39%	22%	8.81	8.81	4.97	WaterNSW
Total ICT Expenditure in RF102	47.70				16.16	23.79	7.75	BSI
Integrated Business Systems Business Case	1.62	33%	51%	16%	0.53	0.83	0.26	Corporate
Total capital expenditure	**49.32**	34%	50%	16%	**16.69**	**24.61**	**8.01**	
NET IMPACT OF PROJECT LEVEL METHODOLOGY								
Adjustment to expenditure proposals					**-1.91**	**4.87**	**-2.96**	

Source: RFI102 and Atkins analysis

The impact of applying a project-related approach to the ICT projects is to increase the Rural Valleys capex by $4.87m and reduce the allocation to WaterNSW by $2.96m and $1.91 to Greater Sydney. We consider the approach to allocate expenditure to businesses should be carried out at business case stage on the basis of the scope, deliverables and efficiency assumptions as applied to each regulated business. There is normally no need to revisit this allocation during the life of a project as changes are not likely to have a material impact on cost allocation. However, if there is a material change in scope requiring an amendment to the business case then the allocation should be revisited.

For the Rural Valley business, capital costs are further allocated to each valley using RAB. Following the WaterNSW use of salaries for allocation of corporate costs to business, it is curious that RAB is used for the further allocation. This method is not cost-reflective as these capital costs are driven by factors such as the size of the business or number of systems as for water operations, the number of customers in the case of the Water Markets, and the number of monitoring stations for data collection. Using RAB may unduly bias costs to those valleys having high RABs for example where there are dams. The method could be applied at project level when costs are allocated across regulated businesses.

In the absence of sufficient information, we propose that corporate capital costs should be allocated across valleys using total direct opex.

8.4. Findings

8.4.1. Cost Allocation

Objectives

The Cost Allocation Manual (CAM) sets out methods to allocate expenditure to the four regulated business and non-core activities. The objectives are to show that the allocation methods are

- fair and reasonable;
- transparent;
- demonstrate that there is no cross-subsidy across the regulated businesses and non-core activities; and
- comply with the IPART Cost Allocation Guide[53].

While WaterNSW states that there is no requirement under the WIC Act[54] for it tor prepare a CAM. Nevertheless, the CAM is a fundamental part of the regulatory process as it has a significant cost impact on the regulatory businesses and prices to customers. This is because corporate expenditure forms about 25% of total costs and overheads a further 4%.

The TOTEX methodology

WaterNSW uses TOTEX, the sum of direct operating costs and capital expenditure on maintenance, as a measure for allocating corporate and overhead costs. It states that *TOTEX is a concept that has been widely adopted by regulators and utilities as a regulatory measure of expenditure, TOTEX is a cost concept consistent with regulatory best practice* and that *it is reasonable to expect direct totex to be correlated with indirect and shared costs*.

[53] Cost Allocation Guide, IPART March 2018
[54] Water Industry Competition Act, 2006

However, the CAM method does not demonstrate any links between cost drivers in TOTEX and the level of corporate expenditure incurred as required by the IPART Guide. There is no detailed granular analysis of the cost drivers such as FTE numbers or other measures which drive corporate costs.

We found from our experience in regulation across domains that

- TOTEX is used in regulatory assessments as a measure of total costs and applied to econometric modelling and efficiency assessments and not as a cost allocator;
- We are not aware of any other water utility using TOTEX as a cost allocator. We comment on our benchmarking analysis of methods in Section 8.3.5.7;
- The IPART Guide states in Appendix B that '*a service's indirect costs are also likely to be highly correlated with its direct costs'*;
- Sydney Water's CAM states that *corporate costs are allocated to Cost Objects based on the proportion of direct operating costs calculated for each Cost Object*.
- Water companies in England and Wales are required to allocate costs across several price controls. They have prepared detailed accounting separation manuals, similar to the cost allocation requirements in NSW. The allocation methods a set at a detailed level with specific cost drivers determined for each area of the business. Cost drivers are generally operating costs or specific activities within each area of the business. This granular approach provides clear processes which can be readily reviewed by regulators and auditors. The manuals are approved by the regulator and published on company websites. A good example is Bristol Water[55].

The TOTEX methodology is not appropriate for allocating corporate costs across regulatory businesses. The method is applied at a high level in the business yet is complex in terms of how costs are allocated with certain inclusions and exclusions. A more granular approach is needed with cost drivers identified at business unit level and detailed methods determined for allocation. The method needs to be clearer, more transparent and simplified so that it can be understood by regulators, customer groups and other interested parties.

There is much reliance on spreadsheets for analysis with the difficulties of document control and risk of errors. A corporate system is needed to provide the necessary quality controls.

Alternative Methods of cost allocation

The TOTEX methodology is not cost reflective, capex maintenance is volatile and independent of the level of corporate expenditure. For example. capital expenditure on maintenance was highly variable over the current and 2021 determination periods, from +41% to -25% of the average. The method is not consistent with the IPART Cost Allocation Guidelines in that specific cost drivers are not defined.

We identified cost drivers for corporate and operational costs in Section 8.3.3. From this analysis we found that total direct operating expenditure or salary costs were appropriate and were more robust measures to allocate corporate costs as this comprised labour and associated costs which are closely linked and a clear driver for corporate support activities. There are other drivers for ICT and customer service activities which could be developed.

Cost allocation should be based on IPART guidance which clearly requires the causality principle to be applied; that appropriate cost drivers are used. We noted that Sydney Water identifies cost drivers across its corporate activities and applies direct operating expenditure as a method for allocation.

Overhead expenditure

Overhead expenditure is allocated across the regulated businesses and other activities using the same method as corporate. We found that these costs are supervisory or 'pooled' costs which should be allocated within each operating business unit based on the total direct costs for each regulatory business within each unit. These costs should not be conflated with corporate expenditure.

Reducing the allocated value of corporate expenditure

There is an opportunity to reduce the value of allocated costs in both corporate and overheads through greater direct costing to appropriate activity codes. WaterNSW advised that it was implementing greater direct costing through the business. This will reduce the extent of allocated costs and hence any uncertainties of cost allocation. One way to achieve this is to have internal 'service agreements' where corporate functions provide services to operating units. This approach also helps to drive efficiencies through the business.

[55] Accounting Separation Manual, Bristol Water, 2020

Customer confidence

Where corporate costs are allocated to regulated businesses and non-core activities, customers need to be confident that the methods are appropriate, and they are being asked to make appropriate contributions.

Non-core expenditure

WaterNSW reports significant non-core expenditure which it defines as 'routine' and 'special' and comprises 22% of total direct operating expenditure. Routine non-core expenditure includes MDBA, BRC and other costs which it includes in the TOTEX methodology; this results in an uplift of some 10% for corporate expenditure. Special non-core expenditure relates to government projects including drought management, water industry reform and Warragamba dam raising. It applies a 10% uplift for corporate costs which it describes as 'incremental'. We have not seen any justification for this level of uplift and whether it meets the cost allocation objectives. However, the percentage is significantly lower than that applied to the regulated businesses which questions whether there is an element of cross-subsidy from customers.

The use of an updated CAM is important in explaining and demonstrating to external clients such as government the basis of the corporate cost uplift rather than rely on a nominal value.

Applying a direct cost methodology

We tested the impact of a direct cost allocation method using the total operating expenditure data provided by WaterNSW. The data is sourced from the operating expenditure in the 'MCP project list' worksheet. These are projected expenditures for all the core and non-core activities and could change over time. We tested the direct cost method to the corporate cost allocation assuming two options:

- Option A: using the direct cost application excluding non-core expenditure. Total operating expenditure for the Rural Valleys, WAMC, Greater Sydney and Broken Hill pipeline businesses is used to allocate total corporate expenditure post capitalisation in document 60.
- Option B: using the direct cost application including non-core expenditure. We have included 'routine' and 'special' non-core expenditure in the analysis. We have applied a 40% reduction in the non-core expenditure to recognise that some elements are capital in nature although not capitalised.

We compared the resulting expenditures from the direct cost methodology with the WaterNSW analysis using the TOTEX methodology. Table 8-1nThe indicative results shown in Table 8-28 present a significant movement of corporate allocated costs between businesses. Positive values indicate an increase in corporate overhead; negative values show a reduction when comparing the direct operating method with the TOTEX method.

Table 8-28 Impact of Direct Cost method to the allocation of corporate costs

CORPORATE EXPENDITURE ALLOCATION ALL BUSINESSES
Impact of applying the direct cost methodology compared with the current TOTEX approach

$m 2021 Year ending June	2022	2023	2024	2025	Total 2022 2025	Total 2024 2025
OPTION A DIRECT COST ALLOCATION EXCLUDING NON-CORE						
Rural Valley	-0.61	0.31	-2.48	-0.97	-3.75	-3.45
WAMC	0.45	0.57	0.52	1.13	2.67	1.65
Greater Sydney	-0.29	-1.39	1.34	-0.80	-1.14	0.55
Broken Hill	0.45	0.52	0.62	0.64	2.23	1.26
Non-core	0.00	0.00	0.00	0.00	0.00	0.00
OPTION B DIRECT COST ALLOCATION INCLUDING NON-CORE						
Rural Valley	-0.91	0.05	-2.75	-1.26	-4.87	-4.01
WAMC	0.29	0.42	0.38	0.97	2.07	1.36
Greater Sydney	-0.90	-1.88	0.87	-1.33	-3.24	-0.46
Broken Hill	0.42	0.49	0.58	0.61	2.09	1.19
Non-core	1.11	0.92	0.91	1.01	3.95	1.92

Source: Atkins analysis; detailed analysis presented in section 8.3.5

The allocation of corporate overheads to regulated business using direct operating costs has a significant impact with reduced allocation to Rural Valleys and WAMC and increases to Greater Sydney and Broken Hill. When non-core operating costs are included, as option B, these variances generally widen although the impact on Greater Sydney is less This is because the non-core business currently receives a lower overhead cost. The impact of the analysis is to increase corporate costs applied to non-core activities to about 15%.

The benefit of this methodology is that corporate overheads are fairly distributed across regulated and unregulated businesses and customers are not seen to subsidise non-regulated activities. There are however implications for other determinations and a need to consider how these changes are phased in using a fair approach. There is never a perfect time to phase in the new methodology but is necessary to apply a fair and reasonable process for customers but recognising the impact of these changes on WaterNSW. We discuss implementation options in Section 8.1.2. below

Capitalisation of corporate expenditure where the TOTEX methodology is applied.

We found that the current capitalisation method using the TOTEX methodology is not consistent with the IPART cost allocation guidelines. This results in a likely overstatement of capitalised corporate expenditure. The use of a capital expenditure measure is not a direct driver for corporate costs. The MCP capex measure is independent of corporate costs and is volatile. We concluded that further work is needed to develop an appropriate method which is cost reflective of the drivers of corporate costs. We recommend that when WaterNSW revises its Cost Allocation Manual as part of the determination process, it considers alternative methods of capitalisation of corporate expenditure which is more representative of the cost drivers and would be consistent with the IPART guidance while consistent with accounting standards. This review should consider

(iv) Including only operational unit overhead expenditure which can be directly costed to capital projects through the timesheet process;

(v) Extending the application of direct costing by corporate business units to capex or opex drivers so that the value of residual corporate operating expenditure can be reduced to core functions;

(vi) Identifying more granular causal relationships between operating and capital drivers and corporate expenditure within each business function.

Rural Valley costs to individual valleys

We found that the current approach using the RAB (Regulatory Asset Base) is not a driver of the costs being allocated. We propose and have applied a methodology using total direct opex.

Corporate capital expenditure

The allocation of corporate capital projects across the regulated businesses currently uses salaries. Our view is that each capital project should have a clear view of the scope, assets, deliverables and efficiencies at business plan stage to be able to allocate costs to the relevant regulated businesses. This should be established at business plan stage. Proportional allocation of capital costs to drivers is commonly applied in water utilities.

8.4.2. Recommendations – Cost Allocation

We summarise our recommendations for cost allocation in Table 8-29 below. We recognise that some changes are straightforward can be implemented in the short run, but other changes may need more time to implement. In some instances, time is needed to extend direct costing and implement new methods and systems. We also recognise that these methods need to be tested and in place in advance of the next determination for Greater Sydney.

The Cost Allocation Manual should be redrafted to clearly identify cost objects and drivers consistent with the IPART Guide. The method should be based on direct operating costs or surrogate such as salaries or other relevant drivers to present a transparent and simplified process. More granular causal relationships should be established between operating drivers and corporate expenditure within each business function.

The manual should demonstrate and ensure no cross subsidy between regulatory and non-core activities. We suggest the document should be reviewed and approved by IPART before placing on the WaterNSW website. The Sydney Water CAM provides a good example to follow.

Table 8-29 summarises the recommended actions including capitalisation of overheads in (3) below. Recommendations for the allocation of costs to rural valleys (7) and corporate capital expenditure (8) have been included within our proposals on efficient operating and capital expenditure in sections 5 and 6 respectively.

Table 8-29 Recommended actions

	Allocation	WaterNSW current method	Proposed method	Ease of change	Timing	Comment
1	Update of the Cost Allocation Manual			Straightforward	December 2021	For IPART to approve
2	Greater penetration of direct costing			Business as usual	June 2022	Reduce value of corporate by greater direct costing
3	Capitalisation of overheads	TOTEX	Need to test direct cost method	Complex -need to involve auditor	July 2024	Reduce corporate by greater direct costing
4	Post-capitalisation corporate expenditure to regulated businesses	TOTEX	Direct total costs	Needs time for new systems and training	Options: July 2021 or 2023	Corporate system may be needed for analysis
5	Overheads to non-core businesses	10% assumed	Include in analysis for (2)	Needs time for new systems and training; may need contract changes	July 2023	Include in direct cost analysis
6	Overheads for operational business units	TOTEX	Apply direct costing to activities	Existing systems in place	July 2022	Extend direct costing within business units
7	Rural Valley costs to valleys	RAB	Total operating costs	Straightforward	July 2021	Include in 2021 Determination
8	Corporate capital expenditure	Salary	Project level at business plan stage	Straightforward	July 2021	Based on scope, deliverables and outcomes. Include in 2021 Determination

Source: Atkins analysis

These recommendations meet the objective of applying a clear, accurate and auditable method of allocating expenditure to the regulated businesses giving confidence to regulators that customers are only paying for reasonable and efficient costs related to their service.

The method of fully implementing an activity-based costing system is that efficiencies which may not have been evident through a relatively high level of overheads may be exposed. This is reflective of potential catch-up efficiencies as the business moves towards the frontier.

Implementation

Implementation of more-reflective method of cost allocation will need to consider preparing a comprehensive Cost Allocation development and application of the business processes, training of staff, testing and ensuring that appropriate systems are in place. With the new FMS accounting system in place, the main focus would be for each business unit to apply activity-based costing. For operating business units, it will be important to examine the options for accounting for supervisory or pool costs and how these are apportioned internally to each regulated business so there are no significant overheads to allocate. For corporate business units, it is important to identify activities that are provided to operating units and those to service the corporate functions.

There is a need to modify the CAM methodology to reflect cost reflective methods but with rolling determinations there is never a good time. The options available are:

Option 1: A phased approach implementing the new method from July 2023. This gives time to develop, test and apply the new methodology with associated training. Also, time to address current non-core contracts to reflect any changes to corporate uplifts. This would ensure that the methodology is developed and tested in advance of submissions for the 2024 Greater Sydney determination. The methodology would also inform the Broken Hill pipeline determination in 2022.

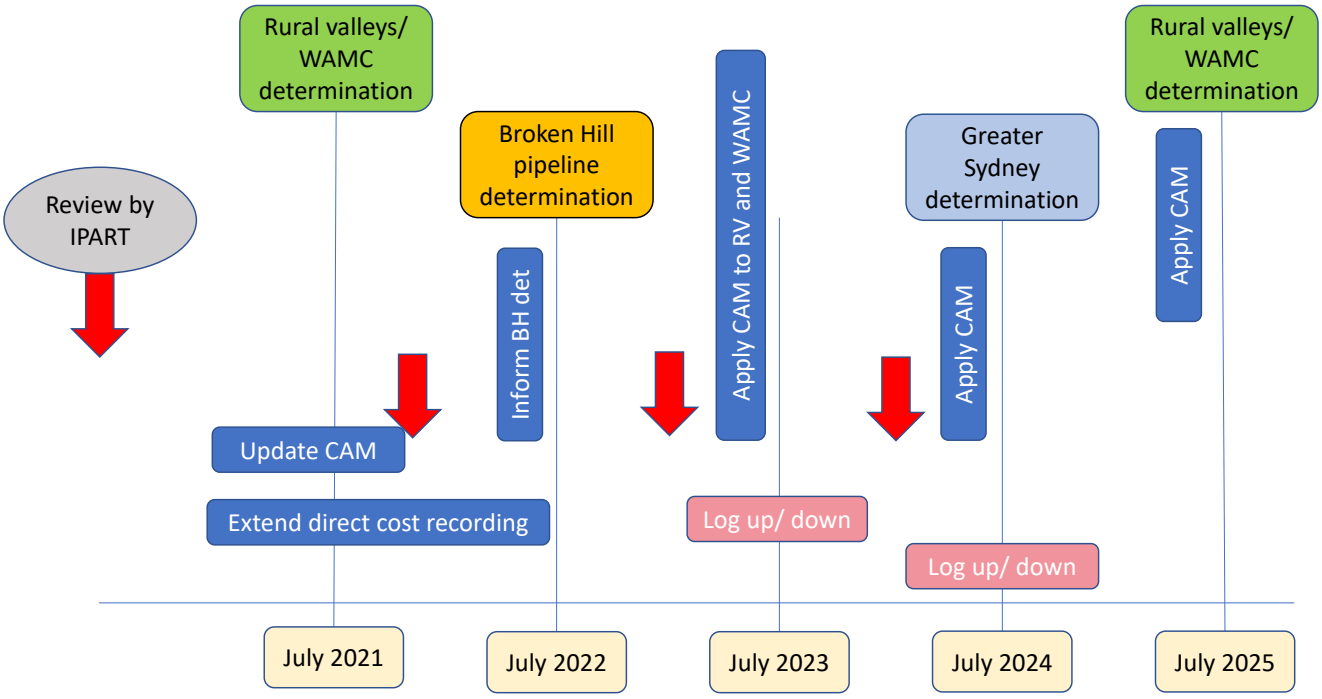
Option 2: Implement changes from July 2021 to deliver benefits to WaterNSW and WAMC customers at the start of the 2021 determination period. This would require some interim assessments until the new CAM is in place.

Option 3: As option 2 but including the non-core expenditure from July 2023, recognising that it would be preferable to have time to renegotiate current and future contracts with revised uplifts.

Our preferred approach is for Option A which provides a reasonable timeline to establish and embed a new methodology but it means that the full cost savings may not be available for customers unless a retrospective change is made.

A proposed implementation program is shown in Figure 8-13.

Figure 8-13 Implementation program



Source: Atkins analysis

The program minimises the impact on determinations. We suggest that IPART should consider how the impact of these changes in allocation methods on determinations can be addressed within regulatory processes so that WaterNSW does not lose or gain as these changes are applied. Some form of logging up or down as the determinations are applied or there are material changes to the cost impacts assumed in Table 8-1.

8.4.3. Allocation of Corporate Capital Expenditure

This expenditure comprises mainly large ICT projects to deliver new and enhanced systems across the regulated businesses. Some systems are specific to a regulated business and others apply across two or all. Because of the value of some of these projects, there is a risk that a significant level of expenditure may not be allocated to the correct driver with a corresponding impact on cost allocation and charges to customers. An example here is the Water Markets ICT project where the benefits are for the Rural Valleys business yet the costs are allocated across the three businesses.

We concluded that the current method of allocating capital costs to regulated businesses based on salaries is not appropriate. We identified the cost drivers based on the scope of work, assets created or replaced, deliverables and efficiencies assumed.

We have reviewed each project with significant expenditure to determine their scope, deliverables, assets and efficiencies and made an assessment of the impact of direct cost allocation at individual project level and collated this for the projects with comprise corporate capital expenditure.

As this has a material impact on the capital expenditure proposals as detailed in Table 8-26 and summarised below. The corporate capital expenditure proposals should be adjusted to reflect

(i) An increase of $4.87m to Rural Valleys;
(ii) A reduction of $2.96m to WAMC; and
(iii) A reduction of $1,91m to Greater Sydney.

We recommend that assessment of the project cost allocation is made at business plan stage and forms part of the approval process. This assessment can be made by the project manager based on the relative outputs and benefits the project is intended to deliver. This would be approved by the business and could be applied over the life of the project provided there were no material variations in scope. This step is appropriate for all projects with a total cost exceeding $2m. Where a project benefits all three businesses then the current method of allocation using salaries reflective of the size of each business may be appropriate. Apportionment using benefits would also be appropriate.

8.4.4. Efficient Corporate Operating Expenditure

Our role is to recommend a level for efficiency which can be delivered over the 2021 determination period based on the opportunities we have found and the ability of other water utilities to achieve and outperform. It is for WaterNSW to identify the areas of the business to deliver efficiency savings. We consider that WaterNSW is well placed with the resources it has to achieve and out-perform the efficiency targets set. A focus on the bullet points above should enable the business to move much closer to a frontier company.

We have set a level of catch-up efficiency which has been applied to all corporate operating expenditure for Rural Valleys and WAMC which is explained in Section 5.6.5.2. We have also applied a continuing efficiency similar to that applied to the Greater Sydney review earlier in 2020.

Our review of efficient corporate expenditure is presented in Section 8.2. We have identified several opportunities for WaterNSW to catch up with frontier companies. This needs a closer view of its structure and working practice including

- A greater focus of monitoring costs against the three main determinations;
- A greater internal challenge on increasing FTEs and costs to test whether additional obligations can be met through prioritising workload to limit cost increases;
- A program to drive efficiencies across the business units – the finance teams have a key role here;
- A drive for greater direct activity-based costing with a focus on reducing the extent of allocated overheads where there is potential for further efficiencies;
- A closer look at the business structure with a greater focus on service delivery with supporting business units. Some form of service provision arrangements may be appropriate for support from BIS and some functions of people, legal and finance;
- Whether a change to rationalise the business structure would enable the earlier bullet point objectives to be achieved.

The potential efficiency gains are reflected in the catch-up and continuing efficiencies applied to all operating costs. These are set out in Section 5.

8.4.5. Efficient Corporate Capital Expenditure

For ICT expenditure in the 2021 determination period, we are not proposing any efficiency adjustments for specific projects beyond the efficiency challenges being set for the whole capital program. We have identified some opportunities for future efficiency gains.

- Benefits, especially relating to future efficiencies, delivered by ICT investments are set out in business cases but the approach to tracking and demonstrating their achievement needs to be clearer and more effectively. At times there is not a clear line of sight between many of the benefits highlighted by ICT investments and the efficiencies being presented by WaterNSW, or it cannot be robustly demonstrated that efficiencies have been realised as exemplified by the CIMS implementation;
- There is potential for horizon scanning, collaboration and partnering on areas of emerging or unproven technology which may be happening but this was not demonstrated at any time by WaterNSW as occurring;

- The impact of ICT investments should lead to demonstrable improvements in Customer and Other KPIs which WaterNSW can be monitored against and therefore held accountable for;
- ICT Corporate costs should in our view be presented in the submission to IPART as a combined capex and opex submission rather than focusing on ICT capex given the potential trade-offs between capex and opex depending on which solution is selected and the impact of that future capital expenditure has on opex in the long-term both in terms of efficiencies as well as long-term commitments for licences and support.

We have made some adjustments to the efficient level of capital expenditure to reflect the allocation of expenditure on a project basis compared with total salaries used by WaterNSW. We discuss these allocation changes in Section 8.3.5.

We have also made one scope adjustment for WAMC where a proposed significant increase in fleet expenditure in 2024 is not prudent or efficient.

8.4.6. Recommendations – Efficient Corporate Expenditure

Operating expenditure

We have set a level of catch-up efficiency which has been applied to all corporate operating expenditure for Rural Valleys and WAMC which is explained in Section 5.6.5.2. We have also applied a continuing efficiency similar to that applied to the Greater Sydney review earlier in 2020. The efficiency values are shown in Table 8-15.

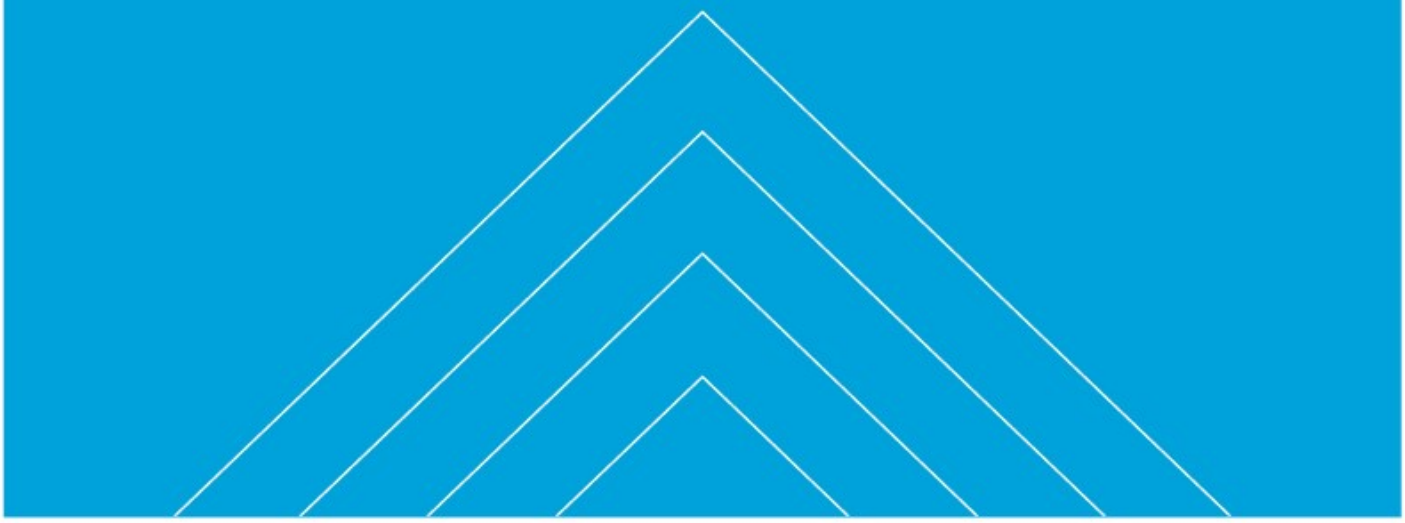
We have proposed some small scope adjustments related to customer service costs and additional regulatory expenditure which are set out in Section 8.2.4.

Capital Expenditure

For ICT expenditure in the 2021 determination period, we are not proposing any efficiency adjustments for specific projects beyond the efficiency challenges being set for the whole capital program. We have made some adjustments to the efficient level of capital expenditure to reflect the allocation of expenditure on a project basis compared with total salaries used by WaterNSW. We discuss these allocation changes in Section 8.2.5.

We have also made one scope adjustment for WAMC where a proposed significant increase in fleet expenditure in 2024 is not prudent or efficient.

Appendices



Appendix A. Expenditure by Valley

A.1. Border

Table A-1 - Capital Expenditure Border

WATERNSW RURAL BULK WATER PROPOSAL - CAPEX - BORDER										
($M 2020/21) year ending June	2018	2019	2020	2021	**2022**	**2023**	**2024**	**2025**	**2023-25 Total**	**2022-25 Total**
Water Delivery & Other Operations	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.01
Asset Management Planning	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.04	0.05
Dam Safety Compliance	0.00	0.00	0.00	0.35	0.30	0.02	0.03	0.02	0.08	0.38
Environmental Planning & Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.04	0.01	0.11	0.23	0.08	0.07	0.07	0.05	0.19	0.26
Drought projects (3 dams)	0.00	0.00	4.43	35.34	23.41	0.73	0.72	0.72	2.17	25.58
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	0.05	0.10	0.50	0.10	0.14	0.23	0.23	0.23	0.69	0.83
Dam safety compliance on pre 1997 capital projects	0.06	0.06	1.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total capex proposed by WNSW	0.14	0.30	6.17	36.05	23.94	1.06	1.08	1.03	3.17	27.11
Atkins/Cardno recommended adjustments for specific programs or projects										
PDMP reallocation from Corporate to Drought projects (3 dams)			0.46	0.09						
Water Delivery & Other Operations - Corporate Systems FY20 miscoding			0.01							
Flood operations - Corporate Systems FY20 miscoding			0.00							
Hydrometric monitoring - Corporate Systems FY20 miscoding			0.01							
Asset management planning - Corporate Systems FY20 miscoding			0.00							
Dam safety compliance pre1997 - Corporate Systems FY20 miscoding			0.00							
Environmental Planning & Protection - Corporate Systems FY20 miscoding			0.00							
Renewals and Replacement - Corporate Systems FY20 miscoding			0.00							
Corporate Systems - Corporate Systems FY20 miscoding			-0.02							
BO Corporate Systems RAB to Salary Allocation adjustment					0.10	0.09	0.09	0.06	0.23	0.33
BO Dam Safety Compliance RAB to Salary Allocation adjustment					0.03	0.03	0.05	0.03	0.11	0.14
BO Asset management planning RAB to Salary Allocation adjustment					0.02	0.01	0.01	0.01	0.03	0.05
BO Routine maintenance RAB to Salary Allocation adjustment					0.00	0.00	0.00	0.00	0.01	0.01
BO Renewals and Replacement RAB to Salary Allocation adjustment					0.00	0.00	0.00	0.00	0.00	0.00
BO - Corporate Scope and Reallocation				0.00	0.01	0.01	0.01	0.01	0.04	0.06
Sub Total adjustments	0.00	0.00	0.46	0.09	0.16	0.15	0.16	0.12	0.43	0.59
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS										
Water Delivery & Other Operations	0.00	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.03	0.01	0.01	0.01	0.01	0.02	0.02
Asset Management Planning	0.00	0.00	0.00	0.01	0.03	0.02	0.02	0.02	0.07	0.10
Dam Safety Compliance	0.00	0.00	0.00	0.35	0.33	0.06	0.08	0.05	0.19	0.52
Environmental Planning & Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.04	0.01	0.09	0.23	0.19	0.17	0.17	0.12	0.47	0.65
Drought projects (3 dams)	0.00	0.00	4.89	35.42	23.41	0.73	0.72	0.72	2.17	25.58
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	0.05	0.10	0.50	0.10	0.14	0.23	0.23	0.23	0.69	0.83
Dam safety compliance on pre 1997 capital projects	0.06	0.06	1.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total pre-efficiency	0.14	0.30	6.64	36.14	24.10	1.21	1.24	1.15	3.60	27.70
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)										
Continuing Efficiency (%)					0.70%	1.40%	2.09%	2.77%		
Continuing Efficiency ($M)					-0.17	-0.02	-0.03	-0.03	-0.07	-0.24
Catch-up efficiency (%)					2.11%	4.22%	6.83%	7.44%		
Catch-up efficiency ($M)					-0.50	-0.05	-0.08	-0.08	-0.22	-0.72
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE										
($M 2020/21) year ending June	2018	2019	2020	2021	**2022**	**2023**	**2024**	**2025**	**2023-25 Total**	**2022-25 Total**
Water Delivery & Other Operations	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Flood Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Hydrometric Monitoring	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Water Quality Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corrective Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Routine Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.02
Asset Management Planning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.06	0.09
Dam Safety Compliance	0.0	0.0	0.0	0.3	0.3	0.1	0.1	0.0	0.17	0.49
Environmental Planning & Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corporate Systems	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.43	0.61
Drought projects (3 dams)	0.0	0.0	4.9	35.4	22.8	0.7	0.7	0.6	1.99	24.75
Drought projects (other)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Renewals and Replacement	0.1	0.1	0.5	0.1	0.1	0.2	0.2	0.2	0.64	0.77
Dam safety compliance on pre 1997 capital projects	0.1	0.1	1.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Structural and other enhancements	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Customer support	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Internal corporate projects	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Total Efficient Expenditure	**0.14**	**0.30**	**6.64**	**36.14**	**23.43**	**1.14**	**1.13**	**1.04**	**3.31**	**26.74**
User Share Capital Expenditure	*0.1*	*0.2*	*0.7*	*0.5*	*0.6*	*0.4*	*0.4*	*0.3*	*1.2*	*1.7*
Government Share Capital Expenditure	*0.1*	*0.1*	*6.0*	*35.6*	*22.9*	*0.7*	*0.7*	*0.7*	*2.1*	*25.0*

Table A-2 – Operating Expenditure Border

WATERNSW RURAL BULK WATER PROPOSAL - OPEX - Border Valley											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.06	0.04	0.04	0.02	0.03	0.16	0.24	0.24	0.23	0.24	0.23
Customer Billing	0.04	0.04	0.03	0.03	0.04	-0.01	0.02	0.02	0.02	0.02	0.02
Metering and Compliance	0.25	0.22	0.17	0.14	0.14	0.13	0.18	0.18	0.18	0.16	0.15
Water Delivery and Other Operations	0.23	0.23	0.32	0.29	0.29	0.33	0.30	0.30	0.29	0.28	0.28
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.05	0.03	0.06	0.07	0.07	0.16	0.05	0.05	0.05	0.05	0.05
Water Quality Monitoring	0.01	0.02	0.05	0.04	0.05	0.03	0.03	0.03	0.03	0.03	0.03
Corrective Maintenance	0.06	0.11	0.12	0.04	0.07	0.09	0.13	0.13	0.13	0.14	0.14
Routine Maintenance	0.25	0.21	0.25	0.24	0.27	0.29	0.35	0.34	0.34	0.36	0.36
Asset management planning	0.13	0.11	0.07	0.05	0.01	0.00	0.05	0.05	0.10	0.04	0.03
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.24	0.20	0.17	0.12	0.09	0.10	0.16	0.13	0.16	0.17	0.17
Environmental Planning and Protection	0.05	0.02	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Direct Insurances	0.07	0.00	0.00	0.09	0.20	0.19	0.11	0.11	0.11	0.11	0.11
Renewal and Replacement	0.00	0.00	0.00	0.09	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.02	0.00	0.00	0.00	0.00	0.03	0.01	0.01	0.05	0.05	0.05
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Border Valley - Total Operating Expenditure	**1.46**	**1.24**	**1.29**	**1.23**	**1.34**	**1.50**	**1.64**	**1.60**	**1.69**	**1.66**	**1.62**
Atkins/Cardno recommended scope adjustments											
Customer Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01
Customer Billing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	0.00
Water Delivery and Other Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	-0.02	-0.01	-0.02
Routine Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	-0.03	-0.02	-0.04
Asset management planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.03	-0.02	-0.03
Environmental Planning and Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01
Direct Insurances	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00
Renewal and Replacement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	-0.03	-0.03
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub Total adjustments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.11	-0.16	-0.14	-0.15
Atkins/Cardno recommended efficiency targets											
Continuing Efficiency (%)								0.70%	1.40%	2.09%	2.77%
Continuing Efficiency ($M)								-0.01	-0.02	-0.03	-0.04
Catch-up efficiency (%)								1.10%	2.19%	3.26%	4.33%
Catch-up efficiency ($M)								-0.02	-0.03	-0.05	-0.06
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.06	0.04	0.04	0.02	0.03	0.16	0.24	0.22	0.21	0.21	0.21
Customer Billing	0.04	0.04	0.03	0.03	0.04	-0.01	0.02	0.02	0.02	0.02	0.02
Metering and Compliance	0.25	0.22	0.17	0.14	0.14	0.13	0.18	0.17	0.16	0.14	0.13
Water Delivery and Other Operations	0.23	0.23	0.32	0.29	0.29	0.33	0.30	0.29	0.27	0.26	0.25
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.05	0.03	0.06	0.07	0.07	0.16	0.05	0.05	0.04	0.04	0.04
Water Quality Monitoring	0.01	0.02	0.05	0.04	0.05	0.03	0.03	0.02	0.02	0.02	0.02
Corrective Maintenance	0.06	0.11	0.12	0.04	0.07	0.09	0.13	0.11	0.11	0.12	0.11
Routine Maintenance	0.25	0.21	0.25	0.24	0.27	0.29	0.35	0.31	0.30	0.31	0.30
Asset management planning	0.13	0.11	0.07	0.05	0.01	0.00	0.05	0.04	0.10	0.03	0.03
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.24	0.20	0.17	0.12	0.09	0.10	0.16	0.11	0.13	0.15	0.13
Environmental Planning and Protection	0.05	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Direct Insurances	0.07	0.00	0.00	0.09	0.20	0.19	0.11	0.11	0.10	0.10	0.10
Renewal and Replacement	0.00	0.00	0.00	0.09	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.02	0.00	0.00	0.00	0.00	0.03	0.01	0.01	0.03	0.03	0.03
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Efficient Expenditure	1.46	1.24	1.29	1.23	1.34	1.50	1.64	1.46	1.48	1.44	1.37

A.2. Gwydir

Table A-3 - Capital Expenditure Gwydir

WATERNSW RURAL BULK WATER PROPOSAL - CAPEX										
($M 2020/21) year ending June	2018	2019	2020	2021	**2022**	**2023**	**2024**	**2025**	**2023-25 Total**	**2022-25 Total**
Water Delivery & Other Operations	0.00	1.88	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.06	0.03	0.03	0.03	0.04	0.11	0.14
Asset Management Planning	0.00	0.00	0.00	0.16	0.17	0.15	0.19	0.17	0.51	0.68
Dam Safety Compliance	0.00	0.00	0.00	0.78	3.95	3.19	1.44	0.74	5.37	9.32
Environmental Planning & Protection	0.00	0.00	0.00	0.10	1.13	1.01	10.16	10.02	21.19	22.31
Corporate Systems	1.05	0.13	5.00	2.00	1.06	0.98	1.42	1.07	3.47	4.53
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	0.56	0.17	0.54	2.69	1.02	1.78	0.87	0.87	3.53	4.54
Dam safety compliance on pre 1997 capital projects	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total capex proposed by WNSW	1.61	2.19	5.80	5.81	7.36	7.14	14.11	12.92	34.17	41.53
Atkins/Cardno recommended adjustments for specific programs or projects										
PDMP reallocation from Corporate to Drought projects (3 dams)			-0.23	-0.04						
Water Delivery & Other Operations - Corporate Systems FY20 miscoding			0.24							
Flood operations - Corporate Systems FY20 miscoding			0.03							
Hydrometric monitoring - Corporate Systems FY20 miscoding			0.31							
Asset management planning - Corporate Systems FY20 miscoding			0.01							
Dam safety compliance pre1997 - Corporate Systems FY20 miscoding			0.12							
Environmental Planning & Protection - Corporate Systems FY20 miscoding			0.03							
Renewals and Replacement - Corporate Systems FY20 miscoding			0.15							
Corporate Systems - Corporate Systems FY20 miscoding			-0.90							
CPTN Fish Passage Offsets contingency adjustment				0.0	-0.9	-0.9	-8.7	-8.6	-18.10	-18.96
GW Corporate Systems RAB to Salary Allocation adjustment					-0.55	-0.32	-0.29	-0.29	-0.91	-1.45
GW Dam Safety Compliance RAB to Salary Allocation adjustment					-0.05	-0.11	-0.10	-0.16	-0.37	-0.41
GW Asset management planning RAB to Salary Allocation adjustment					-0.05	-0.05	-0.04	-0.04	-0.13	-0.18
GW Routine maintenance RAB to Salary Allocation adjustment					-0.01	-0.01	-0.01	-0.01	-0.03	-0.04
GW Renewals and Replacement RAB to Salary Allocation adjustment					-0.03	0.00	0.00	0.00	0.00	-0.03
Copeton Spillway Investigations reallocation from dam safety compliance				-0.59	-3.58	-1.84			-1.84	-5.43
Copeton Spillway Investigations reallocation to <1997 dam safety compliance				0.59	3.58	1.84	0.00	0.00	1.84	5.43
GW - Corporate Scope and Reallocation				0.00	0.05	0.05	0.05	0.05	0.16	0.22
Sub Total adjustments	0.00	0.00	-0.23	-0.04	-1.49	-1.30	-9.07	-9.00	-19.37	-20.86
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS										
Water Delivery & Other Operations	0.00	1.88	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.06	0.02	0.02	0.02	0.03	0.08	0.10
Asset Management Planning	0.00	0.00	0.01	0.16	0.13	0.10	0.15	0.13	0.38	0.50
Dam Safety Compliance	0.00	0.00	0.00	0.20	0.31	1.24	1.34	0.59	3.16	3.48
Environmental Planning & Protection	0.00	0.00	0.03	0.10	0.27	0.15	1.48	1.46	3.08	3.36
Corporate Systems	1.05	0.13	3.87	1.96	0.57	0.71	1.18	0.84	2.73	3.29
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	0.56	0.17	0.69	2.69	0.98	1.78	0.87	0.87	3.53	4.51
Dam safety compliance on pre 1997 capital projects	0.00	0.00	0.30	0.59	3.58	1.84	0.00	0.00	1.84	5.43
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total pre-efficiency	1.61	2.19	5.57	5.77	5.87	5.84	5.04	3.92	14.80	20.67
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)										
Continuing Efficiency (%)				0.00%	0.70%	1.40%	2.09%	2.77%		
Continuing Efficiency ($M)				0.00	-0.04	-0.08	-0.11	-0.11	-0.30	-0.34
Catch-up efficiency (%)				0.00%	2.11%	4.22%	6.83%	7.44%		
Catch-up efficiency ($M)				0.00	-0.12	-0.24	-0.34	-0.28	-0.86	-0.99
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE										
($M 2020/21) year ending June	2018	2019	2020	2021	**2022**	**2023**	**2024**	**2025**	**2023-25 Total**	**2022-25 Total**
Water Delivery & Other Operations	0.0	1.9	0.3	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Flood Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Hydrometric Monitoring	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Water Quality Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corrective Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Routine Maintenance	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.08	0.09
Asset Management Planning	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.35	0.47
Dam Safety Compliance	0.0	0.0	0.0	0.2	0.3	1.2	1.2	0.5	2.92	3.22
Environmental Planning & Protection	0.0	0.0	0.0	0.1	0.3	0.1	1.3	1.3	2.80	3.07
Corporate Systems	1.0	0.1	3.9	2.0	0.6	0.7	1.1	0.8	2.50	3.05
Drought projects (3 dams)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Drought projects (other)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Renewals and Replacement	0.6	0.2	0.7	2.7	1.0	1.7	0.8	0.8	3.26	4.22
Dam safety compliance on pre 1997 capital projects	0.0	0.0	0.3	0.6	3.5	1.7	0.0	0.0	1.74	5.22
Structural and other enhancements	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Customer support	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Internal corporate projects	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Total Efficient Expenditure	**1.61**	**2.19**	**5.57**	**5.77**	**5.71**	**5.51**	**4.60**	**3.53**	**13.64**	**19.35**
User Share Capital Expenditure	*1.6*	*2.2*	*5.1*	*4.8*	*1.9*	*3.3*	*3.8*	*3.0*	*10.1*	*12.0*
Government Share Capital Expenditure	*0.1*	*0.0*	*0.4*	*1.0*	*3.8*	*2.2*	*0.8*	*0.6*	*3.6*	*7.3*

Table A-4 – Operating Expenditure Gwydir

WATERNSW RURAL BULK WATER PROPOSAL - OPEX - Gwydir Valley											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.06	0.05	0.05	0.03	0.03	0.17	0.14	0.14	0.14	0.15	0.15
Customer Billing	0.08	0.08	0.06	0.05	0.10	0.45	0.04	0.04	0.04	0.04	0.04
Metering and Compliance	0.24	0.14	0.20	0.18	0.18	0.04	0.04	0.04	0.03	0.03	0.03
Water Delivery and Other Operations	0.46	0.33	0.37	0.39	0.45	0.52	0.71	0.86	0.73	0.85	0.81
Flood Operations	0.04	0.02	0.07	0.04	0.06	0.01	0.19	0.17	0.20	0.20	0.19
Hydrometric Monitoring	0.73	0.71	0.85	0.77	0.70	0.53	0.53	0.53	0.52	0.59	0.57
Water Quality Monitoring	0.03	0.04	0.11	0.06	0.08	0.08	0.04	0.04	0.04	0.04	0.04
Corrective Maintenance	0.34	0.34	0.28	0.27	0.47	0.48	0.58	0.57	0.56	0.60	0.58
Routine Maintenance	1.07	1.06	1.20	1.25	1.69	1.90	1.48	1.50	1.48	1.61	1.72
Asset management planning	0.33	0.27	0.19	0.12	0.04	-0.01	0.19	0.28	0.50	0.52	0.45
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.37	0.33	0.30	0.37	0.22	0.30	0.30	0.32	0.53	0.51	0.43
Environmental Planning and Protection	0.16	0.21	0.01	0.00	0.00	0.00	0.05	0.07	0.06	0.10	0.09
Direct Insurances	0.19	0.00	0.00	0.25	0.74	0.70	0.41	0.41	0.41	0.41	0.41
Renewal and Replacement	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.06	0.00	0.01	0.00	0.00	0.54	0.20	0.19	0.37	0.39	0.38
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gwydir Valley - Total Operating Expenditure	**4.15**	**3.58**	**3.69**	**3.82**	**4.77**	**5.72**	**4.91**	**5.17**	**5.61**	**6.04**	**5.90**
Atkins/Cardno recommended scope adjustments											
Customer Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	-0.02	-0.02
Customer Billing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01
Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Delivery and Other Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.13	-0.09	-0.15	-0.20
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05	-0.07	-0.04	-0.08
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	-0.02	-0.09	-0.09
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05	-0.05	-0.09	-0.11
Routine Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.08	-0.05	-0.22	-0.23
Asset management planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.02	-0.07	-0.06
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	-0.09	-0.09	-0.10
Environmental Planning and Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.07	-0.06	-0.10	-0.09
Direct Insurances	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	-0.01	-0.06	-0.05
Renewal and Replacement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	-0.16	-0.19	-0.18
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub Total adjustments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.46	-0.63	-1.14	-1.23
Atkins/Cardno recommended efficiency targets											
Continuing Efficiency (%)								0.70%	1.40%	2.09%	2.77%
Continuing Efficiency ($M)								-0.03	-0.07	-0.10	-0.13
Catch-up efficiency (%)								1.10%	2.19%	3.26%	4.33%
Catch-up efficiency ($M)								-0.05	-0.11	-0.16	-0.20
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.06	0.05	0.05	0.03	0.03	0.17	0.14	0.13	0.13	0.12	0.12
Customer Billing	0.08	0.08	0.06	0.05	0.10	0.45	0.04	0.04	0.04	0.03	0.03
Metering and Compliance	0.24	0.14	0.20	0.18	0.18	0.04	0.04	0.04	0.03	0.03	0.03
Water Delivery and Other Operations	0.46	0.33	0.37	0.39	0.45	0.52	0.71	0.72	0.61	0.66	0.57
Flood Operations	0.04	0.02	0.07	0.04	0.06	0.01	0.19	0.12	0.12	0.14	0.10
Hydrometric Monitoring	0.73	0.71	0.85	0.77	0.70	0.53	0.53	0.50	0.49	0.47	0.45
Water Quality Monitoring	0.03	0.04	0.11	0.06	0.08	0.08	0.04	0.03	0.03	0.03	0.03
Corrective Maintenance	0.34	0.34	0.28	0.27	0.47	0.48	0.58	0.51	0.50	0.48	0.44
Routine Maintenance	1.07	1.06	1.20	1.25	1.69	1.90	1.48	1.40	1.37	1.31	1.39
Asset management planning	0.33	0.27	0.19	0.12	0.04	-0.01	0.19	0.26	0.47	0.43	0.36
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.37	0.33	0.30	0.37	0.22	0.30	0.30	0.29	0.42	0.40	0.31
Environmental Planning and Protection	0.16	0.21	0.01	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00
Direct Insurances	0.19	0.00	0.00	0.25	0.74	0.70	0.41	0.39	0.39	0.34	0.33
Renewal and Replacement	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.06	0.00	0.01	0.00	0.00	0.54	0.20	0.21	0.20	0.19	0.19
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Efficient Expenditure	4.15	3.58	3.69	3.82	4.77	5.72	4.91	4.63	4.80	4.64	4.34

A.3. Namoi

Table A-5 - Capital Expenditure Namoi

WATERNSW RURAL BULK WATER PROPOSAL - CAPEX - NAMOI										
($M 2020/21) year ending June	2018	2019	2020	2021	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	0.00	1.16	0.30	0.46	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.02	0.06	1.07	0.67	0.00	0.00	0.67	1.74
Routine Maintenance	0.00	0.00	0.00	0.15	0.05	0.05	0.05	0.07	0.17	0.22
Asset Management Planning	0.00	0.00	0.00	0.24	0.27	0.23	0.30	0.27	0.80	1.07
Dam Safety Compliance	0.00	0.00	0.00	3.46	0.63	1.46	1.15	0.60	3.21	3.84
Environmental Planning & Protection	[redacted]									
Corporate Systems	1.34	0.18	2.23	3.51	1.67	1.53	2.51	1.46	5.51	7.18
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.55	1.02	0.00	0.00	0.00	0.00	1.02
Renewals and Replacement	0.11	0.23	0.35	3.08	0.30	0.74	1.49	1.11	3.34	3.64
Dam safety compliance on pre 1997 capital projects	9.64	12.83	17.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.01	0.01	0.06	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total capex proposed by WNSW	[redacted]									
Atkins/Cardno recommended adjustments for specific programs or projects										
PDMP reallocation from Corporate to Drought projects (3 dams)			-0.22	-0.04						
Water Delivery & Other Operations - Corporate Systems FY20 miscoding			0.11							
Flood operations - Corporate Systems FY20 miscoding			0.02							
Hydrometric monitoring - Corporate Systems FY20 miscoding			0.14							
Asset management planning - Corporate Systems FY20 miscoding			0.00							
Dam safety compliance pre1997 - Corporate Systems FY20 miscoding			0.05							
Environmental Planning & Protection - Corporate Systems FY20 miscoding			0.01							
Renewals and Replacement - Corporate Systems FY20 miscoding			0.07							
Corporate Systems - Corporate Systems FY20 miscoding			-0.40							
KEEP Fish Passage Offsets contigency adjustment				0.0	4.4	4.2	-4.3	-4.3	-4.44	0.00
NO Corporate Systems RAB to Salary Allocation adjustment					-1.37	-0.81	-0.73	-0.72	-2.26	-3.62
NO Dam Safety Compliance RAB to Salary Allocation adjustment					-0.12	-0.26	-0.26	-0.39	-0.92	-1.04
NO Asset management planning RAB to Salary Allocation adjustment					-0.12	-0.13	-0.10	-0.10	-0.32	-0.44
NO Routine maintenance RAB to Salary Allocation adjustment					-0.03	-0.02	-0.02	-0.02	-0.07	-0.10
NO Renewals and Replacement RAB to Salary Allocation adjustment					-0.08	0.00	0.00	0.00	0.00	-0.08
NO - Corporate Scope and Reallocation				0.00	0.06	0.06	0.06	0.06	0.18	0.24
Sub Total adjustments	0.00	0.00	-0.22	-0.04	2.79	2.99	-5.36	-5.45	-7.83	-5.04
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS										
Water Delivery & Other Operations	0.00	1.16	0.41	0.46	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.02	0.06	1.07	0.67	0.00	0.00	0.67	1.74
Routine Maintenance	0.00	0.00	0.00	0.15	0.02	0.03	0.03	0.05	0.10	0.12
Asset Management Planning	0.00	0.00	0.00	0.24	0.16	0.11	0.20	0.17	0.48	0.63
Dam Safety Compliance	0.00	0.00	0.00	3.46	0.51	1.19	0.89	0.21	2.29	2.80
Environmental Planning & Protection	[redacted]									
Corporate Systems	1.34	0.18	1.60	3.47	0.36	0.79	1.84	0.81	3.43	3.79
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.55	1.02	0.00	0.00	0.00	0.00	1.02
Renewals and Replacement	0.11	0.23	0.42	3.08	0.23	0.74	1.49	1.11	3.34	3.57
Dam safety compliance on pre 1997 capital projects	9.64	12.83	17.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.01	0.01	0.06	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total pre-efficiency	11.23	14.48	20.36	11.60	8.22	8.11	4.51	2.34	14.96	23.18
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)										
Continuing Efficiency (%)				0.00%	0.70%	1.40%	2.09%	2.77%		
Continuing Efficiency ($M)				0.00	-0.06	-0.11	-0.09	-0.06	-0.27	-0.33
Catch-up efficiency (%)				0.00%	2.11%	4.22%	6.83%	7.44%		
Catch-up efficiency ($M)				0.00	-0.17	-0.34	-0.30	-0.17	-0.81	-0.98
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE										
($M 2020/21) year ending June	2018	2019	2020	2021	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	0.0	1.2	0.4	0.5	0.0	0.0	0.0	0.0	0.00	0.00
Flood Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Hydrometric Monitoring	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Water Quality Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corrective Maintenance	0.0	0.0	0.0	0.1	1.0	0.6	0.0	0.0	0.64	1.68
Routine Maintenance	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.09	0.11
Asset Management Planning	0.0	0.0	0.0	0.2	0.2	0.1	0.2	0.2	0.44	0.59
Dam Safety Compliance	0.0	0.0	0.0	3.5	0.5	1.1	0.8	0.2	2.12	2.62
Environmental Planning & Protection	[redacted]									
Corporate Systems	1.3	0.2	1.6	3.5	0.3	0.7	1.7	0.7	3.15	3.50
Drought projects (3 dams)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Drought projects (other)	0.0	0.0	0.0	0.5	1.0	0.0	0.0	0.0	0.00	1.00
Renewals and Replacement	0.1	0.2	0.4	3.1	0.2	0.7	1.4	1.0	3.06	3.28
Dam safety compliance on pre 1997 capital projects	9.6	12.8	17.4	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Structural and other enhancements	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Customer support	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Internal corporate projects	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Total Efficient Expenditure	[redacted]									
User Share Capital Expenditure	*1.5*	*1.6*	*2.8*	*9.0*	*5.8*	*6.3*	*3.5*	*1.9*	*11.7*	*17.5*
Government Share Capital Expenditure	*9.7*	*12.9*	*17.6*	*2.6*	*2.2*	*1.3*	*0.6*	*0.2*	*2.1*	*4.3*

Table A-6 – Operating Expenditure Namoi

WATERNSW RURAL BULK WATER PROPOSAL - OPEX - Namoi Valley											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.07	0.05	0.05	0.03	0.09	0.15	0.13	0.13	0.13	0.13	0.13
Customer Billing	0.10	0.09	0.07	0.06	0.11	-0.02	0.05	0.05	0.04	0.04	0.04
Metering and Compliance	0.23	0.35	0.21	0.17	0.09	0.06	0.02	0.02	0.02	0.02	0.02
Water Delivery and Other Operations	0.56	0.39	0.44	0.54	0.59	0.52	0.89	0.72	0.67	0.76	0.71
Flood Operations	0.06	0.02	0.07	0.04	0.08	0.01	0.19	0.17	0.20	0.20	0.19
Hydrometric Monitoring	0.67	0.67	1.07	0.82	0.78	0.65	0.55	0.52	0.52	0.57	0.55
Water Quality Monitoring	0.02	0.06	0.07	0.04	0.07	0.06	0.07	0.07	0.07	0.08	0.07
Corrective Maintenance	0.37	0.28	0.18	0.37	0.18	0.35	0.44	0.44	0.43	0.46	0.45
Routine Maintenance	1.24	1.30	1.45	1.60	1.63	2.11	1.64	1.59	1.58	1.71	1.75
Asset management planning	0.26	0.22	0.14	0.09	0.03	-0.01	0.31	0.16	0.38	0.34	0.24
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.48	0.42	0.41	0.49	0.31	0.35	0.56	0.49	0.73	0.68	0.61
Environmental Planning and Protection	0.12	0.05	0.00	0.01	0.01	0.00	0.08	0.04	0.04	0.07	0.06
Direct Insurances	0.15	0.00	0.00	0.23	0.72	0.69	0.40	0.40	0.40	0.40	0.40
Renewal and Replacement	0.00	0.00	0.00	0.08	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.06	0.00	0.00	0.00	0.02	0.61	0.37	0.35	0.55	0.58	0.57
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Namoi Valley - Total Operating Expenditure	**4.41**	**3.90**	**4.18**	**4.59**	**4.72**	**5.54**	**5.71**	**5.16**	**5.75**	**6.02**	**5.78**
Atkins/Cardno recommended scope adjustments											
Customer Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00
Customer Billing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Delivery and Other Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	-0.04	-0.07	-0.09
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	-0.06	-0.03	-0.07
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	-0.04	-0.02
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.02	-0.04	-0.05
Routine Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.03	-0.12	-0.07
Asset management planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	-0.02	-0.01
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	-0.12	-0.08	-0.12
Environmental Planning and Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	-0.04	-0.07	-0.06
Direct Insurances	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	-0.03	-0.02
Renewal and Replacement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	-0.18	-0.21	-0.20
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub Total adjustments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	-0.41	-0.73	-0.71
Atkins/Cardno recommended efficiency targets											
Continuing Efficiency (%)								0.70%	1.40%	2.09%	2.77%
Continuing Efficiency ($M)								-0.04	-0.07	-0.11	-0.14
Catch-up efficiency (%)								1.10%	2.19%	3.26%	4.33%
Catch-up efficiency ($M)								-0.06	-0.12	-0.17	-0.21
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.07	0.05	0.05	0.03	0.09	0.15	0.13	0.13	0.12	0.11	0.11
Customer Billing	0.10	0.09	0.07	0.06	0.11	-0.02	0.05	0.05	0.04	0.04	0.04
Metering and Compliance	0.23	0.35	0.21	0.17	0.09	0.06	0.02	0.02	0.02	0.02	0.02
Water Delivery and Other Operations	0.56	0.39	0.44	0.54	0.59	0.52	0.89	0.68	0.61	0.65	0.57
Flood Operations	0.06	0.02	0.07	0.04	0.08	0.01	0.19	0.13	0.13	0.16	0.11
Hydrometric Monitoring	0.67	0.67	1.07	0.82	0.78	0.65	0.55	0.53	0.51	0.50	0.49
Water Quality Monitoring	0.02	0.06	0.07	0.04	0.07	0.06	0.07	0.07	0.07	0.07	0.07
Corrective Maintenance	0.37	0.28	0.18	0.37	0.18	0.35	0.44	0.42	0.39	0.39	0.37
Routine Maintenance	1.24	1.30	1.45	1.60	1.63	2.11	1.64	1.61	1.54	1.50	1.57
Asset management planning	0.26	0.22	0.14	0.09	0.03	-0.01	0.31	0.17	0.38	0.30	0.21
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.48	0.42	0.41	0.49	0.31	0.35	0.56	0.46	0.59	0.57	0.46
Environmental Planning and Protection	0.12	0.05	0.00	0.01	0.01	0.00	0.08	0.00	0.00	0.00	0.00
Direct Insurances	0.15	0.00	0.00	0.23	0.72	0.69	0.40	0.41	0.40	0.36	0.36
Renewal and Replacement	0.00	0.00	0.00	0.08	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.06	0.00	0.00	0.00	0.02	0.61	0.37	0.42	0.36	0.35	0.34
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Efficient Expenditure	4.41	3.90	4.18	4.59	4.72	5.54	5.71	5.10	5.15	5.02	4.72

A.4. Peel

Table A-7 - Capital Expenditure Peel

WATERNSW RURAL BULK WATER PROPOSAL - CAPEX - PEEL										
($M 2020/21) year ending June	2018	2019	2020	2021	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.05	0.01	0.01	0.01	0.02	0.04	0.05
Asset Management Planning	0.00	0.00	0.00	0.06	0.06	0.05	0.07	0.06	0.18	0.24
Dam Safety Compliance	0.00	0.00	0.00	0.07	0.17	0.12	0.17	0.10	0.39	0.56
Environmental Planning & Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.26	0.03	0.21	0.86	0.38	0.35	0.34	0.24	0.94	1.32
Drought projects (3 dams)	0.00	0.00	5.94	75.01	22.18	0.53	0.53	0.52	1.58	23.76
Drought projects (other)	0.00	0.00	25.08	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	0.04	0.10	0.39	0.63	0.18	0.18	0.19	0.18	0.55	0.73
Dam safety compliance on pre 1997 capital projects	0.54	0.12	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total capex proposed by WNSW	0.90	0.25	31.75	76.71	22.98	1.24	1.31	1.13	3.68	26.66
Atkins/Cardno recommended adjustments for specific programs or projects										
PDMP reallocation from Corporate to Drought projects (3 dams)			0.77	0.14						
Water Delivery & Other Operations - Corporate Systems FY20 miscoding			0.01							
Flood operations - Corporate Systems FY20 miscoding			0.00							
Hydrometric monitoring - Corporate Systems FY20 miscoding			0.01							
Asset management planning - Corporate Systems FY20 miscoding			0.00							
Dam safety compliance pre1997 - Corporate Systems FY20 miscoding			0.01							
Environmental Planning & Protection - Corporate Systems FY20 miscoding			0.00							
Renewals and Replacement - Corporate Systems FY20 miscoding			0.01							
Corporate Systems - Corporate Systems FY20 miscoding			-0.04							
PE Corporate Systems RAB to Salary Allocation adjustment					-0.28	-0.17	-0.15	-0.15	-0.46	-0.74
PE Dam Safety Compliance RAB to Salary Allocation adjustment					-0.03	-0.05	-0.05	-0.08	-0.19	-0.21
PE Asset management planning RAB to Salary Allocation adjustment					-0.02	-0.03	-0.02	-0.02	-0.07	-0.09
PE Routine maintenance RAB to Salary Allocation adjustment					-0.01	0.00	0.00	-0.01	-0.01	-0.02
PE Renewals and Replacement RAB to Salary Allocation adjustment					-0.02	0.00	0.00	0.00	0.00	-0.02
PE - Corporate Scope and Reallocation				0.00	0.02	0.02	0.02	0.02	0.05	0.06
Sub Total adjustments	0.00	0.00	0.77	0.14	-0.34	-0.24	-0.21	-0.24	-0.69	-1.02
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS										
Water Delivery & Other Operations	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.05	0.01	0.01	0.01	0.01	0.02	0.03
Asset Management Planning	0.00	0.00	0.00	0.06	0.04	0.03	0.05	0.04	0.12	0.15
Dam Safety Compliance	0.00	0.00	0.00	0.07	0.14	0.07	0.11	0.02	0.20	0.34
Environmental Planning & Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.26	0.03	0.17	0.86	0.10	0.18	0.19	0.10	0.47	0.57
Drought projects (3 dams)	0.00	0.00	6.71	75.15	22.18	0.53	0.53	0.52	1.58	23.76
Drought projects (other)	0.00	0.00	25.08	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	0.04	0.10	0.40	0.63	0.16	0.18	0.19	0.18	0.55	0.72
Dam safety compliance on pre 1997 capital projects	0.54	0.12	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total pre-efficiency	0.90	0.25	32.52	76.85	22.63	0.99	1.08	0.87	2.94	25.57
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)										
Continuing Efficiency (%)				0.00%	0.70%	1.40%	2.09%	2.77%		
Continuing Efficiency ($M)				0.00	-0.16	-0.01	-0.02	-0.02	-0.06	-0.22
Catch-up efficiency (%)				0.00%	2.11%	4.22%	6.83%	7.44%		
Catch-up efficiency ($M)				0.00	-0.47	-0.04	-0.07	-0.06	-0.18	-0.65
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE										
($M 2020/21) year ending June	2018	2019	2020	2021	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Flood Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Hydrometric Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Water Quality Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corrective Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Routine Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.03
Asset Management Planning	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.11	0.14
Dam Safety Compliance	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.18	0.32
Environmental Planning & Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corporate Systems	0.3	0.0	0.2	0.9	0.1	0.2	0.2	0.1	0.44	0.53
Drought projects (3 dams)	0.0	0.0	6.7	75.2	21.6	0.5	0.5	0.5	1.45	23.01
Drought projects (other)	0.0	0.0	25.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Renewals and Replacement	0.0	0.1	0.4	0.6	0.2	0.2	0.2	0.2	0.51	0.67
Dam safety compliance on pre 1997 capital projects	0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Structural and other enhancements	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Customer support	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Internal corporate projects	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Total Efficient Expenditure	**0.9**	**0.2**	**32.5**	**76.9**	**22.0**	**0.94**	**1.0**	**0.8**	**2.7**	**24.7**
User Share Capital Expenditure	*0.4*	*0.1*	*0.6*	*1.6*	*0.4*	*0.4*	*0.4*	*0.3*	*1.1*	*1.5*
Government Share Capital Expenditure	*0.5*	*0.1*	*31.9*	*75.3*	*21.6*	*0.6*	*0.5*	*0.5*	*1.6*	*23.2*

Table A-8 – Operating Expenditure Peel

WATERNSW RURAL BULK WATER PROPOSAL - OPEX - Peel Valley											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.01	0.03	0.02	0.01	0.01	0.07	0.23	0.23	0.22	0.22	0.22
Customer Billing	0.07	0.06	0.04	0.03	0.06	0.00	0.01	0.01	0.01	0.01	0.01
Metering and Compliance	0.09	0.09	0.04	0.05	0.05	0.10	0.05	0.05	0.05	0.05	0.04
Water Delivery and Other Operations	0.13	0.17	0.22	0.20	0.30	0.68	0.39	0.34	0.34	0.34	0.33
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.21	0.21	0.16	0.15	0.15	0.18	0.09	0.09	0.09	0.09	0.09
Water Quality Monitoring	0.01	0.02	0.03	0.01	0.02	0.03	0.02	0.02	0.02	0.02	0.02
Corrective Maintenance	0.07	0.03	0.06	0.06	0.06	0.07	0.04	0.04	0.04	0.04	0.04
Routine Maintenance	0.17	0.15	0.23	0.23	0.22	0.20	0.18	0.18	0.18	0.19	0.19
Asset management planning	0.11	0.09	0.05	0.03	0.01	0.00	0.05	0.04	0.09	0.03	0.03
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.20	0.18	0.24	0.23	0.19	0.19	0.19	0.21	0.23	0.24	0.23
Environmental Planning and Protection	0.04	0.02	0.01	0.00	0.00	0.07	0.01	0.01	0.01	0.01	0.01
Direct Insurances	0.04	0.00	0.00	0.08	0.07	0.05	0.03	0.03	0.03	0.03	0.03
Renewal and Replacement	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.02	0.00	0.00	0.00	0.00	0.09	0.06	0.06	0.10	0.10	0.10
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Peel Valley - Total Operating Expenditure	**1.18**	**1.05**	**1.09**	**1.24**	**1.13**	**1.74**	**1.37**	**1.30**	**1.40**	**1.38**	**1.35**
Atkins/Cardno recommended scope adjustments											
Customer Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
Customer Billing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Delivery and Other Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Asset management planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	-0.01
Environmental Planning and Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.07	0.07
Direct Insurances	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewal and Replacement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	-0.03	-0.03	-0.03
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub Total adjustments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.04	0.03	0.06
Atkins/Cardno recommended efficiency targets											
Continuing Efficiency (%)								0.70%	1.40%	2.09%	2.77%
Continuing Efficiency ($M)								-0.01	-0.02	-0.03	-0.04
Catch-up efficiency (%)								1.10%	2.19%	3.26%	4.33%
Catch-up efficiency ($M)								-0.02	-0.03	-0.05	-0.06
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.01	0.03	0.02	0.01	0.01	0.07	0.23	0.23	0.21	0.21	0.21
Customer Billing	0.07	0.06	0.04	0.03	0.06	0.00	0.01	0.01	0.01	0.01	0.01
Metering and Compliance	0.09	0.09	0.04	0.05	0.05	0.10	0.05	0.05	0.05	0.04	0.04
Water Delivery and Other Operations	0.13	0.17	0.22	0.20	0.30	0.68	0.39	0.35	0.33	0.32	0.32
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.21	0.21	0.16	0.15	0.15	0.18	0.09	0.09	0.09	0.09	0.09
Water Quality Monitoring	0.01	0.02	0.03	0.01	0.02	0.03	0.02	0.02	0.02	0.02	0.02
Corrective Maintenance	0.07	0.03	0.06	0.06	0.06	0.07	0.04	0.04	0.04	0.04	0.04
Routine Maintenance	0.17	0.15	0.23	0.23	0.22	0.20	0.18	0.18	0.18	0.18	0.19
Asset management planning	0.11	0.09	0.05	0.03	0.01	0.00	0.05	0.04	0.09	0.03	0.03
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.20	0.18	0.24	0.23	0.19	0.19	0.19	0.21	0.21	0.23	0.21
Environmental Planning and Protection	0.04	0.02	0.01	0.00	0.00	0.07	0.01	0.07	0.07	0.07	0.07
Direct Insurances	0.04	0.00	0.00	0.08	0.07	0.05	0.03	0.03	0.03	0.03	0.03
Renewal and Replacement	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.02	0.00	0.00	0.00	0.00	0.09	0.06	0.07	0.06	0.07	0.06
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Efficient Expenditure	1.18	1.05	1.09	1.24	1.13	1.74	1.37	1.39	1.39	1.34	1.31

A.5. Lachlan

Table A-9 - Capital Expenditure Lachlan

WATERNSW RURAL BULK WATER PROPOSAL - CAPEX - LACHLAN										
($M 2020/21) year ending June	2018	2019	2020	2021	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	0.00	1.50	0.12	0.21	1.43	1.04	0.00	0.00	1.04	2.47
Flood Operations	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.04	0.03	0.03	0.03	0.04	0.10	0.13
Asset Management Planning	0.00	0.00	0.00	0.14	0.16	0.14	0.18	0.16	0.47	0.63
Dam Safety Compliance	0.00	0.00	0.00	2.28	4.55	0.73	0.69	0.63	2.06	6.61
Environmental Planning & Protection	0.02	0.01	2.10	0.15	1.22	1.23	12.26	12.10	25.60	26.81
Corporate Systems	0.85	0.10	2.80	1.95	0.99	0.91	1.20	1.02	3.13	4.11
Drought projects (3 dams)	0.00	0.00	7.59	67.96	47.47	1.05	1.05	1.04	3.14	50.61
Drought projects (other)	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	1.18	2.13	3.49	6.85	3.79	14.07	5.25	3.01	22.32	26.12
Dam safety compliance on pre 1997 capital projects	0.15	0.02	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.10	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total capex proposed by WNSW	2.21	3.86	16.35	79.59	59.64	19.20	20.66	17.99	57.85	117.50
Atkins/Cardno recommended adjustments for specific programs or projects										
PDMP reallocation from Corporate to Drought projects (3 dams)			0.66	0.12						
Water Delivery & Other Operations - Corporate Systems FY20 miscoding			0.14							
Flood operations - Corporate Systems FY20 miscoding			0.02							
Hydrometric monitoring - Corporate Systems FY20 miscoding			0.17							
Asset management planning - Corporate Systems FY20 miscoding			0.00							
Dam safety compliance pre1997 - Corporate Systems FY20 miscoding			0.07							
Environmental Planning & Protection - Corporate Systems FY20 miscoding			0.02							
Renewals and Replacement - Corporate Systems FY20 miscoding			0.08							
Corporate Systems - Corporate Systems FY20 miscoding			-0.50							
Lake Cargelligo Embankment upgrade reallocation from Renewal and Replacement						-7.72				
Lake Cargelligo Embankment upgrade reallocation to Dam Safety Compliance						7.72				
Lake Cargelligo Embankment upgrade - business case alignment						-1.28				
WYGL Fish Passage Offset contigency adjustment				-0.2	-1.2	-1.2	-12.1	-10.6	-23.91	-25.13
LA Corporate Systems RAB to Salary Allocation adjustment					0.00	0.00	0.00	0.00	0.01	0.01
LA Dam Safety Compliance RAB to Salary Allocation adjustment					0.00	0.00	0.00	0.01	0.01	0.01
LA Asset management planning RAB to Salary Allocation adjustment					0.00	0.00	0.00	0.00	0.00	0.00
LA Routine maintenance RAB to Salary Allocation adjustment					0.00	0.00	0.00	0.00	0.00	0.00
LA Renewals and Replacement RAB to Salary Allocation adjustment					0.00	0.00	0.00	0.00	0.00	0.00
LA - Corporate Scope and Reallocation				0.00	0.08	0.08	0.08	0.08	0.23	0.31
Sub Total adjustments	0.00	0.00	0.66	-0.03	-1.13	-2.43	-12.03	-10.48	-23.66	-24.79
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS										
Water Delivery & Other Operations	0.00	1.50	0.26	0.21	1.43	1.04	0.00	0.00	1.04	2.47
Flood Operations	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.04	0.03	0.03	0.03	0.04	0.10	0.13
Asset Management Planning	0.00	0.00	0.00	0.14	0.16	0.14	0.18	0.16	0.47	0.63
Dam Safety Compliance	0.00	0.00	0.00	2.28	4.55	7.17	0.70	0.63	8.51	13.06
Environmental Planning & Protection	0.02	0.01	2.12	0.00	0.00	0.00	0.15	1.53	1.68	1.68
Corporate Systems	0.85	0.10	2.30	1.95	1.07	0.99	1.28	1.10	3.37	4.44
Drought projects (3 dams)	0.00	0.00	8.25	68.09	47.47	1.05	1.05	1.04	3.14	50.61
Drought projects (other)	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	1.18	2.13	3.57	6.85	3.79	6.34	5.25	3.01	14.60	18.39
Dam safety compliance on pre 1997 capital projects	0.15	0.02	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.10	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total pre-efficiency	2.21	3.86	17.01	79.56	58.51	16.77	8.63	7.51	32.91	91.42
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)										
Continuing Efficiency (%)				0.00%	0.70%	1.40%	2.09%	2.77%		
Continuing Efficiency ($M)				0.00	-0.41	-0.23	-0.18	-0.21	-0.62	-1.03
Catch-up efficiency (%)				0.00%	2.11%	4.22%	6.83%	7.44%		
Catch-up efficiency ($M)				0.00	-1.23	-0.70	-0.58	-0.54	-1.82	-3.04
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE										
($M 2020/21) year ending June	2018	2019	2020	2021	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	0.0	1.5	0.3	0.2	1.4	1.0	0.0	0.0	0.98	2.37
Flood Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Hydrometric Monitoring	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Water Quality Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corrective Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Routine Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.09	0.12
Asset Management Planning	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.1	0.43	0.59
Dam Safety Compliance	0.0	0.0	0.0	2.3	4.4	6.8	0.6	0.6	7.98	12.41
Environmental Planning & Protection	0.0	0.0	2.1	0.0	0.0	0.0	0.1	1.4	1.52	1.52
Corporate Systems	0.9	0.1	2.3	1.9	1.0	0.9	1.2	1.0	3.09	4.13
Drought projects (3 dams)	0.0	0.0	8.2	68.1	46.1	1.0	1.0	0.9	2.89	49.03
Drought projects (other)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Renewals and Replacement	1.2	2.1	3.6	6.8	3.7	6.0	4.8	2.7	13.49	17.17
Dam safety compliance on pre 1997 capital projects	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Structural and other enhancements	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Customer support	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Internal corporate projects	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Total Efficient Expenditure	**2.2**	**3.9**	**17.0**	**79.6**	**56.9**	**15.8**	**7.9**	**6.8**	**30.5**	**87.3**
User Share Capital Expenditure	*1.9*	*3.6*	*7.1*	*9.6*	*9.4*	*12.9*	*6.3*	*5.1*	*24.3*	*33.7*
Government Share Capital Expenditure	*0.3*	*0.2*	*10.0*	*69.9*	*47.5*	*2.9*	*1.6*	*1.7*	*6.2*	*53.7*

Table A-10 – Operating Expenditure Lachlan

WATERNSW RURAL BULK WATER PROPOSAL - OPEX - Lachlan Valley											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.10	0.07	0.07	0.06	0.03	0.24	0.14	0.13	0.13	0.14	0.14
Customer Billing	0.10	0.10	0.08	0.07	0.12	-0.04	0.05	0.05	0.05	0.05	0.05
Metering and Compliance	0.47	0.35	0.20	0.25	0.24	0.26	0.28	0.30	0.28	0.28	0.25
Water Delivery and Other Operations	0.67	0.61	0.85	0.80	0.97	1.03	1.20	1.37	1.08	1.22	1.14
Flood Operations	0.14	0.19	0.25	0.07	0.07	0.01	0.19	0.17	0.20	0.20	0.19
Hydrometric Monitoring	0.81	0.78	0.54	1.09	0.95	0.95	0.77	0.77	0.75	0.83	0.81
Water Quality Monitoring	0.04	0.05	0.12	0.06	0.17	0.14	0.22	0.21	0.21	0.22	0.22
Corrective Maintenance	0.38	0.51	0.44	0.44	0.33	0.52	0.42	0.41	0.40	0.43	0.42
Routine Maintenance	1.56	1.35	1.64	1.78	1.86	2.53	2.24	2.26	2.21	2.39	2.53
Asset management planning	0.31	0.25	0.16	0.12	0.06	0.04	0.39	0.47	0.83	0.66	0.52
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.79	0.69	0.99	0.48	0.53	0.78	0.54	0.54	0.62	0.72	0.67
Environmental Planning and Protection	0.13	0.05	0.01	0.00	0.00	0.00	0.10	0.12	0.09	0.15	0.13
Direct Insurances	0.17	0.00	0.00	0.29	0.90	0.86	0.51	0.51	0.51	0.51	0.51
Renewal and Replacement	0.00	0.00	0.00	0.15	0.03	0.04	0.01	0.01	0.83	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.08	0.00	0.00	0.00	0.00	0.44	0.25	0.24	0.45	0.47	0.46
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.00
Lachlan Valley - Total Operating Expenditure	**5.74**	**5.00**	**5.35**	**5.69**	**6.29**	**7.81**	**7.29**	**7.55**	**8.63**	**8.28**	**8.04**
Atkins/Cardno recommended scope adjustments											
Customer Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	-0.02	-0.02
Customer Billing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01
Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	-0.01	-0.04	-0.03
Water Delivery and Other Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.20	-0.05	-0.18	-0.17
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06	-0.07	-0.04	-0.08
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.07	-0.03	-0.11	-0.09
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	-0.01	-0.03	-0.03
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	-0.01	-0.06	-0.05
Routine Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.19	-0.08	-0.32	-0.30
Asset management planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	-0.03	-0.09	-0.06
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05	-0.02	-0.10	-0.08
Environmental Planning and Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.12	-0.09	-0.15	-0.13
Direct Insurances	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	-0.02	-0.07	-0.06
Renewal and Replacement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	-0.18	-0.21	-0.20
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub Total adjustments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.84	-0.63	-1.42	-1.29
Atkins/Cardno recommended efficiency targets											
Continuing Efficiency (%)								0.70%	1.40%	2.09%	2.77%
Continuing Efficiency ($M)								-0.05	-0.11	-0.14	-0.19
Catch-up efficiency (%)								1.10%	2.19%	3.26%	4.33%
Catch-up efficiency ($M)								-0.07	-0.17	-0.22	-0.28
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.10	0.07	0.07	0.06	0.03	0.24	0.14	0.12	0.12	0.11	0.11
Customer Billing	0.10	0.10	0.08	0.07	0.12	-0.04	0.05	0.05	0.05	0.04	0.04
Metering and Compliance	0.47	0.35	0.20	0.25	0.24	0.26	0.28	0.27	0.26	0.23	0.21
Water Delivery and Other Operations	0.67	0.61	0.85	0.80	0.97	1.03	1.20	1.15	0.99	0.98	0.91
Flood Operations	0.14	0.19	0.25	0.07	0.07	0.01	0.19	0.11	0.12	0.15	0.10
Hydrometric Monitoring	0.81	0.78	0.54	1.09	0.95	0.95	0.77	0.69	0.69	0.68	0.66
Water Quality Monitoring	0.04	0.05	0.12	0.06	0.17	0.14	0.22	0.19	0.19	0.18	0.18
Corrective Maintenance	0.38	0.51	0.44	0.44	0.33	0.52	0.42	0.37	0.38	0.35	0.35
Routine Maintenance	1.56	1.35	1.64	1.78	1.86	2.53	2.24	2.03	2.05	1.96	2.08
Asset management planning	0.31	0.25	0.16	0.12	0.06	0.04	0.39	0.42	0.78	0.54	0.43
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.79	0.69	0.99	0.48	0.53	0.78	0.54	0.48	0.58	0.59	0.55
Environmental Planning and Protection	0.13	0.05	0.01	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00
Direct Insurances	0.17	0.00	0.00	0.29	0.90	0.86	0.51	0.45	0.47	0.41	0.42
Renewal and Replacement	0.00	0.00	0.00	0.15	0.03	0.04	0.01	0.00	0.77	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.08	0.00	0.00	0.00	0.00	0.44	0.25	0.26	0.26	0.25	0.24
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.00
Total Efficient Expenditure	5.74	5.00	5.35	5.69	6.29	7.81	7.29	6.60	7.72	6.49	6.28

A.6. Macquarie

Table A-11 - Capital Expenditure Macquarie

WATERNSW RURAL BULK WATER PROPOSAL - CAPEX - MACQUARIE										
($M 2020/21) year ending June	2018	2019	2020	2021	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	0.02	1.52	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	1.51	0.32	-1.72	0.09	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.03	0.02	0.02	0.02	0.03	0.08	0.10
Asset Management Planning	0.00	0.00	0.17	0.11	0.12	0.11	0.14	0.12	0.36	0.49
Dam Safety Compliance	0.00	0.00	0.00	0.12	0.32	0.65	1.02	0.31	1.99	2.31
Environmental Planning & Protection	-0.01	0.00	0.00	0.15	0.55	0.56	6.07	5.98	12.61	13.16
Corporate Systems	0.69	-0.31	1.09	1.91	0.76	0.70	1.62	1.18	3.50	4.26
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	9.13	3.87	0.40	0.41	0.40	0.40	1.21	1.61
Renewals and Replacement	1.85	2.04	2.56	4.39	2.51	3.51	3.41	2.60	9.52	12.03
Dam safety compliance on pre 1997 capital projects	0.09	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total capex proposed by WNSW	4.15	3.61	11.37	10.68	4.69	5.95	12.68	10.64	29.27	33.96
Atkins/Cardno recommended adjustments for specific programs or projects										
PDMP reallocation from Corporate to Drought projects (3 dams)			-0.28	-0.05						
Water Delivery & Other Operations - Corporate Systems FY20 miscoding			0.05							
Flood operations - Corporate Systems FY20 miscoding			0.01							
Hydrometric monitoring - Corporate Systems FY20 miscoding			0.07							
Asset management planning - Corporate Systems FY20 miscoding			0.00							
Dam safety compliance pre1997 - Corporate Systems FY20 miscoding			0.03							
Environmental Planning & Protection - Corporate Systems FY20 miscoding			0.01							
Renewals and Replacement - Corporate Systems FY20 miscoding			0.03							
Corporate Systems - Corporate Systems FY20 miscoding			-0.20							
BNDG Fish Passage Offsets contingency adjustment				-0.15	-0.55	-0.56	-5.91	-5.28	-11.76	-12.31
MA Corporate Systems RAB to Salary Allocation adjustment					0.25	0.15	0.13	0.13	0.41	0.65
MA Dam Safety Compliance RAB to Salary Allocation adjustment					0.02	0.05	0.05	0.07	0.17	0.19
MA Asset management planning RAB to Salary Allocation adjustment					0.02	0.02	0.02	0.02	0.06	0.08
MA Routine maintenance RAB to Salary Allocation adjustment					0.01	0.00	0.00	0.00	0.01	0.02
MA Renewals and Replacement RAB to Salary Allocation adjustment					0.01	0.00	0.00	0.00	0.00	0.01
MA - Corporate Scope and Reallocation				0.00	0.07	0.07	0.07	0.07	0.22	0.29
Sub Total adjustments	0.00	0.00	-0.28	-0.21	-0.17	-0.27	-5.64	-4.99	-10.89	-11.06
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS										
Water Delivery & Other Operations	0.02	1.52	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	1.51	0.32	-1.72	0.09	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.03	0.03	0.03	0.03	0.04	0.09	0.12
Asset Management Planning	0.00	0.00	0.17	0.11	0.14	0.13	0.15	0.14	0.42	0.56
Dam Safety Compliance	0.00	0.00	0.00	0.12	0.34	0.70	1.07	0.39	2.16	2.50
Environmental Planning & Protection	-0.01	0.00	0.01	0.00	0.00	0.00	0.15	0.70	0.85	0.85
Corporate Systems	0.69	-0.31	0.61	1.86	1.08	0.92	1.83	1.39	4.13	5.21
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	9.13	3.87	0.40	0.41	0.40	0.40	1.21	1.61
Renewals and Replacement	1.85	2.04	2.59	4.39	2.52	3.51	3.41	2.60	9.52	12.04
Dam safety compliance on pre 1997 capital projects	0.09	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total pre-efficiency	4.15	3.61	11.09	10.47	4.52	5.68	7.04	5.65	18.38	22.90
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)										
Continuing Efficiency (%)				0.00%	0.70%	1.40%	2.09%	2.77%		
Continuing Efficiency ($M)				0.00	-0.03	-0.08	-0.15	-0.16	-0.38	-0.41
Catch-up efficiency (%)				0.00%	2.11%	4.22%	6.83%	7.44%		
Catch-up efficiency ($M)				0.00	-0.09	-0.24	-0.47	-0.41	-1.12	-1.21
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE										
($M 2020/21) year ending June	2018	2019	2020	2021	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	0.0	1.5	0.2	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Flood Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Hydrometric Monitoring	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Water Quality Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corrective Maintenance	1.5	0.3	-1.7	0.1	0.0	0.0	0.0	0.0	0.00	0.00
Routine Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.08	0.11
Asset Management Planning	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.38	0.52
Dam Safety Compliance	0.0	0.0	0.0	0.1	0.3	0.7	1.0	0.4	1.99	2.32
Environmental Planning & Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.77	0.77
Corporate Systems	0.7	-0.3	0.6	1.9	1.0	0.9	1.7	1.2	3.78	4.83
Drought projects (3 dams)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Drought projects (other)	0.0	0.0	9.1	3.9	0.4	0.4	0.4	0.4	1.11	1.50
Renewals and Replacement	1.8	2.0	2.6	4.4	2.5	3.3	3.1	2.3	8.77	11.22
Dam safety compliance on pre 1997 capital projects	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Structural and other enhancements	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Customer support	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Internal corporate projects	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Total Efficient Expenditure	**4.1**	**3.6**	**11.1**	**10.5**	**4.4**	**5.4**	**6.4**	**5.1**	**16.9**	**21.3**
User Share Capital Expenditure	*3.9*	*3.4*	*1.7*	*6.1*	*3.6*	*4.5*	*5.3*	*4.2*	*14.0*	*17.6*
Government Share Capital Expenditure	*0.3*	*0.2*	*9.4*	*4.4*	*0.8*	*0.9*	*1.1*	*0.9*	*2.9*	*3.7*

Table A-12 – Operating Expenditure Macquarie

WATERNSW RURAL BULK WATER PROPOSAL - OPEX - Macquarie Valley											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.10	0.09	0.07	0.04	0.04	0.24	0.17	0.17	0.16	0.17	0.17
Customer Billing	0.11	0.11	0.08	0.07	0.13	-0.03	0.05	0.05	0.05	0.05	0.05
Metering and Compliance	0.46	0.38	0.28	0.20	0.14	0.17	0.10	0.10	0.09	0.09	0.09
Water Delivery and Other Operations	0.90	0.89	0.58	0.61	0.91	0.97	0.95	0.94	0.86	0.97	0.92
Flood Operations	0.06	0.02	0.09	0.06	0.08	0.10	0.19	0.17	0.20	0.20	0.19
Hydrometric Monitoring	0.65	0.62	0.96	0.89	0.87	0.81	0.59	0.58	0.57	0.64	0.62
Water Quality Monitoring	0.05	0.07	0.09	0.03	0.15	0.11	0.06	0.06	0.06	0.06	0.06
Corrective Maintenance	0.40	0.40	1.35	0.21	0.49	0.26	0.12	0.11	0.11	0.12	0.12
Routine Maintenance	1.14	1.36	1.27	1.55	1.96	2.47	2.47	2.43	2.41	2.60	2.68
Asset management planning	0.46	0.39	0.26	0.17	0.05	-0.01	0.27	0.22	0.53	0.44	0.38
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.49	0.42	0.31	0.38	0.34	0.33	0.44	0.41	0.68	0.88	0.63
Environmental Planning and Protection	0.22	0.09	0.01	0.00	0.00	0.00	0.07	0.06	0.05	0.10	0.08
Direct Insurances	0.28	0.00	0.00	0.40	0.96	0.89	0.53	0.53	0.53	0.53	0.53
Renewal and Replacement	0.01	0.00	0.12	0.24	0.03	0.02	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.08	0.00	0.00	0.00	0.00	0.97	0.39	0.38	0.65	0.68	0.67
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.05	0.04	0.01	0.09	0.08	0.08	0.08	0.08
Macquarie Valley - Total Operating Expenditure	**5.42**	**4.83**	**5.48**	**4.89**	**6.17**	**7.30**	**6.50**	**6.30**	**7.05**	**7.62**	**7.26**
Atkins/Cardno recommended scope adjustments											
Customer Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	-0.01	-0.01
Customer Billing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00
Water Delivery and Other Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	-0.07	-0.05
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	-0.03	-0.02	-0.04
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	-0.04	-0.03
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01
Routine Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.03	-0.19	-0.21
Asset management planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	-0.03	-0.02
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.11	-0.11	-0.13
Environmental Planning and Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06	-0.05	-0.10	-0.08
Direct Insurances	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	-0.04	-0.03
Renewal and Replacement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	-0.24	-0.28	-0.27
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00
Sub Total adjustments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	-0.37	-0.91	-0.89
Atkins/Cardno recommended efficiency targets											
Continuing Efficiency (%)								0.70%	1.40%	2.09%	2.77%
Continuing Efficiency ($M)								-0.05	-0.09	-0.14	-0.18
Catch-up efficiency (%)								1.10%	2.19%	3.26%	4.33%
Catch-up efficiency ($M)								-0.07	-0.14	-0.21	-0.27
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.10	0.09	0.07	0.04	0.04	0.24	0.17	0.17	0.16	0.15	0.15
Customer Billing	0.11	0.11	0.08	0.07	0.13	-0.03	0.05	0.05	0.05	0.04	0.04
Metering and Compliance	0.46	0.38	0.28	0.20	0.14	0.17	0.10	0.11	0.09	0.08	0.08
Water Delivery and Other Operations	0.90	0.89	0.58	0.61	0.91	0.97	0.95	0.95	0.84	0.85	0.81
Flood Operations	0.06	0.02	0.09	0.06	0.08	0.10	0.19	0.15	0.16	0.16	0.14
Hydrometric Monitoring	0.65	0.62	0.96	0.89	0.87	0.81	0.59	0.59	0.56	0.56	0.55
Water Quality Monitoring	0.05	0.07	0.09	0.03	0.15	0.11	0.06	0.06	0.06	0.06	0.05
Corrective Maintenance	0.40	0.40	1.35	0.21	0.49	0.26	0.12	0.12	0.11	0.11	0.10
Routine Maintenance	1.14	1.36	1.27	1.55	1.96	2.47	2.47	2.46	2.36	2.29	2.30
Asset management planning	0.46	0.39	0.26	0.17	0.05	-0.01	0.27	0.23	0.52	0.39	0.34
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.49	0.42	0.31	0.38	0.34	0.33	0.44	0.40	0.55	0.73	0.46
Environmental Planning and Protection	0.22	0.09	0.01	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00
Direct Insurances	0.28	0.00	0.00	0.40	0.96	0.89	0.53	0.54	0.52	0.47	0.47
Renewal and Replacement	0.01	0.00	0.12	0.24	0.03	0.02	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.08	0.00	0.00	0.00	0.00	0.97	0.39	0.46	0.39	0.38	0.37
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.05	0.04	0.01	0.09	0.08	0.08	0.07	0.07
Total Efficient Expenditure	5.42	4.83	5.48	4.89	6.17	7.30	6.50	6.35	6.45	6.36	5.93

A.7. Murray

Table A-13 - Capital Expenditure Murray

WATERNSW RURAL BULK WATER PROPOSAL - CAPEX - MURRAY										
($M 2020/21) year ending June	2018	2019	2020	2021	**2022**	**2023**	**2024**	**2025**	**2023-25 Total**	**2022-25 Total**
Water Delivery & Other Operations	0.00	1.13	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.04	0.05
Asset Management Planning	0.00	0.00	0.00	0.06	0.06	0.05	0.07	0.06	0.18	0.24
Dam Safety Compliance	0.00	0.00	0.00	8.04	1.02	7.28	0.17	0.10	7.55	8.57
Environmental Planning & Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.36	0.00	3.25	1.08	0.53	0.35	1.18	0.94	2.47	3.00
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	0.05	0.62	1.63	3.63	1.41	1.45	2.78	1.52	5.76	7.17
Dam safety compliance on pre 1997 capital projects	0.07	0.93	-0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.01	0.20	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total capex proposed by WNSW	0.47	2.69	4.18	13.01	3.03	9.15	4.22	2.63	16.00	19.03
Atkins/Cardno recommended adjustments for specific programs or projects										
PDMP reallocation from Corporate to Drought projects (3 dams)			-0.18	-0.03						
Water Delivery & Other Operations - Corporate Systems FY20 miscoding			0.16							
Flood operations - Corporate Systems FY20 miscoding			0.02							
Hydrometric monitoring - Corporate Systems FY20 miscoding			0.20							
Asset management planning - Corporate Systems FY20 miscoding			0.01							
Dam safety compliance pre1997 - Corporate Systems FY20 miscoding			0.08							
Environmental Planning & Protection - Corporate Systems FY20 miscoding			0.02							
Renewals and Replacement - Corporate Systems FY20 miscoding			0.10							
Corporate Systems - Corporate Systems FY20 miscoding			-0.59							
MR Corporate Systems RAB to Salary Allocation adjustment					0.34	0.20	0.18	0.18	0.56	0.90
MR Dam Safety Compliance RAB to Salary Allocation adjustment					0.03	0.07	0.07	0.10	0.23	0.26
MR Asset management planning RAB to Salary Allocation adjustment					0.03	0.03	0.02	0.02	0.08	0.11
MR Routine maintenance RAB to Salary Allocation adjustment					0.01	0.01	0.01	0.01	0.02	0.03
MR Renewals and Replacement RAB to Salary Allocation adjustment					0.02	0.00	0.00	0.00	0.00	0.02
MR - Corporate Scope and Reallocation				0.00	0.05	0.05	0.05	0.05	0.14	0.19
Sub Total adjustments	0.00	0.00	-0.18	-0.03	0.47	0.35	0.33	0.35	1.03	1.50
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS										
Water Delivery & Other Operations	0.00	1.13	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.06	0.08
Asset Management Planning	0.00	0.00	0.01	0.06	0.09	0.08	0.09	0.08	0.26	0.35
Dam Safety Compliance	0.00	0.00	0.00	8.04	1.05	7.35	0.23	0.20	7.78	8.83
Environmental Planning & Protection	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.36	0.00	2.49	1.05	0.91	0.60	1.41	1.16	3.18	4.09
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	0.05	0.62	1.73	3.63	1.43	1.45	2.78	1.52	5.76	7.19
Dam safety compliance on pre 1997 capital projects	0.07	0.93	-0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.01	0.20	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total pre-efficiency	0.47	2.69	4.01	12.98	3.50	9.50	4.54	2.99	17.03	20.53
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)										
Continuing Efficiency (%)				0.00%	0.70%	1.40%	2.09%	2.77%		
Continuing Efficiency ($M)				0.00	-0.02	-0.13	-0.09	-0.08	-0.31	-0.33
Catch-up efficiency (%)				0.00%	2.11%	4.22%	6.83%	7.44%		
Catch-up efficiency ($M)				0.00	-0.07	-0.40	-0.30	-0.22	-0.91	-0.99
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE										
($M 2020/21) year ending June	2018	2019	2020	2021	**2022**	**2023**	**2024**	**2025**	**2023-25 Total**	**2022-25 Total**
Water Delivery & Other Operations	0.0	1.1	0.2	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Flood Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Hydrometric Monitoring	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Water Quality Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corrective Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Routine Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.05	0.07
Asset Management Planning	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.24	0.33
Dam Safety Compliance	0.0	0.0	0.0	8.0	1.0	6.9	0.2	0.2	7.33	8.35
Environmental Planning & Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corporate Systems	0.4	0.0	2.5	1.0	0.9	0.6	1.3	1.0	2.90	3.79
Drought projects (3 dams)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Drought projects (other)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Renewals and Replacement	0.1	0.6	1.7	3.6	1.4	1.4	2.5	1.4	5.28	6.67
Dam safety compliance on pre 1997 capital projects	0.1	0.9	-0.7	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Structural and other enhancements	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.00	0.00
Customer support	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Internal corporate projects	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Total Efficient Expenditure	**0.5**	**2.7**	**4.0**	**13.0**	**3.4**	**9.0**	**4.1**	**2.7**	**15.8**	**19.2**
User Share Capital Expenditure	*0.4*	*1.7*	*4.5*	*8.6*	*2.9*	*7.4*	*3.7*	*2.4*	*13.5*	*16.4*
Government Share Capital Expenditure	*0.1*	*1.0*	*-0.5*	*4.4*	*0.5*	*1.6*	*0.4*	*0.3*	*2.3*	*2.8*

Table A-14 – Operating Expenditure Murray

WATERNSW RURAL BULK WATER PROPOSAL - OPEX - Murray Valley											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.15	0.15	0.09	0.09	0.05	0.21	0.18	0.17	0.17	0.17	0.17
Customer Billing	0.15	0.15	0.13	0.12	0.21	-0.09	0.11	0.10	0.10	0.10	0.10
Metering and Compliance	1.14	0.86	0.54	0.68	0.60	0.49	0.65	0.66	0.61	0.60	0.55
Water Delivery and Other Operations	0.54	0.49	0.41	1.14	0.78	0.94	1.43	1.05	1.00	1.01	0.98
Flood Operations	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.01	0.03	0.28	0.20	0.18	0.23	0.09	0.06	0.05	0.06	0.05
Water Quality Monitoring	0.01	0.01	0.01	0.02	0.12	0.06	0.08	0.08	0.08	0.08	0.08
Corrective Maintenance	0.01	0.01	0.02	0.02	0.01	0.02	0.12	0.12	0.12	0.13	0.13
Routine Maintenance	0.69	0.80	0.91	0.94	0.96	1.22	0.93	0.86	0.84	0.89	0.91
Asset management planning	0.42	0.35	0.23	0.15	0.07	0.05	0.44	0.18	0.49	0.21	0.14
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.09	0.04	0.06	0.21	0.11	0.48	0.34	0.29	0.30	0.33	0.33
Environmental Planning and Protection	0.21	0.42	0.10	0.00	0.00	0.00	0.10	0.04	0.03	0.03	0.03
Direct Insurances	0.14	0.02	0.03	0.10	0.56	0.64	0.38	0.38	0.38	0.38	0.38
Renewal and Replacement	0.00	0.00	0.00	0.07	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.05	0.00	0.00	0.02	0.00	0.85	0.25	0.23	0.43	0.45	0.44
New Metering and Compliance	0.05	0.07	0.15	0.02	0.01	0.03	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Strutural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Murray Valley - Total Operating Expenditure	**3.65**	**3.41**	**3.05**	**3.79**	**3.66**	**5.12**	**5.10**	**4.23**	**4.60**	**4.44**	**4.27**
Atkins/Cardno recommended scope adjustments											
Customer Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
Customer Billing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.03
Water Delivery and Other Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.01	0.01	0.03
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	-0.03	-0.01	-0.03
Routine Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.02	0.04
Asset management planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.01
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.02
Environmental Planning and Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	-0.03	-0.03	-0.03
Direct Insurances	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.02
Renewal and Replacement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	-0.18	-0.19	-0.18
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Strutural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub Total adjustments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	-0.14	-0.16	-0.08
Atkins/Cardno recommended efficiency targets											
Continuing Efficiency (%)								0.70%	1.40%	2.09%	2.77%
Continuing Efficiency ($M)								-0.03	-0.06	-0.09	-0.12
Catch-up efficiency (%)								1.10%	2.19%	3.26%	4.33%
Catch-up efficiency ($M)								-0.05	-0.10	-0.14	-0.18
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.15	0.15	0.09	0.09	0.05	0.21	0.18	0.17	0.17	0.17	0.16
Customer Billing	0.15	0.15	0.13	0.12	0.21	-0.09	0.11	0.10	0.10	0.10	0.09
Metering and Compliance	1.14	0.86	0.54	0.68	0.60	0.49	0.65	0.67	0.61	0.58	0.53
Water Delivery and Other Operations	0.54	0.49	0.41	1.14	0.78	0.94	1.43	1.02	0.97	0.97	0.94
Flood Operations	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.01	0.03	0.28	0.20	0.18	0.23	0.09	0.06	0.05	0.05	0.05
Water Quality Monitoring	0.01	0.01	0.01	0.02	0.12	0.06	0.08	0.08	0.08	0.08	0.08
Corrective Maintenance	0.01	0.01	0.02	0.02	0.01	0.02	0.12	0.10	0.09	0.11	0.09
Routine Maintenance	0.69	0.80	0.91	0.94	0.96	1.22	0.93	0.86	0.84	0.86	0.89
Asset management planning	0.42	0.35	0.23	0.15	0.07	0.05	0.44	0.18	0.49	0.20	0.13
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.09	0.04	0.06	0.21	0.11	0.48	0.34	0.29	0.30	0.32	0.32
Environmental Planning and Protection	0.21	0.42	0.10	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00
Direct Insurances	0.14	0.02	0.03	0.10	0.56	0.64	0.38	0.38	0.38	0.37	0.37
Renewal and Replacement	0.00	0.00	0.00	0.07	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.05	0.00	0.00	0.02	0.00	0.85	0.25	0.27	0.24	0.25	0.24
New Metering and Compliance	0.05	0.07	0.15	0.02	0.01	0.03	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Strutural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Efficient Expenditure	3.65	3.41	3.05	3.79	3.66	5.12	5.10	4.18	4.30	4.05	3.90

A.8. Murrumbidgee

Table A-15 - Capital Expenditure Murrumbidgee

WATERNSW RURAL BULK WATER PROPOSAL - CAPEX - MURRUMBIDGEE										
($M 2020/21) year ending June	2018	2019	2020	2021	**2022**	**2023**	**2024**	**2025**	**2023-25 Total**	**2022-25 Total**
Water Delivery & Other Operations	0.00	1.29	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.03	0.17	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.06	0.04	0.03	0.04	0.04	0.05	0.12	0.15
Asset Management Planning	4.50	1.09	-5.45	0.17	0.19	0.16	0.20	0.18	0.54	0.73
Dam Safety Compliance	0.00	0.00	0.00	0.18	0.51	0.72	1.35	1.54	3.61	4.12
Environmental Planning & Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.99	0.00	0.22	2.40	1.21	1.05	1.72	1.27	4.04	5.25
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	3.29	3.60	14.58	15.25	6.12	6.69	6.23	6.11	19.03	25.14
Dam safety compliance on pre 1997 capital projects	0.05	0.02	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.27	1.49	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total capex proposed by WNSW	9.14	7.65	10.16	18.05	8.06	8.64	9.55	9.15	27.34	35.39
Atkins/Cardno recommended adjustments for specific programs or projects										
PDMP reallocation from Corporate to Drought projects (3 dams)			-0.44	-0.08						
Water Delivery & Other Operations - Corporate Systems FY20 miscoding			0.01							
Flood operations - Corporate Systems FY20 miscoding			0.00							
Hydrometric monitoring - Corporate Systems FY20 miscoding			0.01							
Asset management planning - Corporate Systems FY20 miscoding			0.00							
Dam safety compliance pre1997 - Corporate Systems FY20 miscoding			0.01							
Environmental Planning & Protection - Corporate Systems FY20 miscoding			0.00							
Renewals and Replacement - Corporate Systems FY20 miscoding			0.01							
Corporate Systems - Corporate Systems FY20 miscoding			-0.04							
MB Corporate Systems RAB to Salary Allocation adjustment					0.36	0.21	0.19	0.19	0.59	0.95
MB Dam Safety Compliance RAB to Salary Allocation adjustment					0.03	0.07	0.07	0.11	0.25	0.28
MB Asset management planning RAB to Salary Allocation adjustment					0.03	0.03	0.03	0.02	0.08	0.11
MB Routine maintenance RAB to Salary Allocation adjustment					0.01	0.01	0.01	0.01	0.02	0.03
MB Renewals and Replacement RAB to Salary Allocation adjustment					0.02	0.00	0.00	0.00	0.00	0.02
MB - Corporate Scope and Reallocation				0.00	0.11	0.11	0.11	0.11	0.33	0.44
Sub Total adjustments	0.00	0.00	-0.44	-0.08	0.56	0.43	0.41	0.44	1.27	1.83
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS										
Water Delivery & Other Operations	0.00	1.29	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.03	0.17	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.06	0.04	0.04	0.04	0.04	0.05	0.14	0.18
Asset Management Planning	4.50	1.09	-5.45	0.17	0.22	0.19	0.23	0.20	0.62	0.84
Dam Safety Compliance	0.00	0.00	0.00	0.18	0.54	0.79	1.43	1.65	3.86	4.40
Environmental Planning & Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.99	0.00	-0.26	2.32	1.68	1.37	2.02	1.57	4.96	6.64
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	3.29	3.60	14.59	15.25	6.14	6.69	6.23	6.11	19.03	25.16
Dam safety compliance on pre 1997 capital projects	0.05	0.02	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.27	1.49	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total pre-efficiency	9.14	7.65	9.72	17.97	8.62	9.07	9.95	9.58	28.61	37.23
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)										
Continuing Efficiency (%)				0.00%	0.70%	1.40%	2.09%	2.77%		
Continuing Efficiency ($M)				0.00	-0.06	-0.13	-0.21	-0.27	-0.60	-0.66
Catch-up efficiency (%)				0.00%	2.11%	4.22%	6.83%	7.44%		
Catch-up efficiency ($M)				0.00	-0.18	-0.38	-0.67	-0.69	-1.74	-1.92
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE										
($M 2020/21) year ending June	2018	2019	2020	2021	**2022**	**2023**	**2024**	**2025**	**2023-25 Total**	**2022-25 Total**
Water Delivery & Other Operations	0.0	1.3	0.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Flood Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Hydrometric Monitoring	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Water Quality Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corrective Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Routine Maintenance	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.13	0.17
Asset Management Planning	4.5	1.1	-5.4	0.2	0.2	0.2	0.2	0.2	0.57	0.78
Dam Safety Compliance	0.0	0.0	0.0	0.2	0.5	0.7	1.3	1.5	3.52	4.05
Environmental Planning & Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corporate Systems	1.0	0.0	-0.3	2.3	1.6	1.3	1.8	1.4	4.55	6.19
Drought projects (3 dams)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Drought projects (other)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Renewals and Replacement	3.3	3.6	14.6	15.3	6.0	6.3	5.7	5.5	17.50	23.46
Dam safety compliance on pre 1997 capital projects	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Structural and other enhancements	0.3	1.5	0.4	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Customer support	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Internal corporate projects	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Total Efficient Expenditure	**9.1**	**7.7**	**9.7**	**18.0**	**8.4**	**8.6**	**9.1**	**8.6**	**26.3**	**34.6**
User Share Capital Expenditure	*8.8*	*7.3*	*8.1*	*16.3*	*7.6*	*7.8*	*8.2*	*7.8*	*23.7*	*31.4*
Government Share Capital Expenditure	*0.4*	*0.4*	*1.6*	*1.6*	*0.7*	*0.7*	*0.9*	*0.9*	*2.5*	*3.3*

Table A-16 – Operating Expenditure Murrumbidgee

WATERNSW RURAL BULK WATER PROPOSAL - OPEX - Murrumbidgee Valley											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.12	0.11	0.07	0.15	0.26	0.18	0.18	0.18	0.17	0.18	0.18
Customer Billing	0.12	0.12	0.11	0.10	0.19	0.47	0.18	0.19	0.18	0.18	0.17
Metering and Compliance	0.58	0.44	0.42	0.48	0.54	0.39	0.49	0.50	0.44	0.43	0.39
Water Delivery and Other Operations	1.40	0.95	0.99	0.95	0.95	1.19	1.72	1.43	1.32	1.26	1.20
Flood Operations	0.04	0.02	0.19	0.07	0.09	0.01	0.25	0.23	0.27	0.27	0.25
Hydrometric Monitoring	1.31	1.55	2.38	1.75	1.20	1.41	1.11	1.07	1.05	1.13	1.10
Water Quality Monitoring	0.02	0.04	0.08	0.05	0.08	0.04	0.13	0.13	0.13	0.13	0.13
Corrective Maintenance	0.78	0.85	0.66	0.56	0.73	1.40	0.69	0.68	0.67	0.72	0.70
Routine Maintenance	1.98	1.89	2.43	2.82	2.54	3.25	2.50	2.42	2.40	2.52	2.57
Asset management planning	0.59	0.51	0.47	0.28	0.16	0.07	0.60	0.37	0.76	0.49	0.43
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.74	0.65	0.54	0.88	0.52	0.75	0.68	0.57	0.82	0.82	0.74
Environmental Planning and Protection	0.25	0.11	0.01	0.00	0.02	0.00	0.15	0.09	0.08	0.08	0.07
Direct Insurances	0.30	0.00	0.00	0.68	1.55	1.44	0.85	0.85	0.85	0.85	0.85
Renewal and Replacement	0.00	0.00	0.00	0.06	0.00	0.06	0.01	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.12	0.00	0.00	0.00	0.00	0.21	0.22	0.21	0.43	0.44	0.43
New Metering and Compliance	0.05	0.05	0.10	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Murrumbidgee Valley - Total Operating Expenditure	**8.40**	**7.27**	**8.45**	**8.91**	**8.81**	**10.87**	**9.77**	**8.91**	**9.58**	**9.50**	**9.22**
Atkins/Cardno recommended scope adjustments											
Customer Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01
Customer Billing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01
Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.02
Water Delivery and Other Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.06
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05	-0.08	-0.02	-0.08
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.03	0.03	0.06
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.02	0.04
Routine Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.08	0.07	0.14
Asset management planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.01	0.02
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.02	0.04
Environmental Planning and Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.09	-0.08	-0.08	-0.07
Direct Insurances	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.03	0.02	0.05
Renewal and Replacement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	-0.14	-0.14	-0.13
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub Total adjustments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	-0.10	-0.02	0.18
Atkins/Cardno recommended efficiency targets											
Continuing Efficiency (%)								0.70%	1.40%	2.09%	2.77%
Continuing Efficiency ($M)								-0.06	-0.13	-0.20	-0.26
Catch-up efficiency (%)								1.10%	2.19%	3.26%	4.33%
Catch-up efficiency ($M)								-0.10	-0.20	-0.30	-0.40
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.12	0.11	0.07	0.15	0.26	0.18	0.18	0.18	0.17	0.17	0.17
Customer Billing	0.12	0.12	0.11	0.10	0.19	0.47	0.18	0.19	0.18	0.17	0.16
Metering and Compliance	0.58	0.44	0.42	0.48	0.54	0.39	0.49	0.51	0.43	0.41	0.39
Water Delivery and Other Operations	1.40	0.95	0.99	0.95	0.95	1.19	1.72	1.40	1.27	1.22	1.18
Flood Operations	0.04	0.02	0.19	0.07	0.09	0.01	0.25	0.17	0.18	0.23	0.16
Hydrometric Monitoring	1.31	1.55	2.38	1.75	1.20	1.41	1.11	1.10	1.05	1.10	1.08
Water Quality Monitoring	0.02	0.04	0.08	0.05	0.08	0.04	0.13	0.13	0.12	0.13	0.13
Corrective Maintenance	0.78	0.85	0.66	0.56	0.73	1.40	0.69	0.70	0.66	0.70	0.69
Routine Maintenance	1.98	1.89	2.43	2.82	2.54	3.25	2.50	2.49	2.39	2.45	2.52
Asset management planning	0.59	0.51	0.47	0.28	0.16	0.07	0.60	0.38	0.75	0.48	0.42
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.74	0.65	0.54	0.88	0.52	0.75	0.68	0.59	0.79	0.79	0.73
Environmental Planning and Protection	0.25	0.11	0.01	0.00	0.02	0.00	0.15	0.00	0.00	0.00	0.00
Direct Insurances	0.30	0.00	0.00	0.68	1.55	1.44	0.85	0.88	0.85	0.83	0.84
Renewal and Replacement	0.00	0.00	0.00	0.06	0.00	0.06	0.01	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.12	0.00	0.00	0.00	0.00	0.21	0.22	0.25	0.28	0.28	0.28
New Metering and Compliance	0.05	0.05	0.10	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Efficient Expenditure	8.40	7.27	8.45	8.91	8.81	10.87	9.77	8.96	9.13	8.98	8.75

A.9. Lowbidgee

Table A-17 - Capital Expenditure Lowbidgee

WATERNSW RURAL BULK WATER PROPOSAL - CAPEX - LOWBIDGEE										
($M 2020/21) year ending June	2018	2019	2020	2021	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Asset Management Planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Planning & Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	2.22	0.22	0.07	0.07	0.07	0.05	0.18	0.25
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	3.36	4.32	0.88	0.43	1.00	2.37	1.04	1.01	4.42	5.42
Dam safety compliance on pre 1997 capital projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total capex proposed by WNSW	3.36	4.32	3.12	0.65	1.08	2.44	1.11	1.07	4.61	5.69
Atkins/Cardno recommended adjustments for specific programs or projects										
PDMP reallocation from Corporate to Drought projects (3 dams)			-0.03	-0.01						
Water Delivery & Other Operations - Corporate Systems FY20 miscoding			0.11							
Flood operations - Corporate Systems FY20 miscoding			0.02							
Hydrometric monitoring - Corporate Systems FY20 miscoding			0.14							
Asset management planning - Corporate Systems FY20 miscoding			0.00							
Dam safety compliance pre1997 - Corporate Systems FY20 miscoding			0.05							
Environmental Planning & Protection - Corporate Systems FY20 miscoding			0.01							
Renewals and Replacement - Corporate Systems FY20 miscoding			0.07							
Corporate Systems - Corporate Systems FY20 miscoding			-0.40							
LB Corporate Systems RAB to Salary Allocation adjustment					0.01	0.00	0.00	0.00	0.01	0.01
LB Dam Safety Compliance RAB to Salary Allocation adjustment					0.00	0.00	0.00	0.00	0.00	0.00
LB Asset management planning RAB to Salary Allocation adjustment					0.00	0.00	0.00	0.00	0.00	0.00
LB Routine maintenance RAB to Salary Allocation adjustment					0.00	0.00	0.00	0.00	0.00	0.00
LB Renewals and Replacement RAB to Salary Allocation adjustment					0.00	0.00	0.00	0.00	0.00	0.00
LB - Corporate Scope and Reallocation				0.00	0.01	0.01	0.01	0.01	0.02	0.03
Sub Total adjustments	0.00	0.00	-0.03	-0.01	0.01	0.01	0.01	0.01	0.03	0.04
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS										
Water Delivery & Other Operations	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Asset Management Planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Planning & Protection	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	1.79	0.22	0.08	0.08	0.07	0.06	0.21	0.29
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	3.36	4.32	0.95	0.43	1.00	2.37	1.04	1.01	4.42	5.42
Dam safety compliance on pre 1997 capital projects	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total pre-efficiency	3.36	4.32	3.09	0.65	1.09	2.45	1.11	1.08	4.64	5.73
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)										
Continuing Efficiency (%)				0.00%	0.70%	1.40%	2.09%	2.77%		
Continuing Efficiency ($M)				0.00	-0.01	-0.03	-0.02	-0.03	-0.09	-0.09
Catch-up efficiency (%)				0.00%	2.11%	4.22%	6.83%	7.44%		
Catch-up efficiency ($M)				0.00	-0.02	-0.10	-0.07	-0.08	-0.25	-0.28
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE										
($M 2020/21) year ending June	2018	2019	2020	2021	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Flood Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Hydrometric Monitoring	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Water Quality Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corrective Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Routine Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.01
Asset Management Planning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Dam Safety Compliance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Environmental Planning & Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corporate Systems	0.0	0.0	1.8	0.2	0.1	0.1	0.1	0.1	0.19	0.27
Drought projects (3 dams)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Drought projects (other)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Renewals and Replacement	3.4	4.3	0.9	0.4	1.0	2.2	0.9	0.9	4.10	5.07
Dam safety compliance on pre 1997 capital projects	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Structural and other enhancements	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Customer support	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Internal corporate projects	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Total Efficient Expenditure	**3.4**	**4.3**	**3.1**	**0.6**	**1.1**	**2.3**	**1.0**	**1.0**	**4.3**	**5.4**
User Share Capital Expenditure	*3.0*	*3.9*	*2.9*	*0.6*	*1.0*	*2.2*	*1.0*	*0.9*	*4.1*	*5.0*
Government Share Capital Expenditure	*0.3*	*0.4*	*0.2*	*0.0*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.3*

Table A-18 – Operating Expenditure Lowbidgee

WATERNSW RURAL BULK WATER PROPOSAL - OPEX - Lowbidgee Valley											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer Billing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Delivery and Other Operations	0.18	0.03	0.04	0.01	0.01	0.00	0.08	0.11	0.09	0.07	0.07
Flood Operations	0.00	0.00	0.24	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.04	0.05	0.01	0.02	0.00	0.02	0.16	0.16	0.16	0.17	0.17
Routine Maintenance	0.36	0.45	0.33	0.41	0.36	0.48	0.63	0.63	0.63	0.66	0.66
Asset management planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Planning and Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Direct Insurances	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.02	0.02	0.02	0.02
Renewal and Replacement	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.02	0.02	0.02
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.08	0.04	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00
Lowbidgee Valley - Total Operating Expenditure	**0.59**	**0.60**	**0.66**	**0.54**	**0.43**	**0.55**	**0.90**	**0.93**	**0.93**	**0.96**	**0.95**
Atkins/Cardno recommended scope adjustments											
Customer Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer Billing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Delivery and Other Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	-0.04	-0.02	-0.03
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06	-0.07	-0.04	-0.07
Routine Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.14	-0.14	-0.12	-0.16
Asset management planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Planning and Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Direct Insurances	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewal and Replacement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub Total adjustments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.25	-0.27	-0.19	-0.29
Atkins/Cardno recommended efficiency targets											
Continuing Efficiency (%)								0.70%	1.40%	2.09%	2.77%
Continuing Efficiency ($M)								0.00	-0.01	-0.02	-0.02
Catch-up efficiency (%)								1.10%	2.19%	3.26%	4.33%
Catch-up efficiency ($M)								-0.01	-0.01	-0.02	-0.03
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer Billing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Delivery and Other Operations	0.18	0.03	0.04	0.01	0.01	0.00	0.08	0.07	0.05	0.05	0.03
Flood Operations	0.00	0.00	0.24	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.04	0.05	0.01	0.02	0.00	0.02	0.16	0.10	0.09	0.12	0.09
Routine Maintenance	0.36	0.45	0.33	0.41	0.36	0.48	0.63	0.48	0.47	0.52	0.47
Asset management planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Planning and Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Direct Insurances	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.02	0.02	0.02	0.02
Renewal and Replacement	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.01	0.01	0.01
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.08	0.04	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00
Total Efficient Expenditure	0.59	0.60	0.66	0.54	0.43	0.55	0.90	0.67	0.64	0.72	0.62

A.10. North Coast

Table A-19 - Capital Expenditure North Coast

WATERNSW RURAL BULK WATER PROPOSAL - CAPEX - NORTH COAST										
($M 2020/21) year ending June	2018	2019	2020	2021	**2022**	**2023**	**2024**	**2025**	**2023-25 Total**	**2022-25 Total**
Water Delivery & Other Operations	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Asset Management Planning	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.04	0.05
Dam Safety Compliance	0.00	0.00	0.00	0.05	0.03	0.02	0.03	0.02	0.08	0.11
Environmental Planning & Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.06	0.00	0.11	0.43	0.08	0.07	0.15	0.20	0.42	0.49
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	0.15	0.20	0.11	0.51	0.15	0.16	0.16	0.16	0.47	0.63
Dam safety compliance on pre 1997 capital projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total capex proposed by WNSW	0.21	0.22	0.23	1.00	0.27	0.26	0.35	0.40	1.02	1.29
Atkins/Cardno recommended adjustments for specific programs or projects										
PDMP reallocation from Corporate to Drought projects (3 dams)			-0.17	-0.03						
Water Delivery & Other Operations - Corporate Systems FY20 miscoding			0.01							
Flood operations - Corporate Systems FY20 miscoding			0.00							
Hydrometric monitoring - Corporate Systems FY20 miscoding			0.01							
Asset management planning - Corporate Systems FY20 miscoding			0.00							
Dam safety compliance pre1997 - Corporate Systems FY20 miscoding			0.00							
Environmental Planning & Protection - Corporate Systems FY20 miscoding			0.00							
Renewals and Replacement - Corporate Systems FY20 miscoding			0.00							
Corporate Systems - Corporate Systems FY20 miscoding			-0.02							
NC Corporate Systems RAB to Salary Allocation adjustment					0.12	0.07	0.07	0.06	0.20	0.32
NC Dam Safety Compliance RAB to Salary Allocation adjustment					0.01	0.02	0.02	0.04	0.08	0.09
NC Asset management planning RAB to Salary Allocation adjustment					0.01	0.01	0.01	0.01	0.03	0.04
NC Routine maintenance RAB to Salary Allocation adjustment					0.00	0.00	0.00	0.00	0.01	0.01
NC Renewals and Replacement RAB to Salary Allocation adjustment					0.01	0.00	0.00	0.00	0.00	0.01
NC - Corporate Scope and Reallocation				0.00	0.01	0.01	0.01	0.01	0.04	0.05
Sub Total adjustments	0.00	0.00	-0.17	-0.03	0.16	0.12	0.11	0.12	0.35	0.52
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS										
Water Delivery & Other Operations	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.02
Asset Management Planning	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.06	0.09
Dam Safety Compliance	0.00	0.00	0.00	0.05	0.04	0.05	0.06	0.06	0.16	0.20
Environmental Planning & Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.06	0.00	-0.09	0.39	0.21	0.15	0.22	0.28	0.66	0.87
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	0.15	0.20	0.11	0.51	0.16	0.16	0.16	0.16	0.47	0.63
Dam safety compliance on pre 1997 capital projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total pre-efficiency	0.21	0.22	0.05	0.97	0.44	0.39	0.47	0.52	1.37	1.80
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)										
Continuing Efficiency (%)				0.00%	0.70%	1.40%	2.09%	2.77%		
Continuing Efficiency ($M)				0.00	0.00	-0.01	-0.01	-0.01	-0.03	-0.03
Catch-up efficiency (%)				0.00%	2.11%	4.22%	6.83%	7.44%		
Catch-up efficiency ($M)				0.00	-0.01	-0.02	-0.03	-0.04	-0.08	-0.09
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE										
($M 2020/21) year ending June	2018	2019	2020	2021	**2022**	**2023**	**2024**	**2025**	**2023-25 Total**	**2022-25 Total**
Water Delivery & Other Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Flood Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Hydrometric Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Water Quality Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corrective Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Routine Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.02
Asset Management Planning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.06	0.08
Dam Safety Compliance	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.15	0.18
Environmental Planning & Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corporate Systems	0.1	0.0	-0.1	0.4	0.2	0.1	0.2	0.3	0.60	0.80
Drought projects (3 dams)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Drought projects (other)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Renewals and Replacement	0.1	0.2	0.1	0.5	0.2	0.1	0.1	0.1	0.43	0.59
Dam safety compliance on pre 1997 capital projects	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Structural and other enhancements	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Customer support	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Internal corporate projects	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Total Efficient Expenditure	**0.2**	**0.2**	**0.1**	**1.0**	**0.4**	**0.4**	**0.4**	**0.5**	**1.3**	**1.7**
User Share Capital Expenditure	*0.2*	*0.2*	*0.0*	*0.9*	*0.4*	*0.3*	*0.4*	*0.4*	*1.1*	*1.4*
Government Share Capital Expenditure	*0.0*	*0.0*	*0.0*	*0.1*	*0.1*	*0.0*	*0.1*	*0.1*	*0.2*	*0.2*

Table A-20 – Operating Expenditure North Coast

WATERNSW RURAL BULK WATER PROPOSAL - OPEX - North Coast Valley											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.00	0.00	0.00	0.03	0.01	0.06	0.16	0.16	0.15	0.15	0.15
Customer Billing	0.02	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Metering and Compliance	0.03	0.01	0.01	0.01	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Water Delivery and Other Operations	0.05	0.05	0.18	0.03	0.06	0.20	0.11	0.09	0.08	0.07	0.07
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.03	0.03	0.19	0.28	0.25	0.12	0.06	0.05	0.05	0.06	0.05
Water Quality Monitoring	0.04	0.04	0.05	0.05	0.06	0.03	0.02	0.02	0.02	0.02	0.02
Corrective Maintenance	0.11	0.07	0.11	0.06	0.06	0.10	0.11	0.11	0.11	0.11	0.11
Routine Maintenance	0.21	0.20	0.31	0.31	0.27	0.32	0.31	0.30	0.30	0.32	0.32
Asset management planning	0.03	0.02	0.02	0.02	0.00	0.00	0.04	0.03	0.09	0.03	0.03
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.18	0.18	0.15	0.12	0.12	0.10	0.16	0.16	0.18	0.19	0.19
Environmental Planning and Protection	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Direct Insurances	0.05	0.00	0.00	0.07	0.07	0.05	0.03	0.03	0.03	0.03	0.03
Renewal and Replacement	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.01	0.00	0.01	0.00	0.00	0.11	0.08	0.08	0.12	0.12	0.12
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
North Coast Valley - Total Operating Expenditure	**0.77**	**0.62**	**1.03**	**1.02**	**0.92**	**1.18**	**1.09**	**1.04**	**1.13**	**1.12**	**1.10**
Atkins/Cardno recommended scope adjustments											
Customer Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
Customer Billing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Delivery and Other Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01
Asset management planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.02	-0.01	-0.02
Environmental Planning and Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01
Direct Insurances	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewal and Replacement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	-0.03	-0.03	-0.03
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub Total adjustments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	-0.04	-0.04	-0.04
Atkins/Cardno recommended efficiency targets											
Continuing Efficiency (%)								0.70%	1.40%	2.09%	2.77%
Continuing Efficiency ($M)								-0.01	-0.02	-0.02	-0.03
Catch-up efficiency (%)								1.10%	2.19%	3.26%	4.33%
Catch-up efficiency ($M)								-0.01	-0.02	-0.03	-0.04
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.00	0.00	0.00	0.03	0.01	0.06	0.16	0.16	0.15	0.15	0.14
Customer Billing	0.02	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Metering and Compliance	0.03	0.01	0.01	0.01	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Water Delivery and Other Operations	0.05	0.05	0.18	0.03	0.06	0.20	0.11	0.09	0.08	0.07	0.07
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.03	0.03	0.19	0.28	0.25	0.12	0.06	0.05	0.05	0.05	0.05
Water Quality Monitoring	0.04	0.04	0.05	0.05	0.06	0.03	0.02	0.02	0.02	0.02	0.02
Corrective Maintenance	0.11	0.07	0.11	0.06	0.06	0.10	0.11	0.11	0.11	0.11	0.11
Routine Maintenance	0.21	0.20	0.31	0.31	0.27	0.32	0.31	0.31	0.30	0.31	0.31
Asset management planning	0.03	0.02	0.02	0.02	0.00	0.00	0.04	0.03	0.09	0.03	0.02
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.18	0.18	0.15	0.12	0.12	0.10	0.16	0.15	0.15	0.18	0.15
Environmental Planning and Protection	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Direct Insurances	0.05	0.00	0.00	0.07	0.07	0.05	0.03	0.03	0.03	0.03	0.03
Renewal and Replacement	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.01	0.00	0.01	0.00	0.00	0.11	0.08	0.09	0.08	0.08	0.08
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Efficient Expenditure	0.77	0.62	1.03	1.02	0.92	1.18	1.09	1.06	1.06	1.02	0.99

A.11. Hunter

Table A-21 - Capital Expenditure Hunter

WATERNSW RURAL BULK WATER PROPOSAL - CAPEX - HUNTER										
($M 2020/21) year ending June	2018	2019	2020	2021	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.01	0.02	0.02
Asset Management Planning	0.00	0.00	0.00	0.02	0.02	0.02	0.01	0.02	0.05	0.07
Dam Safety Compliance	0.00	0.00	0.00	0.02	0.11	0.34	0.42	0.23	0.99	1.10
Environmental Planning & Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.26	0.03	1.09	0.46	0.23	0.14	0.67	0.41	1.22	1.44
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	0.17	0.51	1.09	4.79	1.25	2.09	1.73	1.37	5.19	6.44
Dam safety compliance on pre 1997 capital projects	0.07	0.03	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total capex proposed by WNSW	0.49	0.85	2.33	5.38	1.62	2.59	2.84	2.03	7.46	9.08
Atkins/Cardno recommended adjustments for specific programs or projects										
PDMP reallocation from Corporate to Drought projects (3 dams)			-0.04	-0.01						
Water Delivery & Other Operations - Corporate Systems FY20 miscoding			0.05							
Flood operations - Corporate Systems FY20 miscoding			0.01							
Hydrometric monitoring - Corporate Systems FY20 miscoding			0.07							
Asset management planning - Corporate Systems FY20 miscoding			0.00							
Dam safety compliance pre1997 - Corporate Systems FY20 miscoding			0.03							
Environmental Planning & Protection - Corporate Systems FY20 miscoding			0.01							
Renewals and Replacement - Corporate Systems FY20 miscoding			0.03							
Corporate Systems - Corporate Systems FY20 miscoding			-0.20							
HU Corporate Systems RAB to Salary Allocation adjustment					0.83	0.49	0.45	0.43	1.37	2.20
HU Dam Safety Compliance RAB to Salary Allocation adjustment					0.07	0.16	0.15	0.21	0.52	0.60
HU Asset management planning RAB to Salary Allocation adjustment					0.07	0.08	0.06	0.07	0.21	0.28
HU Routine maintenance RAB to Salary Allocation adjustment					0.02	0.01	0.01	0.01	0.04	0.06
HU Renewals and Replacement RAB to Salary Allocation adjustment					0.05	0.00	0.00	0.00	0.00	0.05
HU - Corporate Scope and Reallocation				0.00	0.06	0.06	0.06	0.06	0.17	0.23
Sub Total adjustments	0.00	0.00	-0.04	-0.01	1.10	0.80	0.73	0.79	2.32	3.41
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS										
Water Delivery & Other Operations	0.00	0.27	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.05	0.02	0.02	0.02	0.02	0.06	0.08
Asset Management Planning	0.00	0.00	0.00	0.02	0.09	0.10	0.07	0.09	0.26	0.35
Dam Safety Compliance	0.00	0.00	0.00	0.02	0.18	0.50	0.57	0.44	1.52	1.70
Environmental Planning & Protection	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.26	0.03	0.85	0.45	1.11	0.69	1.17	0.90	2.76	3.87
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	0.17	0.51	1.13	4.79	1.30	2.09	1.73	1.37	5.19	6.49
Dam safety compliance on pre 1997 capital projects	0.07	0.03	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total pre-efficiency	0.49	0.85	2.29	5.37	2.72	3.39	3.57	2.82	9.78	12.50
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)										
Continuing Efficiency (%)				0.00%	0.70%	1.40%	2.09%	2.77%		
Continuing Efficiency ($M)				0.00	-0.02	-0.05	-0.07	-0.08	-0.20	-0.22
Catch-up efficiency (%)				0.00%	2.11%	4.22%	6.83%	7.44%		
Catch-up efficiency ($M)				0.00	-0.06	-0.14	-0.24	-0.20	-0.58	-0.64
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE										
($M 2020/21) year ending June	2018	2019	2020	2021	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Flood Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Hydrometric Monitoring	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Water Quality Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corrective Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Routine Maintenance	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.06	0.08
Asset Management Planning	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.24	0.33
Dam Safety Compliance	0.0	0.0	0.0	0.0	0.2	0.5	0.5	0.4	1.40	1.57
Environmental Planning & Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corporate Systems	0.3	0.0	0.8	0.5	1.1	0.6	1.1	0.8	2.53	3.61
Drought projects (3 dams)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Drought projects (other)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Renewals and Replacement	0.2	0.5	1.1	4.8	1.3	2.0	1.6	1.2	4.78	6.05
Dam safety compliance on pre 1997 capital projects	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Structural and other enhancements	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Customer support	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Internal corporate projects	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Total Efficient Expenditure	**0.5**	**0.8**	**2.3**	**5.4**	**2.6**	**3.2**	**3.3**	**2.5**	**9.0**	**11.6**
User Share Capital Expenditure	*0.4*	*0.8*	*2.0*	*4.9*	*2.3*	*2.9*	*2.9*	*2.2*	*8.0*	*10.3*
Government Share Capital Expenditure	*0.1*	*0.1*	*0.3*	*0.5*	*0.3*	*0.3*	*0.4*	*0.3*	*1.0*	*1.4*

Table A-22 – Operating Expenditure Hunter

WATERNSW RURAL BULK WATER PROPOSAL - OPEX - Hunter Valley											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.07	0.07	0.05	0.02	0.01	0.06	0.12	0.12	0.11	0.12	0.12
Customer Billing	0.06	0.05	0.04	0.04	0.07	-0.04	0.03	0.03	0.03	0.03	0.03
Metering and Compliance	0.61	0.53	0.45	0.46	0.40	0.43	0.11	0.11	0.11	0.10	0.09
Water Delivery and Other Operations	0.56	0.30	0.31	0.41	0.43	0.66	0.87	0.78	0.75	0.73	0.69
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.30	0.30	1.28	0.59	0.57	0.52	0.27	0.26	0.26	0.27	0.26
Water Quality Monitoring	0.08	0.10	0.14	0.07	0.08	0.10	0.10	0.10	0.10	0.10	0.10
Corrective Maintenance	0.25	0.38	0.47	0.59	0.48	0.36	0.71	0.70	0.68	0.73	0.71
Routine Maintenance	1.06	0.90	1.29	1.17	1.37	1.75	1.52	1.48	1.47	1.55	1.55
Asset management planning	0.45	0.37	0.23	0.16	0.04	-0.01	0.23	0.15	0.34	0.16	0.12
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.70	0.60	0.52	0.59	0.53	0.54	0.66	0.59	0.86	0.77	0.70
Environmental Planning and Protection	0.19	0.08	0.01	0.00	0.00	0.00	0.06	0.04	0.04	0.04	0.03
Direct Insurances	0.21	0.00	0.00	0.26	0.43	0.39	0.23	0.23	0.23	0.23	0.23
Renewal and Replacement	0.00	0.00	0.00	0.10	0.01	-0.04	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.06	0.00	0.00	0.00	0.00	0.52	0.28	0.27	0.45	0.47	0.46
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hunter Valley - Total Operating Expenditure	**4.59**	**3.69**	**4.78**	**4.46**	**4.42**	**5.25**	**5.20**	**4.85**	**5.44**	**5.31**	**5.10**
Atkins/Cardno recommended scope adjustments											
Customer Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer Billing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Delivery and Other Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.03	-0.01	0.01
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.07	-0.11	-0.04	-0.11
Routine Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.01	-0.01	0.04
Asset management planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	-0.10	-0.03	-0.04
Environmental Planning and Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	-0.04	-0.04	-0.03
Direct Insurances	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
Renewal and Replacement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	-0.16	-0.16	-0.15
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub Total adjustments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	-0.42	-0.29	-0.25
Atkins/Cardno recommended efficiency targets											
Continuing Efficiency (%)								0.70%	1.40%	2.09%	2.77%
Continuing Efficiency ($M)								-0.03	-0.07	-0.10	-0.13
Catch-up efficiency (%)								1.10%	2.19%	3.26%	4.33%
Catch-up efficiency ($M)								-0.05	-0.11	-0.16	-0.20
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.07	0.07	0.05	0.02	0.01	0.06	0.12	0.12	0.11	0.11	0.11
Customer Billing	0.06	0.05	0.04	0.04	0.07	-0.04	0.03	0.03	0.03	0.03	0.03
Metering and Compliance	0.61	0.53	0.45	0.46	0.40	0.43	0.11	0.11	0.11	0.09	0.09
Water Delivery and Other Operations	0.56	0.30	0.31	0.41	0.43	0.66	0.87	0.75	0.70	0.68	0.65
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.30	0.30	1.28	0.59	0.57	0.52	0.27	0.26	0.25	0.26	0.25
Water Quality Monitoring	0.08	0.10	0.14	0.07	0.08	0.10	0.10	0.10	0.09	0.10	0.10
Corrective Maintenance	0.25	0.38	0.47	0.59	0.48	0.36	0.71	0.61	0.56	0.66	0.56
Routine Maintenance	1.06	0.90	1.29	1.17	1.37	1.75	1.52	1.50	1.42	1.46	1.49
Asset management planning	0.45	0.37	0.23	0.16	0.04	-0.01	0.23	0.15	0.33	0.15	0.12
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.70	0.60	0.52	0.59	0.53	0.54	0.66	0.59	0.73	0.71	0.61
Environmental Planning and Protection	0.19	0.08	0.01	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00
Direct Insurances	0.21	0.00	0.00	0.26	0.43	0.39	0.23	0.24	0.23	0.22	0.22
Renewal and Replacement	0.00	0.00	0.00	0.10	0.01	-0.04	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.06	0.00	0.00	0.00	0.00	0.52	0.28	0.32	0.28	0.29	0.29
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Efficient Expenditure	4.59	3.69	4.78	4.46	4.42	5.25	5.20	4.79	4.84	4.76	4.51

A.12. South Coast

Table A-23 - Capital Expenditure South Coast

WATERNSW RURAL BULK WATER PROPOSAL - CAPEX - SOUTH COAST										
($M 2020/21) year ending June	2018	2019	2020	2021	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Asset Management Planning	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.04	0.05
Dam Safety Compliance	0.00	0.00	0.00	0.01	0.03	0.02	0.04	0.08	0.14	0.16
Environmental Planning & Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.04	0.00	0.80	0.36	0.08	0.07	0.07	0.13	0.26	0.34
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	0.05	0.08	0.19	0.41	0.13	0.13	0.13	0.13	0.39	0.52
Dam safety compliance on pre 1997 capital projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total capex proposed by WNSW	0.09	0.12	0.99	0.79	0.24	0.24	0.25	0.35	0.84	1.08
Atkins/Cardno recommended adjustments for specific programs or projects										
PDMP reallocation from Corporate to Drought projects (3 dams)			-0.05	-0.01						
Water Delivery & Other Operations - Corporate Systems FY20 miscoding			0.04							
Flood operations - Corporate Systems FY20 miscoding			0.01							
Hydrometric monitoring - Corporate Systems FY20 miscoding			0.05							
Asset management planning - Corporate Systems FY20 miscoding			0.00							
Dam safety compliance pre1997 - Corporate Systems FY20 miscoding			0.02							
Environmental Planning & Protection - Corporate Systems FY20 miscoding			0.01							
Renewals and Replacement - Corporate Systems FY20 miscoding			0.02							
Corporate Systems - Corporate Systems FY20 miscoding			-0.14							
SC Corporate Systems RAB to Salary Allocation adjustment					0.06	0.04	0.03	0.03	0.10	0.17
SC Dam Safety Compliance RAB to Salary Allocation adjustment					0.01	0.01	0.01	0.02	0.04	0.05
SC Asset management planning RAB to Salary Allocation adjustment					0.01	0.01	0.00	0.00	0.01	0.02
SC Routine maintenance RAB to Salary Allocation adjustment					0.00	0.00	0.00	0.00	0.00	0.00
SC Renewals and Replacement RAB to Salary Allocation adjustment					0.00	0.00	0.00	0.00	0.00	0.00
SC - Corporate Scope and Reallocation				0.00	0.01	0.01	0.01	0.01	0.03	0.04
Sub Total adjustments	0.00	0.00	-0.05	-0.01	0.09	0.07	0.06	0.07	0.19	0.28
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS										
Water Delivery & Other Operations	0.00	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flood Operations	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Asset Management Planning	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.05	0.07
Dam Safety Compliance	0.00	0.00	0.00	0.01	0.03	0.04	0.05	0.10	0.18	0.21
Environmental Planning & Protection	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.04	0.00	0.60	0.35	0.15	0.12	0.11	0.17	0.40	0.54
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	0.05	0.08	0.22	0.41	0.13	0.13	0.13	0.13	0.39	0.53
Dam safety compliance on pre 1997 capital projects	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total pre-efficiency	0.09	0.12	0.94	0.78	0.33	0.30	0.31	0.41	1.03	1.36
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)										
Continuing Efficiency (%)				0.00%	0.70%	1.40%	2.09%	2.77%		
Continuing Efficiency ($M)				0.00	0.00	0.00	-0.01	-0.01	-0.02	-0.02
Catch-up efficiency (%)				0.00%	2.11%	4.22%	6.83%	7.44%		
Catch-up efficiency ($M)				0.00	-0.01	-0.01	-0.02	-0.03	-0.06	-0.07
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE										
($M 2020/21) year ending June	2018	2019	2020	2021	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Flood Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Hydrometric Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Water Quality Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corrective Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Routine Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.01
Asset Management Planning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.05	0.06
Dam Safety Compliance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.16	0.19
Environmental Planning & Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corporate Systems	0.0	0.0	0.6	0.3	0.1	0.1	0.1	0.2	0.36	0.51
Drought projects (3 dams)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Drought projects (other)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Renewals and Replacement	0.0	0.1	0.2	0.4	0.1	0.1	0.1	0.1	0.36	0.49
Dam safety compliance on pre 1997 capital projects	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Structural and other enhancements	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Customer support	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Internal corporate projects	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Total Efficient Expenditure	**0.1**	**0.1**	**0.9**	**0.8**	**0.3**	**0.3**	**0.3**	**0.4**	**0.9**	**1.3**
User Share Capital Expenditure	*0.1*	*0.1*	*0.9*	*0.7*	*0.3*	*0.3*	*0.2*	*0.3*	*0.8*	*1.1*
Government Share Capital Expenditure	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.1*	*0.2*

Table A-24 – Operating Expenditure South Coast

WATERNSW RURAL BULK WATER PROPOSAL - OPEX - South Coast Valley											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.00	0.00	0.00	0.01	0.01	0.06	0.20	0.20	0.19	0.19	0.19
Customer Billing	0.02	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Metering and Compliance	0.02	0.02	0.03	0.02	0.02	0.03	0.00	0.00	0.00	0.00	0.00
Water Delivery and Other Operations	0.05	0.04	0.06	0.05	0.13	0.14	0.10	0.09	0.08	0.07	0.07
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.05	0.07	0.03	0.05	0.07	0.08	0.04	0.04	0.04	0.04	0.04
Water Quality Monitoring	0.00	0.01	0.02	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Corrective Maintenance	0.03	0.00	0.03	0.03	0.08	0.02	0.04	0.04	0.04	0.04	0.04
Routine Maintenance	0.32	0.37	0.31	0.42	0.29	0.36	0.46	0.45	0.44	0.47	0.47
Asset management planning	0.03	0.02	0.02	0.01	0.00	0.00	0.04	0.03	0.09	0.02	0.03
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.20	0.14	0.12	0.11	0.13	0.11	0.17	0.16	0.22	0.19	0.16
Environmental Planning and Protection	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Direct Insurances	0.00	0.00	0.00	0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.01
Renewal and Replacement	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.01	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.04	0.04	0.04
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
South Coast Valley - Total Operating Expenditure	**0.74**	**0.70**	**0.62**	**0.75**	**0.78**	**0.83**	**1.11**	**1.05**	**1.17**	**1.11**	**1.08**
Atkins/Cardno recommended scope adjustments											
Customer Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.02	-0.01
Customer Billing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Delivery and Other Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01
Routine Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05	-0.06	-0.05	-0.07
Asset management planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	-0.05	-0.02	-0.03
Environmental Planning and Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01
Direct Insurances	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewal and Replacement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	-0.02	-0.02
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub Total adjustments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.12	-0.17	-0.14	-0.17
Atkins/Cardno recommended efficiency targets											
Continuing Efficiency (%)								0.70%	1.40%	2.09%	2.77%
Continuing Efficiency ($M)								-0.01	-0.01	-0.02	-0.03
Catch-up efficiency (%)								1.10%	2.19%	3.26%	4.33%
Catch-up efficiency ($M)								-0.01	-0.02	-0.03	-0.04
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.00	0.00	0.00	0.01	0.01	0.06	0.20	0.18	0.17	0.17	0.16
Customer Billing	0.02	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Metering and Compliance	0.02	0.02	0.03	0.02	0.02	0.03	0.00	0.00	0.00	0.00	0.00
Water Delivery and Other Operations	0.05	0.04	0.06	0.05	0.13	0.14	0.10	0.08	0.07	0.06	0.06
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.05	0.07	0.03	0.05	0.07	0.08	0.04	0.03	0.03	0.03	0.03
Water Quality Monitoring	0.00	0.01	0.02	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Corrective Maintenance	0.03	0.00	0.03	0.03	0.08	0.02	0.04	0.03	0.03	0.03	0.03
Routine Maintenance	0.32	0.37	0.31	0.42	0.29	0.36	0.46	0.39	0.37	0.40	0.37
Asset management planning	0.03	0.02	0.02	0.01	0.00	0.00	0.04	0.02	0.08	0.02	0.02
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.20	0.14	0.12	0.11	0.13	0.11	0.17	0.14	0.16	0.15	0.12
Environmental Planning and Protection	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Direct Insurances	0.00	0.00	0.00	0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.01
Renewal and Replacement	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.01	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.03	0.02	0.02
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Efficient Expenditure	0.74	0.70	0.62	0.75	0.78	0.83	1.11	0.92	0.97	0.92	0.85

A.13. Fish River Water Scheme

Table A-25 - Capital Expenditure Fish River Water Scheme

WATERNSW RURAL BULK WATER PROPOSAL - CAPEX - FISH RIVER WATER SCHEME										
($M 2020/21) year ending June	2018	2019	2020	2021	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	0.00	2.04	0.10	0.24	0.95	0.86	0.00	0.00	0.86	1.81
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.03	0.02	0.02	0.02	0.03	0.08	0.10
Asset Management Planning	0.00	0.00	0.00	0.11	0.12	0.11	0.14	0.12	0.36	0.49
Dam Safety Compliance	0.00	0.00	0.00	0.19	0.69	0.24	0.45	0.49	1.19	1.88
Environmental Planning & Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.65	0.08	3.10	1.60	0.76	0.70	1.15	0.72	2.56	3.32
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	4.81	2.58	0.58	1.84	1.79	2.09	3.10	1.86	7.04	8.83
Dam safety compliance on pre 1997 capital projects	0.01	-0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total capex proposed by WNSW	5.47	4.67	3.78	4.00	4.33	4.01	4.85	3.23	12.09	16.42
Atkins/Cardno recommended adjustments for specific programs or projects										
PDMP reallocation from Corporate to Drought projects (3 dams)			-0.24	-0.04						
Water Delivery & Other Operations - Corporate Systems FY20 miscoding			0.15							
Flood operations - Corporate Systems FY20 miscoding			0.02							
Hydrometric monitoring - Corporate Systems FY20 miscoding			0.19							
Asset management planning - Corporate Systems FY20 miscoding			0.01							
Dam safety compliance pre1997 - Corporate Systems FY20 miscoding			0.07							
Environmental Planning & Protection - Corporate Systems FY20 miscoding			0.02							
Renewals and Replacement - Corporate Systems FY20 miscoding			0.09							
Corporate Systems - Corporate Systems FY20 miscoding			-0.56							
FR Corporate Systems RAB to Salary Allocation adjustment					0.06	0.04	0.03	0.03	0.10	0.17
FR Dam Safety Compliance RAB to Salary Allocation adjustment					0.01	0.01	0.01	0.02	0.05	0.05
FR Asset management planning RAB to Salary Allocation adjustment					0.01	0.01	0.00	0.00	0.01	0.02
FR Routine maintenance RAB to Salary Allocation adjustment					0.00	0.00	0.00	0.00	0.00	0.00
FR Renewals and Replacement RAB to Salary Allocation adjustment					0.00	0.00	0.00	0.00	0.00	0.00
FR - Corporate Scope and Reallocation				0.00	0.06	0.06	0.06	0.06	0.19	0.25
Sub Total adjustments	0.00	0.00	-0.24	-0.04	0.14	0.12	0.12	0.12	0.36	0.50
ADJUSTED EXPENDITURE BEFORE APPLICATION OF EFFICIENCY TARGETS										
Water Delivery & Other Operations	0.00	2.04	0.26	0.24	0.95	0.86	0.00	0.00	0.86	1.81
Flood Operations	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Routine Maintenance	0.00	0.00	0.00	0.03	0.02	0.02	0.03	0.03	0.08	0.11
Asset Management Planning	0.00	0.00	0.01	0.11	0.13	0.11	0.14	0.12	0.38	0.50
Dam Safety Compliance	0.00	0.00	0.00	0.19	0.70	0.26	0.46	0.52	1.24	1.93
Environmental Planning & Protection	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.65	0.08	2.30	1.55	0.88	0.80	1.24	0.82	2.86	3.74
Drought projects (3 dams)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drought projects (other)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewals and Replacement	4.81	2.58	0.67	1.84	1.79	2.09	3.10	1.86	7.04	8.83
Dam safety compliance on pre 1997 capital projects	0.01	-0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structural and other enhancements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Customer support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal corporate projects	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total pre-efficiency	5.47	4.67	3.54	3.96	4.48	4.13	4.97	3.35	12.45	16.93
Atkins/Cardno recommended additional capital efficiency targets (beyond those applied by the company)										
Continuing Efficiency (%)				0.00%	0.70%	1.40%	2.09%	2.77%		
Continuing Efficiency ($M)				0.00	-0.03	-0.06	-0.10	-0.09	-0.25	-0.29
Catch-up efficiency (%)				0.00%	2.11%	4.22%	6.83%	7.44%		
Catch-up efficiency ($M)				0.00	-0.09	-0.17	-0.33	-0.24	-0.75	-0.84
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE										
($M 2020/21) year ending June	2018	2019	2020	2021	2022	2023	2024	2025	2023-25 Total	2022-25 Total
Water Delivery & Other Operations	0.0	2.0	0.3	0.2	0.9	0.8	0.0	0.0	0.81	1.73
Flood Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Hydrometric Monitoring	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Water Quality Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corrective Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Routine Maintenance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.08	0.10
Asset Management Planning	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.34	0.47
Dam Safety Compliance	0.0	0.0	0.0	0.2	0.7	0.2	0.4	0.5	1.13	1.81
Environmental Planning & Protection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Corporate Systems	0.7	0.1	2.3	1.6	0.9	0.8	1.1	0.7	2.62	3.48
Drought projects (3 dams)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Drought projects (other)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Renewals and Replacement	4.8	2.6	0.7	1.8	1.7	2.0	2.8	1.7	6.47	8.21
Dam safety compliance on pre 1997 capital projects	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Structural and other enhancements	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Customer support	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Internal corporate projects	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Total Efficient Expenditure	**5.5**	**4.7**	**3.5**	**4.0**	**4.4**	**3.9**	**4.5**	**3.0**	**11.5**	**15.8**
User Share Capital Expenditure	*5.0*	*4.4*	*3.4*	*3.7*	*3.9*	*3.6*	*4.1*	*2.7*	*10.3*	*14.2*
Government Share Capital Expenditure	*0.5*	*0.2*	*0.2*	*0.3*	*0.4*	*0.3*	*0.5*	*0.3*	*1.1*	*1.6*

Table A-26 – Operating Expenditure Fish River Water Scheme

WATERNSW RURAL BULK WATER PROPOSAL - OPEX - Fish River Water Scheme Valley											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.00	0.00	0.03	0.01	0.01	0.17	0.23	0.23	0.22	0.22	0.22
Customer Billing	0.01	0.01	0.03	0.02	0.03	0.04	0.04	0.04	0.04	0.04	0.04
Metering and Compliance	0.05	0.07	0.15	0.14	0.07	0.08	0.09	0.09	0.09	0.10	0.10
Water Delivery and Other Operations	0.92	0.48	0.46	0.73	0.67	0.78	0.89	0.98	0.87	0.86	0.80
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.02	0.02	0.01	0.01	0.01	0.05	0.19	0.20	0.19	0.21	0.19
Water Quality Monitoring	0.11	0.10	0.04	0.01	0.77	0.08	0.06	0.06	0.06	0.06	0.06
Corrective Maintenance	0.51	0.37	1.04	1.08	0.74	1.14	0.62	0.61	0.60	0.64	0.62
Routine Maintenance	1.25	1.23	0.97	2.48	2.70	2.39	2.47	2.45	2.41	2.55	2.53
Asset management planning	0.54	0.43	0.28	0.21	0.08	0.05	0.16	0.21	0.32	0.19	0.14
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.31	0.26	0.26	0.21	0.15	0.14	0.21	0.26	0.29	0.32	0.29
Environmental Planning and Protection	0.26	0.10	0.01	0.00	0.00	0.00	0.04	0.05	0.05	0.05	0.03
Direct Insurances	0.00	0.00	0.00	0.19	0.18	0.14	0.09	0.09	0.09	0.09	0.09
Renewal and Replacement	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.05	0.00	0.00	0.00	0.04	0.16	0.00	0.01	0.15	0.15	0.15
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fish River Water Scheme Valley - Total Operating Expend	**4.03**	**3.08**	**3.32**	**5.21**	**5.47**	**5.23**	**5.11**	**5.27**	**5.39**	**5.49**	**5.27**
Atkins/Cardno recommended scope adjustments											
Customer Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Customer Billing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Delivery and Other Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	-0.02	-0.01	0.03
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	-0.05	-0.02	-0.05
Water Quality Monitoring	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corrective Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.03
Routine Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	-0.02	0.06
Asset management planning	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	-0.05	-0.02	-0.04
Environmental Planning and Protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05	-0.05	-0.05	-0.03
Direct Insurances	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Renewal and Replacement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.09	-0.09	-0.08
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub Total adjustments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.11	-0.22	-0.20	-0.06
Atkins/Cardno recommended efficiency targets											
Continuing Efficiency (%)								0.70%	1.40%	2.09%	2.77%
Continuing Efficiency ($M)								-0.04	-0.07	-0.11	-0.14
Catch-up efficiency (%)								1.10%	2.19%	3.26%	4.33%
Catch-up efficiency ($M)								-0.06	-0.11	-0.17	-0.22
ATKINS/CARDNO ASSESSMENT OF EFFICIENT EXPENDITURE											
($M 2020/21) year ending June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Customer Support	0.00	0.00	0.03	0.01	0.01	0.17	0.23	0.23	0.21	0.21	0.21
Customer Billing	0.01	0.01	0.03	0.02	0.03	0.04	0.04	0.04	0.04	0.04	0.04
Metering and Compliance	0.05	0.07	0.15	0.14	0.07	0.08	0.09	0.09	0.09	0.09	0.09
Water Delivery and Other Operations	0.92	0.48	0.46	0.73	0.67	0.78	0.89	0.92	0.82	0.80	0.77
Flood Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrometric Monitoring	0.02	0.02	0.01	0.01	0.01	0.05	0.19	0.16	0.14	0.18	0.14
Water Quality Monitoring	0.11	0.10	0.04	0.01	0.77	0.08	0.06	0.06	0.06	0.06	0.06
Corrective Maintenance	0.51	0.37	1.04	1.08	0.74	1.14	0.62	0.61	0.59	0.61	0.61
Routine Maintenance	1.25	1.23	0.97	2.48	2.70	2.39	2.47	2.43	2.35	2.40	2.41
Asset management planning	0.54	0.43	0.28	0.21	0.08	0.05	0.16	0.21	0.31	0.18	0.13
Dam Safety Compliance Capital Projects pre-1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dam Safety Compliance	0.31	0.26	0.26	0.21	0.15	0.14	0.21	0.23	0.23	0.28	0.23
Environmental Planning and Protection	0.26	0.10	0.01	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00
Direct Insurances	0.00	0.00	0.00	0.19	0.18	0.14	0.09	0.09	0.09	0.08	0.09
Renewal and Replacement	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Corporate Systems	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Internal	0.05	0.00	0.00	0.00	0.04	0.16	0.00	0.01	0.06	0.06	0.06
New Metering and Compliance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Delivery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Efficient Expenditure	4.03	3.08	3.32	5.21	5.47	5.23	5.11	5.06	4.99	5.01	4.85

Appendix B. Capital projects reviewed

Table B-1 - Capital Projects reviewed

Type	Activity	Project example for review	Valley	Total Capex	Period
Fish Passage Offsets schemes	Environmental planning and protection	CPTN Fish Passage Offsets	Gwydir	22,334.35	Future
Renewals Provision	Renewals and Replacement	HUNT Renewals Provision	Hunter	4,925.61	Future
Dam Safety Compliance	Dam Safety Compliance	KEPT Upgrade Phase 2 & NO270000.13 KEPT Upgrade Phase 2	Namoi	[redacted]	Current
Dam Safety Compliance	Dam Safety Compliance	Lake Cargelligo Dam Safety Upgrade - Design and Delivery	Lachlan	[redacted]	Current & Future
Renewals & Replacement (MCP)	Renewals and Replacement	LACH Renewals & Replacement (MCP)	Lachlan	5,278.36	Current
Cableway Upgrade	Renewals and Replacement	Burrinjuck Dam Cableway Upgrade & (MB320047.12 Burrinjuck Dam Cableway Upgrade, MB320047.13 Burrinjuck Dam Cableway Upgrade, MB320047.15 Burrinjuck Dam Cableway Upgrade)	Murrumbidgee	[redacted]	Current
Coatings project	Renewals and Replacement	Southern coatings project	Murray	[redacted]	Current
Pipeline renewal	Renewals and Replacement/ Water delivery and other operations	Fish River Pipeline Renewals 2018 & FR140007.13 Fish River Pipeline Renewals 2018	Fish River	2,129.91 503.26	Current & Future

Corporate schemes

Fleet

Property

Under ICT:

- The WAVE Program
- CIMS
- DamGuard

- ICT Replacement and Renewals

Data Centre

iSMART program (current determination period)

Appendix C. Capital project summaries

C.1. Hunter Renewals Provisions

PROJECT DETAILS

Project Name	HUNTER Renewals Provision	
Project Number	[ref in SIR]	2020 determination period
Work Program		
Key Investment Driver(s)	Asset renewals	
Stage	Planning	
Similar Projects	Similar renewals provisions in the other Rural Valleys	
Link to asset plans		
Output Measure		

FINANCIALS AND PROGRAM (costs to 2019/20)

Budget in 2019 Needs Assessment BC	N/A	**Initial Delivery Date**	Annual program
Outturn cost / Forecast outturn cost in Submission	N/A	**Actual / Forecast Delivery Date**	Annual program

Year ending (price base $m 19/20)	**2017**	**2018**	**2019**	**2020**	**Sub Total**	**2021**	**2022**	**2023**	**2024**	**2025**	**Sub Total**	**Total**
Planned (SIR)						0.096	0.985	1.733	1.368	0.744	**4.926**	**4.926**
Planned From review documents							1.232	2.126	1.742	1.381	**6.481**	**6.481**

NEED FOR SCHEME

The Hunter Valley Renewals Provision is an ongoing program of works to maintain the capability of existing water infrastructure in the valley. WaterNSW has similar Renewals Provision programs in its other valleys across the 2021 Determination Period. These renewals are required to maintain WaterNSW's service obligations in delivering water to its customers. The renewals works in the Hunter Valley proposed Renewals Provision program are all for works at the Glenbawn Dam, Glennies Creek Dam and Lostock Dam.

Further details of the needs for key renewals projects included in the FY22 program that were presented to us by WaterNSW are summarised in the next section.

SCOPE OF WORKS

The scope of works is a portfolio of needs assessed to maintain the capability of existing water infrastructure in the Hunter Valley.

Renewals provision program that has been developed by WaterNSW for the Hunter Valley in FY22 and which it included in its project presentation are comprised of:

- Lostock Dissipator refurbishment
- Glennies Creek Trash Rack Refurbishment

- Glenbawn Road Refurbishment
- Initiation of other renewals projects including:
  - Lostock electrical and SCADA replacement
  - Glenbawn 1600mm High Level Butterfly valve refurbishment
  - Glenbawn SCADA equipment replacement.

Lostock Dissipator Refurbishment - The outlet works dissipator steel liner at Lostock dam, which protects the dissipator concrete from damage, has been assessed as being in very poor condition. The refurbishment of the dissipator steel liner was initially proposed for the current determination period but was deferred due to funding constraints into the 2021 Determination Period. The cost of the work has been estimated at $0.4million.

Glennies Creek Trash Racks - The protective coating for the steel trash racks and baulks to the intake tower at Glennies Creek has been assessed as being in poor condition and overdue for renewal. As there are no spare sets, the protective coating cannot be renewed at present, leading to continued deterioration. WaterNSW's scope of works to address these issues is to purchase a spare set of baulks and trash racks and refurbish the existing set. The cost of the work has been estimated at $0.8 million.

Glenbawn Road refurbishment - The saddle dam road and site roads at Glenbawn Dam have been identified as needing to be refurbished due to the deteriorating condition of road base. The request for road resurfacing was deferred in 2019 due to funding constraints for renewals work in the Hunter Valley. WaterNSW has estimated that refurbishing the saddle dam road and various site roads, including resurfacing the top coat of road will cost [redacted] million.

As part of the review work after the project presentation, we requested the proposed expenditure details for the remaining three year period out to FY25 and this information was provided by WaterNSW in the Rural valleys Renewals Plan FY22-FY25 spreadsheet, The spreadsheet provided a summary of each project included in the four year program, the assessed priority for each project, details of drivers, the cost estimate, start and end dates, the breakdown of proposed quarterly expenditure taking into account efficiency savings and the total efficiency saving for each project.

IMPACT ON OPERATING COSTS

No explicit impacts on operating costs have been identified for any of the candidate projects in the Hunter Renewals Provisions.

OPTIONS APPRAISAL

WaterNSW has developed the renewals provision program through its capital renewals program process. As the program is for renewals, typically options to address deficiencies and issues are limited.

As a result of the large number of items, WaterNSW does not undertake any detailed options analysis for any of the renewals provision projects, with the workshops that it uses to validate and prioritise candidate renewals projects used to identify the efficient solution. The programs that are developed typically focus more on refurbishment than replacements, meaning that there are limited options. Due to the bespoke nature of WaterNSW's asset base, there is a low level of commonality between assets, meaning that broad options for a solution are not able to be considered. In this respect, WaterNSW's renewals greatly differ from a typical urban water service provider, where renewals programs tend to focus on large scale replacements of common assets, e.g. pipes, valves, meters, etc.

Source information from internal and external studies, as well as site issues that are identified by the Asset maintenance team, is used to build consolidated issues list of potential renewals projects. The source data is supported by condition and criticality information recorded in WaterNSW's Enterprise Asset Management System (EAMS) and outputs from its PowerPlan planning tool.

A validation workshop is conducted to validate the 'consolidated issues' list and discuss potential options. Prior to the workshop, a description of the identified issues that have been captured is circulated for operational context.

The validation workshop is used to:

- discuss the validity of each issue and identified need with operational stakeholders and allow for a field knowledge-based condition update
- allow for the issue to be captured as a clear and concise Need Statement
- review and record the proposed solution and cost estimate
- Identify issues where operational mitigation is a sufficient solution to address the problem instead of a capital expenditure project.

Post workshop, there are further discussions on refinements to the scope of works and associated estimates for each renewals project and on linkages with existing projects. Validated projects progress to prioritisation, while projects not required to have capital intervention are deferred and/or operationally mitigated.

Validated projects have their priority determined against the portfolio in that valley in the prioritisation workshop. WaterNSW's prioritisation process confirms criticality ratings for the assets identified for renewals projects, with the additional information captured after the validation workshop discussed in more detail and used to review and update the cost estimates. Live scoring of the candidate renewals projects of the validated list is carried out as each project is assessed, with the numerical and graphical results used to allow quick comparative analysis and agreement on relative priorities in the valley.

Based on the compliance, capability and condition scores, the Lostock Dissipator refurbishment, Glennies Creek Trash Rack Refurbishment and the Glenbawn Road Refurbishment projects have been identified as the three highest priority works from the prioritisation process for the Hunter Valley

Prioritised projects progress to form part of the Capital Plan, where further review and refinement is undertaken to develop the final plan. Cashflows for the candidate groupings are analysed and refined and the deliverability of the renewals projects is iteratively optimised with cashflows.

COST ESTIMATING METHOD

The renewals provision programs for each Valley essentially act as an encompassing collection of disparate renewals projects, that uses the allowance for each Valley for funding. Typically the works are grouped by location, allowing for packaging the projects for each site and looking to realise efficiencies through this approach where possible.

The issue validation and prioritisation workshops have a cost estimator at hand to provide input. WaterNSW noted during our discussions that the cost estimates derived in the validation process are based on the preliminary options assessment, as generally this is the only information available at the time. In practice, because of the limited information, this can often mean that a more expensive option is identified and costed.

The cost estimates for the Hunter Renewals Provision Project are documented in the 'Hunter – Detailed Estimate' spreadsheet. The estimates for each candidate project include details of dimensions, where applicable, and line entries for specific tasks to be completed and replacement assets. Estimates of quantities and time are used with unit costs for components and labour costs to calculate labour costs and supply costs. Design and supervision estimates are also included to derive the contractor cost estimate for each activity. WaterNSW also estimates its own internal costs for Planning, Execution & Completion, Project Risks, Management Reserve and Capitalised Overheads.

We reviewed the key renewals provisions that WaterNSW is proposing for the Hunter Valley in FY22:

The Lostock Dam Dissipator Overhaul cost estimate is based on line items for the removal and reinstallation of existing pipework and valves and the coating of the infrastructure. The contractor costs has been estimated at [redacted] with WaterNSW costs estimated as [redacted] resulting in a total project estimate of [redacted]. The project is confirmed in the spreadsheet as a candidate for the prioritisation process.

The Glennies Creek Trash Racks estimate has allowed for the identified steelworks, with the resurfacing calculated on an allowance per tonne and costs for the general preliminaries and contractor mark-up. Contractor costs have been estimated as [redacted] and WaterNSW's costs as [redacted] a total of [redacted] The project is confirmed in the spreadsheet as a candidate for the prioritisation process.

The Glenbawn Road refurbishments of the saddle dam and sites roads has include line items for the earthworks, rockfill/gravel supply and placement and general preliminaries and contractor mark-up. Contractor costs have been estimated as [redacted] and WaterNSW's costs as [redacted] a total of [redacted]. The project is confirmed in the spreadsheet as a candidate for the prioritisation process.

WaterNSW has included efficiencies in the development of its renewals provision program of works and the development and implementation of its efficiency targets for its rural asset renewals and replacement capital expenditure for its FY22-FY25 program have been set out.

Each candidate project has an identified 'Work Type' nominated, which signifies a combination of four efficiency targets:

- Engineering/design
- Works packaging
- Purchase efficiency
- Local contracting

Efficiency targets for each of these for specific project types have been established by WaterNSW. In addition, the financial year commencement date of a renewals project influences the level of efficiency applied due to the progressive rollout.

WaterNSW has calculated the efficiencies for a total of 44 candidate renewals and replacement projects in the Hunter valley using the capital expenditure efficiency targets methodology outlined above. The current Rural Valleys Renewals Plan for FY22-FY25 includes 30 of these projects.

WaterNSW has assigned the type of works for each project, to allow the relevant efficiency assumptions for that type of work to be assigned. Estimates for labour costs, materials and design and engineering costs to derive the total contractor cost. The labour costs have been calculated based on an estimate of the number of crew required, the hours and an assumed crew rate per hour. Although [redacted] is used for each member of a general works crew, the rates change for tasks where specialist personnel are required.

WaterNSW has also estimated the internal costs for each of its projects. These estimates are based on assumed percentages. Although the capital expenditure cost estimates for the renewals and replacement projects included in the spreadsheets provided by WaterNSW are all hard coded, we note the following:

- WaterNSW's planning costs are estimated as 2.5% of the estimated contractor cost
- WaterNSW's Execution and Completion costs are estimated as 8% of the estimated contractor cost
- WaterNSW's project risk costs are estimated as 12.5% of the estimated contractor cost
- WaterNSW's capitalised overhead costs are estimated as 15% of the estimated contractor cost

Therefore, WaterNSW's internal costs have been calculated as 38% of the estimated contractor cost in the calculation of the total project estimate.

The contractor costs and the internal costs, including the capitalised overhead component have been combined to derive each project cost estimate.

The basis for WaterNSW's efficiency calculations is the total project cost estimate net of the capitalised overhead. However, the actual efficiency targets are applied to the direct contractor costs

The savings that WaterNSW has calculated for each of the Hunter Renewals Provision projects that have been included in each of the four years from FY22 to FY25 are provided in the following table.

Hunter Renewals Provision proposed projects FY22FY25

No.	Project	Proposed project start date	Proposed project end date	Duration (no. of quarters)	Original estimate including capitalised overhead $	Post-efficiency estimate $	Total efficiency saving $
HU001	Lostock Dam - Hunter - Dissipator Overhaul	2022 Q1	2022 Q4	4	[redacted]		
789	Glennies Creek Dam - New intake tower baulks and trashracks and overhaul of existing set	2022 Q2	2023 Q1	4			
170	Saddle Dam and site roads resurfacing	2022 Q4	2023 Q3	4			
152	Glenbawn Dam - 10 year hollow jet valve no.2 general overhaul	2023 Q1	2023 Q4	4			
153	Glenbawn Dam - 10 year hollow jet valve no.3 general overhaul	2023 Q1	2023 Q4	4			
151	Glenbawn Dam - 10 year hollow jet valve no.1 general overhaul	2023 Q1	2023 Q4	4			
653	Lostock Dam - Access to Emergency Closure Valves	2023 Q1	2023 Q4	4			
197	Lostock Dam - Hunter - SCADA LAN 3COM optical fibre router	2022 Q4	2024 Q1	6			
142	Glenbawn Dam - Hunter - 10 year butterfly valve general overhaul	2022 Q4	2023 Q3	4			
171	Glenbawn Dam - Hunter - SCADA LAN 3COM optical fibre router	2022 Q4	2023 Q4	5			
183	Glennies Creek Dam - Hunter - SCADA LAN 3COM optical fibre router	2023 Q3	2024 Q2	4			
2515	Glennies Creek Dam – Replace wastewater tanks, plus 200m of pipe section	2023 Q4	2024 Q3	4			
175	Glennies Creek Dam - 10 year butterfly valve general overhaul	2024 Q1	2024 Q4	4			

147	Glenbawn Dam – 10 year gate valve mechanical overhaul	2024 Q1	2024 Q4	4	[redacted]
148	Glenbawn Dam – 10 year gate valve general overhaul	2024 Q1	2024 Q4	4	
190	Lostock Dam – 10 year gate valve mechanical overhaul	2024 Q1	2024 Q4	4	
189	Lostock Dam – 10 year gate valve manual general overhaul	2024 Q1	2024 Q4	4	
198	Lostock Dam – 150m Spillway Safety Barrier (tuffboom)	2024 Q1	2024 Q4	4	
188	Lostock Dam – 10 year FCD valve general overhaul	2024 Q1	2024 Q4	4	
185	Lostock Dam – 10 year bulkhead gate general overhaul	2024 Q1	2024 Q4	4	
176	Glennies Creek Dam - 10 year butterfly valve no. 2 general overhaul	2024 Q1	2024 Q4	4	
145	Glenbawn Dam – 10 year FCD valve electrical overhaul	2024 Q1	2024 Q4	4	
186	Lostock Dam – 10 year butterfly valve general overhaul	2024 Q2	2025 Q1	4	
182	Glennes Creek Dam - Road Resurfacing of 4.5km	2025 Q1	2025 Q4	4	
180	Glennies Creek Dam - 200m of cliff top bar protection fencing	2025 Q1	2025 Q4	4	
158	Glenbawn Dam – 10 year steel dissipator liner for valve general overhaul	2025 Q1	2025 Q4	4	
144	Glenbawn Dam – 10 year FCD valve mechanical overhaul	2025 Q1	2025 Q4	4	
157	Glenbawn Dam – 10 year penstock external coating general overhaul (100+m)	2025 Q1	2025 Q4	4	
191	Lostock Dam – 10 year trahsracks general overhaul	2025 Q4	2026 Q4	5	

146	Glenbawn Dam – 10 year gate valve manual mechanical overhaul	2025 Q3	2026 Q2	4	[redacted]
	TOTALS				

* Note: Projects 191 and 146 are scheduled to start in FY25 but continue into FY26. The original estimate shows the total project cost and the total efficiency saving shows the estimated project saving. However, the post-efficiency estimate only shows the FY25 proposed expenditure on the two projects.

The FY22-F25 calculated efficiency savings total [redacted] or the four financial years (including savings from two projects that are proposed to start but not end in the determination period). This represents an overall saving of 7.1% on the initial cost estimates that have been prepared for each of the Hunter Renewals Provision projects.

PROCUREMENT METHOD

WaterNSW has implemented a new procurement model for its asset renewals and replacement projects to ensure efficient and reliable delivery of 'business as usual' water infrastructure capital investment. This delivery model includes a single design/engineering services partner and two construction partners across the state. WaterNSW is implementing measures to provide visibility related to the partners engaging local resources. The procurement model also allows WaterNSW to engage specialist contractors directly from outside the model, e.g. coatings contractors.

For the renewals provisions, WaterNSW is looking to group projects by location to gain efficiencies.

DELIVERY

As above.

The Hunter renewals provision is an on-going program developed using a bottom-up approach from internal and external source data and based on the assessed needs. The program included in the SIR averages $0.985 million per annum in the forward period, starting at $0.096 million in 2021/22 before increasing to 2023/24 then declining to the end of the period. This is an ongoing renewal program for the infrastructure in the Hunter Valley and is not specific to only the 2021 Determination Period.

However, the program included in the Rural Valleys Renewal Plan FY22-FY25 that was provided as part of the review documents shows a higher expenditure for the Hunter Valley than included in the SIR. The four year total proposed spend is $1.56 million higher, at $6.481 million, and averages $1.62 million in each year.

POST PROJECT REVIEW

N/A

KEY DOCUMENTS REVIEWED

- WaterNSW Powerpoint Presentation - WaterNSW Rural Bulk Water Expenditure Review – Capex Projects - Hunter Valley Renewals - 13 October 2020 (RFI 287)
- WaterNSW, Efficiency challenge evidence (RFI 138)
- WaterNSW, Hunter Prioritisation Workbook Extract (RFI 263)
- WaterNSW, Hunter - Detailed Estimate spreadsheet (RFI 263)
- WaterNSW, Development and Implementation of Efficiency Targets - Rural Asset Renewals and Replacement Capex - FY22 (RFI 98)
- Cashflow (Hunter Extract) spreadsheet (RFI 308)
- Efficiency Calculations (Hunter Extract) spreadsheet (RFI 308)
- Rural Valleys Renewals Plan FY22-FY25

C.2. Lachlan Maintain Capability Program (MCP)

PROJECT DETAILS

Project Name	Lachlan Maintain Capability Program (MCP)	
Project Number	[ref in SIR]	2016 Determination Period
Work Program		
Key Investment Driver(s)	Asset renewals	
Stage	Various	
Similar Projects	Other MCP works in the rural valleys	
Link to asset plans		
Output Measure		

FINANCIALS AND PROGRAM (costs to 2019/20)

Budget in 2019 Needs Assessment BC	$ m	Initial Delivery Date	[month/ year]
Outturn cost / Forecast outturn cost in Submission	$m	Actual / Forecast Delivery Date	[month/ year]

Year ending (price base $m 19/20)	2017	2018	2019	2020	Sub Total	2021	2022	2023	2024	Sub Total	Total
Planned (SIR) (Oct 2020 submission)	0.0034	0.027	2.182	4.343	**6.556**						
Planned From review documents			1.238	6.486	**7.724**						
Approved project budget					**6.1**						

NEED FOR SCHEME

The Lachlan Maintain Capability Program (MCP) was initiated in 2017 as part of an overall business renewals program to address critical operability, reliability, compliance and safety issues across facilities in the rural valleys, which are affecting safe and reliable water storage and delivery to end users, whilst addressing operation, maintenance, asset management, environmental and heritage requirements

The objective of the project is the safe and reliable operation of the rural water supply systems to maintain a service level of safety, operability and maintainability in providing a reliable water supply to customers.

SCOPE OF WORKS

The scope of works for the Lachlan MCP was identified through two reports prepared by Aurecon in December 2017: FY18-FY21 Rural Assets Project Validation Study - Lachlan Valley (Excluding Dams) and Rural Projects Validation - Lachlan Valley Dams.

WaterNSW's Rural Capability Maintenance register identified elements at each of the sites that required further assessment for defects and obvious workplace, health and safety and/or operational issues. Based on the information recorded in the register, Aurecon performed a preliminary assessment of

potential projects to validate the issues raised, to perform asset condition assessment and identify potential remediation options. Workshops were held to assess asset component criticality and prioritisation was performed based on stakeholder consensus and using output from WaterNSW's PowerPlan planning tool. Projects to address the issues raised are now in the process of being implemented

The preferred options for each project are detailed in WaterNSW's MCP Rural Tranche 2 Asset Upgrades Final Business Case (D2019/32867). This business case included MCP projects for all of WaterNSW's rural valleys. The expenditure requested in the business case totalled $33.186 million, with the Lachlan Valley making up $7.486 million (22.56%) of the total.

The summary of recommended options and final scope for the MCP projects for the Lachlan valley included in Annexure 2 of the Final Business Case are:

Site	Scope	Recommended option
Carcoar Dam	Outlet Valves Access	New installation
Carcoar Dam	Access road - dissipator	Renewal
Carcoar Dam	Dissipator Access stairway	Renewal
Carcoar Dam	Access road — outlet valves	Replace
Carcoar Dam	Outlet works Main Switch Board	Replace
Wyangala Dam	Dam Crest Road	Replace
Wyangala Dam	Hoist - 2 tonne	Replace
Wyangala Dam	Hoist - 12.5 tonne	Renewal & Replace
Wyangala Dam	Power Supply - generator	New installation
Wyangala Dam	Spillway Walkway to training wall	New installation
Wyangala Dam	Intake Tower Doors	Replace
Wyangala Dam	Access road to workshop	Renewal
Wyangala Dam	Outlet Works Hydraulic System	Replace
Booberoi Offtake Regulator	Low flow channel	Renewal
Booberoi Offtake Regulator	Gates	Replace
Booberoi Offtake Regulator	Regulator platform	Replace
Booberoi Weir	Erosion of embankments	Renewal
Booligal Weir	Erosion	Renewal
Box Creek Regulator	Regulator access	Replace
Cottons Weir	Erosion – embankment	Renewal
Gonowilia Weir	Weir structure	Renewal
Jemalong Weir	Fence	Replace
Jemalong Weir	Access road	Renewal
Jemalong Weir	Weir platform	Replace
Jemalong Weir	Upper platform access	Replace
Jemalong Weir	Debris Boom	Replace
Lake Brewster Conduit	Actuators	Replace
Lake Brewster Inlet Regulator	Actuators	Replace
Lake Brewster Inlet Regulator	Erosion of embankments	Renewal
Lake Brewster Inlet Regulator	Gates	New installation
Merrowie Creek Offtake Regulator	Erosion	Renewal

Mountain Creek Syphon	Outlet Structure	Renewal
Mountain Creek Syphon	Erosion	Renewal
Muggabah Creek Regulator	Erosion	Renewal
Torriganny Weir	Weir structure - whole weir	Renewal
Wilandra Creek Inlet Regulator	Actuators	Replace

However, a reduced scope of works from the Aurecon list included in the Final Business Case has progressed, together with a reduced project budget. The refinement of the projects recommended by Aurecon was carried out by WaterNSW in the Preliminary Business Case, which is used to develop the initial list of projects to determine which of the projects should progress. Multi-criteria assessment was then completed in order to develop the options for inclusion on the Final Business Case.

The sites, projects, status, issue and solution of the refined scope of Lachlan Valley MCP projects that have been progressed are included in the following table.

Site	Projects Status	Status	Issue	Solution
Wyangala Dam	Hoist – 2 tonne	Design	Operational WHS risk	Replace hoist
	Hoist – 12.5 tonne	Design	Operational WHS risk	Replace hoist
	Intake Tower Doors	Design	WHS Risk – suspended load	Replace doors
	Wire rope replacement	Lead time		
Booberoi Creek	Low flow channel	Complete	Silted blocking flows	Desilting channel bed and vegetation
Booberoi Regulator	Offtake gates	Design	Operational WHS Issue	Refurbish regulator structure
Booligal Weir	Erosion protection	Complete	Inability to deliver water flows and environmental risk	Excavate and remove vegetation, install geofabric and place rock beaching
Gonowilia Weir	New platform	Design	Operational WHS risk	Install new platform including trolley access to reduce operation WHS risks
Jemalong Weir	New fencing	Complete	WHS Risks from public access	Replace existing fence and gates
	Replace debris boom	Complete	Debris boom has reached end of effective life	of effective life Replace debris boom
	Generator	Procurement	Generator has reached the end of its effective life	Replace generator
Lake Brewster	Conduit actuators	Complete	Actuators at end of life	Replace actuators
	Inlet Regulator	Complete	Actuators at end of life	Replace actuators

	Outlet regulator	Lead time	Actuators at end of life	Replace actuators
	Inlet Gates	Complete	Failure from head pressure from opposite side	Investigate head pressures and resolve
Merrowie Creek	Outlet structure	Design	Operational WHS risk	New platform
Mountain Creek Syphon	Erosion protection	Complete	Inability to deliver water flows and environmental risk	Excavate and remove vegetation, install geofabric and place rock beaching
Torriganny Weir	Non-conformances & defects	Design	This structure has significant WHS non-conformances and defects	Investigate structure. Develop design for refurbish/replacement
Wilandra Creek	Inlet Regulator	Lead time	Actuators at end of life	Replace actuators

IMPACT ON OPERATING COSTS

Although the business case has identified "Improved asset reliability and functionality. The improved reliability and functionality will enable WaterNSW to meet its service obligations in the most cost-efficient manner and will provide optimal life cycle solution over the remaining asset life," no explicit impacts on operating expenditure have been calculated.

OPTIONS APPRAISAL

Initial options were developed by Aurecon based on site inspections and condition assessment as part of the work undertaken in the validation studies that were completed for the non-dam and dam sites in the Lachlan Valley.

Each asset included in the assessment was assigned condition rating of 1 to 5 in accordance with WaterNSW's Asset Condition Assessment Guidelines, where 1 is very good (almost new) and 5 is very poor (failed). Aurecon's review was based solely on visual inspections of the sites. No drilling, sampling testing or design assessments were undertaken as part of the investigations in the validation studies. Options for doing nothing, refurbishing and replacing were then developed by Auercon where applicable, with orders of cost provided.

The options were refined by WaterNSW through scenarios and sensitivity analyses that were performed as part of P2 Planning during the development of the Final Business Case. The risks at this stage were mainly limited to contractor unit rates not aligning with the engineer's estimates or necessary changes to the project scope.

COST ESTIMATING METHOD

Initial high level cost estimates for the recommended solution for each identified project were prepared by Auercon as part of its validation studies. These cost estimates were based on external contractor costs only and the estimates did not include internal WaterNSW costs for staff, equipment, overheads etc.

The Final Business Case estimate was based on six packages of similar types of work. The packages were costed separately. A risk workshop attended by design, management, construction and planning specialists was held on 12 March 2019 and focused on profiling the risks for each work package individually and quantifying them. As a result of this process, the risks associated with each type of work was identified and costed and the level of accuracy of the estimate increased. Contingent risk was calculated in accordance with WaterNSW's Estimating Framework (D2017/89290). The risk estimates for

the Final Business Case packages were prepared using @risk software. The risk inputs were set up so the P50 of the packages included the risks quantified by the risk workshop.

The breakdown of the cost estimate for the Lachlan Valley MCP works included in the Final Business Case was:

Internal: [redacted]

External: [redacted]

Risk based contingency: [redacted]

Budget allocation – overhead: [redacted]

Total cost: [redacted]

However, the project total was reported by WaterNSW during its presentation for this project to be in the region of $6.1 million. We note that neither of these project totals aligns with the capital expenditure included in WaterNSW's SIR, which totals $5.256 million over two years (2019/20 and 2020/21). WaterNSW explained that there is no direct linkage between the 2017 determination and the current Lachlan MCP Projects comparison, as provisions were made for the 2017 renewals budget numbers.

We challenged WaterNSW to the difference between the approved project cost and the information it has reported in the SIR. WaterNSW explained that the program of works included in the Lachlan MCP project has been subject to further review and adjustment in terms of inclusions in the works and what the organisation was willing to commit to. The development of projects to include in the MCP started in the submission process with known risks and costs, which were assessed and prioritised at the time that the 2016 pricing submission was being prepared. Latent issues that have been identified as candidate projects have progressed to the design stages, and also the identification of other risks and other projects during the determination period, have resulted in reprioritisation and changes to the program that was envisaged for the four year period.

WaterNSW provided the Lachlan Project Change Request document (September 2020) which details the changes to the project cost and items that have been deferred as part of this process from the projects included in the Final Business Case. This document confirmed the list of projects that have been included in the proposed expenditure, with the adjusted MCP budget for Lachlan totalling $6.05 million. This is comprised of a project budget of $5.1 million and corporate overheads of 0.$95 million.

WaterNSW considers that there was potentially a lot more renewals projects that could have been easily justified for being included in the program of works, with further internal discussions leading to more inclusions and the increase in proposed expenditure reflecting this. At the same time, some works have had to be pushed out due to capital overspend in nine of the ten valleys being forecast.

WaterNSW decided not to include the change in its supplementary submission to IPART and it will absorb any increases above its SIR submission for this project.

PROCUREMENT METHOD

Based on all the projects included in the MCP Rural Tranche 2 Final Business Case across all of the rural valleys, WaterNSW prepared detailed scopes of work and specifications for six packages of work (contracts) across the state; roads, erosion and siltation, valves and gates, access and WHS, mechanical/electrical & buildings, and complex projects (whole of asset upgrades).

The packages that are applicable to the scope of works in the Lachlan Valley are those for Road Works, Erosion and Siltation Works, Access and WHS Works, Mechanical, Electrical and Building Works and Asset Renewal Works.

The Delivery Contractors have been selected from the MCP Panel and be based on price and non-price criteria including design cost, project management, contract management, profit, construction methodology, contracting structure, management systems, capability & scalability and schedule. The requirements for the Lachlan MCP renewals included requirements for the contractors to have capability and capacity that that includes major river experience. WaterNSW's contracting model has been

developed to provide the ability to maintain delivery schedule, manage scope change, provide value by removing excessive risk contingency and ensure robust review and approvals processes.

WaterNSW has a panel of three contractors to undertake the detailed design and construction work: Zinfra, Abergeldie, Comdain.

Once the Final Business Case was approved, individual projects that were bid at less than 110% of the budget price proceeded immediately, projects that had prices in excess of 110% of the budget have been re-scoped or have had an alternate delivery methodology negotiated.

DELIVERY

Project Delivery is managed in compliance with WaterNSW's Project Delivery Framework (PDF) and in consultation with the Program Management Office (PMO).

The Final Business Case included that a delivery date of capital works completed by March 2020.

WaterNSW has experienced some delays in the last few months, due in part to COIVD-19 impacts and sub-contractors based in Victoria not being able to cross into NSW to work. However, WaterNSW is forecasting that it expect to finish by the end of the current financial year. Current cashflow projections show 50% for sites completed so the current May 2021 target appears to be achievable.

POST PROJECT REVIEW

N/A

KEY DOCUMENTS REVIEWED

- WaterNSW presentation - WaterNSW Rural Bulk Water Expenditure Review – Capex Projects - Lachlan MCP Project, 16 October 2020 (RFI 295)
- Aurecon, FY18-FY21 Rural Assets Project Validation Study Lachlan Valley (Excluding Dams), Revision 2, 1 December 2017 (RFI 294)
- Aurecon, Rural Projects Validation - Lachlan Valley Dams, Revision 1, 4 December 2017 (RFI 294)
- WaterNSW, Maintain Capability Program - Rural - Tranche 2 Asset Upgrades - Final Business Case, Version 1.1, 1 April 2019 (RFI 208)

C.3. Southern Coatings Program

PROJECT DETAILS

Project Name	Southern Coatings Program	
Project Number		2016 Determination Period
Work Program		
Key Investment Driver(s)	Asset renewals	
Stage	Various	
Similar Projects	Northern Coatings Program / site-specific coatings programs in the SIR	
Link to asset plans		
Output Measure		

FINANCIALS AND PROGRAM (costs to 2019/20)

Budget in 2019 Needs Assessment BC	[redacted]	Initial Delivery Date	December 2020
Outturn cost / Forecast outturn cost in Submission	[redacted]	Actual / Forecast Delivery Date	February 2021 (forecast)

Year ending (price base $m 19/20)	2017	2018	2019	2020	Sub Total	2021	2022	2023	2024	Sub Total	Total
Planned (SIR)					6.045						
Planned From review documents					12.266						
WaterNSW Presentation					11.8						

NEED FOR SCHEME

WaterNSW's "Annual Works Plan FY18 - Maintain Capability and Regulatory Compliance" was initiated to enable WaterNSW to repair, upgrade or restore WaterNSW assets that:

- Had operational capability that did not meet customer service obligations
- Were not compliant with current with the current regulatory and operating license obligations
- Were experiencing asset condition degradation beyond the point of prudent, cost effective maintenance intervention.

Condition assessment reports were completed for structures in the Southern Valleys, with types of structures inspected including weir superstructures, cranes, working platforms, handrails, valves, and weir/dam gates. The remedial actions from the reports recommended that the protective coatings on affected structures be reinstated, as the underlying steel work of those assets was showing signs of visible corrosion and wear. Such rectification (coating works) involves both surface preparation (sand blasting) and recoating.

Full implementation of the proposed coating works would address the integrity of underlying steel structures. The benefits with coating renewals as opposed to replacing the underlying structures were identified by WaterNSW as:

a. coating renewals being a small fraction of the cost when compared to asset replacement
b. coating renewals resulting in significantly less service disruption to customers, than full replacement.

Both of these benefits were identified by WaterNSW as being crucial to minimise life cycle costs associated with maintaining the capability of the assets and meeting its customer's needs. Deferral of the proposed coating works would result in escalating costs, leading to increased structural rehabilitation being required. In addition, there was a risk that this structural deterioration would result in the underlying structures being condemned.

Based on the outcomes from the assessment reports, a final business case prepared to request funding to complete work on a number of structures in Southern NSW, predominantly for assets in the Murray and Murrumbidgee Valleys.

The objectives of the Southern Coatings project was to reinstate key WaterNSW assets to their original condition, by undertaking a remediation of superstructure and gates. These works are expected to be undertaken once in every 25-year life cycle and they require a large capital investment. The yearly patch repair works remain OPEX function.

WaterNSW's expected benefits from implementing this Project were identified as:

- Reduced staff exposure to non-compliant facilities, by the removal of lead paint. Up to the 1970s many of Water NSW sites were being coated using lead paint, which is now WHS issue and considered to be a hazardous product for both the environment and the people exposed to it.
- Reduced risk of environmental incidents (Paint flaking in the river)
- Good stewardship of the assets consistent with whole of life cost optimisation. The completion of the coatings program will result in long-term reduced maintenance activities for and follows a preventative maintenance approach to the long-term capability of those assets.

Rural valley asset renewals did not receive funding approval at the project level in the 2016 Determination. WaterNSW undertook valley-based analysis of regulatory allowance, expenditure and commitments, and identified that there was a shortfall within the respective valleys. WaterNSW proposed that the works that were included in the Final Business Case proceeded given that:

- further deferral of these works would result in deterioration of structural steel with impacts on costs of deferred work and potential asset life reduction
- WaterNSW would have the ability to decelerate works in FY21 to reduce the risk of overspend if required
- Progressing against a portfolio of work with a forecast over the allowance would provide headroom should some projects encounter delays.

SCOPE OF WORKS

The scope of works included in the Southern Coatings project was based on the findings and recommendations included in condition assessment reports that WaterNSW commissioned. These were refined through WaterNSW's Preliminary Business Case process, with further work on detailed specification, design and consideration of the environmental factors to prioritise the works before they were presented in the Final Business Case.

Typical coating works included at each site include:

- Management Plans & Controls
- Scaffolding and containment
- Abrasive Blast Cleaning
- Primer coat
- Intermediate Coat

- Final Top Coat
- Curing, Inspection, & Testing

The Management Plans and Controls are used to define the outage periods for the assets. The coating activities need to be planned in advance and needs to be aligned with operations to minimise impacts on water users.

The scope of works that was identified through the assessment reports and has been progressed through the required project approvals are as follows:

Site	Scope of works
Stevens Weir	Surface preparation and application of protective coating on all four weir gates as well as the superstructure. Replacement of walkway mesh on the top and bottom deck, as well as replacement of some handrails.
Murrumbidgee Smaller Bulkhead	Surface preparation application of new protective coating on the Bulkhead.
Berembed Weir	Surface preparation application of new protective coating on the two main weir gates. Additionally, undertaking to hot dip galvanize the lower level walkways.
Gogeldrie Weir	Surface preparation application of new protective coating on the entire super structure, including upper deck, operating equipment and lower access platform. Replacement of walkway mesh on the top and bottom deck, as well as replacement of some handrails.
Nimmie Creek	Surface preparation application of new protective coating on three gates. These works have been conducted off site.
Maude Weir	Surface preparation application of new protective coating of the entire superstructure, including upper deck, operating equipment and lower access platform and the removal of all walkway mesh.
Redbank Weir	Surface preparation application of new protective coating of the entire superstructure, including upper deck, operating equipment and lower access platform.

The Final Business Case also identifies other Southern coatings projects that were included as part of the original needs brief, but have been deferred or transferred (to other delivery programs), and did not form part of the internal submission for funding approval request

IMPACT ON OPERATING COSTS

[is there an explicit or implicit impact on opex, plus or minus – please report values and timing if explicit or comment on any likely change is not specifically defined]

OPTIONS APPRAISAL

The condition assessments that were completed for each site included:

- Paint condition on the gates, superstructure
- Working platforms and handrails condition and conformity with the standards
- Existence of red lead
- Reporting on the status of the paint throughout its lifecycle

The prioritisation process included a review of the condition assessment produced for each site in order for WaterNSW to prioritise the remediation works based on the urgency of works. This took into account:

- Removal of all lead paint from the structures (Hazardous Paint – WHS Issue)

- Preserving the structures from deterioration that would require structural elements replacement
- Cost effectively delivering the overall scope

It is not economically feasible to patch up red lead paint and there has been a progressive tightening of the standards over time resulting in more needing to be done for sites painted with red lead paint.

Following the prioritisation assessment, the scope and budget of the program of works with the highest priority was defined by the WaterNSW planning team and followed by the lower priority works. The defined program of works was transferred to WaterNSW's delivery team.

Due to the nature of the work, there are limited options, with WaterNSW considering the only two options available: Do Nothing and Undertake the Protective Coatings Programme.

The options analysis that was completed considered, together with the assessment factor weighting for each of the criteria was:

- Asset life (50%)
- Compliance (20%)
- Operational Continuity (20%)
- Delivery efficiency (5%)
- Operational efficiency (5%)

This was used to derive a multi-criteria assessment (MCA) total for both options. In addition, A 20 year Net Present Cost (NPC) assessment was carried out for each of the two options.

The results of the options analysis were:

- Do Nothing provided the lowest 20 year NPC ($0) but did not include any upgrades to existing infrastructure to maintain the asset integrity. The MCA was scored as 43/100.
- The Undertake Protective Coatings Programme option provided a significantly higher NPC of $16.964 million over 20 years, given the investment in works required to meet corporate compliance, as reflected in the MCA Scores. The MCA was scored as 97.5/100. A higher capital expenditure was required to adequately meet the identified risks.

Based on the analysis, WaterNSW discounted the 'Do Nothing' option. The Final Business Case identified the preferred option for repainting a tranche of assets within the Southern Valleys and requested funding of $12.266 million of the $19 million coatings budget for execution of the works, to undertake the Southern NSW Coatings Program.

COST ESTIMATING METHOD

WaterNSW has a number of similar sites across the state and has previous cost data for coatings projects on its structures.

Scaffolding, encapsulation, mobilisation and removal of lead paint are significant costs in the overall cost for coating project.

The basis of the capital costs were internal and external calculation from Master Coatings Forecasting's spread sheets across the valleys of works. This took account of salaries, travel, overheads, contractor costs, materials, consultancy, other and vehicle expenses.

The breakdown of the costs included in the Final Business Case which was presented for Project Execution Approval was as follows:

Summary	Opex ($ million)	Capex ($ million)	Total ($ million)
Internal resource cost	[redacted]		
External resource cost			
Direct Project Costs			
Risk based contingency			

Total including Contingency & Overheads	[redacted]						
Management Reserve (retained by CEO)							
Total Approval Sought							

The total project budget included in the Final Business Case (excluding the management reserve) was as follows:

Project Costs	FY17 ($million)	FY-18 ($million)	FY-19 ($million)	FY-20 ($million)	FY-21 ($million)	FY-22 ($million)	TOTAL ($million)
Opex	[redacted]						
Capex							
Total Cashflows							

PROCUREMENT METHOD

The Procurement Outcome, including the tender evaluation process and scores for each tenderer have been included in the Final Business Case.

The project was initially earmarked to be procured through WaterNSW's Maintain Capability Program (MCP) Panel. However, due to the nature of the works and requirement of specialist contractors, WaterNSW identified that an Expression of Interest (EOI) approach would obtain a better value for money outcome.

To identify potential Tenderers with the capacity to undertake large scale painting works, WaterNSW undertook a review of the Commonwealth Scientific & Industrial Research Organisation's (CSIRO) Painting Contractor Certification Program (PCCP). This program allows painting contractors to undertake levels of certification to complete works both within CSIRO's facilities and for site works at an owner's site.

As a number of the sites included in WaterNSW's scope of works for the Southern Coatings project were to be blasted and repainted, with the current paint coatings including existing lead and other heavy metals, it was the project procurement strategy was to invite expressions of interest from specialist painting contractors that were fully qualified and experienced to conduct the works and who:

- held a Painting Contractor Certification Program (PCCP) certification to undertake works up to Level 5 (heavy metals)
- had experience in working on structures over water with full encapsulation

Based on these qualifying criteria, WaterNSW identified seven companies to approach to submit EOIs. These contractors were asked to submit financial capacity/capability statements in the form of Balance sheet/P&L account, etc., for WaterNSW to confirm each company's financial capacity to carry out the works.

After the assessment of financial capacity/capability of Tenderers from the EOI stage, a shortlist was prepared for the next stage. Only those who submitted an EOI and passed the financial assessment were selected to proceed to the Request For Tender (RFT) stage. Four contractors were assessed as having the financial capacity/capability to proceed to the RFT stage:

Similar to most projects delivered by Water NSW, multiple evaluation criteria were considered in assessing tenders. The Evaluation Committee also used both internal and external advisors to provide input on specific issues requiring clarification or specialist understanding.

The preferred contractor was engaged under a lump sum supply and install contract inclusive of an agreed schedule of rates and provisional items, to cover several potential risks to works.

DELIVERY

Project Delivery for the Southern Coatings project has been managed in compliance with WaterNSW's Project Delivery Framework and in consultation with its Program Management Office. All environmental documentation (REFs) was completed prior to tender process and the final business case was submitted prior to contract award. A Project Management Plan was been completed and reviewed by the Program Management Office.

The contractor has had their own project managers and supervisors on site while the works are being undertaken. WaterNSW also has had their own project and site construction management teams involved in delivering the works at each location. WaterNSW engaged a third party coatings consultant to undertake site inspection to review the contractor's works and documentation at key phases during the project.

The Business Case proposed that all the works included in the project would be completed by December 2020. However, although the majority of the site-specific coating projects within the overall Southern Coatings program are expected to have been completed by this date, a small number will not be completed until 2021. The progress for the coatings at each site is as follows:

- Redbank Weir (100 % Completed)
- Murrumbidgee Smaller Bulkhead (100 % Completed)
- Berembed Weir (100 % Completed)
- Nimmie Creek (100 % Completed)
- Stevens Weir - As at 25 September 2020, approximately 90% of the surface preparation and application of the protective coating system has been completed. Estimated time of completion is end of Dec 2020
- Maude Weir - As at 25 September 2020, approximately 50% of the surface preparation and application of the protective coating system. Estimated time of completion is end of Jan 2021
- Gogeldrie Weir - As at 25 September 2020, approximately 25% of the surface preparation and application of the protective coating. Estimated time of completion is end of Feb 2021

The project actuals compared to budget at the time of the review, together with the forecasts for the remaining work and the total expected project cost for the work in the two valleys is as follows:

Valley	Budget ($ million)	Actual cost at 15 October 2020 ($ million)	Forecasted cost ($ million)	Total expected project cost ($ million)
Murray	[redacted]			
Murrumbidgee				
Total				

This indicates that WaterNSW expects to deliver the Southern Coatings program slightly under budget.

POST PROJECT REVIEW

None have been documented

KEY DOCUMENTS REVIEWED

- WaterNSW, WaterNSW Rural Bulk Water Expenditure Review – Capex Projects - Southern Coatings Project, 16 October 2020 – Powerpoint presentation
- WaterNSW, Southern NSW Coatings Program - Final Business Case, Version 8, 21/03/2019
- CTI Consultants, Coating Assessment – KeepIt Dam, Revision 0, 26 July 2018

C.4. Burrinjuck Cableway Upgrade

PROJECT DETAILS

Project Name	Burrinjuck Dam Cableway Upgrade	
Project Number		2017 determination
Valley	Murrumbidgee	
Key Investment Driver(s)	Asset Renewals	
Stage	Delivery	

FINANCIALS AND PROGRAM (costs to 2020/21)

Budget in Final BC	[redacted]	**Initial Delivery Date**	Sept 2020
Outturn cost / Forecast outturn cost in Submission	[redacted]	**Actual / Forecast Delivery Date**	Jun 2021

Project line item name (SIR) $20/21	**Activity**	**2018**	**2019**	**2020**	**2021**	**Sub Total**
BRJK Dam Cableway Upgrade	Renewal and replacement	[redacted]				
Burrinjuck Dam Cableway Upgrade	Renewal and replacement					
MB320003.12 BRJK Dam Cableway Upgrade	Renewal and replacement					
MB320003.15 BRJK Dam Cableway Upgrade	Renewal and replacement					
MB320047.12 Burrinjuck Dam Cableway Upgrade	Renewal and replacement					
MB320047.13 Burrinjuck Dam Cableway Upgrade	Renewal and replacement					
MB320047.15 Burrinjuck Dam Cableway Upgrade	Renewal and replacement					
Total proposed expenditure June 2020						

NEED FOR SCHEME

This project is aimed to replace the cableway over the Burrinjuck Dam. The cableway ensures that periodic maintenance of the dam wall and spillway can be undertaken efficiently and without the need to bring cranes to the remote site. The cableway is a state recognised 'heritage asset' and so options were limited to replace the cableway in its entirety.

The upgrading of the cableway was identified to bring it into compliance with AS 2550 (Safe Use of Cranes) and AS 1657 (Access, stairs and platforms). The cableway had reduced structural strength due to the deformed structural members which required upgrading.

IMPACT ON OPERATING COSTS

The cableway ensures that periodic maintenance of the dam wall and spillway can be undertaken efficiently and without the need to bring cranes to the remote site.

OPTIONS APPRAISAL

The cableway is a state recognised 'heritage asset' and so options were limited to replace the cableway in its entirety. The options identified were:

Option	Scope	Conclusion
Replace Cableway	This option involves design, procure, install and commission two new towers, runways, cable and hoists, traverse and long travel functionality and decommission the existing cableway.	As the existing cableway listed as a 'State Significant Item' this option would subject to Heritage Assessment and the existing cableway would need to be preserved in some form. This option was not considered further on the basis of high cost.
Alternative Cranage	This option involves replacement of the existing cableway with an alternative style of crane. Alternative solution was a travelling tower crane mounted on top of the dam crest and strengthening modifications to the dam crest.	The estimated cost of this option is expected to be of a similar magnitude to the 'Replace Cableway'. However this option also required further work for the strengthening/ modifications to the dam crest.
Road Access	This option involves installation of a roadway for 1.5 kms from the dam crest to the base of the dam on the northern bank.	This option regarded as unlikely to be economically feasible. It has difficult terrain (steep valley, potential for rock fall and hard granite rock) and resultant expected high cost.
Complete Upgrade	This option involves upgrade of the existing cableway including strengthening of tower structures, new cable, electrical and controls system.	**Preferred option.** This option addresses the standards compliance, material fatigue, strength and stability issues as well as personal safety, comfort and machine condition deficiencies.
Cableway Mandatory Crane Compliance only		This option is only addressing risks relating to crane Safe Use Standards but not addressing access deficiencies related to Australian Standards (AS) for stairs and walkways.
Do Nothing – Mandatory base case		This option will continue to expose WaterNSW personnel to slip/trip/fall hazards as well as exposing WaterNSW to non-compliance to AS and Work Health and Safety (WHS) regulations by not providing a safe place to work.

COST ESTIMATING METHOD

Initial planning costs were approved previously of [redacted]

Contractor costs were sought via a competitive tendering process of [redacted]

Internal WaterNSW and contingency costs were then applied to get total direct costs of [redacted]

BU overhead, capitalised overheads and a management reserve were then also applied on top to get to total project costs of [redacted]

PROCUREMENT METHOD

The Maintain Capability Works Panel (MCP) was established to procure multidisciplinary projects in Rural and Metropolitan Valleys. The Burrinjuck Dam Cableway was one of the two initial Parcels of works tendered for delivery via the new Works Panel procurement process. Following the Expression of Interest Process, an RFP was issued in April 2017. Proposals were received from five shortlisted contractors and a preferred supplier was selected following a Value for Money evaluation comparing the tendered pricing information.

DELIVERY

Expenditure for this project was not explicitly identified within the 2017 pricing submission as a discreet capital expenditure line item. Rather it was reportedly included within the Murrumbidgee valley 'Maintaining Capability' expenditure bucket. At that time WaterNSW inform us that [redacted] in nominal costs were included for the refurbishment of the cableway upgrade. Forecast expenditure in the current period is [redacted] this compares to [redacted] identified in the Final Business Case in September 2017. The total Approval to Spend (ATS) was then increased to [redacted] sometime between September 2017 and June 2019; we have not been provided details for this increase. Nevertheless there was a project change request initiation in June 2019 subsequent to the major contractor on the project going into receivership. There were some sunk costs and after retendering the project higher tenders were received. This has led to the overall increase in costs for the project as proposed in the SIR submitted in June 2020 to [redacted]

The additional sunk costs variance is identified as:

Additional Internal ATS - [redacted] – sunk costs to date due to the requirement to manage the termination of the contractor, plus management of the extended Execution period.

Additional External ATS - [redacted] plus [redacted]

In its October 2020 SIR submission revised its total capital expenditure for this project to $8.2m (which we assume is to [redacted]) which have now been factored into its expenditure proposals. As such we do not propose any additional adjustments over and above those WaterNSW already made between its June and October 2020 submissions.

POST PROJECT REVIEW

N/A

KEY DOCUMENTS REVIEWED

D2017/90980 – Management Committee on Investment Review - 28 September 2017 - Burrinjuck Cableway Upgrade -
Final Business Case [V1] - Item 3.1c
D2018/104115 – Project Change Request - Burrinjuck Cableway Upgrade Rev C GH 20180926
D2019/64068 – Burrinjuck Cableway Tender Recommendation Report
D2019/60222 - "Background to D2019 221 Project Change Request for Burrinjuck Cableway Upgrade ATS

C.5. Fish River Pipeline Renewal 2018

PROJECT DETAILS

Project Name	Fish River Pipeline Renewal 2018	
Activity	Water Delivery and Other Operations	mainly in 2021 Determination
Work Program	Fish River	
Key Investment Driver(s)	Asset renewals	
Stage	Planning	
Similar Projects	• Fish River MCP FY22 Renewals • Fish River Stage 3 air valve replacements • FRWS Renewals Provision	
Link to asset plans	Fish River asset strategy	
Output Measure	[delete if N/A]	

FINANCIALS AND PROGRAM (costs to 2020/21)

Budget in Needs Assessment BC	$ m	**Initial Delivery Date**	[month/ year]
Outturn cost / Forecast outturn cost in Submission	$m	**Actual / Forecast Delivery Date**	[month/ year]

Year ending (price base $000 20/21)	2018	2019	2020	2021	Sub Total	2022	2023	2024	2025	Sub Total	Total
Fish River Pipeline Renewals 2018	[redacted]										
FR140007.13 Fish River Pipeline Renewals 2018											
Fish river scheme total capex excluding corporate allocation											

NEED FOR SCHEME

The Fish River water supply scheme on the NSW Central Tablelands is unique as the only water supply scheme in eastern Australia to transfer western flowing water east of the Great Dividing Range, mostly by gravity. The scheme draws water from Oberon Dam and Duckmaloi Weir and includes 236 kilometres of pipelines and a tunnel under the Great Dividing Range.

Today the scheme provides water to Wallerawang and Mount Piper power stations, to Oberon and Lithgow councils for domestic and industry use, and to about 230 properties along its route. It also supplements town supplies in the upper Blue Mountains. The scheme was built in three stages:

iv. Stage 1 (1943 to 1949)

- A slab and buttress dam is built on the Fish River just south of Oberon, constructed to a height of 21.3 metres but with foundations and buttress bases to allow later raising of the dam wall.
- A 105-kilometre pipeline from Oberon Dam through Wallerawang and Portland to the shale oil works at Glen Davis.
- A 15-kilometre branch pipeline from Wallerawang to Lithgow.
- A pump station and water main to Oberon town reservoir.

v. Stage 2 (1954 to 1959)

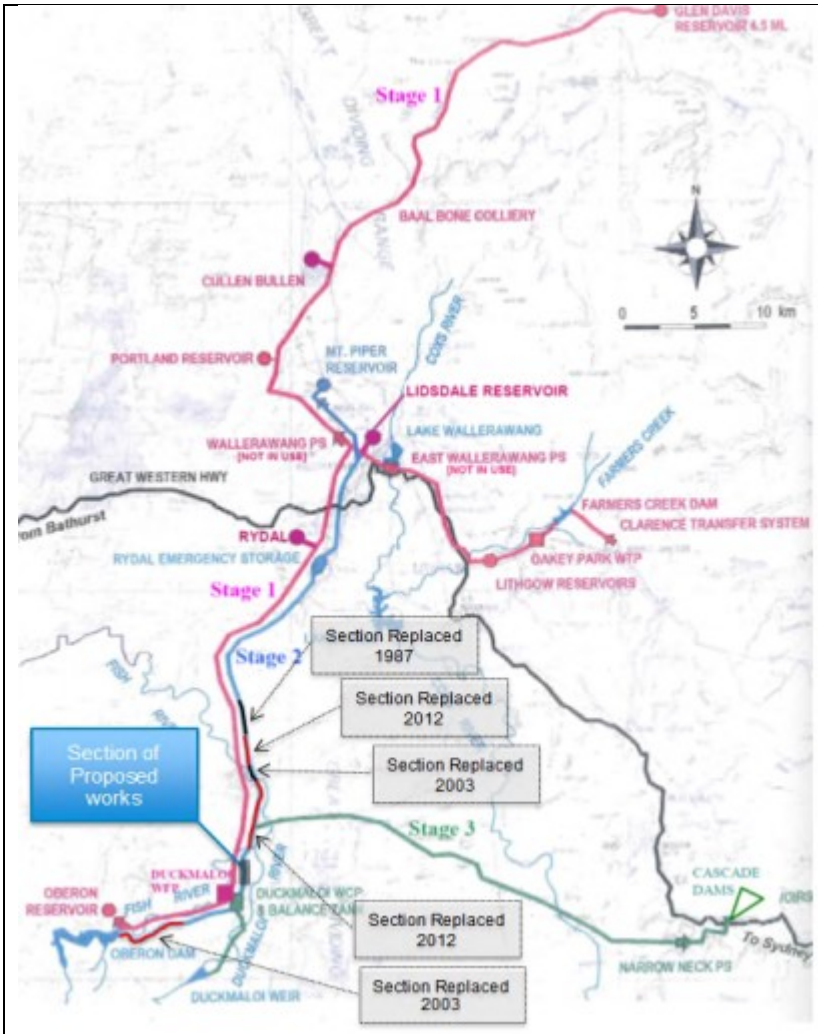
- Raising Oberon Dam wall and outlet tower from 21.3 metres to its full design height of 33.5 metres and building a ski jump spillway into the dam wall.
- A new pipeline from Oberon to Wallerawang to service the new power station.
- A break-pressure tank near Duckmaloi to combine flows from Oberon and the future Duckmaloi Weir and to control pressure in downstream pipeline.
- A small dam at Rydal to ensure reliable supply to the power stations.
- A small reservoir at Lidsdale as an emergency supply and a fire-fighting source for the power station.
- A connection for the future pipeline to the Blue Mountains.

vi. Stage 3 (1961 to 1964)

- A 1.1-kilometre long tunnel at Hampton under the Great Dividing Range, 44 metres under the surface at the range's highest point.
- A 40-kilometre long pipeline connecting the scheme to Cascade Dams at Katoomba.
- A small weir on the Duckmaloi River.

SCOPE OF WORKS

In previous determination periods there has been a progressive replacement of the Fish River Water Supply pipeline (FRWS), a program for which has been underway for several years replacing sections of the pipeline based on criticality and condition.



The key pipeline replacement project executed in the current Determination Period (FY18-21) was to replace a 2.8km length of DN914 pipe north of Duckmaloi with the Project Completed in FY20.

The recently developed Fish River Strategy resulted in a shift in focus from pipeline section renewals to pressure management, and valve replacements, consequently the FY22 Fish River forecast does not include any renewal of pipeline sections.

There is no Watermain Renewals Planned in FY22 with improved Pressure Management Identified as an Opportunity

Key Areas of Focus

- • Pressure Management
- • Air Valve Replacements
- Coating and Concrete Renewals at Oberon Dam

Pressure Management:

- An alternative and cost efficient means to improve system reliability.
- Pressure monitoring
- Upgrades to Pressure Management Infrastructure (eg. Altitude Valves)

- Improvement to System Controls

Air Valve Replacement

- An immediate operational and Safety Risk
- Condition Prioritised Program of Air Valve Replacements
- Significant Access Difficulties
- Some very high operating heads

Oberon Dam:

- Principle Storage in the Fish River Scheme
- Recoating of Intake Tower and Main Discharge Pipe
- Renewal of Concrete on Buttresses, Parapet Wall and Intake Tower

IMPACT ON OPERATING COSTS

With the move towards increased focus on pressure management and away from renewal of the pipeline we would expect to see an increase in operational costs but WaterNSW have not quantified this impact.

OPTIONS APPRAISAL

The fish river strategy has identified three scenarios based on the future demand placed on the scheme. There may be longer term implications for the management of the Fish River scheme in terms of investment and risk in the future if the risk profile for the consequence of failure changes. This may due to potential changes to customer demand. Energy Australia currently owns 55% of the allocations within the scheme but as of 2019 is largely self-sufficient. There is uncertainty over future demand requirements.

There does not appear to have been a detailed options appraisal undertaken beyond this for expenditure in the future period.

COST ESTIMATING METHOD

When looking at the proposed Fish River capital expenditure over the current and future periods we note that after excluding corporate capex that the proposed average expenditure in the future period is broadly consistent with that in the current period.

We have not been provided any level of detail on cost estimates for the future period. E.g. unit costs of how many valves are expected to be replaced in the future period or any cost estimates for the renewal of the concrete buttress at Oberon Dam.

PROCUREMENT METHOD

For the future period we have not been provided any detail on the procurement plans

DELIVERY

For the future period we have not been provided any detail on the delivery plans

POST PROJECT REVIEW

RECCOMMENDATIONS

The scope of the work proposed on the pipeline for the fish river scheme is not directly comparable between the current and future periods and we have not been provided sufficient detail to support the capital expenditure going forward. The proposed provisions appear to be based on a similar basis as historical costs despite the move away from pipeline renewals. Therefore we are unable to support all of the proposed expenditure given the reduced scope of works and increasing focus on pressure management,

KEY DOCUMENTS REVIEWED

D201981198 – Asset Class Strategy - Fish River Supply System Pipeline and Accessories
Fish river presentation 6 October 2020

C.6. Copeton (CPTN) Fish Passage Offsets (Fish Passage Offsets schemes)

PROJECT DETAILS

Project Name	Copeton (CPTN) Fish Passage Offsets, Gwydir valley	
Project Number	GW280001.15	2020 - 2025 Determination Period
Work Program	Environmental planning and protection	
Key Investment Driver(s)	New assets to achieve compliance with Section 218 of the Fisheries Management (FM) Act 1994 (NSW). Avoidance of prosecution by NSW government DPI Fisheries	
Stage	Planning	
Similar Projects	Mollee Fish Pass	
Link to asset plans	Resultant offset of Dam Safety Upgrade programme.	
Output Measure	Fish passages were not included in Output measures in the IPART 2017 Determination (Review of prices for rural bulk water services from 1 July 2017 to 30 June 2017, Appendix B) Environmental output measures to assess fish passage were included in the 2010 determination. Assessment in the 2017 Review of prices (as advised by Aither, WaterNSW Expenditure Review Final Report, Feb 2017) was that "while there had been a gradual increase in the total length of river open to fish, many of the associated output targets were not met".	

FINANCIALS AND PROGRAM

Budget	$22.3m	**Initial Delivery Date**	FY2026
Forecast outturn cost in Submission	$22.3m	**Forecast Delivery Date**	FY2026

Year ending (price base $m 19/20)	**2017**	**2018**	**2019**	**2020**	**Sub Total**	**2021**	**2022**	**2023**	**2024**	**Sub Total**	**Total**
Planned (SIR)	**0**	**0**	**0**	0	**0**	0.1	1.0	2.4 (1.01 in SIR)	11.3 (10.2 in SIR)	12.3M (of 12.4M total for EP&P in Gwydir valley)	**22.3 (total FY22-25) (22.3M inc FY2026 in SIR)**
Planned From review documents											

NEED FOR SCHEME

The Copeton Dam fishway passages are part of an agreed trade-off (between WaterNSW and the DPI) in installing 11 fishways at 5 dams undergoing dam safety upgrades with the construction of fishways at priority weirs located lower in the catchment, in this case on the River Gwydir.

SCOPE OF WORKS

The Copeton Dam offset program included fishways on the River Gwydir at Tyreel Weir, Tyreel Regulator, Boolooroo Weir and Tareelaroi Weir. Design concepts for these locations were assessed and costed by Jacobs as part of their Strategic Fishway Implementation Program (SFIP) report.

IMPACT ON OPERATING COSTS

No significant change in OpEx costs were identified in the Jacobs SFIP report.

However, we have raised an RFI on the OpEx impacts of fish passage schemes as there is a significant requirement to maintain the schemes so they are effective, including clearance of the inlet screens from debris to prevent the blockage of fish. It is also known that recently completed fish passes (for example on Greater Sydney area weirs) have required some expensive repairs, particularly to electrical components in fish passages damaged during flooding.

OPTIONS APPRAISAL

The Jacobs SFIP report included a review of alternative options with costed conceptual designs of fishways at eight weir sites including the four Gwydir River weirs. The options assessed were a variety of different structure types, including fixed crest weirs and gated weirs, as well as a review of earlier fishway designs for the sites by other consultants, with methods including vertical slot fishways and fish locks with regulator gate modifications.

Options for conceptual design were selected for each site based on hydraulic characteristics and presented to WaterNSW and the NSW DPI Fisheries. Following this, detailed cost estimations were developed for the selected options and compared with the Mollee fishpass costs.

COST ESTIMATING METHOD

The Jacobs SFIP estimates were built up in detail with direct costs subtotals based on unit rates and provisional sums for enabling works, plus additional percentages for preliminaries, testing, supervision, contractors fee and margin. The program estimate then added 10% for design, 8% for WaterNSW delivery costs, and 40% for contingency. Projected efficiencies have been achieved in the alternative design concept estimates compared to the previous out-turn costs at the Mollee fishpass.

Lessons learned after the Mollee fishway project, and the subsequent re-assessment of design concepts, have indicated that cost efficiencies of around 30% could be achieved through adoption of the updated design concepts in the 2020 determination period.

A breakdown of the Mollee fishpass costs included a contingency of 12.5% compared to the 40% applied to the 8 sites in the SFIP report..

PROCUREMENT METHOD

Procurement efficiencies from packaging groups of sites to framework contractors have been identified.

DELIVERY

The 2009 – 2014 Dam Safety upgrade project was accompanied by the DSU Offsets program including the Mollee fishway project. The high cost of the Mollee project caused the Ministers suspension of the DSU Offset Program. As a result, the Fish Passage Optimisation project has been developed by Jacobs with costed conceptual designs for 8 fishway sites of the 11 remaining sites programmed for 2020 – 2025 (out of the 28 weir project sites originally considered). The SFIP included a review of concept designs, feasibility design studies, performance criteria, design standardization for lowest whole life cost approach and a statewide program estimating process. Methods for savings were identified including pre-fabrication of units for gravity channel fishways with variable baffles, achieving reduced weight for similar design life, to be incorporated into novel fishway designs.
An example is the assessment that the fish lock (in weir) and multi-function regulator gate combination may potentially provide at least 50% construction cost savings over the fish lock (in abutment) type at this site.
The direct construction cost estimates for the 4 Gwydir river fish passes (using vertical slot or fish lock types) were on average 36% less than the Mollee fishway rate / m height (based on the Standard Lock type) if specific site conditions were excluded from the calculation of the average rate for the four sites.
The site specific costs of [redacted] of the four Gwydir sites were all at the Tyreel Regulator and included the costs of replacement regulators gates, relocation of a bridge and other site services apparently not occurring elsewhere.
This average rate was 10% if specific site conditions were included, so the average saving could be taken as 23%.

KEY DOCUMENTS REVIEWED

DSU Fishway Offsets Program Estimate
Fish Passage Offsets Program Overview
Letter to DPI Fisheries - WaterNSW Dam Safety Upgrade Program June 2020
OUT20-2516 WaterNSW Dam Safety Upgrade Fishway Offset Revised Site Confirmation
SFIP Options to Design Fishways - Conceptual Designs of Fishways at 8 Sites Final Rev B (Jacobs, 2020)

C.7. Dam Safety Upgrades: Keepit Dam

PROJECT DETAILS

Project Name	**Keepit Dam Post Tensioning, Namoi valley**	
Project Number	KEPT Upgrade Phase 2 NO270000.12 KEPT Upgrade Phase 2 NO270000.13 KEPT Upgrade Phase 2 NO270000.14 KEPT Upgrade Phase 2	KEPT Upgrade Phase 2: 2017 – 2020 Determination Period, Works completion 2020 - 2021 Determination Period
Work Program	Dam Safety Compliance	
Key Investment Driver(s)	Regulatory Dam Safety	
Stage	Delivery	
Similar Projects	Lake Cargelligo Dam Safety Upgrade	
Link to asset plans	Dam Safety Upgrade programme.	
Output Measure (2017 Determination)	No.4) Keepit Dam: Completion of works meeting the stated needs & requirements No.5) Keepit Dam safety project: Life safety risk position from Keepit Dam reduced to below Australian National Committee on Large Dams (ANCOLD) Limit of Tolerability for societal risk.	

FINANCIALS AND PROGRAM

Budget	[redacted] in Final Business case	**Initial Delivery Date**	June 2019 in Final Business case
Forecast outturn cost in Submission	Actual spend [redacted] in 2017-20	**Forecast Delivery Date**	FY2021

Year ending (price base $m 19/20)	**2017**	**2018**	**2019**	**2020**	**Sub Total**	**2021**	**2022**	**2023**	**2024**	**Sub Total**	**Total**
Actual (in SIR) NO270000.12, .13, .14 KEPT Upgrade Phase 2	[redacted]			- (Project split in SIR for	[redacted]						

				FY 2020 onwards)							
Actual (in SIR) KEPT Upgrade Phase 2 (2020 onwards)				[redacted]							
TOTAL (Actual & forecast)	[redacted]										
Planned From review documents **(Final business case, Aug 2016)**			[redacted]								[redacted]

NEED FOR SCHEME

Keepit Dam is the third highest dam in the state and is a concrete mass gravity dam completed in 1960.

Keepit Dam was assessed to not meet statutory safety requirements of the NSW Dams Safety Committee and the Australian National Committee on Large Dams guidelines for large flood and earthquake events. A program of 2 stages of works was agreed.

Stage 1 works including the construction of new fuse bay spillways, completed in 2012.

Stage 2 works were to consist of 3 separate packages. The first, for the relocation of electrical works was completed in 2015 for $2.5M. The third, raising of the dam crest, was deferred before the time of the final business case (2016) which was supporting the post-tensioning works. The second package was the post-tensioning of the dam wall with anchors to improve sliding stability under loadings from the extreme events. The societal risk of the dam (likely loss of life vs probability of failure) was marginally tolerable so the post-tensioning anchor works were required to reduce the risk.

SCOPE OF WORKS

The Stage 2 risk reduction works include installation of post-tensioned cable anchors in the dam wall and adjacent spillway with 67 holes drilled in the crest of the dam and within internal chambers.

Additional geotechnical investigation was to provide confidence in terms of anchoring risk.

IMPACT ON OPERATING COSTS

No significant change to operating costs was expected, as the risk level was reduced but the consequence category remained the same so operating and inspecting regimes would be maintained at the same level.

OPTIONS APPRAISAL

Over 70 options were considered as part of the initial Business Case for achieving the required level of dam safety within the constraint of maintaining the full supply level. Multi-criteria analysis was used to assess the long list and then a shortlist of three options, all including dam wall strengthening with post-tensioning, were selected for the next stage of environmental and economic assessment.

Detailed design and specifications were submitted to the NSW Dams Safety Committee (DSC) for endorsement in 2016.

COST ESTIMATING METHOD

The budget in the final business case in 2016 included a principal contract tender price (based on the detailed design by consultants SMEC), plus other contract prices, contingency and WaterNSW costs.

The CapEx cost estimate included a contingency of approximately 10%. The contingency was built up from Risk Analysis involving WaterNSW and SMEC producing a Risk Register including risk mitigation strategies with costing.

$4.0M had been spent on initiation and planning phases before the business case, bringing the whole life cost estimate in 2016 to $36.5M. This was less than risk-based cost estimates modelled by cost consultants Advisian, who provided estimates with a P50 model at $42.1M and a P90 model at $46.4M.

PROCUREMENT METHOD

The construction works were awarded following a three stage open tender, including an Early Tender Involvement process which informed the finalisation of the specification and drawings for the second, Request For tender stage and then an extensive post tender clarification process. The works were awarded to SRG Pty Ltd, the highest scoring Tender who it was argued would represent best value for money to WaterNSW.

The works were undertaken as a construct only lump sum contract with an agreed schedule of rates to cover any additional items.

Detailed design was completed after an open tender process by SMEC who also undertook the ground investigations, which were peer reviewed by GHD (consultant of similar standing in dam engineering to SMEC). Project and site management was undertaken by WaterNSW, and ongoing external design support was also selected through an open tender.

DELIVERY

Project Governance was put in place complying with the WaterNSW Project Governance Framework. This included a project peer review group with an external expert and External Project Assurance Review (EPAR).

Project Delivery was managed in compliance with the WaterNSW Project Delivery Framework.

The NSW Government contributed to the Keepit Dam Safety Upgrade, with the result that the Namoi valley was the only valley where users did not provide the most significant contribution to capital expenditure.

POST PROJECT REVIEW

A progress summary report was requested in RFI No.206 but not made available.

We have little information on the reasons behind the spend increase of [redacted] between the final business case estimate and the current actual+forecast cost (with the project mostly complete in 2020).

The progress of the project is mentioned in the WaterNSW commentaries on the achievement of outcome measures, to the effect that:

- In 2018 there was work planned to identify further risk reduction measures (presumably further to the scope in the 2016 business case)
- In 2019 there were additional strengthening works being carried out that were outside the original scope and would extend the works until December 2020 (where the original completion date was to be June 2019). $20.1M was spent (or forecast) in FY 2019/2020 and FY 2020/2021 but it is not clear how much of this was the cost of the additional works outside the scope.

KEY DOCUMENTS REVIEWED

Keepit Dam Post Tensioning Final Business Case
Water NSW 2021 Rural Valleys Pricing Proposal
WaterNSW RV FY20 SIR, CapEx budget

C.8. Dam Safety Upgrades: Lake Cargelligo

PROJECT DETAILS

Project Name	Lake Cargelligo Dam Safety Upgrade – Design and Delivery, Lachlan valley	
Project Number	LA270020.12	Design 2017 – 2020 Determination Period Delivery 2020 - 2025 Determination Period
Work Program	Dam Safety Compliance	
Key Investment Driver(s)	Regulatory Dam Safety Augmentation (but not as one of the recovery dams or other drought-related projects, the embankment crest raising is to reduce risk of failure as opposed to increasing dam capacity) Split into Renewals on the SIR CapEx table	
Stage	Delivery	
Similar Projects	Keepit Dam (KEPT upgrade Phase 2)	
Link to asset plans	Dam Safety Upgrade programme.	
Output Measure	No.6) Future Dam Safety capital works strategy: *Following expected changes in dam safety regulations, formulate a medium-term (5-10 year plan of capital works required)* Lake Cargelligo included in DS plan.	

FINANCIALS AND PROGRAM

Budget	[redacted] for DS Compliance 2021-26 0 for Lachlan Valley DS Compliance on pre-1997 projects for 2021 - 2026	**Initial Delivery Date**	March 2022 in Prelim Business case
Forecast outturn cost in Submission	[redacted] Lachlan Valley for DS Compliance on pre-1997 projects in 2017-2020 ([redacted] in 2013)	**Forecast Delivery Date**	FY2023 in SIR

Year ending (price base $m 19/20)	2017	2018	2019	2020	Sub Total	2021	2022	2023	2024	Sub Total	Total
Planned (SIR) = Dam Safety Upgrade - Design & Delivery	[redacted]										
Renewal and replacement Embankment upgrade											
OFFSET Lake Cargelligo - Renewal & Replacement Lake Cargelligo Embankment upgrade											
TOTAL CapEx in SIR											
Planned From review documents (Prelim business case, Oct 2020)											

NEED FOR SCHEME

Lake Cargelligo is an off-river storage system in the Lachlan Valley, consisting of three embankments. Historical floods have damaged the embankments and a 2016 flood event caused a dam safety incident. Poor conditions have been observed at all embankments with seepages monitored during the flood event indicating a heightened risk of piping (internal erosion) failure.

Actions to date include temporary works (not included in the capital spend figures above) and dambreak and consequence assessments. The risk assessment demonstrated the need for upgrade works with design to focus on the most efficient means of risk reduction. A concept design and cost estimations for the risk reduction works have since been developed.

These remedial works are to address the risk of failure due to internal erosion, overtopping during flooding and slope instability. The works are intended to bring the societal risks of all three embankments into the acceptable risk zone, ie below the SFAIRP / ALARP threshold line on the F-N chart of probability of failure vs potential loss of life.

The project benefits include the reduction of unacceptable risk and possible damage due to dam failure (estimated at $43M+), reduction of the risk of loss of storage water and extension of the life of the embankments.

Planning is underway for the detailed design and construction, and the Preliminary Business Case (October 2020) has recommended planning phase expenditure of $904k for the preparation of the Final Business Case and undertake detailed planning activities.

SCOPE OF WORKS

The risk reduction works are to include 1) addition of a full height filter buttress on the downstream slope of the existing embankment and/or 2) the raising of embankment crests by up to [redacted]

IMPACT ON OPERATING COSTS

The Preliminary Business Case argues that there should be a reduction in ongoing maintenance costs by avoiding ad-hoc repairs.

OPTIONS APPRAISAL

Conceptual risk reduction options were developed as part of the risk assessment in order to quantity the estimated risk reduction achieved by the options, which included:

Raise embankment crests, 2) Install filter buttress downstream, 3) combination of 1 and 2.

The risk reduction from the combined option was shown to be greater than the sum of the options 1 and 2, so this was shown to be mutually beneficial.

Criteria for assessing options were focused on risk reduction effectiveness, with a multi-criteria analysis scoring method weighted across three risks of failure mechanisms.

Cost benefit analysis was also undertaken to show that the annualised risk cost, as a benefit gained, outweighed the cost of reducing the residual risk for all options.

COST ESTIMATING METHOD

Cost estimating methods used were not provided in the Preliminary Business Case or elsewhere in the submissions.

The costs of the project in the SIR are split between the Dam Safety Upgrade - Design & Delivery ([redacted]) and the Renewal and replacement Embankment upgrade ([redacted]), totalling [redacted] The total cost estimate in the latest preliminary business case (PBC, issued October 2020) is lower at [redacted]

PROCUREMENT METHOD

The initiation / planning phase (including geotechnical investigation and detailed design) will be awarded to the Asset Renewals and Replacement (ARR) – Engineering Design Partner (EDP). The construction works execution will use the ARR Construction Partner arrangement.

WaterNSW will also appoint an Expert Peer Reviewer to participate in workshops and review technical reports and documentation.

A Review of Environmental Factors will be awarded after a selective competitive tender process.

DELIVERY

The plan to directly award the detailed design and construction to framework consultants and contractors is potentially driven by the very short programme, with the works scheduled for completion in March 2022 with design complete by February 2021 and construction contract award in June 2021. The completion date appears to be driven by the need to achieve dam safety compliance, including the reduction of risk into the SFAIRP region, following the new 2019 Dam Safety Regulations.

POST PROJECT REVIEW

As only the preliminary design stage has completed at October 2020, the proposed programme of design and geotechnical investigations at 4 months is unlikely to be achievable without causing undue stress. Similarly the project execution / construction costs of [redacted] in the PBC are shown as compressed into FY2021/2022, however this is unlikely to be achievable and the CapEx projections in the SIR showing $8.6M spread into the following year of FY2022/2023 (for the Renewals and replacement embankment upgrade split of the project) are more realistic.

KEY DOCUMENTS REVIEWED

Lake Cargelligo Embankment Upgrade Preliminary Business Case
142 Dam Safety Management Program – IPART Interview – RV FY22 Submission 08.09.20 (presentation)

Appendix D. Corporate ICT Expenditure Additional Analysis

D.1. Strategic Overview

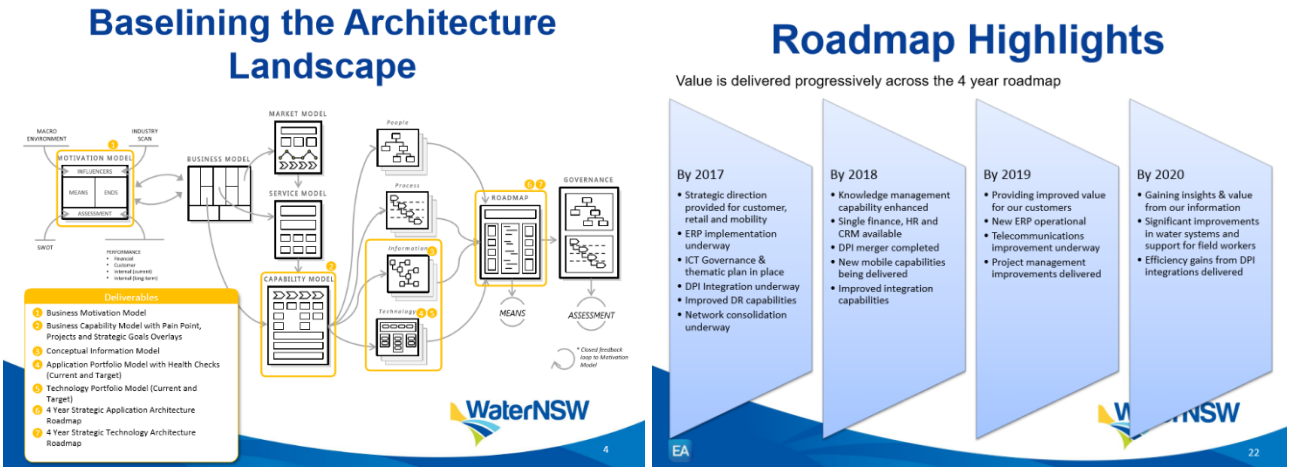
Business Systems & Information (BSI) is the department with responsibility for the provision of all information and communications technology and services required to meet the needs of WaterNSW.

The merger of three entities to establish WaterNSW resulted in a complex and antiquated ICT environment which needed a root and branch assessment and subsequently a programme of transformation to make it fit for purpose for the organisation. This resulted in the development of a four year Enterprise Architecture roadmap which was approved by the Board in July 2016.

The roadmap baselined the architecture landscape, defined the strategic intent and created a Business Capability Model which described the services, customers, value chain and required capabilities of WaterNSW. In terms of the application architecture, this allowed WaterNSW to identify the current state and target state, the highlights of which were:

- Technology landscape was generally good but there was considerable duplication
- Opportunities to reduce applications from ~450 to ~270, a 40% decrease but most importantly equivalent to a ~50% decrease in "core" technologies
- Telephony technologies that are no longer in the mainstream investment lifecycle and thus unsupported
- Opportunities to take up emerging technologies so that replacement will not be on a like for like basis but provide enhanced capability
- Five strategic programs identified: Customer Value, Insightful Information, Improved Productivity, Proactive Planning & Governance, Healthy IT Assets
- Benefits and risks clearly identified
- High level estimates created to provide a funding envelope for the Strategic Roadmap initiatives and provide good visibility on financial impact of pursuing this strategy

Figure D-1 - WaterNSW Enterprise Architecture (Source: Final Report Presentation to Business Stakeholders June 2016)

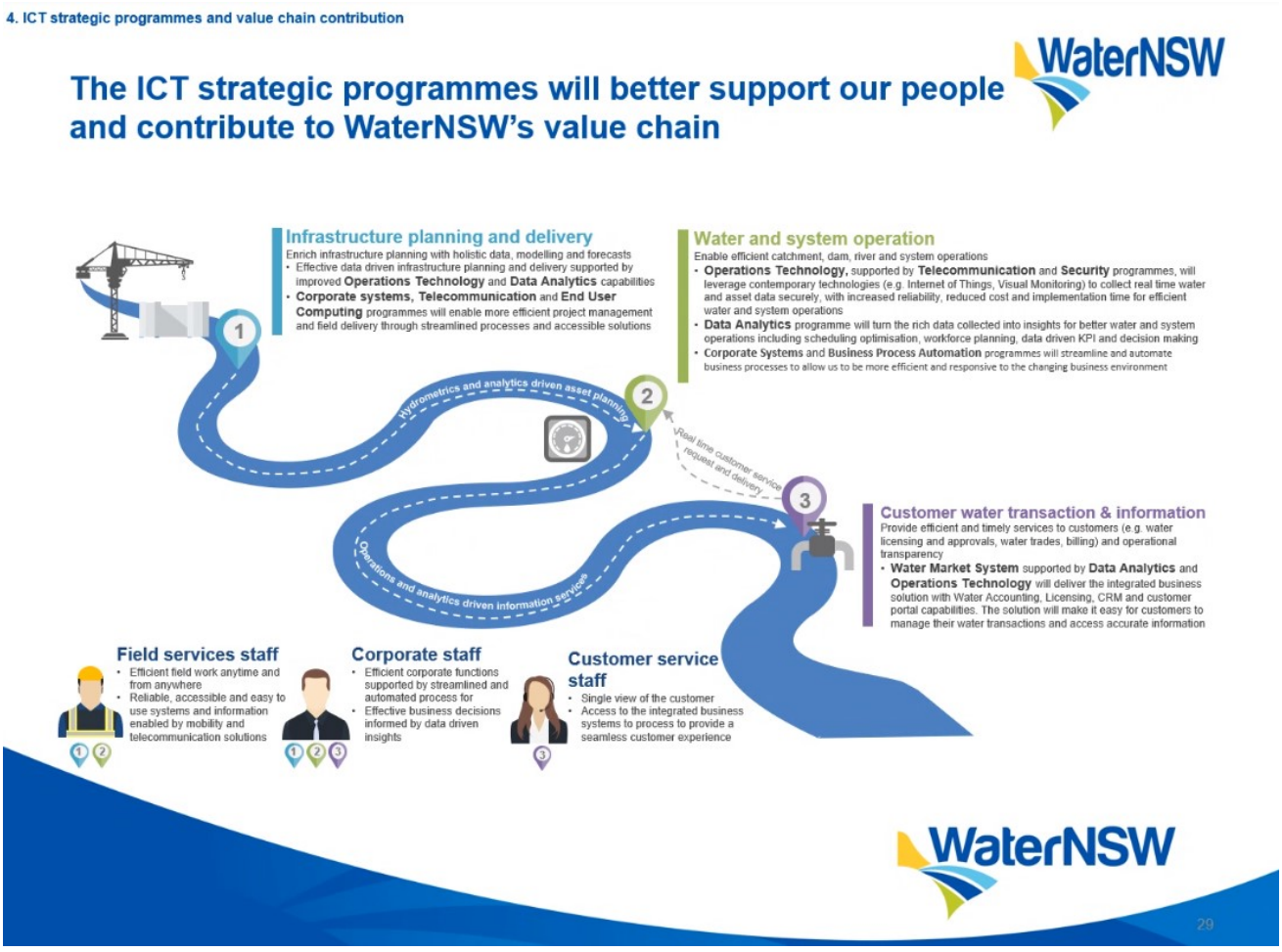


Overall, we formed the view that the merger from a digital perspective has been managed efficiently and effectively. There is strong evidence to show that there was a clear strategic direction, that needs and gaps were

identified and understood, that the organisation has planned and prioritised within a constrained budget envelope and that the implementation of projects has generally been delivered within the original program.

Investment priorities for the future price path are informed and underpinned by the ICT Strategic Plan 2020-2029, which was refreshed in February 2019 with the support of KPMG who had been commissioned to carry out a review of progress on implementation of the original roadmap. The plan identifies that the level of expenditure will increase over the next 10 years from current levels, although it is important to note that this is only reflected in the ICT operational expenditure, this is not specifically borne out by WaterNSW's ICT capital expenditure proposals for the next price path. It is also positive to note that the program costs identified ($207m) take into account both the capital and operational expenditure but we note that the 79% and 21% split respectively is very different from what is proposed

Figure D-2 - ICT impact on WaterNSW (Source: Presentation to Atkins, September 2020)



Having established the foundation by putting in the back-office infrastructure for information management in current price path, the focus then shifts to operations and information access in the next price path. In essence, this is about replacing, simplifying and rationalising operations systems with benefits linked to optimising information to improve the customer experience and enabling digital processes (customer journeys, field force mobility, back office, etc.). This has been translated into 9 strategic programs supporting four themes focused on the customer, supporting WaterNSW's staff, efficiency and maintaining the technology foundation. This is summarised in Figure D-3.

Figure D-3 - WaterNSW ICT Strategic Programs (Source: ICT Strategy from 2019 to 2029)

The third phase, which is identified as from 2024 will focus on optimising and improving, leveraging technology capabilities to transform operational delivery, driving business decisions using machine learning based forecasts.

There are approximately 50 business systems and applications identified by WaterNSW as key and approximately a further 40 also being maintained and employed (the exact numbers are changing as systems have also been retired or replaced). A total of 36 systems are identified as related to the WAVE Program, which are set out in the relevant section below. In the CIMS section, we also capture the key changes in the make-up of the ICT landscape as a result of the implementation of this project. We have also summarised below the other key WaterNSW systems. Together, these summaries illustrate both the significant volume of tools and applications managed by the BSI business unit and which underpin the day to day functioning of WaterNSW as well as the rationalisation and enhancement that has and continues to take place.

Table D-1 - WaterNSW Other Key ICT systems

System	Description	Comment
12D Model	12d Model is a surveying processing software use to process field data captured from survey instrument and to analyses survey result.	
Amazon Web Services	AWS Service charges (data transfer, cloudwatch, cludtrail, direct connect support, Wathnet) introduced in 2018	Shared
Application staging (Water Licensing)	Allows customer to view progress of application through the approval process	
Azure Cloud hosting	Hosting of various new applications introduced in 2018	Shared
Assessment Support Tool (AST)	Assess applications for approval. In house development updated as required internally	Rural and WAMC application

System	Description	Comment
ARK - HPE Records Manager	ARK (HPE Records Manager 8) is the WaterNSW Content Management system.	Updated to latest version in 2019
AutoCAD	Autocad is a software package used within WaterNSW to prepare maps and plans for the organisation.	
CAIRO	CAIRO is a decision support system that assists river operators in their day-to-day running of NSW regulated river systems and to improve the efficiency and effectiveness of this task.	
CARMS	Computer Aided River Management for the Murrumbidgee River maximizes knowledge of the current and predicted river behaviour as a basis for improved and more efficient river operations.	
Chris21	Comprehensive Human Resource Integrated Solution used for Human Resources, Payroll, Learning and Development, Performance Management, Payment Advisor Superannuation, Workforce Profiling.	Now used for all WaterNSW payroll processing. Replacing Technology One and TRS
CONCUR	Travel and expense management	Implemented in 2016-20 price path
DamGuard	Real time monitoring of dam safety.	Implemented in 2016-20 price path. Replaces Legacy Dam Safety systems
Development Asset Register (DAR)	All development applications referred to WaterNSW for concurrence under the State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 are recorded and managed through the DAR.	
Delve	Delve is a file hub, collaboration space and enterprise social network built using the Microsoft Graph and included in Office 365.	
DRS	Key functions are to record daily operation of dams, provide capability to retrieve the latest data collected by key sites through telemetry, provide estimate to the required environmental flow release and summary reports.	Greater Sydney application
EWater Source	eWater Source is the modelling platform that support hydrologic modelling of rivers, incorporating representation of dam and water users.	
Early Warning Network (EWN) Operations	The EWN system is an externally hosted service that provides the ability for WaterNSW to issue notifications to external customers and members of the public, as well as for external parties to register and self-manage their subscription to these alerts.	Rural application
EWN Retail	EWN Customer service instance is used for sending out customer notices by Retail – Supplementary Events from Water Delivery and occasionally used by Comms team. It is hosted by EWN and is an annual subscription service.	
Gallagher Security	Gallagher is primarily a security and identity management program. It controls our field hardware, ID cards and numerous security functions.	
Hunter Salinity	"Hunter Salinity Trading Scheme: collects data Assists with flow forecasting Calculates salt volumes that can be released "	Part of Hydstra
Hydrometic data calculator	Metro real time data capture to be published in WaterNSW web sites	
Hydrotel	Telemetry system used for collecting field data.	
Hydstra Rural	Rural Hydstra System is the data processing and data storage application for WaterNSW water time series, site and related instrumentation metadata.	Rural and Greater Sydney application

System	Description	Comment
IES (Metro SCADA)	IES SCADA system including the plant SCADA systems provide monitor and control function for water operation. It gathers operational data from the field and feeds hydrometric data into other systems like OSI PI	Greater Sydney only
Interop	Interstate trading	Rural application only
Intranet	Internal Websites, via Squix Matrix	Replaced with SharePoint in 2020
iSMART	ISMART SCADA system provide monitor and control function for river operation. It gathers operational data from the field and feeds into other systems like Hydstra and CARM.	Rural application only
iWAS (Internet Water Accounting System)	Provides access to a subset of Water Accounting functions via the Internet. Internal Bespoke application updated as needed.	Rural &WAMC application.
Koncentrator	Manual & telemeted hydrometic data capture and distribution	Rural application only
KRONOS	KRONOS is the time recording system which incorporates staff attendance times against project codes and costings for the staff paid against the TechOne Payroll system	Implemented in current price path. Now used for all WaterNSW timesheet capture. Linkages reengineered to link with CIMS rather than Technology One
Licence Administration System (LAS)	Legacy desktop client application used to manage Old Water Act licences. Will be retired in the future as licenses are transferred to WLS.	Implemented in current price path. Moved to WaterNSW responsibility in DPI function transfer: Rural and WAMC application
Licence Conversion Tool	Convert Old Act to New Act, in house developed and updated as required internally.	Rural and WAMC application
ManageEngine Support Centre	Support Centre or customer helpdesk which manages all customer enquires that are sent in via email and fax generated by both staff and customers	Shared across all regulated businesses
MRT Main (Reference Table Utility)	Maintains all reference tables, developed in house and updated as required internally	Rural and WAMC application
MyWaterNSW (ServiceNow)	MyWaterNSW is WaterNSW ticking system, used for creating, managing and reporting on all Incidents, Problems, Change requests and request fulfilments.	Implemented in current price path.
MSTeams	Document storage, communications, messaging, etc. Linked to SharePoint and Office365	
NSW Water Registers	Internet application used to publish licence and approval data and water trading statistics.	Implemented in current price path. Moved to WaterNSW responsibility in DPI function transfer for Rural and WAMC
Office365	Exchange supports the transfer and storage of email for all email addresses of the form @waternsw.com.au, @statewater.com.au or @sca.nsw.gov.au. There are also associated apps, e.g. One Note, Planner, etc. Linked to MSTeams and SharePoint	Implemented in current price path. Replaces legacy MS Office version
PageUp	Recruitment and onboarding training system	Implemented in current price path. Replaces Scout

System	Description	Comment
RACS (Risk Assurance and Compliance System)	Risk and audit tool. Safety issues, actions on people etc. All risks are articulated in RACS. Safety observations made on a site, near misses, non-compliance etc. should all be captured in RACS.	Implemented in current price path. Replaces Tickit,
Real Time Data Web Site	Website that reports real time water data to customers, public (web front end to Hydstra)	Rural and WAMC application
ScoutRFP	Procurement system introduced in 2019	Shared
SharePoint	Document storage and transfer	
Security Interest Conversion (SIC)	Conversion tool from old to new Act	Rural/WAMC
Solicitors Enquiries	Manage Inquires from solicitors regarding properties	Rural/WAMC
Spatial Data	ARCGIS - will not replace	Shared
SCARMS	SCARMS was developed in response to recommendations from the inquiry into the 1998 water quality incident, to provide the organisation with access to near time information to the behaviour of the reservoirs and modelling capability to forecast future reservoir conditions to reduce the risk in providing poor water quality water to Sydney.	
Terramodel	Terramodel is a surveying processing software use to process field data captured from survey instrument and to analyses survey results and generate AutoCAD input file for drafting purposes. This is mainly used for dam monitoring survey.	
Telemetered Metering System (TMS)	TMS system is a data acquisition system for metering data capturing customer meter data. The metering data gathered feeds into water accounting system and CARM via OSI PI.	Rural application only
Water Accounting System (WAS)	WAS is a business critical system holding all data related to: Customer billing, Legislative rules, Water orders, Budget projections and accruals, Statutory and Regulatory reporting. Internal Bespoke application updated as needed.	Rural and WAMC application
Water Applications Online (WAO)	Public can select an application type and complete application details, lodge, pay and authenticate - online. Generates a received application record in WLS.	Moved to WaterNSW responsibility in DPI function transfer. Rural and WAMC application
Water Billing Module (WBM)	Water Billing Module is a desktop application for facilitating water billing process in WaterNSW.	Moved to WaterNSW responsibility in DPI function transfer. Rural and WAMC application
Water Licensing System (WLS)	Web based portal that provides WaterNSW staff with a consolidated workspace of applications that directly relate to Water Regulation Group activities.	Moved to WaterNSW responsibility in DPI function transfer. Rural and WAMC application
WaterLive (mobile app)	The Water quality database delivers key business requirements in being able to monitor and evaluate the water quality throughout the water supply system.	This has been redeveloped in 2018-19, for use by Customers. Shared across all businesses.
Website	WaterNSW public facing web site, Squiz Matrix	
Webtool/ KONCENTRATOR	Manual data entry tool for Koncentrator. Hydrometric, water orders and potentially other timeseries data.	
Westpac Corporate Online	Credit Card processing system	Implemented in current price path.

System	Description	Comment
Yammer	Yammer is a freemium enterprise social networking service used for private communication within organisations. A Microsoft package.	

Overall, WaterNSW's strategic priorities and programs reflect similar trends and priorities being identified or already implemented across the water sector in Australia and also in other advanced countries. In terms of the pace of its digital transformation, WaterNSW would probably be considered as slightly behind the curve on leveraging technology to transform operational delivery (areas like Machine Learning, Artificial Intelligence, Internet of Things) but there are also risks associated with being an early adopter and investing in unproven technology. In our opinion, the pace identified is appropriate given WaterNSW's current level of ICT maturity and its capacity to deliver large programs of change, when also combined with its need to prioritise within the constraints of a budget envelope.

D.2. ICT Projects

CIMS – Current and Future Price Paths

Need

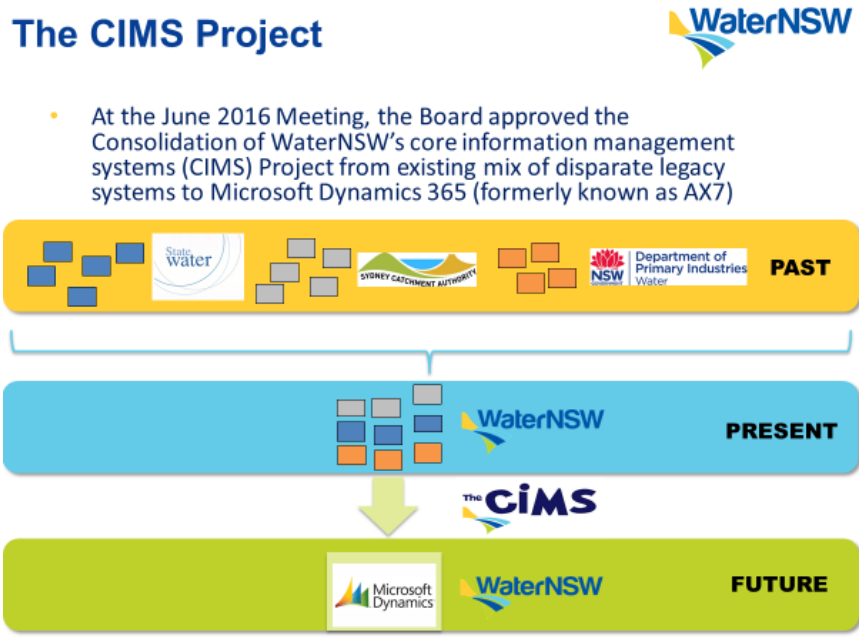
The need for change and potential inefficiencies were underlined at the time of the last IPART review with the "…generally poor state of our information and communications management systems. Our key water accounting systems, by way of example, are more than 10 years out of vendor support period and require a high level of manual intervention to deliver reliable customer account and billing outcomes. Similarly, WaterNSW does not currently have a Program Management Office nor any systems and tools usually provided by such a function. The absence of such systems necessarily means that delivery requires manual input and intervention."[56].

The business case and Board presentation back in June 2016 underlined the mix of legacy systems and processes from State Water, Sydney Catchment Authority and the soon to be integrated Department of Primary Industries functions. This resulted in a complex environment with no 'single source of truth' which caused at least five major 'pain points':

1. Lack of CRM inhibiting 'single customer view' and ability to provide expected levels of customer service, information & analysis
2. Unsupported billing system (>20yrs old) and lack of centralised contracts management system are risks (latter raised by Audit Office as risk in 2016 Management Letter)
3. Lack of Project Delivery System impairing reporting efficiency and adoption of better project management techniques
4. Current multiple systems (such as asset management, HR, timesheet, payroll) causing duplication of tasks and significant time spent performing manual reconciliations to ensure data accuracy
5. Current lack of integration between systems also driving inefficiency from manual processes, reconciliations, reporting and analysis

[56] Quoted in Aither's WaterNSW Greater Sydney expenditure review (December 2015), source: WaterNSW, Confidential Supplementary Information - WaterNSW Organisation Design and Benchmarking, page 3, provided via email on 16th October 2015

Figure D-4 - CIMS Final Business Case (Source: WaterNSW)



Optioneering

All the evidence suggests that WaterNSW followed a rigorous process to arrive at the chosen solution: the Microsoft Dynamics AX7 application. This involved a Needs Analysis and Shortlist of suitable systems for a mid-sized utility using Gartner Magic Quadrant:

- Consolidate to one of existing system platforms (such as TechnologyOne on-premise)
- Implement new system (TechnologyOne Ci5 or MS Dynamics 365 – both "in the Cloud")
- Do nothing (retain risks, capability gaps, duplication, manual processes and pain points)

The evaluation of options considered the following:

- Consolidating to existing system (TechnologyOne on-premise) would require custom integrations with several 3rd party applications due to capability gaps (i.e. such as CRM, Rostering, Risk) and also require an upgrade to the new Ci5 platform (a rewrite and effectively an entire re-implementation) within next 10 years, making it more expensive than implementing a new system now, with significantly lower quality outcome.
- MS Dynamics was evaluated as being superior to TechnologyOne Ci5, meeting a greater number of business needs and significantly greater "valuable upside and innovation" capabilities, for a similar cost. TechnologyOne Ci5 would also require the same 3rd party integrations as on-premise version, making it more expensive in long run.
- MS Dynamics is also a more "open" platform, and will more easily integrate with other essential applications in the future, such as an upgraded Water Accounting System (forecast for next price path)

Cost

[redacted] however our initial reaction was that the original cost estimation appeared low for this type of project. The early estimates were based on feedback from the market on buying the product and estimated time inputs for internal resources as well as a fixed price lump sum contract with the external implementation consortium.

It was subsequently identified that the early business cases "…did not sufficiently address the true complexity and change impacts of implementing an ERP solution for WaterNSW.". [redacted] (this is discussed in more detail below).

Procurement and Implementation Timeline

WaterNSW issued a Request for Tender to the market in October 2015 for the supply and implementation of a cloud-based ERP solution, based on either the Technology One or Microsoft Dynamics AX product set. The desktop evaluation phase considered three conforming responses, with [redacted] on the Microsoft Dynamics AX7 platform recommended to proceed to demonstrations, site visits, reference checks and proof of concept sessions, on the basis that they have provided the best overall proposal to WaterNSW, satisfying most functional requirements at a reasonable price. The results from demonstrations, site visits, reference checks and/or proof of concept sessions were:

- That the functionality of the Microsoft Dynamics AX7 product is a good fit with WaterNSW requirements and provides a significant improvement over the current systems environment
- It was generally felt that [redacted] could and would be motivated to do a good job on the implementation. There was a high level of confidence in [redacted] responsible for the actual application implementation

[redacted]

Upon completion of Phase 1, WaterNSW commenced with Phase 2 of the CIMS Project with the [redacted] WaterNSW delivered the Project using internal subject matter experts, some of whom were backfilled, a dedicated Project Director, and external resourcing and advisory as was required. External Independent Assurance was also sought to ensure the project is successfully delivered and the Board received the assurance it requires during the project.

The project began in earnest in October 2016 with the original timeline set a Go Live date of September 2017. In hindsight, this was optimistic to assume such a short timeframe even without any major changes or challenges, but the business needs evolved and expanded so the revised scope was materially different from what was originally planned to be delivered.

A follow up review in February 2019 identified 22 critical or high priority defects and stated that some of these defects if not resolved may have a material impact to the business and its operation. We were able to confirm that the defects were closed either before or soon after Go Live in April 2019 and did not impact on the delivery of the project.

Challenges and Next Steps

WaterNSW discussed with the review team what they referred to as some of the "struggles" that emerged during the implementation of the project. [redacted]

[redacted] External independent assurance was also sought to provide the Board with comfort about how the project was being managed. [redacted]

We also asked WaterNSW to provide evidence how CIMS was performing since Go Live, i.e. to provide some visibility on the ability to carry out the BAU functions as well as the level of disruption to business operations (it is not uncommon for there to be a dip in performance post implementation of new systems as users familiarise themselves with new systems and new processes bed down). The evidence provided was that all the defects had been corrected.

Essentially a foundation system has been delivered but not the final optimal solution: data is being extracted but WaterNSW is not yet maximising the use of that data. There is a new roadmap identifies future priorities which will be completed over the next price path under the WAVE Program:

- Deliver new CRM capability. The Water Licencing System and satellite systems will continue to be used in the meantime and we were informed this is not adversely affecting the smooth running of operations
- Water Market Systems program was deferred in order to minimise overall increase in ICT capital expenditure program

Benefits Realisation

The table below highlights how CIMS has transformed the digital landscape within WaterNSW.

Table D-2 - WaterNSW Key changes in ICT landscape as a result of CIMS implementation

Functional Area	Previous State		Current State	Implemented?
	Rural (former SW)	Greater Sydney (former SCA)	WaterNSW	
Finance	TechnologyOne Financials		MS Dynamics AX7 (Standard system)	Yes
Asset Management	• T1 Fixed assets register • Smart Asset	• Maximo • T1 Fixed assets register • Asset Datamart	MS Dynamics AX7 (Standard system)	Yes
	Note: No link between finance system and asset management systems – maintained manually by staff.			
Project Management	*No fit for purpose system*	*No fit for purpose system*	MS Dynamics AX7 (Standard system + MS Project Online)	Yes
Procurement and Contract Management	• Purchase orders in T1 • Purchase cards	• Maximo for legacy SCA contracts • Purchase orders in T1 • Purchase cards	MS Dynamics AX7 (Standard system)	Procurement – Yes Contract Management – Yes
	Note: No centralised contracts register – an Excel version maintained.			

Travel and expense management	• Paper expense forms • Travel arranged by BSOs and AP • Concur		MS Dynamics AX7 (Standard system)	No, de-scoped as Concur is considered a best of breed solution.
Billing and Customer Relationship Management	• Billing: Proclaim	• MS Excel • No CRM	MS Dynamics AX7 (Standard system)	Billing – Yes CRM – No de-scoped and to be implemented in next price path as part of the WAVE Program
HR, Payroll and Timesheets	• Payroll: TechnologyOne • Human Resources Management: Paper forms and spreadsheets. • Time Recording: Kronos • Recruitment: Scout	• Payroll: Chris 21 Payroll • Human Resources Management: Chris 21 HR • Time Recording: TRS • Recruitment: Scout	MS Dynamics AX7 (Standard system)	Human Resources - Yes Payroll and timesheets – No, de-scoped as Chris21 is considered a best of breed solution.
Risk Management and Compliance	Tickit		MS Dynamics AX7 (Standard system)	Yes
Cross-application workflow	None / HP-TRIM used for approval workflows.		MS Dynamics AX7 (Standard system)	Yes
Business intelligence	• Data kept within systems • No centralised data warehouse		MS Dynamics AX7 (Standard system)	Yes

The June 2018 Board Paper identified the following tangible and intangible benefits to the WaterNSW business:

1. *Financial Benefit:* Implementing Dynamics 365 is $4.9 million cheaper than do nothing option. This included a hard savings reduction of the costs of 15 FTEs valued at $2.3m per annum when fully implemented and following redundancy costs anticipated to be by June 2021
2. *Financial Benefit:* Avoided periodic upgrades, replacements and costly integrations of current systems, avoided licence, software maintenance and support costs from current / alternative providers, and avoided infrastructure costs from maintaining applications on on-premises hardware (largely offset by the subscription costs of the new system)
3. *Increased efficiency:* A 'single source of truth' from fully integrated systems will increase the efficiency of multiple functions within the organisation
4. *Customer benefits:* Single view of the customers through CRM to enable better customer service - however due to changes to the Microsoft product offering between tender and contract sign-up, the Microsoft "Customer Service" module was no longer within scope but rather, a more restricted customer management module "finops" was offered as part of the contracted product
5. *Consolidation* of disparate and unintegrated systems to a single instance of Microsoft Dynamics

The benefits plan was formalised at Gate 6 at the end of 2019 and reviewed in June 2020 (Ref. RFI 157a WaterNSW Program Update 18th June 2020 v1.0 CIMS). Key highlights summarised in the report were:

- Efficiency gain of 9,000 hours / year

- Consolidation of systems for asset management, finance, billing, timekeeping/payroll, human resource management, on-line learning, procurement, project management and risk/compliance management.
- A centralised source of data for reporting the state of the business and decision support.
- A platform on which improvements to business process can be made incrementally to business specifications and change management cadence.
- Improved financial and analytical reporting, via Power BI, enabling the business to source key performance information from a “data lake”, reducing the need for data manipulation and providing greater confidence in the performance information i.e. “single source of truth”.
- Mobile office and team collaboration capability, which has been illustrated during Covid-19 with key information, financial processes (e.g. AP, procurement, AR) and reporting being able to be undertaken from the home office via the Cloud. WaterNSW would have not been able to maintain these key processes via previous systems.
- A role-based access system that aligns staff roles with their rights in the system which significantly improves security and compliance with best practices relating to separation of duties, delegation levels and position limits.

However, it was noted that…“The financial benefits of the investment in CIMS 1.0 are not straightforward to assess given the significant changes in the business over the period since the original CIMS business case was approved by the Board in 2016. Our analysis suggests that each business area impacted by CIMS has either maintained or grown their FTE over the last three years and we have not been able to identify any Finance (i.e. billing, AR, AP, accounting, procurement), HR, and IT ERP support FTE savings. This in part was due to changes in the business over time e.g. an increased capital and operating programs, compliance/reporting obligations and/or the expected scope of the project being reduced and did not achieve the functionality required to achieve the benefits claimed in the business case.

Savings claimed in the business case from system decommissioning have been achieved as licencing fees are no longer paid except in the case of TechOne which has an ongoing operational role until late 2020. Further work is required to archive data and will require a further 6 months of work to close out. The Data Centre project will dispose of the hardware and software assets for these decommissioned systems.”

Atkins report on the WaterNSW Greater Sydney determination identified that there was significant scope for improvement on tracking benefits and that there was a risk they were not being realised. While the CIMS implementation has been a success from an operational perspective, the de-scoping of the CRM capability alongside the CIMS report’s conclusions on realising efficiencies supports our earlier assessment that there is considerable scope for WaterNSW to improve compared with how a frontier company would be delivering efficiencies through its ICT investments. This was summed up by WaterNSW’s review that: “A key learning from the CIMS project is that functional deliverables and associated benefits should be undertaken incrementally so that we can avoid the impact of the evolving state of the business over a long term. The Corporate Systems Program operates using this tighter linkage between benefits proposition and realisation. A further key learning is that successful benefits realisation needs to consider in the context of a comprehensive workforce plan that shows the impact of initiatives that both increase and decrease effort (and therefore headcount). The lack of this workforce plan means that it is difficult to explain why headcount has increased over time and to make visible the benefits from various efficiency initiatives. For this reason, Management is focused on development of a workforce plan that is underpinned by planned changes and is dynamic to account for external impacts. The IT Strategy would provide a direct link to the initiatives affecting headcount in that plan.” This learning should therefore be translated into improved management of future initiatives, particularly the WAVE Program.

DamGuard – Current Price Path

DamGuard benefits both Greater Sydney & Rural Valleys by enabling early detection and alarm notification that improves the way the dams are managed, significantly reducing risks of failure. While it was not the main driver, WaterNSW also described this project as their most successful business efficiency project in the current price path.

The previous state was very manual and time-consuming involving multiple systems and processes which had to be pieced together to provide the necessary data. This could take up to six weeks to be analysed, which was described as “unacceptable” as it undermined the primary purpose of the dam safety surveillance which was to take action swiftly if abnormal behaviour occurs.

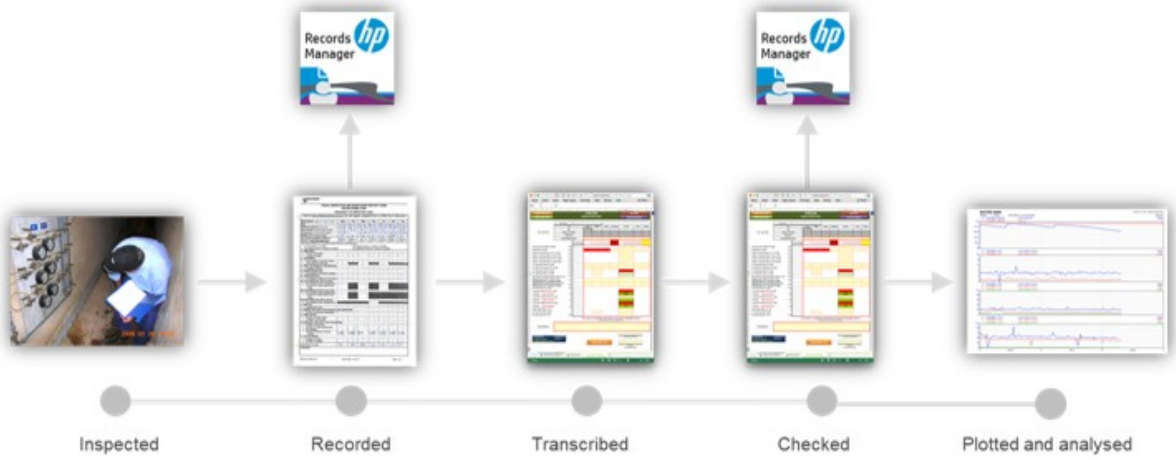


Figure D-5 - Schematic showing 6-week timeline for analysis of inspection data (Source: WaterNSW DamGuard Cost Benefit Analysis)

The rollout of the new solution was managed in an ‘agile’ way, based on a series of sprints in clusters whereby it was first rolled out to 2 dams, a further 5 dams and as of July 2019 it has been implemented in all 41 dams.

The result is that DamGuard has allowed WaterNSW to move to a streamlined digital solution with real time alerts and updates with consolidation of data in one place by adapting an off the shelf Microsoft solution. It has speeded up the alert/analysis process from 6 weeks to an almost real time solution.

The capital cost was $1.3m with annual operating costs of $274k. In terms of financial benefits, $1.5m per year of operational efficiencies were identified in the original business case based mainly on time savings. We were however unclear if these savings were being realised or whether it simply “freed up time” to deploy personnel on other duties. WaterNSW responded that:

- *The opex efficiency identified by DamGuard is factored in the proposed opex budget requirements for the dam safety program in the upcoming IPART Determination (FY21-FY24) period.*
- *The estimated $1.5m operational efficiency identified by in the document supplied by ICT is a corporate wide and applies across the entire WaterNSW Portfolio of dams, i.e.; Greater Sydney and Rural.*
- *There is a greater efficiency gain from DamGuard implementation in the Rural Valley portfolio as compared to Greater Sydney portfolio due to the consequence category associated with the rural dams’ portfolio (18 out of 20 dams in the Rural portfolio are assigned an extreme or High Sunny Day Consequence Category compared to only 9 out of 21 dams in the Greater Sydney portfolio).*
- *It is also worth noting that there has been a reallocation in dam monitoring accountabilities within the AE&DS team as a result of DamGuard implementation which is reflected in the new AE&DS team*

structure. As a result, two positions have been reallocated/redeployed to perform higher value-added activities to meet our new strategic structure.

There is also considerable interest from other States in Australia in the product so there is potentially an opportunity to generate revenue by selling on the product to interested parties.

Overall, we concurred with WaterNSW that the project was not only a success in addressing the risks associated with managing dams and also appears to be an exemplar in terms of return on investment from an efficiency perspective (subject to confirmation that these benefits are actually being realised).

Data Centre – Current and Future Price Paths

WaterNSW inherited a significant amount of legacy Data Centre infrastructure. Large elements of this infrastructure are duplicated and reaching both capacity limits and vendor support and thus in need of replacement. The program focuses on:

- Maintaining capability through asset renewal - replacing existing end-of-life assets in 2019/20 and again in 2024/25
- Augmenting disaster recovery capability which a 3rd party specialist commissioned to carry out a review identified as not fit for purpose
- Developing new capability through currency uplift on server operating systems, databases and consolidation of data centre services
- Augmenting capacity by procurement of increased storage, capability and processing growth (the headroom in the Data Centre is set at around 80% with 10% growth assumed per year, equivalent to $700k total investment

The utilisation of the NSW Government Data Centres (GovDCs)[57] is the preferred option pursued by WaterNSW to maintain core ICT infrastructure for both Production and Disaster Recovery environments. These environments are provided as a service which includes floor space, utility costs, physical security and environmental controls (temperature and humidity).

[redacted]

[57] See https://www.digital.nsw.gov.au/policy/buying-ict/government-data-centres and https://www.digital.nsw.gov.au/policy/buying-ict/government-data-centres for more information
[58] For background information on tier certification and classification systems, see https://uptimeinstitute.com/tiers

- increased security, capacity and faster ICT services

WaterNSW, with assistance from Deloitte, approached the market in an open tender with a set of business requirements. Solutions provided in response to that tender informed the options. The recommended option was the Data Centre Refresh and development of new Disaster Recovery capability which had the lowest total cost of ownership as well as providing the strongest benefit case.

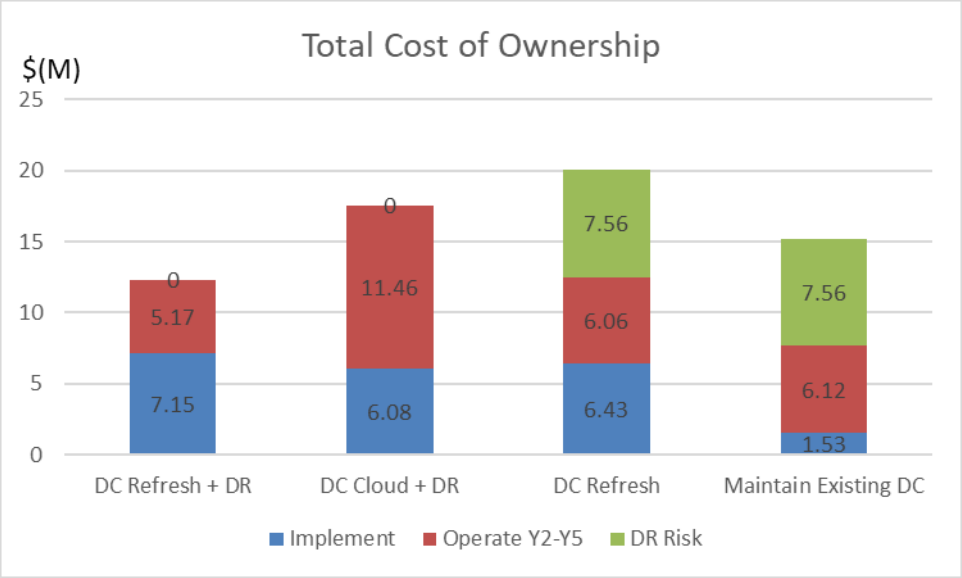


Figure D-6 - Financial summary of options

We also reviewed the delivery model[59] as well as the scope of work, procurement plan and tender evaluation and we were satisfied that the project has been developed and expenditure to date has been in a prudent and efficient way.

We do not believe that there is sufficient justification for the 10% assumption for capacity growth each year on top of the headroom already being allowed for. This also does not set the right incentive to manage data in an efficient way; WaterNSW should be looking at opportunities to reduce its data. This is supported by the Water Services Association of Australia's report on the digital economy[60] which identified that:

New data is being produced at an extraordinary rate: 50% of the data existing worldwide was generated in the last 10 months. Most data remain under-analysed, presenting a real business risk and cost. The Veritas Databerg Report estimates that by 2020, worldwide $4.6 AUD trillion will be wasted due to gathering and storing too much data that is not being used…. only 10% of current data collected in Australia is tagged as 'business critical' while 62% of it remains 'dark' (of unidentified value) and 28% are ROT (redundant, obsolete or trivial).

The WAVE Program – Current and Future Price Paths

Need, Objectives and Timeline

WaterNSW in its own words inherited an ICT landscape which had suffered from "prolonged underinvestment" and by the very nature of the merger was complex with for example three different telemetry systems in place and operated separately. Following on from CIMS implementation, the WAVE Program is the next step in rationalising and improving the digital backbone of the organisation to make it fit for purpose today and for the

[59] The key characteristics of the design of the delivery model is that (1) WaterNSW and the external vendor are jointly in-charge of the Project Management Office, Change Management and associated project management activities and (2) the external vendor delivers the technology components needed for refresh and transform. This is designed to both maximise WaterNSW oversight of the project and also reduce risks.
[60] WSAA (2018) Harnessing The Digital Economy, a discussion paper for the Australian and New Zealand water industry

future. The Program is not really new, what's different is that it aims to bring together three of the nine existing ICT key workstreams to address them in a more joined up and holistic way. These are Operational Technology[61], Analytics, Water Market including Customer Relationship Management (CRM) and represent ~60% of ICT spend in the future price path across WaterNSW. This Program has been 18 months in the making and it was taken to the Board for approval in June 2020 so while the groundwork has been laid in the current price path, the majority of expenditure takes place in the future price path.

WaterNSW describes the case for change to address both operational and information security risks as well as complex and ineffective ways of working across the organisation. This is illustrated by some key numbers:

- 4,000+ hours spent on low value activities = 25% on low value activities
- 250 staff over 10 business teams spending a lot of time moving data along the value chain = 40% on date related / reporting activities
- 41 applications Identified for replacement which drive complexity, duplication of costs and effort, and operational and security risk
- 80% of all systems beyond end of life

While the numbers are significant, without being able to directly compare the current state with the future state, the benefits are not articulated as clearly as they could be, however the objectives clearly underpin four of WaterNSW's eight strategic priorities:

1. Improve organisational performance
2. Support performance through innovation and adoption of new technology and scientific advances
3. Be a customer centric organisation
4. Deliver reliable performance in a changing environment

The specific WAVE Program objectives are:

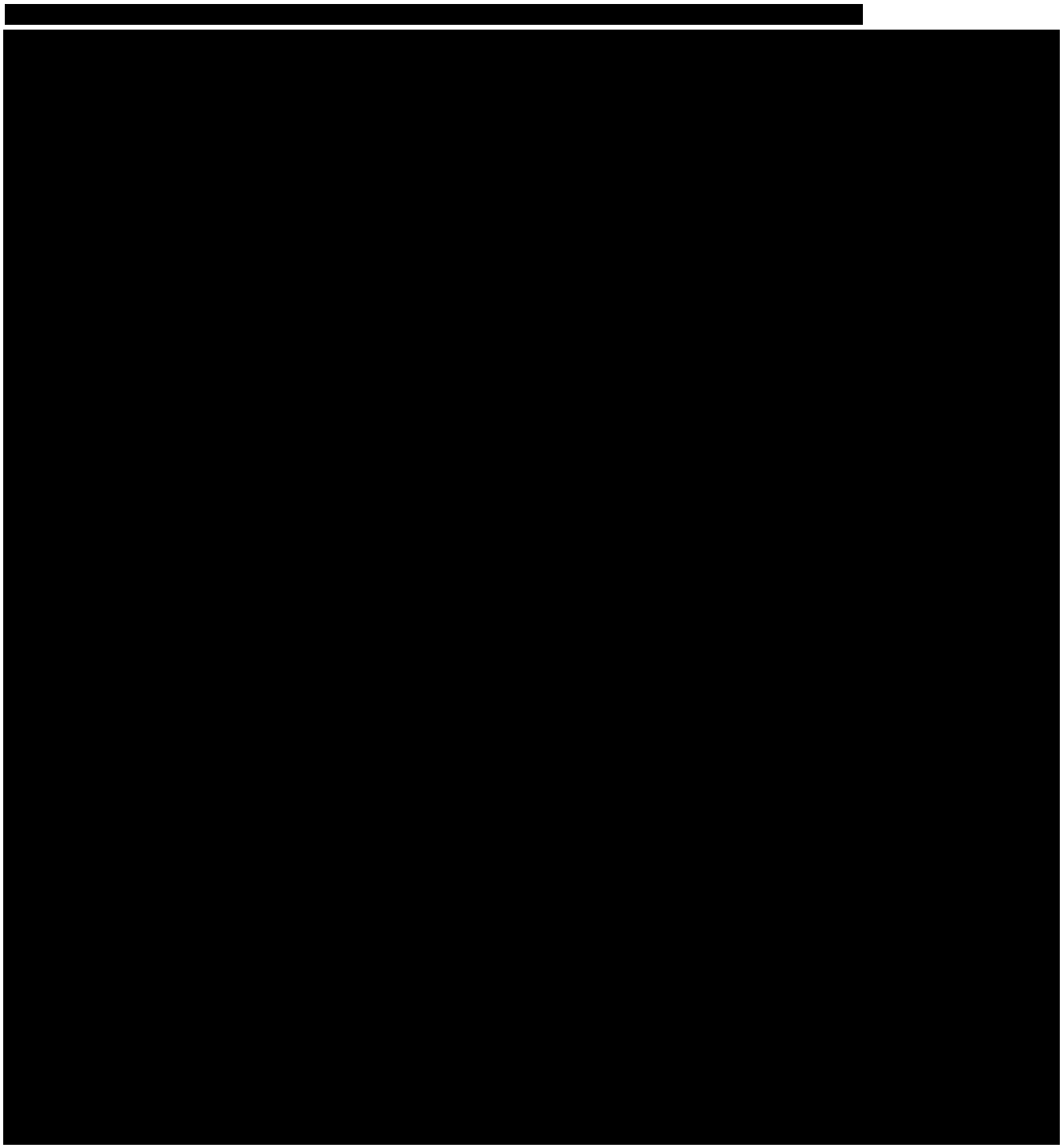
- Service and efficiency improvements by allowing low value tasks to be automated and customer facing staff to resolve more complex matters
- Centralised management of water information by improving access to up-to-date and reliable water information for personnel and customers
- Consolidation of ICT systems with harmonisation and integration of ICT landscape to drive operational efficiencies and enable improved performance of services through better insights from high integrity data
- Mitigation of risks through improving integrity and reliability of business processes and data management

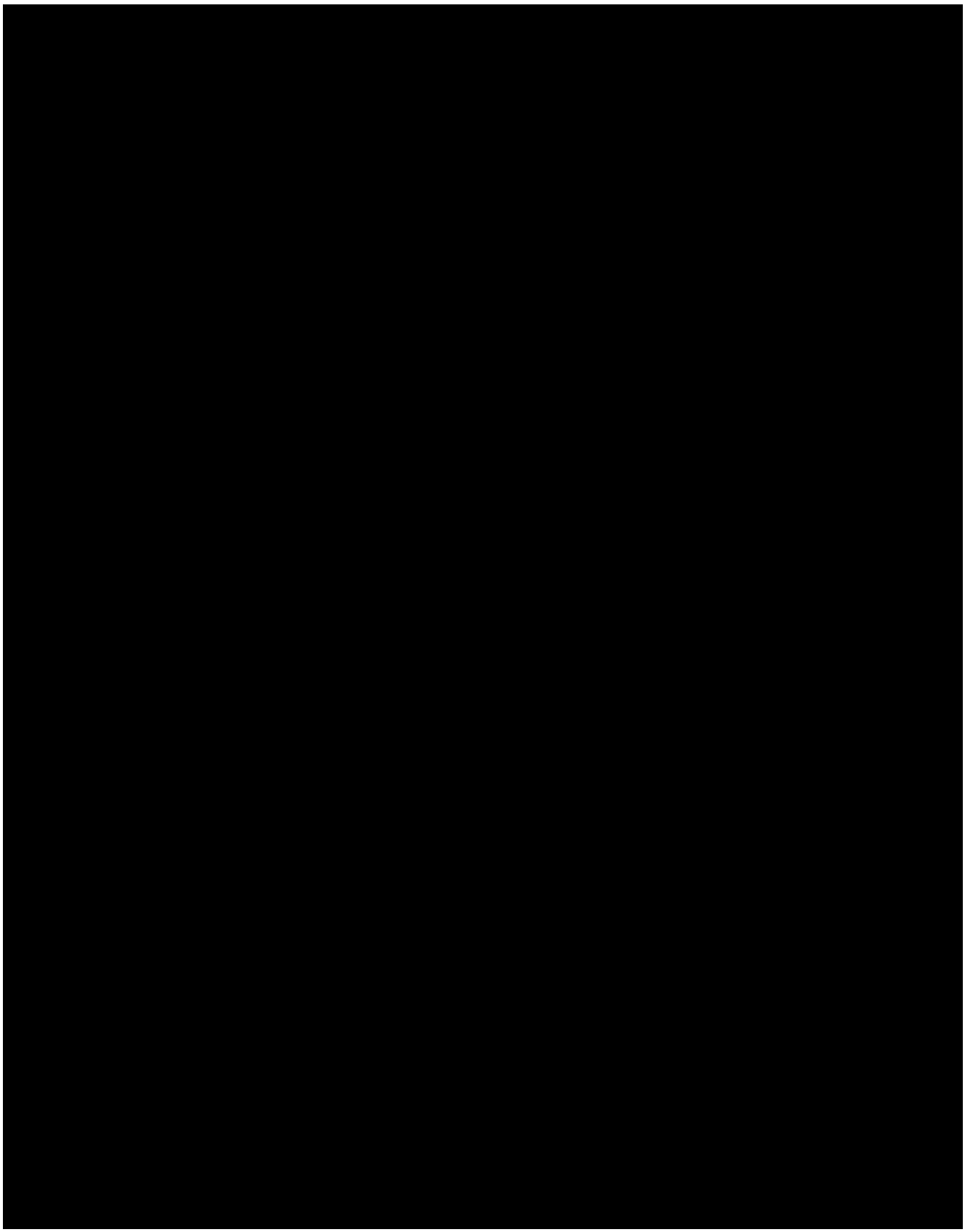
The WAVE Program will impact 36 systems across WaterNSW, summarised in Table E-3 below provided by WaterNSW (there are a small number of blank entries stated as not confirmed). The high-level scope for each technology stream is as follows:

1. WMS and CRM transform these application and associated business process by implementing a new platform to be built on the Pega Software solution;
2. Operational Technology upgrade and consolidate the two legacy SCADA solutions into one platform, utilising ClearSCADA COTS software. Develop and transform a new Telemetry platform to replace the current legacy Telemetry systems using Azure IoT platform;

[61] This does not constitute all SCADA and telemetry activity/expenditure. This relates to the back office systems' costs, including licencing, and the costs for consolidation, but not the expenditure for the individual SCADA programs which are contained within the asset programs and similarly for telemetry, for the field equipment.

3. Design and develop an Azure cloud-based Data platform to be the repository for business and operational data and to develop Data Analytics uses case to provide business insights and enable the business outcomes;
4. To support 1. to 3., there is the service delivery component to deliver a program methodology and structure including governance and change management to enable the successful deployment of the WAVE Program.





[redacted]

[redacted]

[redacted]

Costs and Benefits

[redacted] There is a contract signed for [redacted] with WaterNSW's contractor, who has been "engaged to digitally transform the processes, design, build, transition them to WaterNSW team", however the response we received was unclear if this aligned with the [redacted] envelope in the Business Case:

[redacted]

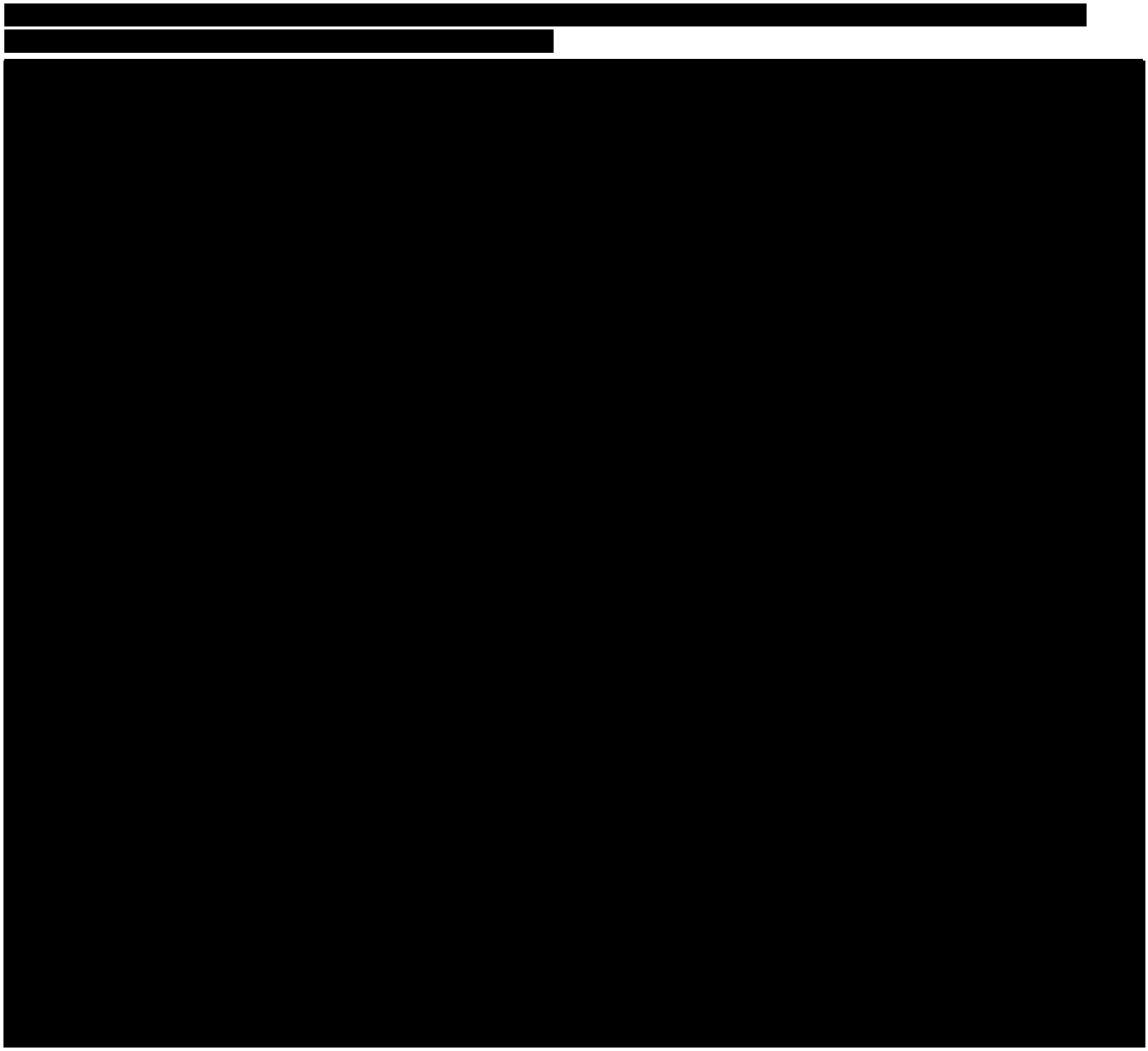
WaterNSW has identified that [redacted] would have been spent on maintaining or enhancing existing systems so it states that it is therefore only the total above this amount which represents a real increase in expenditure.

The benefit type and values as described by WaterNSW have been captured in the table below.

[redacted]

Benefit type	Description	Financial Value	Examples
[redacted]			

[redacted]



[redacted]

Procurement

We reviewed WaterNSW's approach to procurement for the WAVE Program. They adopted a procurement process which included Competitive Dialogue to test the market's ability to provide the required Information and Operational Technology business capabilities with sufficient apacity and capability to deliver vale for money from a WaterNSW prudency and efficiency perspective. This involved:

- Open Expression of Interest (EOI) stage
- 18 vendors invited for to submit proposals (RFP stage)
- 6 vendors invited to Competitive Dialogue (CD) stage
- 1 vendor invited to post-CD stage as preferred bidder

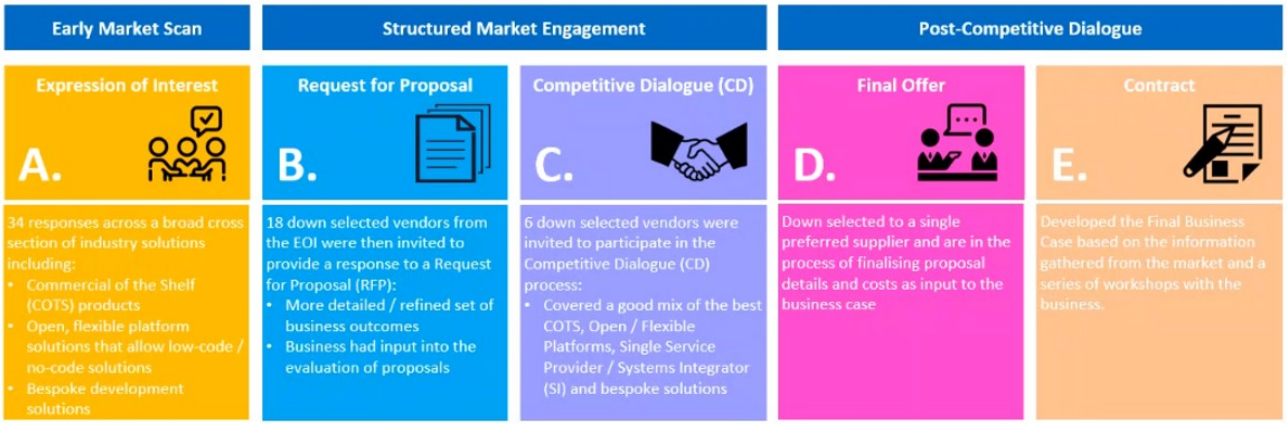


Figure D-7 - WAVE Procurement stages (Source: Presentation to Atkins, September 2020)

The Master Statement of Works agreement with the contactor appears to be comprehensive and robustly prepared with responsibilities clearly set out, service levels and service performance measures established, a knowledge management framework identified as well as a major incident reporting mechanism for managing emergency and high priority incidents in place. The approach to managing this Program clearly builds on the good lessons learnt and challenges from CIMS implementation, it appears to be in line with best practice and being managed to date in a prudent and efficient way.

iSmart – Current Path

The iSMART SCADA system provide monitor and control function for river operation. It gathers operational data from the field and feeds into other systems like Hydstra and CARM.

WaterNSW inherited a mix of technologies and the objective of this project was to create a common platform and technology to facilitate remote monitoring and control and bringing benefits such as reducing or avoiding the

need to travel to sites, increasing resilience and future proofing the organisation (this resonates particularly with the COVID-19 pandemic).

This project first went to the Board as far back as 2010 and the Business Case was approved in 2014 based on a phased process: firstly audit and design followed by implementation of the head system and then the asset renewal of hardware in the field.

We found the audit trail for expenditure challenging to follow as we had understood initially that there was $8.2M Corporate Capex in the current determination period. WaterNSW explained that:

> We did not spend ~$8m on iSMART in the current period only ~$2m. The ~$8m journal entry amount related to prior year accumulated spend on iSMART since inception, which was previously allocated to the Corporate Systems category over a number of years (a few regulatory periods). In FY19 we transferred the cumulative spend for iSMART from Corporate Systems to the Water Delivery category. The net effect to total capex in FY19 is nil and it was only for presentation purposes (note: the debit went to the Water Delivery category while the credit went to the Corporate Systems category; if you reverse the journal entry the total capex in FY19 would remain the same).

The work was undertaken by a managing contractor. It was necessary to procure in this way as the scope was not very well defined, there were no drawings available of the original configuration which would have increased risks if it was procured as a fixed price upfront; this approach put the onus on the contractor to review each site and then seek prices in an open and competitive way from the market to promote best value.

We queried why the allocation of the iSMART costs in the current determination is different (marginally in many cases) to the overall allocation of Corporate costs between the valleys. WaterNSW explained that:

> The allowance for iSMART for the current period, as approved by IPART was split on a pro-rata RV RAB basis…Re: the actuals, originally iSMART expenditure (internal and external) was attributed to a single project code and not to the individual valleys. In order to rectify this, the project manager went through the previous invoices from the contractor and identified the costs attributed to each work package for items that were valley specific. From this, the project manager identified a percentage of the overall valley specific work per valley per FY. This percentage was then used to pro rata the non-valley specific costs (i.e. project management costs, standard code creation to be used at all sites, etc.) and the internal costs to each valley. This approach allows for an accurate distribution of the funds expended based on the actual work undertaken in each valley.

Renewals are subsequently and will continue in the future to be captured under the ICT Renewals and Replacement Program as part of Business As Usual expenditure.

ICT Renewals and Replacement Program – Current and Future Price Paths

The purpose of the ICT Renewals and Replacement Program is to provide WaterNSW with reliability by ensuring that employees have functioning and fit for purpose assets and applications to fulfil their functions and that adequate support is available where required. Expenditure relates for example to:

- Desktop PCs, laptops and monitors
- Toughbooks and tablets for use in the field
- Multi-functional devices for printing, scanning and photocopying
- Contractor support to build machines
- Mobile and satellite phones
- Software licences (under operational expenditure)

There is not a specific business case for this expenditure as the line item represents a provision for minor assets. The provision is a 'rolling' renewals provision.

The costs for the program are built up by replacing the assets once they reach their depreciation age. The renewal formulation is made on the basis of equipment purchased and the replacement dates based on asset life, which historically for desktop PCs is four years, laptop computers three years, mobile telephones two years and for servers and network equipment (e.g. routers) it is five years. While we challenged this approach in the Greater Sydney Review in 2019/20, we discuss below that there appears to be a disjoin in how the budget is prepared and actual practice which leads to the latter outturn costs actually being significantly lower than what is proposed in the IPART submission. This has the effect of largely nullifying our challenge on the previous review that "there was no evidence presented to demonstrate if there had been consideration of the actual condition or performance of the assets during the current price path and thus whether the assumptions behind the age at which assets are replaced had been revisited to determine if they were still reasonable" because there is some evidence this is happening and we can see the approach to budgeting is likely to change so that there is alignment between asset life assumptions and actual spend.

In the current price path, there may appear to be considerable underspend compared with the allowance but when replacement expenditure on other programmes such as telecommunications and the 1PSQ are taken into account, the overall total is much closer to the original determination.

In the future price path, the expenditure is reducing however this would be challenging to achieve if WaterNSW replaces on the basis of the existing asset life settings. In other words, the theory and practice are not the same. Where there is insufficient budget to follow the asset life strategy, the business is managing the procurement in a more pragmatic way and therefore not replacing in line with a set asset life. This is good practice in our opinion as this demonstrates that WaterNSW is sweating the assets and promotes efficiency compared with a standard asset life approach to replacement. While any formal changes in asset lives did not happen in time for this review, we understand that WaterNSW is undertaking modelling for FY22 to see what impact the changes have and present findings to the Board in February 2021.

The only other area that we did not have visibility on is that the plans for asset renewals and replacement in the future price path align with and reflect the revised headcount over the same period. This is as opposed to just rolling forward on the same basis as the current price path. This is an area which should be demonstrated more explicitly and effectively at the next review.

Notwithstanding the issues discussed herein, we believe that in the round the expenditure undertaken in the past and that proposed in the future is prudent and efficient because:

- The need is demonstrated
- The investment is consistent with WaterNSW's asset management strategy
- Procurement is managed in such a way as to promote best value moving from open tender to NSW agreements to increase purchasing power

Appendix E. Terms of reference

Project B – Expenditure review of WaterNSW Rural Bulk Water Services

IPART has commenced its review of WaterNSW's prices for its rural bulk water services to apply from 1 July 2021, with the receipt of WaterNSW's pricing proposal on 30 June 2020.

IPART's review will set both WaterNSW's inland prices (under accreditation from the ACCC) and its coastal prices (under the IPART Act[1]).

The maximum prices determined by IPART for the new determination period will cover a period of up to four years. The length of the determination will be determined by IPART during the course of the review.

Our price reviews help protect customers from paying for inefficient or unnecessary expenditure, while ensuring these businesses raise adequate revenue to cover the efficient costs required to deliver services. IPART seeks to set prices which do not reward inefficient investment and asset management decisions, or inefficient operations and practices.

IPART's regulation seeks to replicate the pressures and incentives of competition to drive efficiency gains.

Information on IPART's price review, including a copy of WaterNSW's pricing proposal, is available at:

https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Rural-Water/Prices- for-Water-NSW%E2%80%99s-Rural-Bulk-Water-Services-from-1-July-2021

For the expenditure review, IPART requires the consultant to provide the following three tasks:

- **Task 1** - a strategic review of WaterNSW's long-term investment plans (10 to 20 years) and asset management systems and practices.
- **Task 2** - a detailed review of WaterNSW's historical and forecast operating and capital expenditures for efficiency.
- **Task 3** - a review of WaterNSW's performance against past output measures and to propose new output measures for the next determination period if appropriate.

Task 1: Review of long-term investment planning and asset management practices and processes

The consultant must undertake a strategic review of WaterNSW's long-term investment planning and its asset management systems and practices as specified below. In undertaking this task the consultant must provide advice on:

(a) Whether the long-term capital investment strategy is the most efficient, and whether processes supporting this including option analysis, procurement processes, customer engagement practices, whole of life cycle planning and assessment of capital and operating expenditure trade-offs are best-practice and therefore likely to result in efficient investment decisions.

(b) The key assumptions that are driving expenditure (eg, asset replacements, licensed volumetric entitlements and extractions forecasts, environmental regulatory requirements, licensing standards, customer service standards and preferences), including comments on whether these assumptions are reasonable and how they have been considered and tested by the utility.

(c) The robustness of systems for linking asset management decisions with current and future levels of service and performance requirements, including customer preferences, service standards and environmental outcomes.

(d) The way in which WaterNSW manages the risks associated with asset failure or

underperformance.

(e) Any particular concerns or issues relating to WaterNSW's strategic processes for determining and prioritising future infrastructure expenditure and asset management decisions.

Task 2: Detailed review of operating and capital expenditure

T2.1.1 Actual operating expenditure

The consultant must review actual operating expenditure incurred over the 2017 determination period. In undertaking this task the consultant must:

(a) Report and comment on the variations in operating expenditure from what was allowed in the 2017 determination, including the extent to which these variations are justified or not.

(b) Identify and comment on the nature and size of operational savings realised (eg, whether they are permanent or temporary in nature).

T2.1.2 Efficiency of forecast operating expenditure for 2021-22

The consultant must review the efficiency of forecast operating expenditure for 2021-22. In undertaking this task the consultant must:

(a) Provide recommendations as to the efficiency of WaterNSW's forecast level of operating expenditure and provide an estimate of the level of operating expenditure that is required to efficiently supply the regulated monopoly services in 2021-22.

(b) Identify the potential for and recommend efficiency savings to be achieved within the operating expenditure budget, and provide evidence and reasoning to support the recommended savings.

(c) Identify any consequential impacts on capital expenditure (ie increased or reduced costs) based on the assessment of operating expenditure.

(d) Where appropriate, have regard to productivity benchmarking analysis when identifying potential efficiency savings.

T2.1.3 Efficiency of forecast operating expenditure for 2022-23 to 2024-25 (Optional task – Subject to IPART direction)

The consultant, upon further written instructions by IPART, will be required to undertake a further review of forecast operating expenditure between 2022-23 and 2024-25. This optional task will be included in any contract based on the quotation provided in your proposal.

The consultant must review the efficiency of forecast operating expenditure for 2022-23 to 2024-25. In undertaking this task, the consultant must:

(a) Provide recommendations as to the efficiency of WaterNSW's forecast level of operating expenditure and provide an estimate of the level of operating expenditure that is required to efficiently supply the regulated monopoly services from 2022-23 to 2024-25.

(b) Identify the potential for and recommend efficiency savings to be achieved within the operating expenditure budget, and provide evidence and reasoning to support the recommended savings.

(c) Identify any consequential impacts on capital expenditure (ie increased or reduced costs) based on the assessment of operating expenditure.

(d) Where appropriate, have regard to productivity benchmarking analysis when identifying potential efficiency savings.

T2.2 Detailed review of capital expenditure

T2.2.1 Capital program

The consultant must review WaterNSW's capital program to inform recommendations as to the efficiency of the utility's level of capital expenditure. In undertaking this task, the consultant must:

(a) Assess the reasonableness of the utility's capital expenditure program as a whole, within the context of its long-term plans and the assumptions underlying them, including the scale, scope and planning of the entire capital expenditure program. That is, the consistency of the utility's proposed 5-year capital expenditure program with its longer term program of capital expenditure, and the implications of and risks associated with the 5-year program for the longer term program.

(b) Undertake a detailed investigation into the outcomes and project planning for a sample of the utility's capital projects above an agreed materiality threshold (to be agreed with IPART, but generally at least 10% of capital projects).

(c) Advise on the appropriateness of the cost allocation method used to allocate operating costs to capital projects.

(d) Review the appropriateness of the asset lives used to calculate regulatory depreciation (or 'return of capital') in the utility's pricing proposal, and recommend adjustments where appropriate.

T2.2.2 Efficiency of actual capital expenditure over the 2017 determination period and forecast capital expenditure for 2021-22

The consultant must review the efficiency of actual and forecast capital expenditure for the 2017 determination period and 2021-22. In undertaking this task, the consultant must for each valley:

(a) Report and comment on actual and forecast capital expenditure for each year, including the variations in actual capital expenditure over the 2017 determination period from what was allowed in the 2017 determination.

(b) Provide recommendations on the efficient level of the utility's capital expenditure over the 2017 determination period required to supply the regulated monopoly services, and provide evidence and reasoning to support any difference between the utility's actual level of capital expenditure and the consultant's recommendations on the efficient level of capital expenditure for this period.

(c) Provide estimates of the level of capital expenditure in 2021-22 that is required to efficiently supply the regulated monopoly services, and provide evidence and reasoning to support any recommended efficiency savings relative to the utility's proposed capital expenditure allowance for 2021-22.

(d) Identify any consequential impacts on operating expenditure (ie, increased or reduced costs) based on the assessment of capital expenditure.

(e) Where appropriate, have regard to productivity benchmarking analysis when identifying potential efficiency savings.

T2.2.3 Efficiency of forecast capital expenditure for 2022-23 to 2024-25 (Optional task - Subject to IPART direction)

The consultant, upon further written instructions by IPART, will be required to undertake a further review of forecast capital expenditure between 2022-23 and 2024-25. Consultants must include pricing for this optional task in their proposal to IPART for consideration.

The consultant must review the efficiency of forecast capital expenditure between 2022-23 and 2024-25. In undertaking this task, the consultant must for each valley:

(a) Provide recommendations as to the efficiency of the utility's level of capital expenditure and provide estimates of the level of capital expenditure between 2022- 23 and 2024-25 that is required to efficiently supply the regulated monopoly services.

(b) Identify any consequential impacts on operating expenditure (ie, increased or reduced costs) based on the assessment of capital expenditure.

(c) Identify the potential for and recommend efficiency savings to be achieved within the capital expenditure budget between 2022-23 and 2024-25 and provide evidence and reasoning to support the recommended savings.

(d) Where appropriate, have regard to productivity benchmarking analysis when identifying potential efficiency savings.

Task 3: Review of output measures and propose new output measures

The consultant should use any findings from Task 1 or 2 to inform this task. In undertaking this task, the consultant must:

(a) Review WaterNSW's performance against its output measures over the 2017 determination period. Where output measures have not been achieved, provide comment on the reasons for this.

(b) Recommend a set of new output measures for the utility's proposed operating and capital expenditure program, for the 2021 determination period.

Graydon Jeal
WS Atkins International Limited
Woodcote Grove
Ashley Road
Epsom
KT18 5BW

Tel: +44 (0)1372 726140