

Draft Report

Review of WaterNSW's Metering Reform Costs

3608-44

Prepared for
IPART

11 March 2021



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Executive Summary

Due to the ongoing uncertainty around the new metering policy and operational landscape, and the associated costs of metering reform, WaterNSW excluded the costs of the non-urban metering reform from its Pricing Proposal to IPART for NSW Rural Bulk Water Services 1 July 2021 to 30 June 2022.

WaterNSW has submitted a separate non-urban metering reform submission to IPART that provides detail and breakdown of its estimated metering costs and metering charges under the metering scheme management for the 2021 Determination period. The submission, which is based on the implementation of the NSW Government's reform program as it stood as of 30 November 2020, presents:

- > Metering activities and requirements resulting from the reforms
- > Process overviews, including activities and systems associated with the new requirements
- > Forecast operating and capital expenditure over the 2021 Determination period, including metering costs associated with each stage of the process
- > Pricing approach and preliminary structures and prices.

The impacts, forecasted expenditure and charges have been separately identified for:

- > Scheme management of user meters
- > Government-owned meters

Cardno has reviewed WaterNSW's separate submission to IPART on the additional costs of non-urban metering reform to be included in Rural Valley and WAMC prices. Based on our analysis, we draw two main conclusions regarding WaterNSW's proposal for implementation of metering reforms:

1. The planning documents and supporting information developed by WaterNSW does not display the level of rigour that we would expect to see to provide assurance over a program of this level of materiality.
2. There appears to be sufficient variance between WaterNSW's expectations over implementation costs and constraints and benefits and opportunities to warrant a reassessment of the implementation against the policy objectives to ensure that the expected benefits will be realised (or cost-benefit maximised).

Expanding on these two main conclusions, we consider that:

- > WaterNSW's assumptions have not been validated nor has the sensitivity of expenditure to the assumptions been tested. The expenditure proposals rely on a large number of assumption which lack supporting evidence and we consider that some of the key assumptions that have been used are overly conservative or inaccurate, e.g. number of working weeks in a year, time allowed to upload data, included annual salary escalation factor. Adjusting these assumptions alone to more central assumptions would reduce expenditure by many millions of dollars. We also consider that there is a general lack of understanding and testing of the sensitivity of the results to the assumptions made.
- > Risk and opportunities for implementation have not been assessed and mitigation measures incorporated in planning. As noted in the previous bullet point, WaterNSW's expenditure forecasts are heavily dependent on a large number of assumptions (the cost model for the NSW scheme meter management includes 75 assumed numbers). Assumptions reflect uncertainty and uncertainty translates into risk to the successful implementation of reform and to customers that will fund the reform. In finding that WaterNSW has made many assumptions that are lacking validation and lacking in testing their sensitivity, we have also found that WaterNSW has not made a corresponding assessment of the risk of this uncertainty to implementation of the reform. Good practice would be to have a comprehensive register of risks aligned with the work program and financial assumptions that is regularly reviewed and mitigating actions identified. WaterNSW stated that it has a register of issues but not a risk register. Risk is not static and good practice would be for WaterNSW to regularly review risks, update mitigation measures and implement these in its work program.
- > Customers have not been consulted over the impact of WaterNSW's proposal, with WaterNSW not planning on consulting with customers regarding the metering reform costs until 2021. This lack on consultation means that customers are not informed of potential pricing impacts to account for in business planning and WaterNSW is not informed of how customers may respond to the policy (as customers have options in some areas). This does not meet the requirements of good practice for implementation of reform.

Based on the above observations, we conclude that WaterNSW's proposal does not meet good practice elements that provide assurance that the expenditure is appropriate, nor does it meet WaterNSW's own assurance framework (Approval to Spend).

We understand that WaterNSW has in part been placed in this position by changes to the policy and its implementation and the timeframes proposed by the Government. Because of the relative immaturity of the proposals compared to what we expect as good practice for an initiative of this significance, we cannot conclude that the proposed expenditure is prudent and efficient based on the evidence provided to us.

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1 Introduction

1.1 Background

New South Wales first signed an inter-governmental agreement on measurement, monitoring and reporting in 2004 as part of the National Water Initiative. This agreed actions for a more cohesive national approach to the way Australia manages, measures, plans for, prices and trades water and specified the requirements for national metering standards and a nationally-consistent framework for water metering and measurement.

In December 2009, the State signed an intergovernmental Framework for Compliance and Enforcement, as well as committing to the National Framework for Non-Urban Metering. The National Framework was designed to deliver the prime objective that national metering standards should provide an acceptable level of confidence that measurement performance under in situ conditions is within a maximum error of $\pm 5\%$.

Implementation of the non-urban metering reform in NSW has gathered pace in recent years with publication of a Framework in 2018. The requirements of the Framework are implemented through provisions within the *Water Management (General) Regulations 2018* and the *Water Management Act*.

The metering policy requires that a work will require a meter if it meets any of the following thresholds:

- > already required to meter or measure
- > infrastructure size. For surface water, all pumps >100mm and for groundwater, all bores >200mm.
- > multiple pumps or multiple bores on the same licence, approval or landholding, except pumps and bores below the capacity threshold
- > at-risk groundwater sources.

The policy is being progressively rolled out across different licence holder groups. The present rollout timetable is shown in Figure 1-1.



Figure 1-1 Program for roll-out of metering policy

1.2 Purpose of this report and scope

This report presents the findings of a review of WaterNSW's proposed costs arising from implementation of metering reform. The objective of our review is to evaluate WaterNSW's proposal and recommend efficient operating and capital expenditure for implementation of metering reform activities.

1.3 New South Wales non-urban water metering reform policies

The *Independent Investigation into NSW Water Management and Compliance* (Matthews Report) was undertaken following allegations of water theft or illegal water take from within the Murray Darling Basin (MDB) and surrounding regions. The review identified shortcomings in the water management and compliance and enforcement system in New South Wales. At the time of the investigation, New South Wales water use accounted for more than half of the water use in the MDB, with one-third of this water take estimated to be unmetered. The Matthews Report validated these allegations and provided recommendations and ultimately a comprehensive plan to significantly improve water management and compliance in NSW, including two key recommendations which impact on WaterNSW's costs:

- > A universal requirement for metering of water extractions
- > A significant improvement to transparency and public accessibility of information about water usage.

The Matthews Report was provided to Department of Planning, Industry and Environment in November 2017.

Following on from the findings and recommendations included in the Matthews Report, as well as those from the Murray-Darling Basin Compliance Review, the NSW Government developed the Water Reform Action Plan (WRAP) in December 2017. The aim of the WRAP was to provide details of how the governance bodies for managing NSW water would implement the review recommendations. This included the NSW Government committing to four key goals:

- > Introduce best practice for water management
- > Ensure transparency in how water is shared, allocated and managed
- > Build a compliance and enforcement regime that ensures strong and certain regulation
- > Build capability to support implementation of water reforms.

As a result, the WRAP committed the New South Wales Government to 40 actions to improve water management in NSW, including a commitment to implement a robust water metering framework.

The objectives of the new metering framework are to ensure that:

- > the vast majority of licensed water take is accurately metered
- > meters are accurate, tamper proof and auditable
- > undue costs on smaller water users are minimised.

The WRAP outlines a staged approach to implementation of the recommendations, with all actions sought to be completed by Q1 2019. The WRAP also identifies five key investment projects to drive sustainability of water across the State.

The Metering Reform Program that sets out the implementation of the metering framework is also detailed in the WRAP. This program impacts on the roles and responsibilities and requires implementation across all NSW water governance bodies – Department of Planning, Industry and Environment (DPIE), Natural Resource Access Regulator (NRAR) and WaterNSW.

The new metering framework includes the New South Wales Non-Urban Water Metering Policy (the policy), the metering-related provisions of the *Water Management (General) Regulation 2018* (the Regulation) and the metering-related provisions of the *Water Management Act 2000* (the Act).

The New South Wales Non-Urban Water Metering Policy published by DPIE in June 2020 explains the requirements of the new framework, including:

- > which works need to have a meter
- > the standards that metering equipment will need to meet, including arrangements for existing meters and how telemetry works
- > the staged roll-out of metering requirements
- > other requirements for duly qualified persons
- > requirements for record-keeping and reporting
- > requirements that apply when metering equipment is faulty
- > the review of the Regulation and policy that will occur after five years.

The Act provides for and strengthens the legal basis for the new metering framework. It imposes a metering condition requiring metering equipment to be installed, used and properly maintained on all water supply work approvals. The Regulation sets out the requirements that must be complied with by all holders of approvals, licences and entitlements who are subject to the metering condition. It also prescribes which holders are exempt from the metering condition, based on thresholds. The Regulation also contains new requirements for duly qualified persons (DQP), telemetry, record-keeping and reporting rules, and a new process for faulty meters.

The Act and the Regulation give the Minister the powers to administer the framework. In practice, DPIE will administer the new metering framework under delegation from the Minister. The policy and the metering-related provisions of the Act and Regulation commenced on 1 December 2018. Some parts of the Regulation relating to new and replacement meters, faulty meters and inactive works commenced on 1 April 2019. The remainder of the framework is being rolled out in stages between 1 December 2020 and 1 December 2023.

Further metering and measurement reforms are also being implemented under the Floodplain Harvesting Measurement Policy released in August 2020, and which are being integrated with the Metering Reform Program. The Floodplain Harvesting Measurement Policy which sets out an approach for measuring water taken under a floodplain harvesting access licence.

1.4 WaterNSW's role and responsibilities for implementing and maintaining the non-urban water metering policy

As part of the WRAP, the NSW Government sought to clearly articulate and designate roles and responsibilities to the various governance and management bodies responsible for managing NSW water. This included establishing the roles and responsibilities for the Department of Planning, Industry and Environment (DPIE), Natural Resources Access Regulator (NRAR), WaterNSW and the Office of Environment and Heritage.

As the bulk water supplier and operational manager of surface water and groundwater resources in NSW, WaterNSW has the following responsibilities related to the implementation and maintenance of the non-urban water metering policy:

- > Developing and operating infrastructure solutions for water supply and security and reliability
- > Conducting customer-facing functions, including customer management and the delivery of water
- > Recording and tracking water take and billing.

WaterNSW's role spans program establishment, the oversight of installation certification and ongoing management, meter reading and data management for both telemetry and non-telemetry sites, customer education, and exception and enquiry management.

1.5 Water users' responsibilities related to implementing and maintaining the non-urban water metering policy

The metering requirements only apply to approvals or water access licences that meet the metering thresholds, with different requirements for different users.

Water users are responsible for the costs of buying, installing and maintaining all metering equipment, including telemetry. Telemetry equipment includes the compatible telemetry device as well as a sim card and monthly telemetry subscription.

In addition to the requirements related to the physical metering and associated infrastructure, water users also have responsibilities related to reporting their water take. DPIE has provided an online metering guidance tool on its website to allow water users to check if and when the rules apply to them. In addition, about a year before each rollout date, water users will be contacted by DPIE by letter so that they can:

- > understand what the rules are
- > have time to comply by the rollout date for their region
- > can check if their infrastructure is correct
- > can apply for their works to be tagged as inactive if relevant
- > can contact a duly qualified person (DQP) to discuss requirements.

Water user responsibilities for implementing and maintaining the non-urban water metering policy include:

- > ensuring the right metering equipment is installed for their particular water-take activities
- > ensuring the equipment is accurate, correctly installed and validated
- > reporting their water take
- > meeting the rollout date that applies to their pump size or the area of NSW in which they are located.

Non-urban water users in NSW are expected to make arrangements well ahead of their meter rollout date to bring their equipment into compliance and be able to demonstrate that they have made every effort to comply with the metering rules. All works required to comply under the new metering rules will need to be fitted with a pattern-approved meter by the water user's rollout date. However, it may be possible for water users to keep their existing meter if it was installed before 1 April 2019. The requirements for keeping a non-pattern approved meter and being exempt from needing to replace an existing meter are:

- > the meter's manufacturer confirms the meter is within $\pm 2.5\%$ accuracy in laboratory conditions and a duly qualified person confirms the meter was validated (that is, installed in accordance with the national standards and the manufacturer's specifications) within five years before the rollout date, or
- > a duly qualified person undertakes in-situ accuracy testing and confirms the meter is within $\pm 5\%$ accuracy in the field.

These meters will also need to be fitted with a listed local intelligence device (LID)s and tamper-evident seals and, where applicable, telemetry.

Under the new non-urban water metering reform requirements, water users also have responsibilities related to how they report their water take. This include:

- > Water users with a meter who use a pump, bore or other work to take both licensed water and water that does not need a licence, such as under a basic landholder right, will need to report this water take to the Minister every month.
- > Water users who have a meter but not telemetry will need to submit a 'self-assessed' meter reading to the Minister every month.

These water users will need to report every month, even if they do not take water. However, a water user will not need to report for a period, nominated by the water user, of up to six months if they take the following steps:

- > at least 14 days before that period begins, they notify WaterNSW to confirm that they do not intend to take water for that period.
- > within 14 days after that period ends, they notify WaterNSW to confirm that they did not actually take water in that period.

This will not prevent a water user from taking water during this period. However, if a water user takes water during this period, they will revert to monthly reporting requirements.

Water users also have responsibilities related to if their meter stops working properly. These include:

- > Reporting the faulty meter to WaterNSW within 24 hours and specifying how the water extracted will be measured while the metering equipment is faulty and recording it in a log book that WaterNSW will provide once the fault-notifying form has been submitted.
- > Repairing or replacing the metering equipment within 21 days and having it certified by a Duly Qualified Person (DQP). If the metering equipment cannot be repaired or replaced within 21 days of reporting it, water users can apply for an extension of up to 21 additional days.
- > Submitting a completion form within 28 days to WaterNSW including:
 - the log book used to record the water taken whilst the metering equipment was faulty
 - a copy of the validation certificate completed by the DQP
 - up to two photos of the new or repaired metering equipment.

1.6 Duly Qualified Persons (DQPs)

Duly qualified persons (DQPs), are persons with the qualifications, skills and experience to work on metering equipment. This includes certified meter installers and certified practising hydrographers. DQPs will play a key role in implementing and maintaining the new metering reform rules.

With regard to the meter installation requirements, DQPs are able to advise water users on how to comply with the new rules and what meter, data logger and telemetry device the water users need to have in place. Under the legislation and policy, water users must use a DQP to carry out certain work in relation to their metering equipment, including installation, certain maintenance requirements, validation and checking the accuracy of an existing meter. A list of DQPs is currently maintained on the Irrigation Australia Limited website to allow for water users to find certified installers in their local area.

DQPs must provide water users with the relevant certificate for work performed within seven days of carrying out the work.

In order to process and record the information for the work that the DQPs have undertaken for the water users, WaterNSW is developing a DQP portal. This is an online portal where the DQPs can complete and submit the forms and certificates required to show that the water user metering equipment is compliant with the new rules.

1.7 Impacts of the non-urban water metering policy on WaterNSW/WAMC

Under the new framework, water users with works that meet one or more of the following metering thresholds will be required to have compliant metering equipment:

- > Users who are already required to have a meter or measure water take
- > All surface water works except for pumps below 100mm in diameter
- > All groundwater works except for bores below 200mm in diameter
- > Users with pump infrastructure size of 200mm or larger
- > Multiple works on a single property or authority
- > All groundwater works that take water from at-risk groundwater sources.

In addition, all surface water works, except for pumps below 200mm in diameter, will be required to remotely transmit water take information to the NSW Government. DPIE has recently released a *Market Engagement Policy* for Telemetry which provides a pathway for customers to retain their existing telemetry services if they are shown to meet equivalent outcomes to the telemetry requirements under the metering policy.

As WaterNSW maintains, manages and operates the major infrastructure to deliver bulk water to licensed water users on NSW's regulated rivers, primary responsibility for the administration of the new meter reforms rests with WaterNSW. Metering activities under the new reforms impacting on WaterNSW will include metering compliance, recording, reporting and general enquiries

In addition, WaterNSW will be required to periodically report to both NRAR and DPIE on the compliance of relevant irrigators with non-urban metering regulatory requirements.

WaterNSW's role in implementing the policy covers:

- > program establishment
- > the oversight of installation of meters and telemetry
- > certification and ongoing management
- > meter reading and data management for both telemetry and non-telemetry sites
- > customer education
- > exception and enquiry management.

The scope of these activities means that there will be significant impacts on WaterNSW's work processes and activities, including integration of new systems and data, to implement and maintain the requirements included under the meter reform framework.

Costs associated with the implementation of the metering scheme management are captured for the purposes of price regulation. Non-urban meters administered by WaterNSW include customers in regulated rivers (Rural Valleys) and unregulated rivers (WAMC).

2 WaterNSW's metering scheme cost proposals

In this section we provide an overview of WaterNSW's proposals to implement and maintain the meter reform obligations over the future determination period starting in 2021/22. This includes an overview of WaterNSW's proposed metering work program and the operating and capital expenditure forecasts related to customer meters and government-owned meters. Our review on the cost build-ups presented by WaterNSW are provided in Section 3. WaterNSW has provided forecasts for a four year period.

2.1 WaterNSW's proposed metering work program

2.1.1 Customer-owned meter works program

The NSW Government's new non-urban water metering framework came into effect in December 2018 and is being implemented through a staged roll-out over five years. Different rollout dates will apply to water users in NSW depending on their pump size or the area of NSW in which they are located. The regional rollout dates are based on water sharing plan areas and have been staged with the intention of giving water users enough notice to ensure that their equipment is compliant: Once fully implemented, the metering rules will replace any metering or measuring requirements in water sharing plans. This means there will be a consistent and streamlined metering framework across NSW, rather than separate requirements for separate water sharing plan areas.

WaterNSW's proposed metering work program to meet the requirements underpinning the new metering framework are intended to be rolled out over a five-year period between FY21 and FY25. WaterNSW's program of work is based on the government policy developed by DPIE, with the rollout dates set in the policy document. The program of works has been prioritised to start with the largest consumers of water and then be progressively implemented on a region-by-region basis. As noted above, the regional rollout dates are based on water sharing plan areas rather than a specific water user/meter risk-profile.

The remaining transition to the new metering requirements will impact the 2021 Determination period:

- > Stage 1 - 1 December 2020 - for all surface water pumps 500mm or larger
- > Stage 2 - 1 December 2021 - for all remaining works in the inland northern region
- > Stage 3 - 1 December 2022 - for all remaining works in the inland southern region
- > Stage 4 - 1 December 2023 - for all remaining works in the coastal regions.

The number of customer-owned meters to be included in its regional rollout from known in situ meter information on the size and location of its meter fleet and the size and location of unmetered works. The data in the regional rollout dates worksheet in WaterNSW's model is based on the size of the works on the approval. WaterNSW metering data records the size of the meter. However, these numbers often do not align because as long as the pump size installed on site does not exceed the pump size of the works, the water user is compliant. The water user does not have to install a pump that is the same size as that listed on the works. This is quite typical on smaller works. WaterNSW has developed its works program and the associated costs to implement and maintain the requirements of the framework using these meter numbers, the meter size and their location as the starting point for its cost estimates.

Although we requested a breakdown to show the works program by regulated and unregulated sources in each stage of the program, WaterNSW responded that this data was not readily available in the timeframe for the drafting of this report. However, it confirmed that 74% of current existing surface water meters are in the regulated system and the balance is in the unregulated system. All new surface meters are expected to be in the unregulated system.

The overall breakdown of the currently metered and new meter works required for each size of meter in each region for surface water and ground water sources is included in Table 2-1.

The rollout for the government-owned meters is being covered by WaterNSW in a separate workstream, with a separate cost build-up. The work program for the roll-out of the government-owned meters is provided in Section 2.1.2.

Table 2-1 WaterNSW's breakdown of customer meters by meter size and region included in the works program

	Stage 1- Largest Users (above 500mm)			Stage 2- Northern region (remaining works)			Stage 3- Southern region (remaining works)			Stage 4- Coastal region (remaining works)		
Worksize (mm)	Currently Metered	Total Works required	New Works	Currently Metered	Total Works required	New Works	Currently Metered	Total Works required	New Works	Currently Metered	Total Works required	New Works
Surface Water (above 200mm needs telemetry)												
0–49	0	0	0	6	9	3	19	33	14	13	42	29
50–99	0	0	0	58	156	98	151	255	104	155	572	417
100–149	0	0	0	271	1,147	876	530	1,306	776	693	2,280	1,587
150–199	0	0	0	149	434	285	396	718	322	106	295	189
200–249	0	0	0	81	162	81	299	513	214	32	79	47
250–299	0	0	0	48	107	59	306	519	213	9	23	14
300–349	0	0	0	70	153	83	456	727	271	15	30	15
350–399	0	0	0	53	86	33	213	322	109	0	9	9
400–449	0	0	0	153	246	93	180	257	77	0	5	5
450–499	0	0	0	19	48	29	55	73	18	1	3	2
500–549	118	182	64	0	0	0	0	0	0	0	0	0
550–599	2	5	3	0	0	0	0	0	0	0	0	0
600–649	408	538	130	0	0	0	0	0	0	0	0	0
650–699	248	349	101	0	0	0	0	0	0	0	0	0
700–749	6	10	4	0	0	0	0	0	0	0	0	0
750–899	43	73	30	0	0	0	0	0	0	0	0	0
900–999	31	50	19	0	0	0	0	0	0	0	0	0
100–1,200	22	32	10	0	0	0	0	0	0	0	0	0
>1,200	9	18	9	0	0	0	0	0	0	0	0	0
Total	887	1,257	370	908	2,548	1,640	2,605	4,723	2,118	1,024	3,338	2,314

	Stage 1- Largest Users (above 500mm)			Stage 2- Northern region (remaining works)			Stage 3- Southern region (remaining works)			Stage 4- Coastal region (remaining works)		
Worksize (mm)	Currently Metered	Total Works required	New Works	Currently Metered	Total Works required	New Works	Currently Metered	Total Works required	New Works	Currently Metered	Total Works required	New Works
Groundwater (no telemetry)												
<50	0	0	0	20	57	37	106	275	169	1	360	359
50–99	0	0	0	1	7	6	13	28	15	0	1	1
100–199	0	0	0	137	826	689	161	536	375	18	53	35
200–299	0	0	0	441	1,391	950	336	673	337	13	785	772
300–399	0	0	0	424	982	558	369	564	195	4	123	119
400–499	0	0	0	210	404	194	189	252	63	3	31	28
500–599	0	0	0	150	239	89	68	104	36	0	4	4
600–699	0	0	0	23	53	30	47	72	25	0	8	8
700–799	0	0	0	4	28	24	14	24	10	0	6	6
800–899	0	0	0	5	8	3	7	15	8	0	0	0
900–999	0	0	0	16	88	72	8	23	15	1	22	21
1,000–1,199	0	0	0	40	151	111	1	8	7	0	71	71
>=1,200	0	0	0	202	651	449	7	32	25	16	934	918
Excavations	0	0	0	24	168	144	13	49	36	0	259	259
Total	0	0	0	1,697	5,053	3,356	1,339	2,655	1,316	56	2,657	2,601

Based on this known meter information, WaterNSW has identified that a total of 14,709 new or replacement meters need to be installed by FY25, with a total of 8,090 meters currently in place to remain. There are allowances for water users to retain their existing meter if it is validated and confirmed as accurate. On site testing and validation of existing meters is required to be completed by a DQP

The meter program numbers have been based on an assumption made by WaterNSW that 95% of the meters included in its regional rollout will be active, with 5% being inactive. Customers can identify their works as inactive, which means that they do not have to be compliant with the new requirements and have to provide evidence that they can't take water, with this change in status being processed by WaterNSW. WaterNSW considers that there will be an uplift in customers nominating their meters as inactive in the short term for low end works or where customers are not taking but listed as active. An increase in customers reactivating their meters back to being active is also anticipated by WaterNSW in a few years' time based on the customers having more time to understand what is needed to be compliant.

In addition, WaterNSW has estimated that a total of 651 additional groundwater meters will be installed over the four year determination period. WaterNSW has identified 1,066 flood plain harvesting meters for FY21 and FY22, with 373 in the first year and 693 in the second, and has included these in the new meters to be installed including telemetry totals in those two years period. WaterNSW has also made assumptions related to customers who will not need to have a meter but who will still have reporting obligations.

WaterNSW's estimate of the numbers of meters with telemetry has been based on the requirement for all meters 200mm and above to have telemetry. WaterNSW has assumed that no meters below this threshold will be telemetered at this stage.

The breakdown of WaterNSW's meters works program is presented in Table 2-2, showing the total of each meter type in each year and the cumulative totals across the four year period.

Table 2-2 WaterNSW's overall breakdown of meters to be installed and meters to remain

Description	FY21	FY22	FY23	FY24	FY25	Total
New or replacement meters to be installed	706	5,405	3,262	4,669	667	14,709
Including telemetry	706	1,017	857	87	127	2,794
Non-telemetry	-	4,387	2,405	4,582	540	11,915
Cumulative new or replacement meters to be installed	706	6,110	9,373	14,042	14,709	
Cumulative Including telemetry	706	1,723	2,580	2,668	2,794	
Cumulative non-telemetry	-	4,387	6,793	11,374	11,915	
Existing meters to remain	843	2,475	3,747	1,026	-	8,090
Including telemetry	843	403	1,434	54	-	2,733
Non telemetry	-	2,072	2,313	972	-	5,357
Cumulative existing meters to remain	843	3,317	7,064	8,090	8,090	
Cumulative including telemetry	843	1,245	2,679	2,733	2,733	
Cumulative non-telemetry	-	2,072	4,385	5,357	5,357	
Additional groundwater meters (non-telemetry)	-	253	133	133	133	651
Cumulative additional groundwater meters		253	385	518	651	
Total	1,549	8,132	7,142	5,828	800	23,450
Telemetry	1,549	1,420	2,290	142	127	5,527
Non-Telemetry	-	6,712	4,851	5,687	673	17,923
Cumulative total	1,549	9,680	16,822	22,650	23,450	

Description	FY21	FY22	FY23	FY24	FY25	Total
Cumulative telemetry	1,549	2,969	5,259	5,401	5,527	
Cumulative non-Telemetry	-	6,712	11,563	17,250	17,923	-
Cumulative no meter reporting obligations	1,000	2,000	4,000	6,000	7,350	

The breakdown between the telemetry and the non-telemetry meters numbers forms the basis of the build-up of WaterNSW's operating expenditure forecasts for the four year determination period and the activities and tasks that have been considered for achieving and maintaining compliance with the new meter reform requirements.

The number of new or replacement meters that WaterNSW has identified as being required and the cumulative totals are also shown in Figure 2-1. This clearly shows that after the new or replacement meters for the largest users (>500mm) have been installed in FY21, the program ramps up over the next three year period before tailing off in FY25. The majority of new or replacement meters to be installed are for users requiring a meter less than 200mm and, therefore, not requiring to have telemetry in accordance with the requirement.

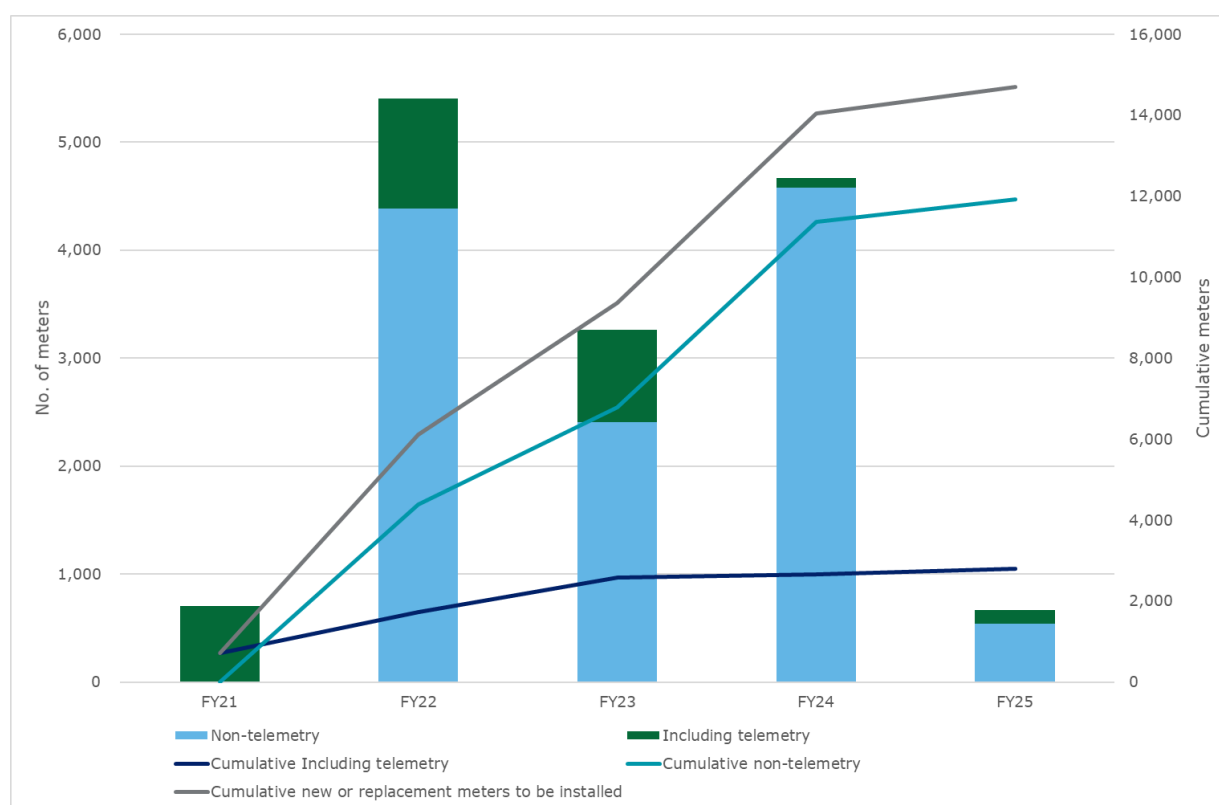


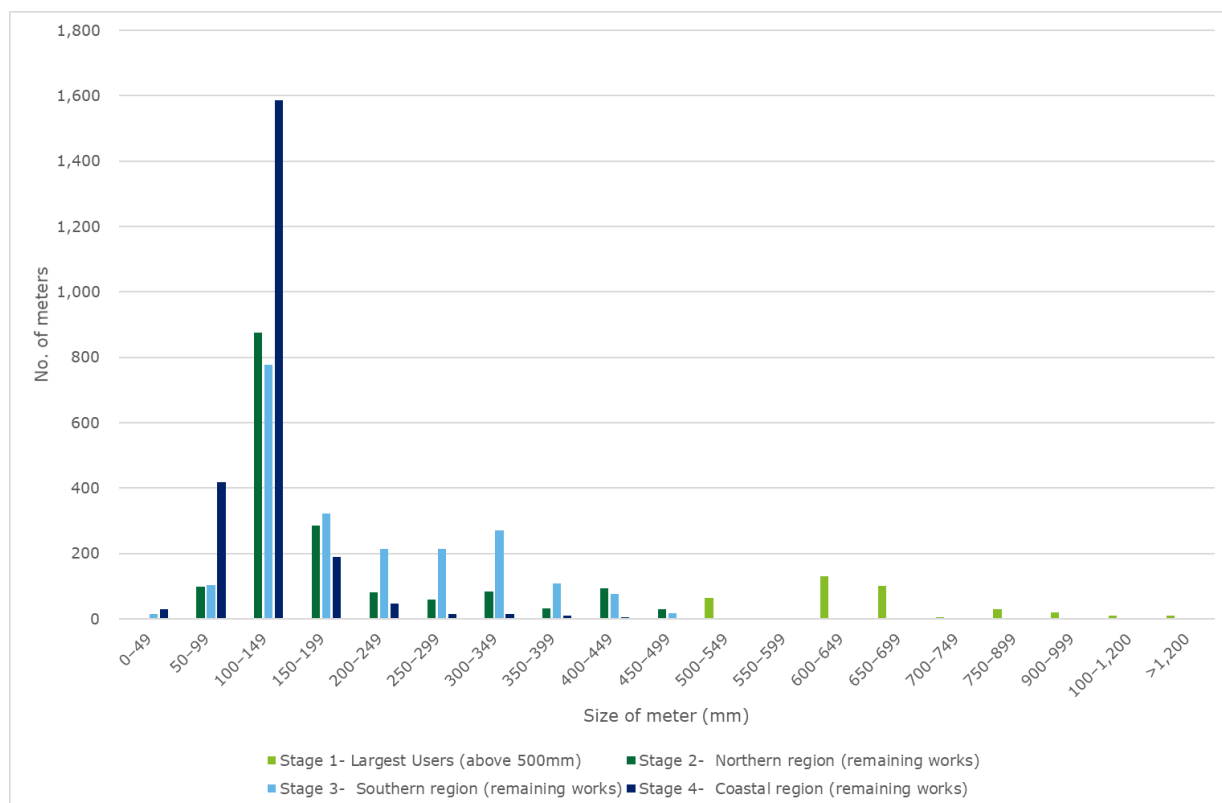
Figure 2-1 New or replacement meters to be installed

The overall new or replacement meters to be installed has been programmed based on the rollout set out in at the start of this section, with the meters for large users (>500mm) being installed in FY21 and the remaining meters rolled out on a regional basis across the remaining four years to FY25. The regional rollout has been developed based on the surface water and groundwater meters to be installed. The groundwater meters are not required to be installed with telemetry.

The breakdown of the regional rollout of the new/replacement surface water meters by meter size is provided in Figure 2-2. This shows that across each of the Southern, Coastal and Northern regions, the majority of meters are less than 200mm in size and so do not require telemetry to be installed under the meter reform framework requirements. The majority of user meters across the three regions are in the 100 - 149 mm range, with the total of 3,239 new works constituting over 53% of the total number of new works in the regions.

The breakdown of the regional rollout of the new/replacement groundwater meters (which do not require telemetry regardless of size) is provided in Figure 2-3. The majority of the new/replacement groundwater

meters that have been identified as being required for the regions are between 100 and 399 mm. These represent more than 55% of the new/replacement groundwater meters to be installed, with meters >1,200mm also constituting more than 19% of the new groundwater works.



has been provided by DPIE. Although these sites have been identified as not requiring new or replacement meters, whether the current meters meet the new compliance requirements has yet to be confirmed. These meters will have to be validated and certification provided as evidence that they comply with the obligations. As such, this means that the number of new or replacement meters might increase if existing meters are shown to not meet the new requirements.

The breakdown of the currently metered surface water and groundwater sites based on the regional rollout across the five year period is provided in Figure 2-4. Sites with meters >200mm have telemetry, while there is no requirement for this function for meters beneath this threshold.

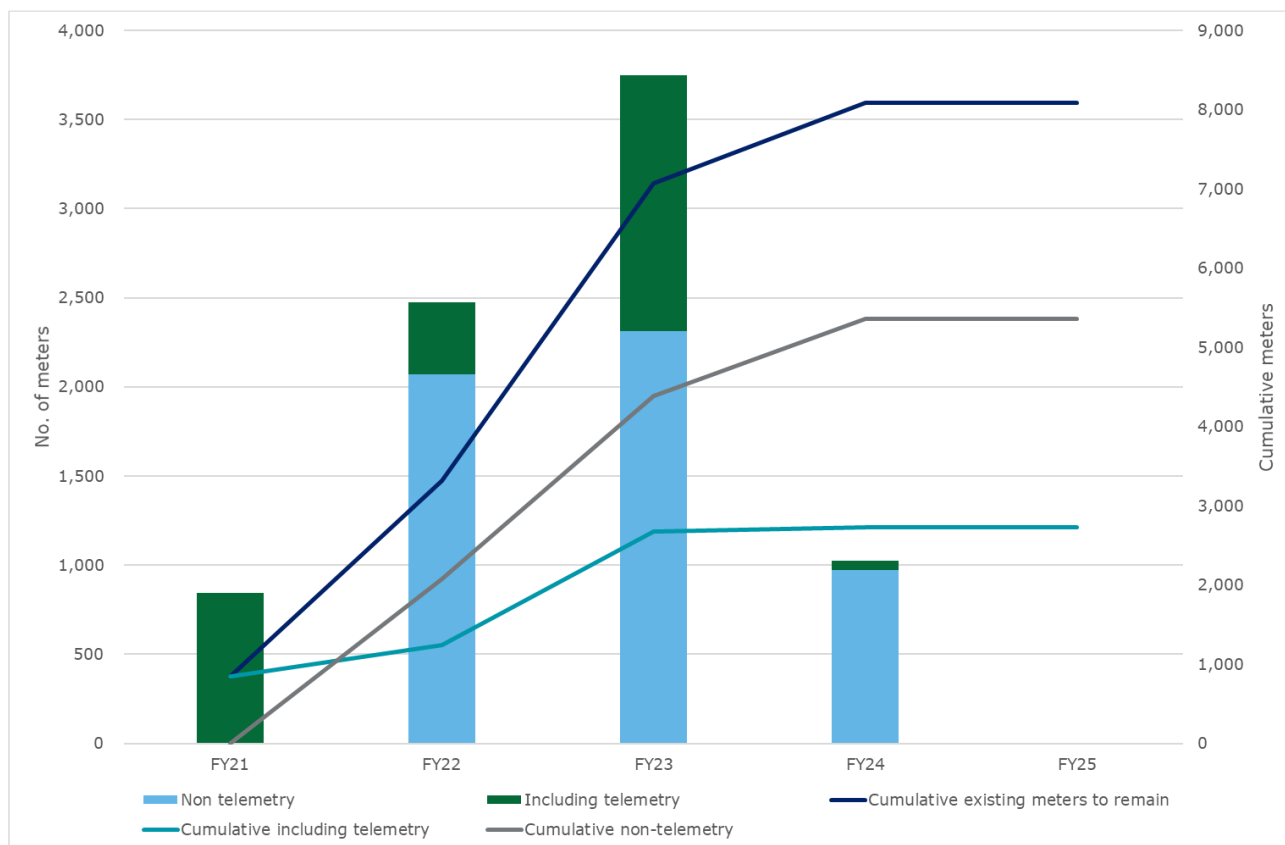


Figure 2-4 Existing meters to remain

The combination of the new or replacement meters to install and the existing meters to remain, including the additional groundwater meters that have been identified and the new floodwater harvesting meters due to be installed in FY21 and FY22, for the basis of the total telemetered and non-telemetered users that WaterNSW has used in its cost model for the subsequent communications and ongoing service centre and systems activities.

By the end of FY25, WaterNSW expects to have a total of 23,450 active users (excluding the assumed 5% of users who will be inactive). The overall breakdown of between the telemetered and non-telemetered users as the reform program is rolled out, together with the cumulative totals, is provided in Figure 2-5.

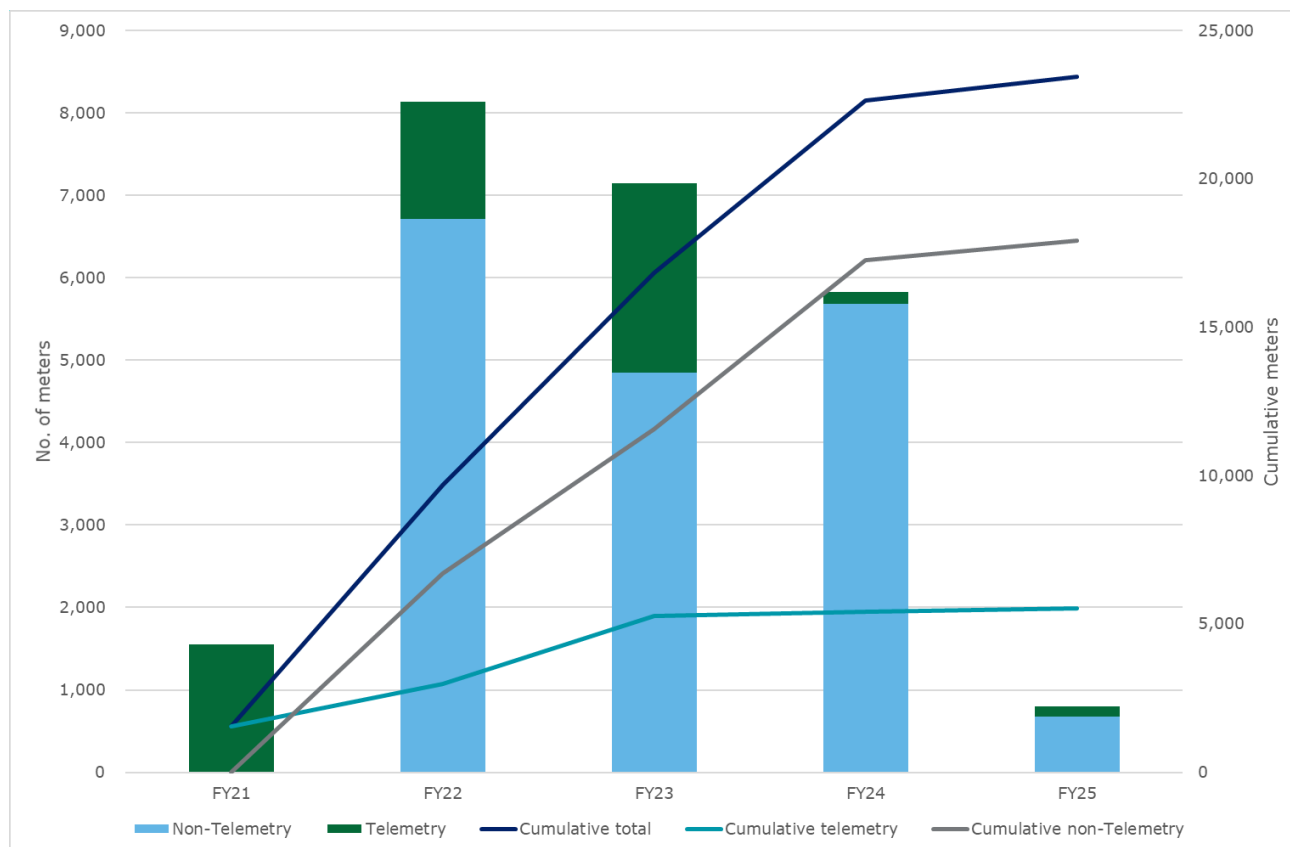


Figure 2-5 Overall number of user meters to be made compliant (new/replacement & existing meters)

This shows that after the large users with >500 mm meters are addressed in FY21, WaterNSW expects that a total of more than 8,000 users will either have new or replacement meters installed or have their current meter validated and certified in FY22. This is the peak year across the five year period for user meters becoming compliant with the new requirements. There is then a decline in the region of 1,000 users/year becoming compliant across the next two years, with less than 1,000 in total anticipated to have meters installed or validated as compliant in FY25. Based on the meter numbers provided by DPIE and the assumed rollout of the program, less than 14% of user meters are expected to have telemetry by the end of FY25, with more than 76% without telemetry based on the requirements that it is only required for meters in excess of 200mm.

2.1.2 Government-owned meter works program

In addition to the customer-owned meters discussed in Section 2.1.1, there are also a number of existing government-owned meters. These meters were installed in the Southern Basin, Hawkesbury Nepean and Bega regions, largely through Commonwealth-funded programs.

A key principle of the non-urban metering reforms was that all meters should be in private ownership. This meant that the 2,822 government-owned meters would need to be transferred into private ownership after they had been made compliant. Each government-owned meter would need to follow the same compliance regime that the privately owned meters would be subject to. This would include excavating all buried meters and replacing the existing telemetry solution being used for the government-owned meters with the market telemetry system (the Local Intelligent Device – LID) through to the Data Acquisition Service (DAS). Following this key principle would have meant an end of the government-owned maintenance program and the end of the Meter Service Charge in its current form.

However, on 29 August 2020 WaterNSW received a directive from the Minister's Office that these meters would now remain in the ownership of WaterNSW. WaterNSW then commenced to review the compliance program in relation to the total costs and commence the building of a new and ongoing meter maintenance program based on the new maintenance requirements of the non-urban metering reforms.

The works program for the government-owned meters, together with the forecast operating and capital expenditure cost build-up, has been developed separately by WaterNSW from those developed for the customer-owned meters.

In order to develop its works program for the government-owned meters, WaterNSW has used known information about the meter fleet. Based on this, it has identified the buried and above ground meters that need to be made compliant and set out a program to complete this over a four year period between FY21 and FY24.

WaterNSW's proposed works program to make the government-owned meters compliant is provided in Table 2-3.

Table 2-3 WaterNSW's proposed works program for government-owned meter compliance

	FY21	FY22	FY23	FY24	FY25
Buried to be made compliant	376	510	243	0	0
Above Ground/Other to be made compliant	447	335	581	330	0
Meters to be made compliant each year	823	845	824	330	0
Cumulative compliant meters	823	1,668	2,492	2,822	2,822
Cumulative non-compliant meters	1,999	1,154	330	0	0

The breakdown between the buried and above ground/other to be made compliant in each year, together with the cumulative total of meters to be made compliant is also shown in Figure 2-6. This shows that WaterNSW estimate that approximately 800 government-owned meters will be made compliant in the three years between FY21 and FY23, with the 330 remaining above ground/other meters made compliant in FY24.

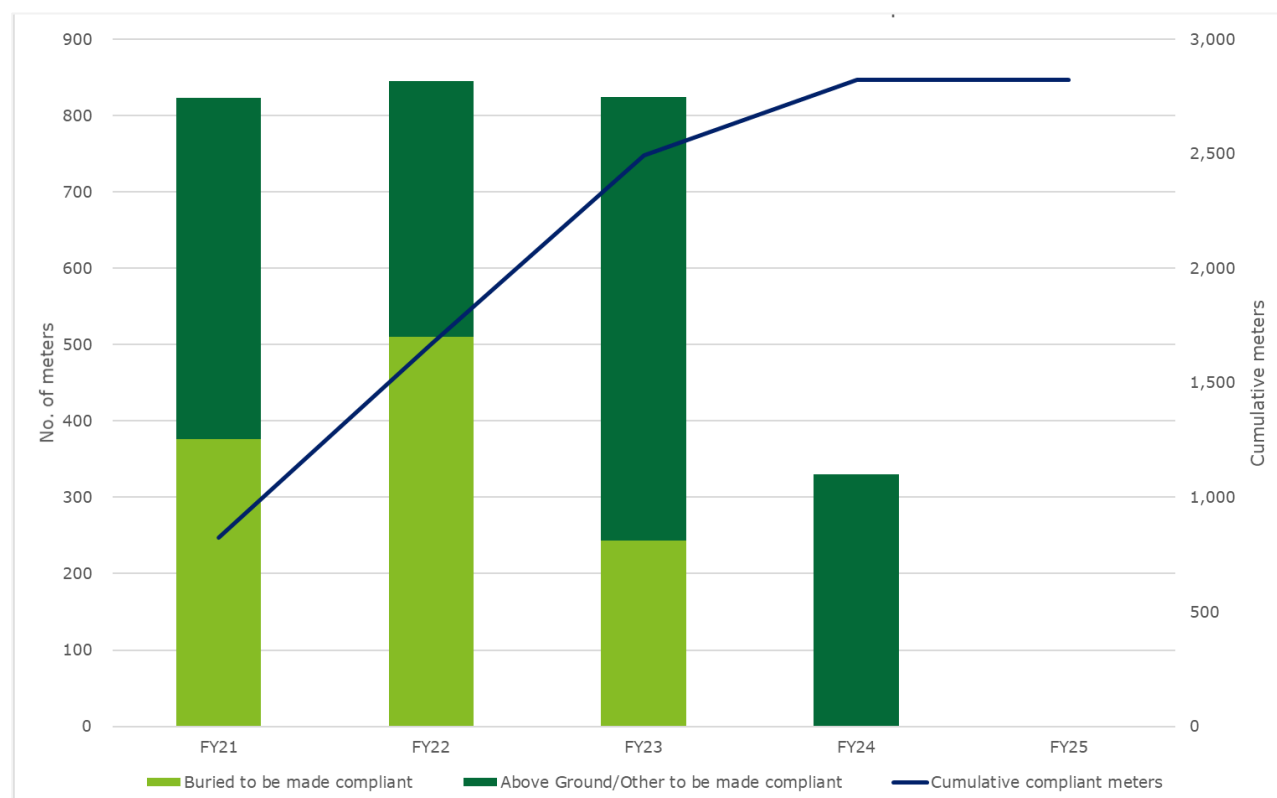


Figure 2-6 Government-owned meters to be made compliant

These meter numbers and the cumulative totals are an input into WaterNSW's capital and operating expenditure build-up across the determination period.

2.2 NSW metering scheme management costs

WaterNSW has undertaken a bottom-up build of costs to derive the preliminary cost estimates that it has included in its submission to IPART. Since its 30 November 2020 'Response to Request for Information on Metering Reform Costs, document that was provided to IPART, WaterNSW has made some adjustments to its cost model. These have an overall impact of increasing the four year operating costs by \$0.27 million and increasing the proposed capital expenditure over the same time by \$0.43 million.

As the cost model spreadsheets provided by WaterNSW have been the updated current versions of the forecasts, our analysis has been completed on this information. We have not assessed the initial version of the model that derived the costs provided to IPART and we have not looked to explain the variances between the cost forecasts provided to IPART and the current forecasts included in WaterNSW's most recent cost model.

2.2.1 Operating expenditure

Operating expenditure forms the majority of WaterNSW's metering scheme management costs, for both project establishment and ongoing management.

The main drivers of operating expenditure are labour and IT licensing fees (e.g. DAS portal). Key activities that WaterNSW staff will be required to undertake include field work (e.g. downloading LIDs), customer communications (e.g. notifying customers of the reform process) and enquiry management (e.g. reporting and recording and general enquiries) activities.

WaterNSW's proposed operating expenditure forecast over the four year regulatory period is presented in Table 2-4.

Table 2-4 NSW metering scheme management operating expenditure

	FY22	FY23	FY24	FY25	Total
	\$ millions				
Downloading LID Data*	\$2.70	\$3.94	\$5.74	\$5.56	\$17.94
Customer Self Reporting	\$1.09	\$1.71	\$2.27	\$2.38	\$7.45
Operating and Maintaining DAS & DQP Portal	\$1.41	\$1.72	\$1.72	\$1.75	\$6.60
Managing DQP Certificates	\$0.31	\$0.26	\$0.20	\$0.03	\$0.80
General Enquiries and Education	\$0.36	\$0.45	\$0.58	\$0.51	\$1.91
Other Activity (processing inactive works and faulty meters)	\$0.14	\$0.25	\$0.34	\$0.36	\$1.10
Total	\$6.01	\$8.33	\$10.85	\$10.60	\$35.79

Expenditure will be split across the WAMC and Rural Valley determinations. Excludes overhead.

Key assumptions that WaterNSW has made and which are driving its operating expenditure forecast include:

- > Reporting from water users to WaterNSW and recording requirements
- > The management of customer declarations for non-usage is required
- > 100% of non-telemetry sites to be visited annually to download LIDs
- > The need for WaterNSW to undertake follow up activities in circumstances where a customer does not self-report.

2.2.2 Capital expenditure

WaterNSW has included motor vehicle and corporate system costs in its estimate of the required capital expenditure. Vehicle costs will be incurred carrying out the necessary field work. Corporate systems will need to be upgraded to effectively upload, store and validate the significant increase in meter data from implementing the metering reforms.

WaterNSW's capital expenditure forecast over the four year regulatory period, as included in its submission to IPART, is presented in Table 2-5

Table 2-5 NSW metering scheme management capital expenditure

	FY22	FY23	FY24	FY25	Total
	\$ millions				
Vehicle capex	\$1.04	\$0.48	\$0.57	\$0.00	\$2.09
Corporate systems capex	\$0.20	\$0.20	\$0.20	\$0.20	\$0.79
Total	\$1.24	\$0.68	\$0.77	\$0.20	\$2.88

2.3 Government-owned meters

2.3.1 Capital expenditure

The WaterNSW Board has approved approximately \$2.5 million in capital expenditure to bring the ≥500 mm pumps in the Southern Valley up to standard in the current FY21 financial year. This is to bring Government-owned meters through the transition scheme and support compliance with the new regulatory framework.

WaterNSW has completed further analysis and review and has identified a total of \$14.6 million in capital expenditure that it considers required across the four-year 2021 Determination period in order to achieve compliance for the 2,822 government-owned meters. This expenditure will be split across the WAMC and Rural Valley determinations.

WaterNSW's proposed capital expenditure for government-owned meters to achieve the meter reform compliance requirements is provided in Table 2-6.

Table 2-6 WaterNSW's proposed capital expenditure FY22-FY25 for government-owned meters

Cost recovery	Description	Total (\$ millions)
Meter Compliance Update charge of \$601 per meter p.a.	Water users upgraded to the DAS	\$2.54
	Metering equipment certification	\$3.25
	Validation of buried meters (e.g. excavation)	\$0.56
	Removal of above ground meters in exceptional circumstances	\$1.02
	Cost of bringing non-Pattern Approved meters into compliance	\$0.52
	Rectify or replace damaged or faulty meters	\$1.85
	Sample verification of 10% of WaterNSW's metering fleet	\$2.54
	Salary costs to administrate the program over four years	\$2.31
	Accuracy testing (10% of compliant meters)	
	Total capital expenditure	\$14.58

WaterNSW has calculated a capital charge of \$601 per annum per meter to recover this capital expenditure (across the 2021 Determination period) based on the assumptions of no meter replacement, a 10-year remaining asset life for meters and 3.2% and 1.7% WACCs for WAMC (unregulated and groundwater) and Rural Bulk Water customers, respectively.

We note that there is a small error in WaterNSW's calculation spreadsheet as a slightly higher capital expenditure total (\$14.61 million) appears to have been used to calculate the \$601 charge.

2.3.2 Operating expenditure

WaterNSW has reviewed the annual operating costs required to maintain the government-owned meters in a condition and to a standard that complies with the new requirements. These costs are proposed to be applied as an ongoing meter service charge. Although a meter service is currently applied to the government-owned meters to cover the costs of maintaining the meter fleet to the existing standards, WaterNSW's operating expenditure forecast considers the increase in the charge resulting from the additional regulatory requirements and obligations.

WaterNSW's operating expenditure forecasts for government-owned meters for the four year determination period commencing in FY22 are presented in Table 2-7. The forecasts exclude the costs and charges

associated with channel meters as there are currently no pattern approved channel meters and the requirements have not yet been confirmed.

Table 2-7 WaterNSW's operating expenditure FY22-FY25 forecast for government-owned meters

Cost recovery	Description	Total (\$ millions)
Meter Service Charge \$1,269 per meter p.a.	Supervisory charge	\$0.98
	Contract Administration	\$1.13
	On site telemetry costs (all compliant meters)	\$3.38
	DQPP data entry -0.5 hour per visit	\$0.74
	Office work	\$0.74
	Consumables	\$0.74
	Accuracy Testing	\$0.25
	Resealing meters/LIDs - 0.5 hour per visit	\$0.74
	Cutting back vegetation- 0.5 hour per visit	\$0.37
	Travel 1 hours per site @ \$150	\$0.74
	Faults meter/telemetry - 0.5 hour per visit	\$0.74
	LID Repair costs	\$0.70
	Meter Replacement costs	\$0.88
	Meter Rectification Costs	\$0.34
	Total operating expenditure	\$12.44

Based on total number of site visits required to make and maintain the compliance requirements for the 2,822 government-owned meters over the four year determination period, WaterNSW has derived a proposed meter service charge of \$1,269 per year per meter.

3 Review of meter installation program and WaterNSW's forecast costs to meet the metering reform requirements

3.1 Works program to meet the new meter reform requirements

Essentially all of WaterNSW's expenditure forecasts for the metering reform requirements depend on the number of meters that can be made compliant in each year of the works program and cumulatively across the four year determination period. The number of meters made compliant determines the number of meters needing to be maintained as compliant. If a meter is not made compliant, none of the assumed activities and tasks that WaterNSW has identified as being required will apply, meaning that none of the associated costs will apply.

In terms of the customer meters, 14,709 new or replacement meters are forecast to be installed over a five year period between FY21 and FY25. This works out to 3,600 meters/year, which is equivalent to installing about 10 meters per day for 7 days a week over 4 years. We note that FY21 only has 706 new works for the largest users (above 500mm) and floodplain harvesting meters with the number of meters requiring to be installed in FY22 being proposed at 5,405 new works (including another 693 floodplain harvesting meters).

For the government-owned meters, 2,822 meters are to be made compliant by the end of FY24, at a rate averaging in the region of than 830 per year in each of the three years and 330 in FY24. This is equivalent to a rate of 705 meters per year over the full four years, equal to two meters every day.

We challenged WaterNSW as to how achievable the works program is to install complaint meters and/or the associated periphery technology to meet the new reform requirements. WaterNSW responded that it is not up to WaterNSW to achieve the new/replacement installations, it is up to DPIE as it is a policy position from the department for the works that need to be metered. Instead WaterNSW's role is to facilitate the compliance and provide support to customers, with the number of meters required to be made compliant not within its control.

During the preparation of this report, we followed-up with WaterNSW as to current progress regarding implementing the meter program and if it was able to provide any details of meter that had been installed/validated against the FY21 rollout.

WaterNSW responded in an email dated 27 January 2020 that:

As of Monday 8 Feb 2021, there are 45 sites installed in the DAS against 1,257 meters above the 500mm threshold which all require telemetry. There have also been 61 works that have been made inactive based on water users lodging the relevant application.

An additional 270 sites have been visited by a Duly Qualified Person (DQP) and are now on the pathway to compliance. For these sites a Local Intelligence Device (LID) has been ordered and is currently undergoing configuration for use in the field, we expect to see these sites become active in the DAS over the next few months.

As of Monday 8 February, 140 people have taken the DQP training course and become qualified, 98 of them have registered in the WaterNSW DQP Portal, but currently only 33 DQPs are actively conducting installations in NSW based on certificates lodged in the portal. We expect a large percentage of the remaining 65 to become active in the portal as the second compliance date (northern inland) closes in.

As water users with surface pumps 500 mm and above were expected to make arrangements well ahead of their rollout date to bring their equipment into compliance and be able to demonstrate that they have made every effort to comply with the metering rules by 1 December 2020, WaterNSW's data shows that the majority of customers in the first stage of the rollout have not achieved the expectations and are not complying with the non-urban water metering requirements. Of the 1,257 total works required in Stage 1 and included in WaterNSW's cost model, only 106 have either been installed or made inactive. As this only just over 8% of the total number of meters required to be compliant by the 1 December 2020 rollout date for Stage 1, this suggests that progress is well behind schedule. In addition, the program ramps up substantially for the Stage 2 Northern Region works that have a 1 December 2021 rollout date, with a total of 7,601 surface water and groundwater meters either needing to be installed, replaced, validated by a DQP as meeting the requirements to remain in place or to be made inactive by the water user.

Although DQP actively conducting installations and validations has also had a slow uptake to date, simple arithmetic would suggest that if each of the 98 DQPs registered in WaterNSW's becomes actively engaged in the work, they would each need to install/validate less than 78 meters each in the Northern Region by 1

December 2021, which would appear to be an achievable number. However, obviously this will also depend on the water users being organised to make arrangements to bring their metering equipment into compliance by the required date but also ensuring that they allow for sufficient time for the work to take place to avoid the potential impacts of a last minute rush to meet the deadline. In addition, it will also depend on the geographic spread of DQPs, so that enough of those trained, registered and actively involved are able to service water users in the region.

In addition, the issue of compatible devices has also impacted on the expectations to deliver the required program of works. The 2020 review of Progress of the NSW Water Reform Action Plan and related NSW Water Reform Commitments completed for DPIE by Alluvium¹ identified that:

Through 2019 and early 2020, DPIE - Water was still funding the testing of telemetry compatible devices for transmission of meter data to a secure, cloud-based data acquisition system. Compatible devices must meet requirements of the Water Management (General) Regulation 2018 and the NSW Government has taken the approach of supporting a market-based roll-out, rather than a single government-owned system. Market maturity has taken time to develop. The list of compatible devices was released 2 April 2020, and only includes one compatible device, while six others are listed as undergoing testing. It therefore appears that these may not have been ready for a December 2019 roll-out date in any case. The Metering Program team is mindful of the need to balance providing certainty in timelines to the market, while allowing sufficient testing of devices so that water users invest in fit for purpose technology and allowing sufficient time for water users to comply.

There has been progress since the April 2020 review report regarding the current status of approved compatible data logging and telemetry devices and solutions. As at 11 February 2021, DPIE's website now lists five devices as having been approved for installation, with one further device currently in testing. As such, the availability of suitable compliant data logging and telemetry devices has improved in the last 10 months and is expected to be less of an issue on being able to achieve the program than was reported in 2020. In addition, during our discussions with WaterNSW, it noted that it expected to see the number of devices increase further this year.

Even without considering whether the overall number of meters scheduled to be made compliant in the next five years can be achieved, there are other uncertainties associated with the proposed meter works program that impact on WaterNSW and the activities and tasks that it has resourced and costed as part of its expenditure forecast. WaterNSW has identified that these uncertainties include:

- > The number of customers who will provide their own meter, rather than opt for a WaterNSW government - owned meter
- > The decommissioning costs of removing a Government-owned meter on request from a water user, as these costs will be borne by WaterNSW
- > The number of customers who opt into telemetry.
- > The number of customers that use the online platform to lodge their usage.

However, the cost forecasts that WaterNSW has developed for the customer-owned and the government-owned meters do not include any sensitivity analysis related to this specific uncertainties that assesses alternative assumptions and how these might impact on the costs. With regard to the telemetry, WaterNSW's cost forecasts have assumed that only water users required to install telemetry for compliance purposes will do so, with no assumptions made as to how many water users under the 200 mm meter size threshold might voluntarily install telemetry. For the purpose of the cost model, WaterNSW has made broad assumptions as to how many meter reads it expects will be processed digitally versus manually.

3.2 NSW metering scheme management costs

3.2.1 Basis of the WaterNSW scheme management operating costs

The separate work activities and tasks that WaterNSW has included in its cost forecasts for the water-user owned meters have been built-up under three main categories; field work, communications and service centre & systems.

¹ Alluvium, Final Report - Independent Review of Progress of the NSW Water Reform Action Plan and related NSW Water Reform Commitments, April 2020

The field work covers the initial site inspections to confirm the standing data and ongoing annual downloading of LIDs for water user meters not connected to telemetry. The communication costs cover informing water users of the meter reform conditions, providing ongoing metering compliance education and reporting submissions to NRAR. The service centre and systems costs cover the ongoing activities related to processing, recording and reporting of water user meter certification and meter read data, as well as managing general and more specific water users enquiries.

The breakdown of the activities that WaterNSW has included in its cost forecast for implementing and maintaining the meter reforms for the customer-owned meters, together with the requirements under the policy and our comments are presented in Table 3-1. More detailed analysis and commentary on specific key activities, the cost build-up and the assumptions included are provided in following sections.

Table 3-1 Activities and costs included in WaterNSW's forecasted operating costs

Item	WaterNSW cost forecast FY22 to FY25	Requirement under the NSW non-urban water metering policy and comments
Field work		
Initial site inspection	\$6.31 million	For both new/replacement and existing meters to remain, there are requirements for the meters to be fitted with a LID, tamper-evident seals and, if required, connected to the DAS via telemetry and for the meters to be validated by a DQP. Validation certification is required to be provided to WaterNSW. For the initial site inspection activities, WaterNSW have estimated costs to visit each non-telemetered meter site to confirm the standing data. Essentially this involves a confirmation that the validation certificate prepared by the DQP is correct and reconciles with the meter installation observed in the field by WaterNSW's field staff. As such, there is a degree of duplication of the validation process. However, WaterNSW have noted that in the site visits that have been completed to date, a significant proportion of the validation certificates have not reconciled with the meter installation that has been observed in the field. Although there is this degree of duplication of work that should have already been completed (and paid for by the water user), we consider that it is not unreasonable that WaterNSW undertakes an inspection of the meter in what is essentially year zero. Under the NSW policy, WaterNSW are required to download the LIDs not connected to telemetry each year so it would be reasonable to inspect the meter initially after installation rather than waiting another 12 months before visiting for the first time to download the LID. However, WaterNSW's experiences to date indicate that there is scope for improvements in the DQP training/education so that the validation certificates they are required to complete for the water user are complete and correct.
Downloading LIDs (not connected to telemetry)	\$10.83 million	Under the NSW policy: <i>"If a meter is not connected to the NSW Government's data acquisition service via telemetry,</i> ▪ <i>the water user will need to self-report their meter reading to the Minister in the approved form and manner 3 monthly, not later than 14 days after the end of the month,</i> ▪ <i>WaterNSW will upload the water take data from each data logger annually, to be verified against self-reported meter readings."</i> As such, this indicates that is a requirement under the policy for WaterNSW to visit each non-telemetered site each year to download data from the LID and verify this information against the meter read information that the customer has self-reported each month. However, we also observed that the NSW policy states that: <i>"These water users [those without telemetry, where the LID only serves as a data logger] will also need to have the data from their data loggers downloaded every 12 months by an authorised person."</i> There is no definition of an 'authorised person' in the NSW policy document, the <i>Water Management Act 2000</i> or the <i>Water Management (General) Regulation 2018</i>

Item	WaterNSW cost forecast FY22 to FY25	Requirement under the NSW non-urban water metering policy and comments
		As such, this suggests that the downloading of LIDs not connected to telemetry does not have to be done specifically by WaterNSW personnel.
Communications		
Informing water users of the licence and Meter Reform Conditions	\$0.13 million	Although not specifically addressed in the policy, WaterNSW has been tasked with informing water users of the new rules and requirements being brought in under the meter reforms. Costs for this have been developed based on each meter owner receiving a total of three letters – one letter in FY21 to all meter owners and then two more in the 12 months before the relevant regional rollout affecting the meter owner.
Reporting to NRAR	\$0.74 million	The NSW policy notes that “Data collected by the DAS [data acquisition service] , and through manual recording and reporting, will assist NRAR, WaterNSW and DPIE to undertake compliance and enforcement, billing and other water management activities”. Although the DAS is being provided by DPIE, the field data populating the service, e.g. meter read data, as well as the interface with the water user, will be largely managed by WaterNSW. As the independent regulator responsible for monitoring and enforcing compliance with the new meter reforms, NRAR have read-only access to water user meter data but also submit requests for interpretation and analysis of data to WaterNSW. As a result of the increase in the number of meters and the new requirements, WaterNSW are expecting a significant increase in requests from NRAR that it will need to respond to. WaterNSW has assumed that 1% of the meters will be followed-up by NRAR and require WaterNSW to provide additional analysis and submit this to NRAR. The time assumption of 7.5 hours to prepare each submission has been based on current NRAR requests, although this assumption has not been followed-up to confirm its accuracy. Based on the current requirements to provide NRAR with additional data and analysis, it would be expected that the volume would increase in at least the short to medium term future as the new metering reforms are rolled-out across the state.
Additional communications educating water users	\$0.14 million	Similar to informing water users of the licence and Meter Reform Conditions, additional communications educating water users is not specifically addressed in the NSW policy but is an expected task that WaterNSW would be expected to deliver as part of its work in maintaining the new rules. The forecast cost is based on an assumed number of hours (in the region of 2 hours a day) but also reducing each year based on the assumption that less education will be required in the future as the policy becomes embedded and water users become more accustomed to the requirements.
Service centre and systems		
Exemption inactive meters	\$0.95 million	Under the NSW policy. inactive works do not need a meter if: - the work is marked as inactive on the authority - the authority contains a condition that prohibits the work from being used to take water and from being capable of taking water from a water source while the work is inactive, and - all conditions applying to the inactive work are complied with. <i>This exception applies to both surface water and groundwater works.</i> Before a work will be tagged as inactive, a water user will need to demonstrate the work is physically incapable of taking water, e.g. pipes removed and pump disabled or pipes are sealed shut and connected to a tamper proof device. As a result, there will be associated activities for WaterNSW to complete to process water user

Item	WaterNSW cost forecast FY22 to FY25	Requirement under the NSW non-urban water metering policy and comments
		meters as being inactive. WaterNSW has assumed that 5% of the total number of customer-owned meters will become inactive. This is one of the key assumptions in its overall cost model as it also determines the number of active meter installations that WaterNSW will have to manage. WaterNSW has stated that as at January 2021, 69 works have been made inactive, which represents 5.5% of the 1,257 meters due to be compliant by 1 Dec 2020. As such, the available data to date does support the 5% assumption made by WaterNSW.
Operating and maintaining DAS and DQP Portal	\$5.81 million	Under the NSW policy, all surface and groundwater works captured by the rules need to be fitted with an accurate meter and a telemetry-capable data logger (a Local Intelligence Device or 'LID'). All LIDs must be able to connect to a meter, be capable of transmitting metering data to the government via telemetry and meet certain minimum physical and functional requirements. Although all LIDs need to be equipped with the capability to transmit data via telemetry to the DAS, only water users with surface water works, except pumps less than 200mm, need to utilise this capability. Telemetry is not required for groundwater works. In cases where the authority does not specify a pump size, the holder of the approval will be required to have telemetry. Other water users can choose not to utilise this capability and instead operate the LID as a data logger only. However additional record keeping and reporting requirements will apply to these water users. These water users will also need to have the data from their data loggers downloaded every 12 months by an authorised person. To enable the secure transmission of telemetered data, DPIE procured a cloud-based data acquisition service (DAS) that collects and stores data transmitted, via telemetry, from LIDs. The DAS was acquired by DPIE circa 2019 and went live in July 2020 and was implemented as a component of the NSW Government Non-urban Metering policy. Ownership of the DAS is in the process of being transferred from DPIE to WaterNSW, with this transfer expected to complete Q1 2021. With this transfer, WaterNSW will have responsibility for contract management, maintenance, and support of the DAS, as well as providing support for DQPs, water users, and NRAR, relating to LID transmission of data. As such, the infrastructure and licensing costs for maintaining the DAS have been included in WaterNSW's cost forecast. The infrastructure, data charges, SIM costs and licensing fee have been included based on prices quoted by Eagle.io. As some of these costs are on a per meter basis, they will depend on the meter compliance rollout program being achieved as proposed in each year. The technology costs involved with the DAS total \$2.97 million over the four year period between to FY25, with an additional \$0.374 also expected in FY21. The remainder of the costs are salary costs associated with facilitating and maintain the DAS and also the DQP portal. Under clause 6.18.1 of its current Operating Licence, <i>"WaterNSW must develop, operate and maintain an online portal to allow for the electronic lodgement of the following:</i> <i>– a certificate provide under clause 237(1) or (2) of the Water Management (General) Regulation 2018, as required by clause 238(2) of that Regulation,</i> <i>a report by a person who intends to rely on clause 8 of Schedule 8 to the Water Management (General) Regulation 2018 setting out the steps taken in relation to the metering equipment, as required by clause 8(3) of that Regulation</i> <i>written certification as to the matter set out in clause 9(2)(b) of Schedule 8 to the Water Management (General) Regulation 2018</i>

Item	WaterNSW cost forecast FY22 to FY25	Requirement under the NSW non-urban water metering policy and comments
		a report from a person who intends to rely on clause 9 of Schedule 8 to the Water Management (General) Regulation 2018, setting out the steps taken in relation to the metering equipment, as required by clause 9(5) of that Regulation." The DQP Portal is a WaterNSW bespoke built software solution that supports a range of functions relating to non-urban metering and flood plain harvesting and in addition, provides for the initial registration of a telemetered meter site to the NSW Government's Data Acquisition Service (DAS). The DQP portal stack is also to be used to support WaterNSW bespoke software solutions for S91i/Faulty Metering and the Recording and Reporting portals. With the transfer of the DAS from DPIE to WaterNSW and the DQP portal requirements included in its operating licence, WaterNSW's inclusion of the cost components related to these systems is appropriate. We have provided further commentary on the cost build-up for these items in Section 3.2.2.4
Processing certificates of compliance and non-compliance from DQP	\$0.80 million	Under the NSW policy, DQP certification /validation is required for every new/replaced meter, as well as for existing meters to remain in place. In addition, certification is required for ongoing maintenance and repairs and for the five year inspection and validation work. As responsible for the online portal for lodgement of documents relating to metering equipment under clause 6.18 of the operating licence, WaterNSW's inclusions for these activities are aligned to the policy and its own operating licence. Each meter will need to be certified and WaterNSW's costs are based on assumptions of time to process compliant and different categories of non-compliant certificates. The time assumed for managing non-compliant certificates is higher due to the follow-up work required. However, changes to these assumed time per certificate can have a material impact on the overall costs for this activity.
Processing data	\$7.45 million	Under the NSW policy, "If the meter is not connected to the NSW Government's data acquisition service via telemetry, the water user will need to self-report their meter reading to the Minister in the approved form and manner monthly, not later than 14 days after the end of the month" WaterNSW's activities for processing data are aligned to the policy. However, the cost-build up is heavily sensitive to assumed numbers of customers and times to process different meter read activities. In addition, WaterNSW's cost forecast assumes that only water users that are required to have telemetry installed have telemetry. All water users with meters less than 200mm are assumed in the cost model to not have telemetry installed, meaning that water users who voluntarily install telemetry are not considered. As such, WaterNSW has taken a very conservative approach and also one that is likely to overestimate the costs associated with processing the meter read data.
General enquiries (various reasons)	\$0.90 million	Although the policy doesn't provide specific guidance related to managing enquiries, as the main contact for the meter reading, soon-to-be owner of the DAS, owner of the DQP portal and as the issue of the water bills, the remit for managing enquiries would logically lie with WaterNSW. Similar to the cost build-up for 'Processing data', WaterNSW's forecast costs are based on broad assumptions as to percentages of all water users contacting the business for different types of issues, with more assumptions used for times to deal with calls depending on their complexity, in order to derive the number of FTEs working 36 hours a week and a 40 week working year required to manage the total call time.

Item	WaterNSW cost forecast FY22 to FY25	Requirement under the NSW non-urban water metering policy and comments
Dealing with faulty meter notification process	\$0.15 million	As the soon-to-be owner of the DAS, as well as the owner of the DQP portal, WaterNSW are also responsible for dealing with the faulty meter notification under the NSW policy. The percentages of assumed telemetry and non-telemetry faults are based on WaterNSW's current meter performance, which provides some robustness to the forecasts for this activity than for some of the other activities WaterNSW has include in its forecasts.
Third party telemetry options	\$0.79 million	WaterNSW has included 1 FTE for this activity, with proposed costs being entirely salary costs over the four year FY22 to FY25 period. WaterNSW has noted that there is a requirement for it to continue to develop the specifications and business process for other in-market telemetry systems to be adopted as approved telemetry systems that customer can connect their meters too which may give them additional infield functionality. We note that the NSW policy does not specify who this responsibility lies with although the Alluvium 2020 review of progress of the NSW WRAP noted that DPIE was funding the testing of telemetry devices for transmission of meter data through 2019 and early 2020.
Total FY22 to FY25	\$35 million	

3.2.2 Operating expenditure

WaterNSW has developed a detailed model to build-up the operating expenditure costs related to bringing customer meters into compliance with the new metering reform requirements and maintaining the compliance with regard to meter reading and reporting, as well as the associated customer management activities that will be required.

The operating expenditure has largely been built-up based on the number of meters, the tasks and activities required, the time taken for these, the number of FTEs required to complete them and the salary costs for the appropriate staff carrying out the work. As there is so much uncertainty related to many of the inputs associated with implementing the new metering framework for non-urban water take, WaterNSW's model is heavily reliant on best-guess assumptions and estimates at this point in time. The cost model that has been developed to provide the operating expenditure forecasts uses a total of 75 assumptions, the majority of which are unsupported by known information or data.

As such, at this point in time, the operating expenditure forecasts cannot be considered robust. As many of the processes are new to the businesses, it expects that a full understanding of costs and volumes will evolve over time.

We have completed a detailed review of the cost model and its assumptions and this has been supported through by a number of interview sessions with the key WaterNSW involved in developing the expenditure forecasts.

3.2.2.1 Overview

WaterNSW has split its operating expenditure between three main categories: Field, Communications and Service Centre and Systems. Under each of these three categories it has identified the specific activities to be completed.

The breakdown of the operating expenditure forecasts over the four year determination period by specific activity are presented in Table 3-2. This table also shows the total number of FTEs that WaterNSW has calculated as being required to complete the work activities that have been identified under each main category.

Table 3-2 Breakdown of WaterNSW's activities related to implementing and maintaining the meter reform requirements

Description	FY22	FY23	FY24	FY25	Total	% of total opex
	\$ millions					
Initial site inspection	\$2.32	\$1.71	\$2.04	\$0.25	\$6.31	18.04%
Downloading LIDs (not connected to telemetry)	\$0.18	\$2.03	\$3.50	\$5.12	\$10.83	30.94%

Description	FY22	FY23	FY24	FY25	Total	% of total opex
	\$ millions					
Total field opex	\$2.50	\$3.74	\$5.54	\$5.36	\$17.14	48.98%
Licence and Meter Reform Conditions	\$0.06	\$0.05	\$0.03	\$0.00	\$0.13	0.37%
Reporting to NRAR	\$0.09	\$0.16	\$0.23	\$0.25	\$0.74	2.10%
Additional comms educating consumers	\$0.04	\$0.04	\$0.03	\$0.03	\$0.14	0.41%
Total communications opex	\$0.19	\$0.25	\$0.29	\$0.28	\$1.01	2.88%
Exemption inactive meters	\$0.12	\$0.22	\$0.30	\$0.32	\$0.95	2.72%
Operating and maintaining DAS and DQP Portal	\$1.22	\$1.52	\$1.52	\$1.55	\$5.81	16.60%
Processing certificates of compliance and non-compliance from DQP	\$0.31	\$0.26	\$0.20	\$0.03	\$0.80	2.29%
Processing data	\$1.09	\$1.71	\$2.27	\$2.38	\$7.45	21.28%
General enquiries (various reasons)	\$0.18	\$0.21	\$0.29	\$0.23	\$0.90	2.57%
Dealing with faulty meter notification process	\$0.02	\$0.04	\$0.05	\$0.05	\$0.15	0.42%
Third party telemetry options	\$0.19	\$0.19	\$0.20	\$0.20	\$0.79	2.26%
Total service centre & systems opex	\$3.12	\$4.15	\$4.83	\$4.75	\$16.85	48.13%
Total opex	\$5.81	\$8.13	\$10.66	\$10.40	\$35.00	100.00%
Field FTEs	15	22	32	31		
Comms FTEs	1	1	2	2		
Service Centre FTEs	20	26	31	30		
Total FTEs	36	50	65	62		

We note that the total operating expenditure in this table does not completely reconcile with the forecast provided by WaterNSW. During our review we identified that the 'Total Corporate Systems Capex (required for field work)' had been double counted in WaterNSW's summary table, having been incorrectly included the 'Downloading LID Data' cost forecasts and then included again (correctly) in the capital expenditure forecast. This doubling counting totals \$990,000 split evenly \$198,000 against each year across a five year period between FY21 and FY22. Therefore, this totals \$792,000 across the four year determination period forecast.

In addition to this double count, we also identified a small number of critical assumptions used by WaterNSW which have significant impacts on the overall operating expenditure forecast. These are:

- > Inclusion of a 2.5% per annum salary escalation factor for all staff
- > Assumption of a 40 week working year for all staff.

Although WaterNSW's rationale for including the 2.5% salary escalator is that it is included in the current Enterprise Bargaining Agreement (EBA), we consider that the expenditure items submitted to IPART should be in a consistent price base. As a result, we consider that the 2.5% escalator should be removed from the model so that the salary costs are reported as real costs. By itself (e.g. without being compounded together with any other changes to assumptions in the model), the removal of the 2.5% salary escalator reduces the operating expenditure forecast by approximately \$2 million, from \$35 million to \$33 million over the four year determination period.

In deriving its 40 week working year, WaterNSW considers that it has been prudent based on the reality of how many hours are available to carry out the tasks that need to be created and has taken into account its obligations as an employer. As a result, deductions have been made from the 52 week year to take into account not just annual leave and public holidays, but also to include for sick leave, training and meetings.

For its model, WaterNSW has calculated its 40 week working year as follows:

- > 52 weeks per annum

- > 2.2 weeks public holidays
- > 5 weeks annual leave for WaterNSW staff in regional areas
- > 1.56 weeks sick and other leave (not annual leave)
- > 3.2 weeks organisational requirements (to cover team meetings, 1:1 meetings, mandatory training, safety training, vehicle maintenance and other training)

Total available weeks = 40.04

Although we recognise that WaterNSW has looked to accurately derive the available time that staff have available to complete the tasks and activities that it has included in its cost model, we consider that WaterNSW has been overly conservative in estimating the number of working weeks in a year.

As an example of the impact this base assumption has, an increase to an assumed 45 week working year, taking into account five weeks annual leave (based on field staff receiving an additional week) and two weeks of public holidays, by itself (e.g. without being compounded together with any other changes to assumptions in the model), would reduce the operating expenditure by more than \$3 million, from \$35 million to \$31.9 million over the four year determination period. We note that the 40 week working year has been applied universally throughout WaterNSW's build-up of salary costs. As the same basis for the 40 week working year has also been applied to the non-field staff, e.g. communications and service centre personnel, the non-field FTEs and the associated staff costs are also likely to have been overestimated.

Analysis of the operating expenditure forecasts shows that four activities are responsible for almost 87% of WaterNSW's forecast over the four year period, equivalent to \$30.4M. These are:

- > Initial site inspection (18%)
- > Downloading LIDs (not connected to telemetry) (31%)
- > Operating and maintaining DAS and DQP Portal (17%)
- > Processing data (21%)

As the initial site inspection and downloading LIDs are both related to the field work required to implement and maintain the metering reforms, this shows that the field work makes up almost half of WaterNSW's operating expenditure forecast over the four year period.

As these four activities comprise the majority of WaterNSW's forecast costs, we have reviewed these activities in more detail to assess the key drivers of the costs and the assumptions that have been included in the cost build-up.

3.2.2.2 Initial site inspection

The salary costs for the initial site inspection task comprises over 90% of the total forecast over the four year determination period. Vehicle operating costs make up the remaining 10% of the \$6.31M total for the activity. The salary costs for the field staff are driven by the assumed time to complete the tasks associated with the initial site inspection. This includes for:

- > Download time if correct (e.g. if the certificate reconciles with the observations at site)
- > Download time if incorrect (e.g. if the certificate does not reconciles with the observations at site)
- > Travel time
- > Upload time to enter into systems
- > Data account establishment time

The breakdown of the assumed times for inspecting 'correct' and 'incorrect' meters is presented in Table 3-3

Table 3-3 Breakdown of WaterNSW's assumed times for initial inspection tasks

Task	Assumed Hours	Correct	Incorrect
Average download time on site if correct (non-telemetry) (validation of standing data)	0.8	32.65%	
Average download time on site if incorrect (non-telemetry) (validation of standing data)	1.0		37.74%
Average travelling time	1	40.82%	37.74%

Task	Assumed Hours	Correct	Incorrect
Average upload time (e.g. entering works undertaken into systems)	0.4	16.33%	15.09%
Average data account establishment time	0.25	10.20%	9.43%
Average total time if correct (non-telemetry)	2.5	100.00%	
Average total time if incorrect (non-telemetry)	2.7		100.00%

We note that the total times included in this table exclude the 20% factor that WaterNSW has applied to its field work total times to allow for the times when the field staff are not able to get onto the site to complete the tasks and have to repeat the visit at a later date. WaterNSW explained that it does not generally go to site when raining and may not be able to access a site after rain in order to not cause any damage to a landowner's property.

The information in this table shows that the assumed travel time for the initial inspection activities comprises in the region of 40% of the total time WaterNSW has estimated to complete the tasks.

WaterNSW has also included 0.4 hours (24 minutes) for the upload time for each inspection. This is to cover the time it takes for the data that the field officer has downloaded into their mobile device (e.g. iPad, tough book) from the customer's meter to be subsequently uploaded into WaterNSW's system. Although this is a task that needs to be completed, we consider that this is largely a passive task. We would not expect that the upload would have to be continually monitored and would typically either be taking place while the field officer is in transit to their next location or having arrived back at an office/depot. If a lack of mobile signal meant that the upload could not take place from the field officer's mobile device until they were back in the office, we would again expect that this task would largely be passive, with the member of staff able to continue with other work while the upload takes place.

As such, we do not consider that the upload time is valid task to be costed and included in the estimates for the initial inspection activities. Excluding the upload time reduces the average total time for the initial inspections, which decreases the number of FTEs and the salary costs that WaterNSW has calculated as being required to complete this activity. Excluding the upload time also has an impact on the proportion of the activity that has been allocated to travel time, increasing it to 44% of the time to inspect a 'correct' site and 49% of the time to inspect an 'incorrect' site.

In addition to the 40 week working year and the inclusion of a 2.5% annual salary escalation rate, WaterNSW has also included an 'Other' component in the salary build up for the Field Officers and Team Leaders. A total of \$25,000 has been included for FY21, increasing by the 2.5% annual escalator in each year through to FY25. We challenged WaterNSW as to what was included in the 'Other' salary costs for field staff, as this item constitutes a sizeable component of the total salary costs. 'Other' makes up 18% of the Field Officers and 15% of the Team Leader total salary costs that form the basis of the cost build-up for the field work. WaterNSW responded that this provides an allowance for costs associated with needing to work away from home, such as accommodation and sustenance costs, as well as phone calls and other incidentals. WaterNSW consider that the estimated cost included against each salary is as accurate as can be estimated and is prudent.

Some basic analysis of the \$25,000 'other' salary costs included for each Field Officer and Team Leader, and using WaterNSW's assumed 40 week working year, shows that this is equivalent to \$625 per week. This suggests that each Field Officer and Team Leader would be working away from home for roughly two nights a week, every week. The Australian Tax Office (ATO) website publishes data on reasonable travel and overtime meal allowance expense amounts, with the most up-to-date information for the 2019-20² income year showing reasonable expenses for Tier 2 country centres (e.g. Albury, Armidale, Goulburn, Gunnedah, etc.) at \$257.60 per day and for other country centres at \$237.60 per day for employees with an annual salary of \$124,480 and below. However, we note that although WaterNSW's costs have included this 'other' salary costs each year for each Field Officer and Team Leader, it has not provided any detailed

² Australian Tax Office, Taxation Determination – Income tax: what are the reasonable travel and overtime meal allowance expense amounts for the 2019–20 income year?

evidence based on the location of the water user meters that its field staff would need to be working away from home to this extent.

After our discussions with WaterNSW, it provided more information in support of the level of the 'Other costs' it has included in its cost forecasts. This was as follows:

The average opex (or other cost) per field Officer for the first 6 months of 2020/21 is \$7,260. This would equate to an annual cost of \$14,521. This excludes mobile phone costs, software licence costs and iPad costs which would equate to approximately \$3,000 per annum.

These CFOs are located in current offices aligned to regulated customers. It is hard to determine the travel time and associated costs that a field officer would incur if located at the same locations and had to travel to their designated water source each week. The allowable travel allowance varies depending on the location visited but has been budgeted at \$300 per night.

The balance between the current average other (opex) costs of \$17,521 and the \$25,000 estimated within the model is only \$7,479 which would only covers an additional 25 nights working away from home, which would be inadequate with the work that needs to be undertaken. Currently, Field Officers on average stay 37 nights away from home on average across the year.

The location of where the field officer is located is key to keeping down unnecessary costs but is difficult to determine give our comments in the "Total Time Allocated to Downloading LIDs on site" document."

The review of WaterNSW's forecast costs for the initial site inspections highlights that the activity is heavily dependent on the assumed costs associated with getting to the sites more so that the costs involved with the physical tasks that need to be completed on site. Together with the vehicle costs and the accommodation and sustenance costs, this presents a case that delivering these activities using internal staff resources might not be the most efficient approach to undertaking the field activities associated with implementing the new non-urban meter reforms. However, WaterNSW has not completed any cost benefit analysis that looks at other options for delivering the field activities to confirm, or otherwise, that WaterNSW's proposed approach is the most efficient approach.

3.2.2.3 Downloading LIDs (not connected to telemetry)

Our key findings from the review of WaterNSW's costs forecasts for downloading LIDs are very similar to those outlined for the initial site inspection activities in Section 3.2.2.2.

The salary costs associated with downloading LIDs comprise more than 90% of the total operating expenditure WaterNSW has forecast for the four year determination period for this activity.

As noted previously, we have identified that the 'Total Corporate Systems Capex (required for field work)' had been double counted in WaterNSW's summary table, having been incorrectly included the 'Downloading LID Data' cost forecasts and then included again (correctly) in the capital expenditure forecast. This doubling counting totals \$990,000 split evenly \$198,000 against each year across a five year period between FY21 and FY22. Therefore, this totals \$792,000 across the four year determination period forecast. The correct total for the Downloading LIDs activity is \$10.83 million, compared to the \$11.62 million, that combined with the forecast \$6.31 million of initial site inspection costs totals the \$17.94 million of Downloading LID Data included in WaterNSW's updated 'Current cost model opex' summary table

As with the initial site inspections, salary costs for the field staff are driven by the assumed time to complete the tasks associated with downloading LIDs from customer meters not connected to telemetry. This includes for:

- > Download time on site
- > Travel time
- > Upload time to enter into systems

The breakdown of the assumed times for downloading LIDs not connected to telemetry is presented in Table 3-4.

Table 3-4 Breakdown of WaterNSW's assumed times for downloading LIDs tasks

	Assumed Hours	Proportion
Average download time on site (non-telemetry)	0.5	26.32%
Average Travelling time	1	52.63%

	Assumed Hours	Proportion
Average upload time (e.g. entering works undertaken into systems)	0.4	21.05%
Average Total time (non-telemetry)	1.9	100.00%

As for the initial site inspections, the total times included in this table exclude the 20% factor that WaterNSW has applied to its field work total times to allow for the times when the field staff are not able to get onto the site to complete the tasks and have to repeat the visit at a later date.

The information in this table shows that the assumed travel time for the downloading LIDs activities comprises more than 50% of the total time WaterNSW has estimated to complete the tasks.

As for the initial site inspections, WaterNSW has also included 0.4 hours (24 minutes) for the upload time, which we consider is a passive task and should be excluded. Excluding the upload time also has an impact on the proportion of the activity that has been allocated to travel time, increasing it to 67% of the total time estimated to download LIDs.

As noted in the previous section, in addition to the 40 week working year and the inclusion of a 2.5% annual salary escalation rate, WaterNSW has also included an 'Other' component in the salary build up for the Field Officers and Team Leaders to cover accommodation, sustenance and other costs associated with working away from home. This suggests that each member of the field staff involved with downloading LIDs will be away from home in the region of two nights a week every week.

As for the initial site inspection work, the review of WaterNSW's forecast costs for downloading LIDs, highlights that the overall activity expenditure forecast is heavily dependent on the costs associated with getting to the sites more so that the costs involved with the physical tasks that need to be completed on site.

As the travel costs comprise such a significant proportion of the overall costs associated with the field work to read non-telemetered meters, we queried WaterNSW over the requirements for telemetry to be installed and whether any cost benefit analysis has been completed to look at 100% telemetry. WaterNSW responded that the decision was made by DPIE for surface water customers with meters over 200mm to be telemetered, it has derived its costs based on the known information and obligations. As a result, WaterNSW has not undertaken a detailed assessment of telemetry nor completed any modelling to assess the cost impacts of installing telemetry on all meters. The WaterNSW cost forecasts assume that only water users with meters greater than 199mm who are required to install telemetry will have telemetry. No assumption has been made for water users with meters less than 200mm who might voluntarily install telemetry. As such, WaterNSW's forecast costs for downloading LIDs not connected to telemetry are likely to be overstated. Although we consider that this is work that should be completed as part of the supporting evidence for WaterNSW's proposed costs, WaterNSW considers that this is a discussion to be had with DPIE.

We also note that in Section **Error! Reference source not found.**, that although water users with meter who do not require telemetry under the legislation can voluntarily install it, and this will avoid the need for some manual recording and reporting, essentially the benefits from installing telemetry on a voluntary basis are not recognised by the water-user bearing the technology costs but by WaterNSW for the operating costs associated with downloading LIDs that are not connected to telemetry. In its proposal, WaterNSW has forecast operating costs of more than \$13.9 million of operating and capital costs over the four year period for the field work to download LIDs not connected to telemetry. This would suggest that there is little incentive for a water user to voluntarily install telemetry at their own costs when there is no real incentive for them and where they are not the predominant financial benefactor.

Given the level of the travel costs associated with the initial site inspections and downloading of LIDs, we challenged WaterNSW as to the efficiency of undertaking these activities internally, and whether outsourcing would be a more efficient option, particularly in the areas where it does not have staff located and where extensive travel time would be required by Field Officers to travel to these areas. WaterNSW responded that under the conditions of its Operating Licence it has to undertake these activities and is not able to outsource the field work.

We note that under clause 6.19.2 of its current Operating Licence, "WaterNSW must, at least once a year, download all data from the metering equipment to which this clause applies." However, we also note that under clause 3.1.1, "WaterNSW must construct, maintain and operate its Water Management Works in accordance with its Asset Management System referred to in clause 5.1." WaterNSW uses contractors for its construction activities and for specialist maintenance activities so we do not consider that this clause in the Operating Licence prevents WaterNSW from outsourcing any metering activities. We also note that the

ISO 55001 asset management system standard specifically allows outsourcing for the management of assets.

3.2.2.4 Operating and maintaining DAS and DQP Portal

WaterNSW's operating expenditure forecast shows operating and maintaining the Data Acquisition Service (DAS) and Duly Qualified Person (DQP) Portal as making up 16.6% of the total operating expenditure costs over the four year determination period.

The NSW Government has procured a cloud-based DAS to collect and store data received from the compatible data logging and telemetry devices on meters. Data collected will inform compliance and enforcement activities. WaterNSW is responsible for the establishment of DAS and its ongoing operation and maintenance.

The DQP is a newly created role as part of the metering scheme management program, being a person with the qualifications, skills and experience to carry out work on metering equipment. The DQP Portal will enable DQPs to register new and replacement meters, telemetry, complete online and submit validation certificates. WaterNSW is responsible for managing the online portal used by DQPs to submit validation certificates.

The salary costs included by WaterNSW for operating and maintaining the DAS and DQP Portal constitute 49% of the overall forecast for the activity, with the technology-related costs and charges making up the other 51% of the \$5.81 million total for the four year determination period.

The breakdown of WaterNSW's costs for operating and maintaining the DAS and DQP Portal are presented in Table 3-5

Table 3-5 WaterNSW's operating expenditure forecast for operating and maintaining the DAS and DQP Portal

Item (\$ million)	FY22	FY23	FY24	FY25	Total	Proportion
DAS Licensing Fee (per annum) (GST inclusive)	\$0.16	\$0.28	\$0.29	\$0.29	\$1.01	17.41%
Telemetry fixed infrastructure costs (GST inclusive)	\$0.17	\$0.17	\$0.17	\$0.17	\$0.67	11.49%
Telemetry data charges (GST inclusive)	\$0.19	\$0.34	\$0.34	\$0.35	\$1.22	21.06%
SIM purchase & postage (GST inclusive)	\$0.02	\$0.04	\$0.00	\$0.00	\$0.07	1.21%
Total salary cost	\$0.68	\$0.70	\$0.72	\$0.74	\$2.84	48.83%
Total cost	\$1.22	\$1.52	\$1.52	\$1.55	\$5.81	100.00%

Whereas for the field work and its service centre activities, where costs have been build bottom-up based on estimates to complete tasks, WaterNSW has estimated the salary costs for the operating and maintaining the DAS and DQP Portal based on the FTE roles required. It has assumed a total of four FTEs will be required:

- > 2 FTEs for DAS Facilitation
- > 1 FTE for DQP Portal Facilitation
- > 1 FTE for C&C Systems maintenance

The salary costs for these four FTE roles totals \$2.84 million over the four year determination period.

We queried WaterNSW regarding the work tasks involved and the basis for the assumption that four FTEs would be required and whether these would be internal or outsourced. WaterNSW responded that it has assumed internal roles for the required tasks but that the required commitments are still largely unknown. Although it uses an external DQP for the telemetry in the southern region for approximately 2,000 meters, and they manage a lot of the technical issues, WaterNSW is still involved if the DQP cannot rectify the issue and for dealing with minor issues. WaterNSW expects to be involved in managing 90-100 DQPs but at this point in time, and during the first few years of the meter reform works roll out, it anticipates that it will need to provide technical support to external DQPs, WaterNSW staff and customers who might not have a high level of understanding and technical knowledge regarding telemetry and the new systems that are being implemented.

The other costs included in WaterNSW's forecast for the DAS and DQP portal operating costs have been based on assumed per meter unit costs. These costs are known costs, based on vendor quotes. The following costs have been used as the basis of the costs on a per meter basis in each of the four years in the determination period.

- > DAS Licensing Fee (per meter) (GST inclusive) - \$52.80

- > Telemetry data charges per meter (GST inclusive) - \$63.88
- > SIM purchase & postage per meter (GST inclusive) - \$17.60

3.2.2.5 Processing data

WaterNSW's operating expenditure forecast shows its data processing activities as making up \$7.45 million (21.28%) of the total operating expenditure costs over the four year determination period. The costs associated with processing data are all salary costs. In order to develop its expenditure cost forecast for this activity, WaterNSW has assigned assumed times to complete individual tasks associated with processing the data to derive the total number of hours in each year to complete all of the tasks, and used this to calculate the number of FTEs (based on 36 hours a week for a 40 week working year) and multiplied this by the average salary costs for the service centre staff carrying out the work. The tasks and WaterNSW's estimate of the time to complete them each year is presented in Table 3-6.

Table 3-6 WaterNSW's forecast for the total annual time to complete the processing data tasks (\$ million)

	FY22	FY23	FY24	FY25	Total	Proportion of total
Total time to process non telemetry-digital	738	1,299	1,979	2,056	6,073	6.67%
Total time to process non telemetry-manual	3,705	6,522	9,936	10,324	30,486	33.50%
Total time to process telemetry- digital	444	786	807	826	2,862	3.14%
Total time- random sampling	2,743	4,839	6,588	6,820	20,990	23.06%
Total time to follow up	3,222	4,163	4,140	4,301	15,826	17.39%
Total time for estimated reads	1,611	2,081	2,070	2,151	7,913	8.69%
Total time helping customers to register	906	655	768	91	2,420	2.66%
Total time no meter reporting obligations-digital	50	100	149	183	482	0.53%
Total time no meter reporting obligations-manual	200	400	600	735	1,935	2.13%
Total time to follow up	80	120	120	147	467	0.51%
Total time for estimated reads	40	60	60	74	234	0.26%
Total time helping customers to register	134	314	395	477	1,321	1.45%
Total time associated with processing monthly data	13,872	21,338	27,612	28,185	91,007	100.00%
FTEs required	9.6	14.8	19.2	19.6		
Total salary cost	\$1.09	\$1.71	\$2.27	\$2.38	\$7.45	

This breakdown shows that five tasks account for more than 89% of the total time forecast by WaterNSW to process data as a result of implementing the meter reforms. These are:

- > Total time to process non telemetry-manual (33.50%)
- > Total time- random sampling (23.06%)
- > Total time to follow up (17.39%)
- > Total time for estimated reads (8.69%)
- > Total time to process non telemetry-digital (6.67%)

The basis for how the time has been calculated for each of these tasks is as follows:

- > Total time to process non telemetry-manual = installed non-telemetry meters * assumed 20% to manually read monthly * 12 months * assumed 0.25 hours to process (excluding follow-ups needing an estimated read)
- > Total time - random sampling = random sample of 10% of total meter reads processed * 0.25 hour per sample
- > Total time to follow up = Non-telemetry meters assumed processed each month * 12 months * assumed 50% not reporting needing follow-up * 0.1 hour each

- > Total time to process non telemetry-digital = Number to process * assumed process % * assumed time to process each type of method
- > Total time for estimated reads = Non-telemetry meters installed * reporting 12 times a year * assumed 50% requiring needing follow up * assumed 20% needing estimated read * 0.25 hours per estimate.

Although the majority of these key tasks are generally straightforward in terms of calculation, the outputs are heavily dependent on unsubstantiated assumptions. The basis of all the tasks to be completed under the 'Processing data' activity is the number of meters that have been installed and/or made compliant with the new requirements, which is dependent on WaterNSW achieving its proposed meter works program. In addition, the majority of these five tasks have been assumed to take 0.25 hours to process, the time to follow up assumes 50% of customer not reporting need to be followed-up and the random sampling assumes that 10% of all meter reads processed will be checked for assurance purposes. Changes to any of the key assumed inputs for these five tasks can have a large impact on the total time to complete the task, the calculated FTEs and the salary costs that make up all of the operating expenditure for the processing data activity.

We note that the 40 week working year is a base assumption and has been universally throughout WaterNSW's cost models. As the same basis for the 40 week working year has also been applied to the non-field staff, e.g. communications and service centre personnel, the non-field FTEs and the associated staff costs are also likely to have been overestimated.

3.2.3 Capital expenditure

WaterNSW's capital expenditure forecast totals \$2.84 million over the four year determination period (refer to Table 2-5)) based on estimated costs for field staff vehicles and corporate systems.

The \$2.09 million of vehicle capital expenditure is based on a unit price per vehicle of \$68,266, which includes registration and CTP. This is based in a fleet services quote. Total vehicle capital expenditure has been calculated on the basis that each Field Officer and Team Leader will have a vehicle. As a result, changes in the numbers of meters being made compliant and the time taken for the field tasks will impact on the number of FTEs calculated as being required for the field work, and this will have a subsequent impact on the vehicle costs.

Although leasing vehicles may be a more efficient approach to procuring vehicles for the field staff involved with the initial site inspections and ongoing downloading of LIDs, we did not challenge WaterNSW as to whether this options had been assessed or costed during our discussions. We note that the estimated vehicle capital costs over the four year period comprise just over 10% of the total field costs for initial site inspections and downloading LIDS not connected to telemetry. However, we followed this up with WaterNSW during the preparation of our report. WaterNSW responded that leasing options had been considered but due to the current low cost of financing, and with a proportion of the fleet also requiring extensive modification (e.g. Gross Vehicle Mass (GVM) upgrades, customised rear bodies, etc.), and with the increase from 3 years/100,000 km to 5 years/150,000 km (with consideration of any issues relating mileage caps and operating requirements), WaterNSW opted for Company-owned vehicles in the immediate term. As a result, the capital costs for purchasing the vehicles needs to carry out the proposed field activities were included by WaterNSW in its cost forecasts.

As noted in Sections 3.2.2.2 and 3.2.2.3, we consider that the upload times for the initial site inspections and the downloading LIDs (not connected to telemetry) should not be included in WaterNSW's calculations as this is largely a passive task that does not active monitoring. Removing the 0.4 hours (24 minutes) that WaterNSW has allowed for reduces the field FTEs from 31 to 24 in FY24, and has the effect of reducing vehicle capital expenditure over the four year determination period to \$1.66 million. This highlights the sensitivity of WaterNSW's cost model to small changes in the assumptions that have been used.

The \$990,000 of corporate systems capital expenditure has been assumed for building the reporting and recording requirements and enhancements to WaterNSW's existing systems in the next few years until its WAVE program is implemented. This assumed expenditure allows WaterNSW to reach a position where customers can be compliant with the obligations. WaterNSW also noted that some of the applications that it is intending to use for managing the meter reform requirements are not being replaced by WAVE. The total expenditure has been split evenly at \$198,000 per year across a five year period starting in FY21.

3.3 Government-owned meters

The initial intention was that government-owned meters were to be handed back and DPIE had informed stakeholders that the meters would be made compliant at the government's cost before the meters were handed over. As a result, water users have considered that there was a public commitment by DPIE that

water users would not have to pay for making the government-owned meters compliant and they would be handed over as compliant meters at no cost to the individual.

Therefore, water users have questioned that the WaterNSW submission to IPART is not consistent with the clear intention of the NSW Government that the costs of making the government-owned meters compliant would not be passed onto water users.

As a result of the decision to not transfer ownership of the meters to water users WaterNSW has significantly revised its estimates for bringing the government-owned meters into compliance from its original cost forecasts. The major difference is that under a maintenance plan, WaterNSW can use a fleet-based approach to compliance where it needs to demonstrate that a sample of between 3% and 10% are accurate and are compliant when buried. Based on this, WaterNSW has assumed that as it undertakes the same maintenance and service approach, the remaining meters would deliver the same outcomes.

3.3.1 Operating expenditure

The breakdown of WaterNSW's proposed operating expenditure for government-owned meters is provided in Table 3-7.

Table 3-7 WaterNSW's operating expenditure FY22-FY25 forecast for government-owned meters

Item	Assumed unit cost	FY22	FY23	FY24	FY25	Total	% of total
		\$ millions					
Overhead costs							
Supervisory charge	\$100	\$0.17	\$0.25	\$0.28	\$0.28	\$0.98	7.88%
Contract Administration	\$100	\$0.28	\$0.28	\$0.28	\$0.28	\$1.13	9.07%
Validation costs							
On site telemetry costs (all compliant meters)	\$345	\$0.58	\$0.86	\$0.97	\$0.97	\$3.38	27.18%
DQPP data entry -0.5 hour per visit	\$75	\$0.13	\$0.19	\$0.21	\$0.21	\$0.74	5.91%
Office work	\$75	\$0.13	\$0.19	\$0.21	\$0.21	\$0.74	5.91%
Consumables	\$75	\$0.13	\$0.19	\$0.21	\$0.21	\$0.74	5.91%
Accuracy Testing	500	\$0.04	\$0.06	\$0.07	\$0.07	\$0.25	1.97%
Resealing meters/LIDs - 0.5 hour per visit	\$75	\$0.13	\$0.19	\$0.21	\$0.21	\$0.74	5.91%
In field costs							
Cutting back vegetation- 0.5 hour per visit	\$37.5	\$0.06	\$0.09	\$0.11	\$0.11	\$0.37	2.95%
Travel 1 hours per site @ \$150	\$75	\$0.13	\$0.19	\$0.21	\$0.21	\$0.74	5.91%
Meter service costs							
Faults meter/telemetry - 0.5 hour per visit	\$75	\$0.13	\$0.19	\$0.21	\$0.21	\$0.74	5.91%
LID Repair costs	\$780	\$0.18	\$0.18	\$0.18	\$0.18	\$0.70	5.66%
Meter Replacement costs	\$15,650	\$0.22	\$0.22	\$0.22	\$0.22	\$0.88	7.10%
Meter Rectification Costs	\$500	\$0.08	\$0.08	\$0.08	\$0.08	\$0.34	2.72%
	Total	\$2.36	\$3.15	\$3.47	\$3.47	\$12.44	100.00%

The basis for the cost build-up is assumed per meter unit rates for each of the identified tasks multiplied by the number of meters made compliant. As a result, the operating costs are largely dependent on WaterNSW's works program to make the government-owned meters compliant with the new reform requirements.

WaterNSW also noted that its cost model has been created to use an average cost per activity, meaning that if the number of sites changes, the total cost can change. WaterNSW has also used this approach in order to allocate the costs equally across all meters. In addition, WaterNSW has looked to reconcile costs to an hourly rate where possible in order to ensure an equal cost allocation to each customer across the entire stock of the government-owned meters.

Generally the costs that WaterNSW has used in its build-up are based on its current contract costs. As per the WaterNSW procurement approach, it will conduct a full market evaluation, which is hoped may result in the identification of more suppliers in the NSW market which may reduce costs. The basis for each of the items that WaterNSW has included in the build-up of its operating cost forecasts for the government-owned meters is provided in the following sections.

3.3.1.2 *Supervisory charge*

The \$100 unit rate for a supervisory charge has been based on a WaterNSW assumption that one hour of supervisory work is required per compliant meter per year. This supervision takes into account activities that include:

- > DQP Portal Updates
- > Updating the systems
- > Keeping accurate records
- > All other appropriate administration
- > HR and Direct Line Management
- > DQP Portal contract DQP audits
- > Field Work standards audits
- > Safety and WHS standards conformity audits and toolbox delivery

Under WaterNSW's current maintenance contract, an office-based manager/supervisor role is required. This role manages the HR direct line reporting and escalation role for the field-based staff who carry out the meter maintenance work. This role manages the day-to-day workload for the team, relevant qualifications, training, competence skill reviews, invoice and billing, contract reporting and service level agreement measuring. We consider that the included activities are appropriate and the assumed overhead applied to each government-owned meter is reasonable based on one hour per year per meter.

3.3.1.3 *Contract Administration*

WaterNSW's Contract Administration is the overhead charge used to manage the delivery of ongoing maintenance and future compliance for the government-owned meter fleet. While these meters remain under WaterNSW ownership there will be requirements to manage the Fleet-Based maintenance, service and support to keep all 2,822 government-owned meters compliant and fully functional to water take measurement, recording and reporting.

The \$100 Contract Administration unit rate that WaterNSW has applied is based on two dedicated Contract Administration staff plus their corporate rate staff charge out cost, plus monthly field visit for contract audits of contractor work plus other support staff such as Field Staff. Contract Administration roll HR Line Management support and Principal Contract Manager (WaterNSW) role funding.

We do not consider that the activities included under WaterNSW's Contract Administration overhead or the unit rate being applied are unreasonable.

3.3.1.4 *On site telemetry costs (all compliant meters)*

WaterNSW has included \$345 a year for the onsite telemetry costs for all compliant meters. It explained that this is the equivalent charge to private customers based on the submission to IPART. However, we are unsure of what is included in this cost. We note that the cost on site telemetry costs for all compliant meters is 27.18% of WaterNSW's forecast cost for the government-owned meters remaining compliant across the four year period between FY22 and FY25.

3.3.1.5 *DQP Portal data entry*

After each site visit the DQP Portal must be updated to ensure that all compliance data is available for WaterNSW and NRAR. Failure to update this information in a timely manner could have compliance implications for a customer and prevent WaterNSW from billing accurately. For example, every time a security seal is replaced, the DQP Portal needs to be updated with the correct seal number, otherwise NRAR could find the customer non-compliant.

WaterNSW has assumed that DQP Portal data entry will take half an hour a year at a rate of \$150/hour for each compliant meter. WaterNSW noted that the average industry rate per hour for a DQP is \$150 to \$250 but based on the scale of size and economy it hopes to secure a \$150 per hour rate.

We consider that WaterNSW's assumptions and cost estimates for DQP Portal data entry are reasonable.

3.3.1.6 Office work

Work requests from WaterNSW need to be reviewed before visiting site. WaterNSW Customer Field Officers are key stakeholders and require information on any non-standard visits (usually a phone call before going to site). In addition, some Customers require prior notice before accessing their land. The office work tasks that WaterNSW has costed for also includes updating the DQP Portal compliance system with all work done in the field to ensure WaterNSW's and NRAR's records are up to date, staff checking maps of where they need to go, reviewing the DQP Portal, and visiting stores to ensure they have appropriate materials to take to site.

The as-constructed drawings need to be reviewed prior to any site visit and all appropriate documents must also be prepared before leaving for the field. This includes site checks for safety alerts, completing the maintenance log and pre-visit preparation to ensure they can get on site.

WaterNSW has costed these activities based on half an hour of work per year at a rate of \$150 per hour per compliant meter. We do not consider that the assumptions, inclusions or forecast costs are unreasonable.

3.3.1.7 Consumables

WaterNSW has allowed for \$75 worth of consumables per year per compliant meter. WaterNSW states that this has been based on the last five years of service visits. However, we note that other than batteries and antennas, the majority of consumables are not likely to be expensive items. As such, we consider that this is likely to be a generous allowance.

3.3.1.8 Accuracy Testing

WaterNSW has allowed for ongoing testing 5% of compliant meters per year at an average cost of \$500 per test. This has been based on the assumption that once an initial 10% sample has been tested as part of the compliance program (refer to Section 3.3.2.8), WaterNSW would then be able to work on a 5% approach for ongoing requirements, with 5% of the total 2,822 government-owned meters tested each year once they have been made compliant. Although WaterNSW has stated that DPIE and NRAR would be consulted on this approach, this has not yet been approved by them.

We note that there does not appear to be any requirement under the NSW policy to test for accuracy annually although there are requirements for ongoing validation metering equipment, including validations to be undertaken by a DQP every five years. We also note that for existing non-pattern approved meters to remain in place, the initial certification requires that the owner either obtains a meter manufacturer certificate showing the accuracy of the meter is $\pm 2.5\%$ or the meter is tested in situ and a certificate confirming that the meter is accurate to within $\pm 5\%$. For pattern approved meters installed prior to 1 April 2019, no in situ accuracy testing is required. As such, the accuracy testing proposed by WaterNSW does not appear to conform to the NSW policy.

3.3.1.9 Resealing meters/LIDs

Once a tamper proof seal is cut, a new one needs to be installed, a photo taken and the serial number recorded for governance of site and meter security. Where possible, maintenance that doesn't require new tamper proof seals is completed.

However, WaterNSW has assumed that the meters/LIDs will need to be resealed annually and has estimated that this will take half an hour each time at a rate of \$150 per hour. WaterNSW has stated that every LID must be opened and tested on every visit to prove it will go into alarm and is capable of secure data transfer to the DAS for WaterNSW and NRAR's requirements. LID checking involves removing the tamper proof seal to test the LID alarm. Meters will need tamper proof seals replaced if weathered or broken with some meters requiring a tamper seal replacement to check inside the meter case or recording cabinet.

As the forecast cost is largely based on the assumed time to reseal, we question whether this task is likely to take a full half an hour each time. Therefore, it is likely that WaterNSW has over-estimated the forecast costs.



Figure 3-1 Example of an installed tamper-evident seal

3.3.1.10 Cutting back vegetation

The maintenance requirements for metering equipment are set out in the 2019 Maintenance Specifications under the *Water Management (General) Regulation 2018* including “General cleaning and housekeeping; suction clear, cleaning solar panel, clear away debris, excess soil, check for vermin issues/damage and check that site is weed free.” Therefore, there is a legal requirement for WaterNSW to maintain the meter sites.

Although only a DQP is allowed to work on the LID or meter, site maintenance can be delivered by non-DQP personal. WaterNSW’s maintenance tasks include tree trimming, whipper sniping grass and pulling debris clear at site and clearing out the dust blown in around the meter and LID. This has been budgeted to be completed every two years by WaterNSW, with the water user is expected to conduct basic maintenance in the interim. However, it has been identified that there is confusion in the regulation to the expectations for water users as to their obligations for clearing vegetation for a government-owned meter they don’t own.

WaterNSW has allowed for half an hour every two years at a contractor rate of \$150 per hour. This is equivalent to a cost of \$37.50 per site per year. We do not consider that this is unreasonable.

3.3.1.11 Travel time per site

WaterNSW has assumed a travel time of half an hour per compliant meter per year. This has been derived using an optimised route based on previous experience and also includes a safety evaluation at the start and close of each visit. Customer consultation has been excluded, though it is anticipated that customers may wish to engage with technicians for support.

While wet weather and extreme weather events can be managed as part of scheduled maintenance, WaterNSW has identified that there are times that rain events take place while the field officer is en-route, which will prevent the visit from occurring. WaterNSW intends to develop the overall annual maintenance visits for all 2,822 meters over a rolling 12-month program, and include the flexibility to bring forward or delay a visit by three months if you are visiting close by out of sequence.

We consider that the travel cost forecasts that WaterNSW has estimated for its government-owned meters are considerably more developed and reasoned than those that it has proposed for the field activities related to the customer-owned meters.

3.3.1.12 Faults meter/telemetry

Faults with the LIDs will need to be diagnosed on site. Any replacement LIDs will need to be requested from the manufacture, which means a second visit to install a newly configured and dispatched LID. The LIDs are sold as non-fixable parts and are expected to be decommissioned and a new unit procured, configure and then sent out to the DQP, before being replaced onsite.

WaterNSW has assumed that 8% of its compliant meters will experience meter/telemetry faults each year that will need to be rectified. This figure has been based on the failure rate for the current telemetry fleet on state owned meters. A unit rate of \$938 per fix has been assumed by WaterNSW, which is built-up of:

- > Travel to the site and back- half an hour there, half an hour back for the two visits to site = \$300
- > Maintenance work on the site - 1 hour on site each of the two visits = \$300
- > Administration of an S91i form as per the regulations while the equipment is not working = \$200
- > Diagnosis and LID configuration work = \$138

Apportioned against all compliant meters, this charge is equivalent to \$75 per meter per year.

Based on two visits to site, one to carry out the diagnosis, one to carry out the repair, we do not think the cost forecast is unreasonable. However, given the limited number of compliant devices currently available, we would query as to whether DQPs would expect to carry spare devices with them when they visit the site, particularly when they have built-up a customer based, which would significantly reduce the cost. However, we have not discussed this possibility or its likelihood with WaterNSW.

3.3.1.13 LID Repair costs

WaterNSW has included LID repair costs in its forecasts based on an expectation of 8% of compliant meters per year failing and a cost of \$780 per LID to replace. The cost of replacing a LID is below the initially budgeted cost of \$900 as it is anticipated that WaterNSW will receive a refund from the manufacturers in some circumstances and those savings are passed on to the customer.

As these devices are new to market, WaterNSW does not expect to know which model performs the best in the NSW conditions for at least five years (after the compliance due dates are repeated). LIDs are only offered with a 12-month warranty and a life expectancy from the manufacture of five years or five thousand transmissions (factory condition tested only).

We consider that as the \$900 of a LID was provided by a vendor, that the assumed \$780 per replacement is reasonable. It is not known whether the unit cost will decrease over time as a result of more compatible devices being available in the market.

3.3.1.14 Meter Replacement costs

WaterNSW has assumed an expected failure rate of 0.5% of compliant meters at \$15,650 per meter to replace. The 0.5% is based on WaterNSW's current experience in the Southern Catchment area over a five-year period. Age related defects have not been considered and could increase the failure rate as the fleet gets closer to the end-of-life dates between 2032 and 2036.

3.3.1.15 Meter Rectification Costs

WaterNSW has assumed an annual repair rate of 6% at \$500 per repair. The 6% is applied to the total 2,822 government-owned meters to account for rectification costs also being required for meters yet to be made compliant. WaterNSW has based the \$500 cost on staff time over the repair and travel, although it did not provide a more detailed breakdown of the assumed unit cost. By December 2024 WaterNSW expects to have completed the compliance program with new LIDs for all sites and all sites will have had at least one annual maintenance visit and this will then be the benchmark for the state. Site issues are expected to have been rectified by this time with a reduction of faults and issues. Although we do not know the full basis of the assumed unit cost, we do not consider that the forecast is an unreasonable estimate.

3.3.2 Capital expenditure

The breakdown of WaterNSW's proposed capital expenditure for government-owned meters is provided in Table 3-8.

Table 3-8 WaterNSW's capital expenditure FY22-FY25 forecast for government-owned meters (\$ million)

Item	Assumed unit cost	FY21	FY22	FY23	FY24	FY25	Total	% of total
		\$ millions						
Local Intelligence Devices (LIDs)	\$900	\$0.74	\$0.76	\$0.74	\$0.30	\$0.00	\$2.54	17.42%
Validation	\$1,150	\$0.95	\$0.97	\$0.95	\$0.38	\$0.00	\$3.25	22.26%
Excavating meters – 10%	\$5,000	\$0.19	\$0.26	\$0.12	\$0.00	\$0.00	\$0.56	3.87%
Remove above ground meters 10%	\$6,000	\$0.27	\$0.20	\$0.35	\$0.20	\$0.00	\$1.02	6.97%
Non Pattern Approved meter replacement	\$15,650	\$0.19	\$0.00	\$0.33	\$0.00	\$0.00	\$0.52	3.54%

Scheme Administration	\$770,000	\$0.77	\$0.77	\$0.77	\$0.00	\$0.00	\$2.31	15.84%
Accuracy testing (10% of compliant meters)	\$9,000	\$0.74	\$0.76	\$0.74	\$0.30	\$0.00	\$2.54	17.42%
Rectify Damaged Meters (7.8% at \$500 site visit + \$1730 LID)	\$2,230	\$0.14	\$0.29	\$0.43	\$0.49	\$0.49	\$1.85	12.68%
Total		\$3.99	\$4.01	\$4.43	\$1.66	\$0.49	\$14.58	100.00%

As for the operating expenditure forecast for the government-owned meters, the basis for the cost build-up is assumed per meter unit rates for each of the identified tasks multiplied by the number of meters that have been made compliant. As a result, the operating costs are largely dependent on WaterNSW's works program to make the government-owned meters compliant with the new reform requirements.

The basis for each of the items that WaterNSW has included in the build-up of its capital cost forecasts for the government-owned meters is as follows:

3.3.2.2 Local Intelligence Devices

The assumed unit cost for the government-owned LIDs is based on a quote received by WaterNSW from an untested vendor. WaterNSW noted that the current LID costs vary between \$1,200 and \$2,500 depending on the functionality required. However, as the new vendor is untested, there is a risk to WaterNSW if the vendor cannot deliver on the project quantities or meet its procurement requirements. This unit costs has then been applied to each of the 2,822 government-owned meters. This quote also requires more technical changes to the DAS to enable the use of this lower cost vendor.

3.3.2.3 Validation

The \$1,150 unit costs that WaterNSW has assumed for validating the 2,822 government-owned meters is based on WaterNSW's previous contracts with Comdain and market experience. The validation process that is required for the government-owned meters is similar but more complicated than that required to be completed for the customer-owned meters due to the decommissioning costs that are also required, the validation for each site involves:

- > Checking the standing site data
- > Site visit to confirm standing data/complete any data gaps
- > Using standing & site visit data, relevant LID is chosen & an order raised with vendor
- > Vendor configures and ships LID to DQP
- > DQP bench tests LID on receipt
- > DQP registers the LID in the DQP Portal and tests DAS workspace
- > DQP visits site again to decommission old telemetry and installs new LID
- > Live LID data tested through to DAS
- > Workspace made live in DAS and the LID set to live and commissioned
- > Meter is checked installed to AS4747 standards
- > Meter checked for correct operation
- > All Tamper Proof seals replaced with new regulation IAL seals
- > Final Validation and Compliance checks completed, and Validation Certificate is created in the DQP Portal as the DQP closes out the job

WaterNSW has calculated its cost forecast for validation based on the most efficient route, taking into account all sites, not just the ones that need to be made compliant by a specific compliance date. Although WaterNSW has provided the tasks included in the validation process, it has not provided any additional granularity as to the build-up of the costs. As such, it is not possible to fully interrogate the full gamut of assumptions and their impact on the overall cost that WaterNSW has used. As the validation includes two site visits, the travel time that has been allowed, which makes up a significant proportion of the field activities for the customer-owned meters cannot be confirmed. In addition, the information provided by WaterNSW does not make it clear whether it will engage local DQPs for this activity, carry out the work through a panel contractor or complete the work using internal DQP capabilities (assuming that WaterNSW will train and register its own staff to attend the government-owned meters). We note that the validation of the meters in

order to make them compliant constitutes the largest component of the activities WaterNSW has included to make the government-owned meters compliant. Validation makes up 22.26% of WaterNSW's total cost forecast.

3.3.2.4 *Excavation of buried meters*

WaterNSW has identified that it will need to excavate some buried meters in order to verify that what has been installed corresponds with the information that has been recorded for what has been installed. The \$5,000 unit cost for excavating meters has been based on WaterNSW's recent costs for moving buried meters, which has been in the range of \$3,500 to \$9,000 for meters moved in the last year. However, as costs related to excavation are generally site specific, and will also vary depending on the depth that the meter is buried to, there is a risk in selecting an average unit cost to apply to all instances when WaterNSW need to excavate a buried meter. As WaterNSW's estimate has only been based on costs data from the last year, the sample size is small and may not be fully representative of the range of costs or what might the average cost. In addition, WaterNSW's estimate was developed based on excavating all buried meters, with efficiencies expected to be gained from using dedicated teams to complete this work. This intention was subsequently changed to only excavating 10% of the total, which means the unit cost could potentially be understated. However, we have not reviewed the analysis and calculations that WaterNSW used to arrive at the \$5,000 unit rate. In addition, no evidence to support that 10% is an appropriate number of buried meters to excavate to verify the installation for compliance purposes has been provided. Given the original intention was to excavate all buried meters, the rationale for 10% now being sufficient is not known.

3.3.2.5 *Removal of above ground meters*

In addition to excavating a sample of the buried meters, WaterNSW has also allowed for a sample of above ground meters to be removed. Above ground meters may be moved if customer make a request and/or for environmental or safety reasons. When the intention was the government-owned meters would become privately owned, WaterNSW based its original costs estimates on the assumption that 30% of above ground meters would be removed. This was due to feedback from water users that if the meters were going to be transferred then they were more likely to want it removed and replaced with their own meter. With the change in decision regarding ownership, WaterNSW has reduced its assumption to 10% to be removed. This results in an assumption that 169 above ground meters will be removed. The \$6,000 figure that WaterNSW has used is based on previous work completed by our contractors Comdain.

Given that the ownership is to reside with the government, which has removed the impact of feedback from customers who were expecting to have ownership transferred to them, this would suggest that the meter removals are for environmental or safety purposes. However, the basis for the assumed 10% is not known as it would be expected that there would be a confirmed number of meters needing to be removed due to environmental or safety reasons rather than this needing to be assumed.

3.3.2.6 *Non Pattern Approved meter replacement*

WaterNSW has identified that there a 33 non-pattern approved meters in the government-owned meter fleet that it does not believe will meet the alternative pathway to compliance approach and will, therefore, need to be replaced. The assumed cost of \$15,650 per meter is based on work previously completed by Comdain and an analysis of current market costs for meter replacements. We have not confirmed the 33 meters included in the cost build-up but would expect that this is a number that WaterNSW should be able to accurately report.

3.3.2.7 *Scheme administration*

WaterNSW has allowed for three contract FTEs to administer the program to make the government-owned meters compliant. The costs include the salary and on-costs plus additional allowances for travel, vehicles, mobile phones, PPE, legal costs, postage and other minor costs. WaterNSW has established a program to carry out this work for the four annual roll out dates for the regulations to come into force to cover activities related to contract procurement, LID procurement, project planning, reporting and schedule delivery. In addition, customer stakeholder engagement and communications and technical working groups are managed through the program. The compliance program contractors are also managed by this team. The program covers 2020 until 2024, when the final meters are required to be made compliant.

We consider that the work activities included under the scheme administration are appropriate. However, WaterNSW has not provided detailed of the cost build-up to derive the \$770,000 per year estimate. Over three FTEs, this is equivalent to almost \$257,000 per person.

3.3.2.8 Accuracy testing

In order to give confidence to the market and in consultation with DPIE, WaterNSW considers that sampling the accuracy of 10% of the meters made complaint each year is appropriate. As a result over the four year program, it has costed testing 282 meters at a cost of \$9,000 per meter. The cost for the testing is based on the cost published on WaterNSW's website in its 2020-21 regulated river water charges. This states that:

"If you then elect to have your meter tested, a deposit of \$1,750 is payable prior to testing. The deposit will be refunded in full, should your meter be proved inaccurate. If the meter is found to be within accuracy standards then the total meter accuracy testing charge will be applied. The total meter accuracy testing charge is \$6,376.39 for verification and testing in situ (an additional \$4,626.39 on top of the deposit) and \$8,672.88 for lab verification and testing (an additional \$6,922.88 on top of the deposit)."

As such, the unit price selected by WaterNSW is for each tested meter to be sent for lab verification. We note there is a cheaper option to test the meters in situ that would save almost \$2,300 per test. The estimated cost for accuracy testing comprises the largest component of WaterNSW's forecast for making the government-owned meters compliant, more than 17% of the total \$14.58 million. Therefore, we question whether the more expensive lab testing option is the most efficient approach to testing for accuracy as in the region of \$0.74 million could be saved by testing in situ. In addition, we consider that WaterNSW's forecast is likely to be over-estimated as it does not exclude the non-pattern approved meters to be replaced.

We also note that for existing non-pattern approved meters to remain in place, the initial certification requires that the owner either obtains a meter manufacturer certificate showing the accuracy of the meter is $\pm 2.5\%$ or the meter is tested in situ and a certificate confirming that the meter is accurate to within $\pm 5\%$. For pattern approved meters installed prior to 1 April 2019, no in situ accuracy testing is required. As such, the accuracy testing proposed by WaterNSW does not appear to conform to the NSW policy.

3.3.2.9 Rectification of damaged meters

The meters in the Hawkesbury Nepean region have not received any maintenance since they were installed by DPIE. These meters were transferred to WaterNSW on the 1 July 2016. Since then WaterNSW has undertaken an assessment of these meters and estimated that a significant number will require some rectification work to ensure that they can be validated as part of the non-urban metering reforms so they are compliant for water users. This has been estimated at \$2,230 a site. Although the description WaterNSW's cost model states that the basis for this cost was \$500 for the site visit and \$1,730 for the LID, WaterNSW has confirmed that this information is incorrect. However, no basis for the unit cost being applied to each site has been provided. We note that the formula in the cost model derives the number of damaged meters in each year requiring rectification based on 7.8% of the total meters made compliant in the year. The basis for the formula is not known.

3.3.2.10 Asset life of government-owned meters

WaterNSW commented that its use of a 10-year remaining asset life is based around the Australian Compliance Framework for non-urban water meters and their guidelines for an end-of-life meter replacement schedule.

However, it has assigned an overall 10-year life service to the 30% of its meters in the Hawkesbury Nepean and assigned the standard 20 years to the rest of its fleet. The decision to assign a 10-year life span to the Hawkesbury Nepean fleet is based on the sampling of 100 meters in this area where it was discovered all had some type of issue affecting its performance. No maintenance has occurred on these meters over the last ten years by either DPIE (previous owners of the government-owned meter fleet) or WaterNSW since ownership was transferred in 2016, affecting their asset life.

Assigning a 10-year life asset life to 30% of the meters and 20-years to the remaining 70% gives an average lifespan of 17 years. The average age of WaterNSW's government-owned fleet is 7.2 years, giving a 10-year asset life remaining. WaterNSW has estimated that about 5% of the government-owned meters are non-pattern approved, which also has an impact on their expected working life. WaterNSW expects to regularly maintain the government-owned meters to achieve the expected lifespan indicated below.

Table 3-9 Guideline for end-of-life meter replacement schedule used by WaterNSW to derive the government-owned meter asset life

Pattern approved meters	Mechanical	Electronic
Close conduit	After 20 years of service	After 30 years of service
Open channel	After 30 years of service	

Partially filled pipe		
Non-pattern approved meters	Mechanical	Electronic
Closed conduit	After 10 years of service	After 15 years of service
Open channel	After 20 years of service	
Partially filled pipe		

4 Conclusions

WaterNSW has been assigned considerable responsibility by the State government for implementing the non-urban metering reforms. WaterNSW's responsibilities include planning for and implementing metering and telemetry infrastructure and the ongoing operation and maintenance of the metering infrastructure, which includes collecting and managing water take data. WaterNSW has existing functions for customer management and delivery of water which will be impacted by the non-urban metering reforms.

Non-urban metering reform is not a recent idea. New South Wales first signed an inter-governmental agreement on measurement, monitoring and reporting in 2004 as part of the National Water Initiative. In December 2009, the State signed an inter-governmental Framework for Compliance and Enforcement as well as committing to the National Framework for Non-Urban Metering.

The New South Wales non-urban water metering framework commenced on 1 December 2018. However, the policy and implementation of the policy have been under review since that time. The policy was last updated in November 2020. Amendments to the *Water Management (General) Regulation 2018* have been consulted on during 2020 but not yet enacted. Important to implementation for WaterNSW was the decision in late 2020 that the New South Wales government, through WaterNSW, will retain ownership of all existing government-owned meters.

WaterNSW finds itself in the position of having to implement a significant policy for which key requirements have been uncertain until recently, while having to meet the stated implementation timeframe, the bulk of which is staged over three years. While there has been uncertainty over key requirements of the policy, we note that there is also a long history of policy development and consideration of implementation options for this reform over many years. Much of this has been led by the Department of Industry, Planning and Environment and its predecessors. We understand that WaterNSW has had involvement in these ongoing policy and implementation discussions.

Based on the preceding analysis, we conclude that the planning documents and supporting information developed by WaterNSW does not display the level of rigour that we would expect to see to provide assurance over a program of this level of materiality.

WaterNSW has in place an assurance framework to evaluate and govern expenditure. This is the '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" and the Framework is stated to apply to all expenditure over \$20,000. While this framework is specific to WaterNSW, it contains many elements of good practice for assurance over expenditure that are common to other "gateway" frameworks³.

The framework sets out the requirements that need to be provided in order for an assessment to be made and evaluation of expenditure to occur. These requirements include:

- > definition of the need/problem being addressed
- > justification for the proposal, including risk assessment of relevant options
- > consultation with stakeholders.

The framework also includes templates and guidance in areas such as engagement of consultants, procurement and internal financial management. The level of documentation and engagement required varies based on the assessed level of risk, which is in line with good practice.

The documentation that WaterNSW has provided to us setting out its plans for implementation of metering reform does not use the Approval to Spend Framework documentation. Regardless whether WaterNSW has used its own assurance framework, our main concern is that WaterNSW's proposal lacks the rigour and level of maturity that we would expect to see for an initiative of this level of materiality and inherent risk. The main shortcomings we have observed regarding assurance over the expenditure are:

- > **Assumptions have not been validated nor the sensitivity of expenditure to assumptions tested.** As set out in Section 3, WaterNSW's expenditure proposals rely on a large number of assumption which lack supporting evidence. We also consider that a number of the major assumptions, such as working weeks

³ There is also a New South Wales state government gateway policy owned by Treasury and an assurance framework administered by InfrastructureNSW for infrastructure projects.

per year, time to download data and allowed salary increases, are overly conservative or inaccurate. Adjusting these assumptions alone to more central assumptions would reduce expenditure by many millions of dollars. Examples of the potential sensitivity of the forecasts to assumptions include adjusting the working week to a less conservative assumption reducing operating expenditure by \$3.1 million (9% reduction) and a less conservative assumption for downloading LID data reducing field FTEs by 23%. There is also a general lack of understanding and testing of the sensitivity of the results to the assumptions made.

- > **Risk and opportunities for implementation have not been assessed and mitigation measures incorporated in planning.** As detailed above, WaterNSW has made many assumptions in planning for the implementation of the reform and arriving at its expenditure forecasts. Assumptions reflect uncertainty and uncertainty translates into risk to the successful implementation of reform and to customers that will fund the reform. In finding that WaterNSW has made many assumptions that are lacking validation and lacking in testing their sensitivity, we have also found that WaterNSW has not made a corresponding assessment of the risk of this uncertainty to implementation of the reform. Good practice would be to have a comprehensive register of risks aligned with the work program and financial assumptions that is regularly reviewed and mitigating actions identified. WaterNSW stated that it has a register of issues but not a risk register. Risk is not static and good practice would be for WaterNSW to regularly review risks, update mitigation measures and implement these in its work program.
- > **Customers have not been consulted over the impact of WaterNSW's proposal.** WaterNSW is not planning on consulting with customers regarding the metering reform costs until 2021. This lack on consultation means that customers are not informed of potential pricing impacts to account for in business planning and WaterNSW is not informed of how customers may respond to the policy (as customers have options in some areas). This is not meet the requirements of good practice for implementation of reform.

Based on the above observations, we conclude that WaterNSW's proposal does not meet good practice elements that provide assurance that expenditure is appropriate, nor does it meet WaterNSW's own assurance framework (Approval to Spend). We understand that WaterNSW has in part been placed in this position by changes to the policy and its implementation and the timeframes proposed by the Government. Because of the relative immaturity of the proposals compared to what we expect as good practice for an initiative of this significance, we cannot conclude that the proposed expenditure is prudent and efficient based on the evidence provided to us.

5 Recommendations

We make the following recommendations regarding WaterNSW's proposals for implementation of the metering reform:

1. WaterNSW should complete a robust business case under WaterNSW's Approval to Spend framework or the assurance framework administered by InfrastructureNSW for infrastructure projects. This business case should consider:
 - a. Options assessment for different strategies for implementation to demonstrate that the proposed approach is preferred
 - b. Validation of assumptions used as the basis of the forecasts and sensitivity analysis of these assumptions
 - c. Testing of constraints e.g. the potential for outsourcing
 - d. A comprehensive and up to date risk assessment resulting in a live project risk register
2. Gain data from the initial stages of implementation and feed this back into annual updates of the implementation program.
3. WaterNSW should work with NRAR and DPIE to develop benefits realisation plan for implementation of the policy and maintain the benefits realisation plan throughout implementation and communicate this to stakeholders.