



# **Non- Urban Metering Action Plan**

June 2025

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1	Published Metering Action Plan	Nov 2019	Paul Byrnes	Paul Byrnes
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2.1	Reviewed & updated	July 2020	Terry Clapham	Terry Clapham
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# 1.0 Executive Summary

## 1.1 Meter Compliance

Southern Rural Water (SRW) has reviewed its current state of metering for compliance against the Victorian non-urban metering policy (2025). SRW manages just over 11,600 take and use licences across the southern half of the state. Figure 1 below shows that 5,492 of these licences are required to have accurate metering installed to be compliant with state policy. 1,434 licences have been identified as requiring accurate metering. A remedial action plan will be developed to determine the best course of action moving forward to get these sites metered.

Of licences that are metered, 27.5% of SRW's meter fleet is AS4747 compliant. A substantial capital delivery program is currently underway to replace a large portion of SRW's meter fleet with AS4747 compliant meters. Following its completion, 45.3% of the fleet will be AS4747 compliant, 47.8% will be contemporary standard and 6.5% of the fleet will be non-compliant with state policy. SRW will follow its capital delivery processes to have these meters replaced with AS4747 compliant meters.

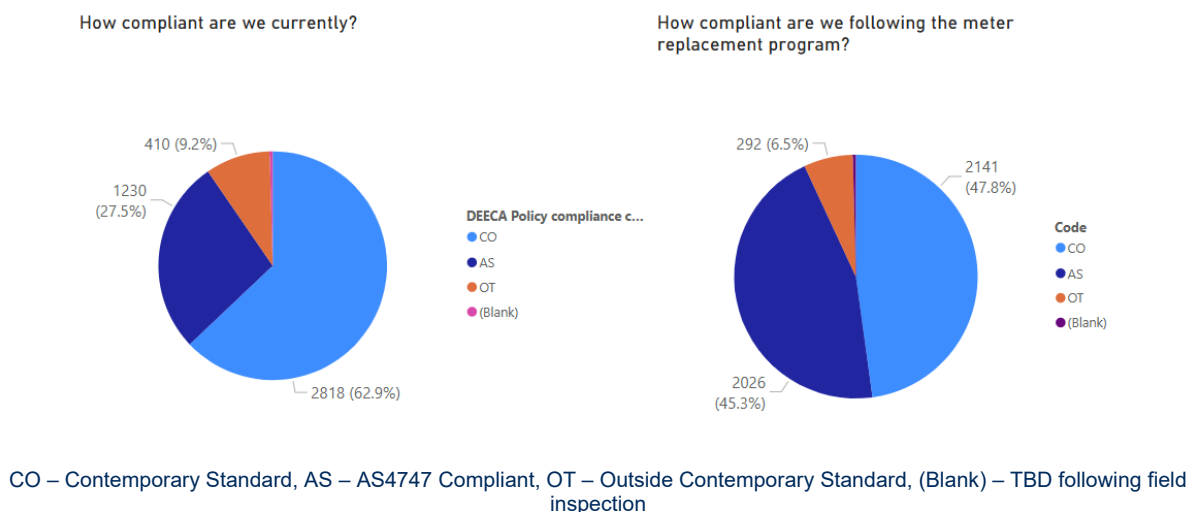


Figure 1 - Current meter compliance vs meter compliance following completion of capital meter replacement program

## 1.2 Telemetry Compliance

SRW utilises Taggle Systems as its automated meter reader (AMR) provider. Around a quarter of SRW's meter fleet has AMR installed across the state. SRW is committed to installing AMR on all its meter fleet where practical.

## 1.3 Actions

Many actions have been identified by SRW that will create improvements for its metering and AMR fleet.



Figure 2 - SRW's improvement actions

## 1.4 Planned Authorisation & Review

SRW will review its metering action plan every 3 years. Approval will be soughtt at the Executive level.

## 2.0 Business Context

### 2.1 Our Service Region

Southern Rural Water (SRW) is responsible for the delivery of water and irrigation drainage services and for administering water shares and take and use licences. The water we harvest, store, manage and license is primarily for agricultural, urban and industrial purposes. SRW splits its water resource responsibilities into two key categories: groundwater and rivers licensing and irrigation district management.



*Figure 3 - SRW's service region map*

### Groundwater and Rivers

SRW are delegated under the Water Act 1989 to manage licensed water use from southern Victoria's surface water systems and groundwater aquifers. Groundwater is water that is found below the ground surface. It is stored in and flows through aquifers and, to a lesser degree, aquitards. Groundwater is a valuable resource because it is generally a very reliable source of water that persists during dry periods when streams can run dry. Its reliability also makes it important for some ecosystems that depend on it during dry periods. SRW manages sustainable access to groundwater systems across its service region, from Gippsland to the South Australian border. More information about groundwater can be found in the groundwater atlases on SRW's website.



Surface water is the generic term used to describe any water that can be found on the earth's surface. It includes water from rivers, creeks and catchment run-off water that is collected and stored in dams. Surface water is replenished from rainfall. Although run-off from rainfall accounts for most of the water flow in rivers and creeks, many permanent rivers and creeks start out because of groundwater (in the form of a spring) flowing into gullies and natural folds in the land. Surface water is a limited resource and needs to be managed sustainably to ensure that rivers and creeks, existing licence holders and the environment are protected. The following is a list of waterways managed by SRW

Gippsland Area	South West Victoria	Westernport & Port Phillip Area
<ul style="list-style-type: none"> <li>•Avon River</li> <li>•Valencia Creek</li> <li>•Latrobe River</li> <li>•Moe River</li> <li>•Morwell River</li> <li>•Narracan Creek</li> <li>•Traralgon Creek</li> <li>•Dargo River</li> <li>•Mitchell River</li> <li>•Wonnangatta River</li> <li>•Tambo River</li> <li>•Buchan River</li> <li>•Snowy River</li> <li>•Cann River</li> <li>•Agnes River</li> <li>•Albert /Jack River</li> <li>•Bruthen River</li> <li>•Franklin River</li> <li>•Merrimans Creek</li> <li>•Tarra River</li> <li>•Tarwin River</li> </ul>	<ul style="list-style-type: none"> <li>•Barwon River</li> <li>•Leigh River/Yaroween River</li> <li>•Glenelg River</li> <li>•Wannon River</li> <li>•Grange Burn River</li> <li>•Crawford River</li> <li>•Hopkins River</li> <li>•Mount Emu Creek</li> <li>•Brucknell (Cudgee) Creek</li> <li>•Merri River</li> <li>•Moorabool River</li> <li>•Curdies River</li> <li>•Gellibrand River</li> <li>•Moyne River</li> <li>•Eumeralla River</li> <li>•Surry River</li> <li>•Fitzroy River</li> <li>•Darlots Creek</li> </ul>	<ul style="list-style-type: none"> <li>•Bunyip/Tarago River</li> <li>•Lang Lang River</li> <li>•Dandenong Creek</li> <li>•Yakkock Creek</li> <li>•Jacksons Creek</li> <li>•Deep Creek</li> <li>•Riddells Creek</li> <li>•Barringo Creek</li> <li>•Bolinda Creek</li> <li>•Turitable Creek</li> <li>•Willimigongon Creek</li> <li>•Emu Creek</li> <li>•Monument Creek</li> <li>•Number 3 Creek</li> <li>•Konagaderra Creek</li> <li>•5 Mile creek</li> <li>•Main Creek</li> <li>•Upper Werribee River</li> <li>•Lerderderg River</li> </ul>

Figure 4 - List of waterways in SRW's service region

## Irrigation Districts

SRW manages the release and delivery of water to the Werribee, Bacchus Marsh and Macalister irrigation districts. This includes operating and maintaining regulated rivers, channels, pipeline networks, drainage systems, and the supply of recycled water. The location and supply sources for the irrigation districts are summarised below.

Table 1 - Irrigation Districts & sources of water

Irrigation District	Sources of Water
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Werribee	Pykes Creek; Melton Reservoir
Macalister	Macalister River, Lake Glenmaggie
Bacchus Marsh	Werribee River; Pykes Creek Reservoir

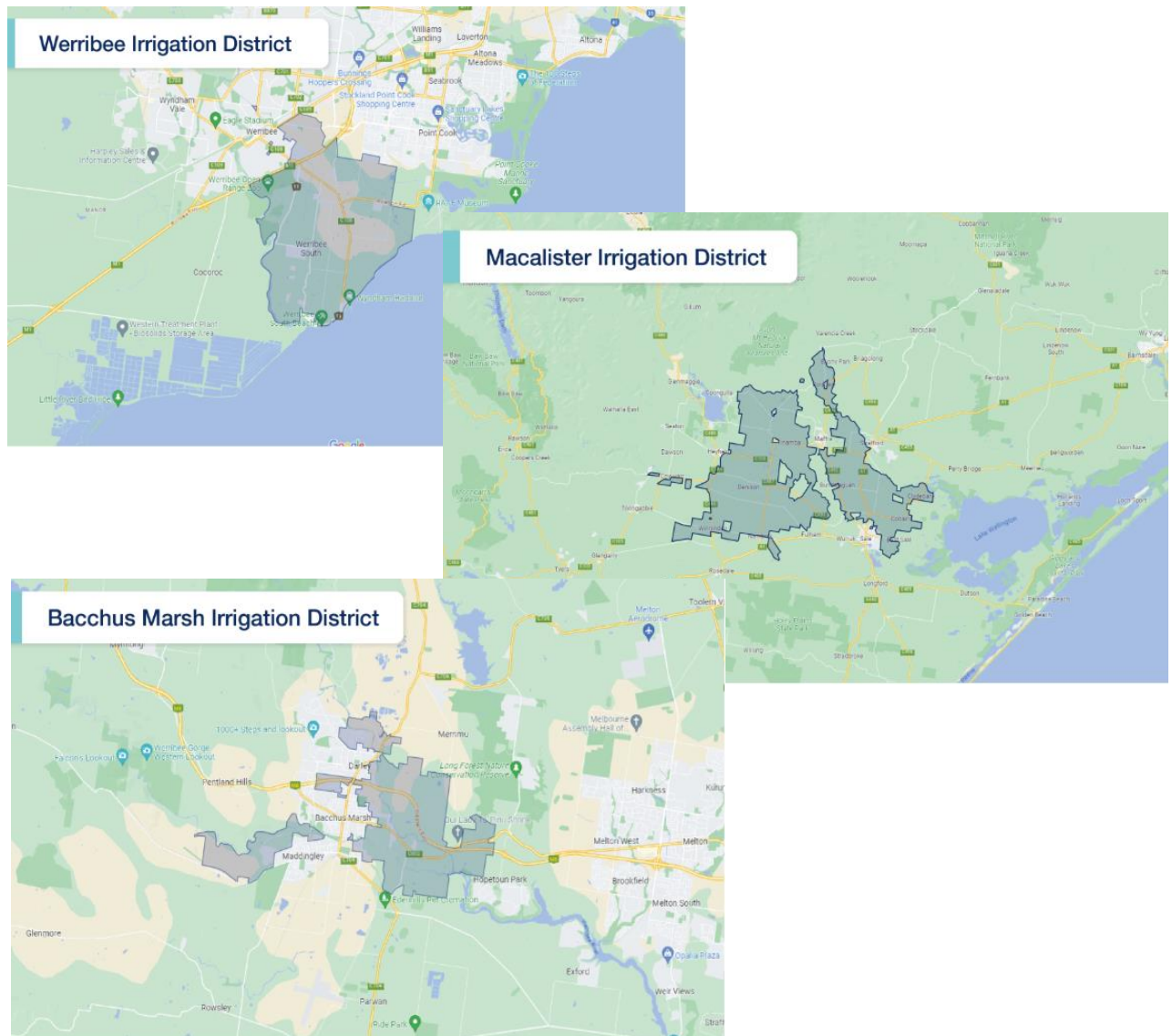


Figure 5 - Irrigation district maps

## 2.2 State Policy



Figure 6 - Hierarchy of metering policy and frameworks (Victoria's non-urban metering policy, 2025)

SRW is guided by state level policy to determine the best practice for the management and measurement of its water resources. For metering, SRW is informed by the Victorian Non-Urban Metering Policy which was updated in January 2025. The policy specifies the minimum standard that must be achieved to ensure measurement of water resources is reliable and accurate. This policy has been informed by key metering standards and frameworks such as AS4747 (the Australian standard for meters for Non-Urban Water Supply), the Meteorological Assurance Framework and national level policies and findings from the compliance review of the Murray Darling Basin. SRW aims to be fully compliant with this state policy.

## 2.3 What's Included in this Metering Action Plan?

A key requirement of state policy is for rural water authorities to update their metering action plan. The objective of a metering action plan is to identify the actions required to be compliant with state policy as well as any improvements that need to be made to non-urban metering practices. This metering action plan summarises the state of metering and AMR at SRW, identifies some gaps in technology and processes and recognises the actions required to address the gaps.

This metering action plan is focussed on SRW's groundwater and rivers metering fleet and does not include the irrigation districts. However, there will be some cross over in improvements and actions. Where shared benefits exist, both the irrigation districts and groundwater and rivers sections of SRW will work collaboratively to share process improvements.

## 2.4 Water System Statistics

### Groundwater & Rivers

SRW manages just under 11,700 take and use licences for non-urban use across the southern half of Victoria. Of these, 37% are for access to groundwater and 63% are for access to Surface water. Figure 7 shows the spread of licence size by volume. The average annual licence volume is 114 ML; however, the median is only 23 ML.

Number of Unregulated Bulk Entitlements managed by SRW

11,657

Count of BEE

Median Volume Size of Unregulated Bulk Entitlements managed by SRW

23

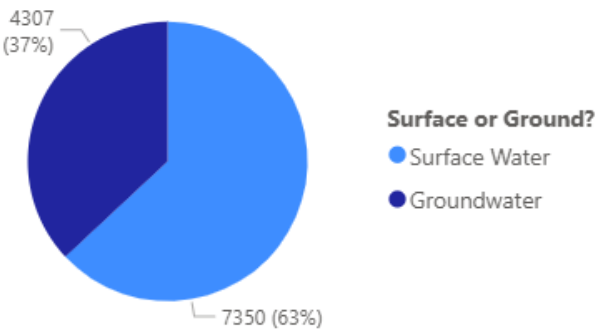
Median of Volume of BEE (ML)

Average Volume Size of Unregulated Bulk Entitlements managed by SRW

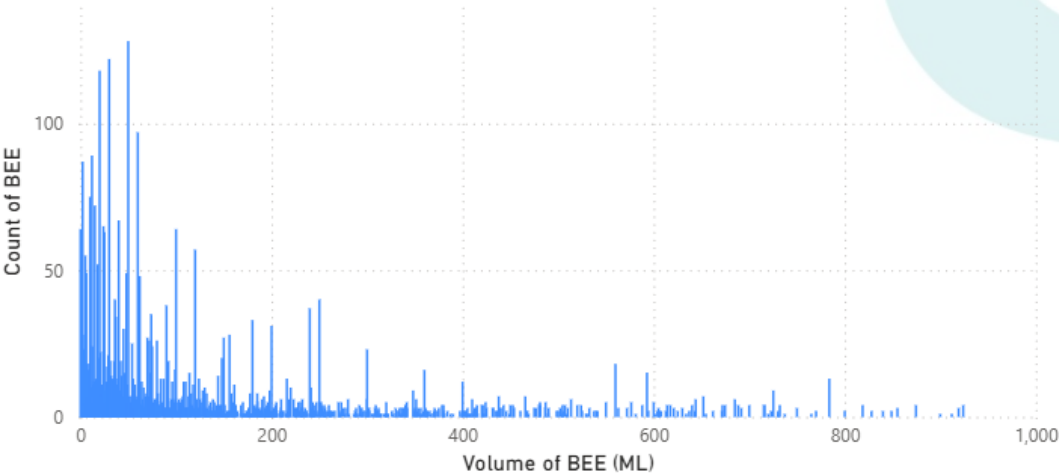
114

Average of Volume of BEE (ML)

How many surface water and groundwater licences?



Take and Use Licences less than 1000 ML



Take and Use Licences greater than 1000 ML

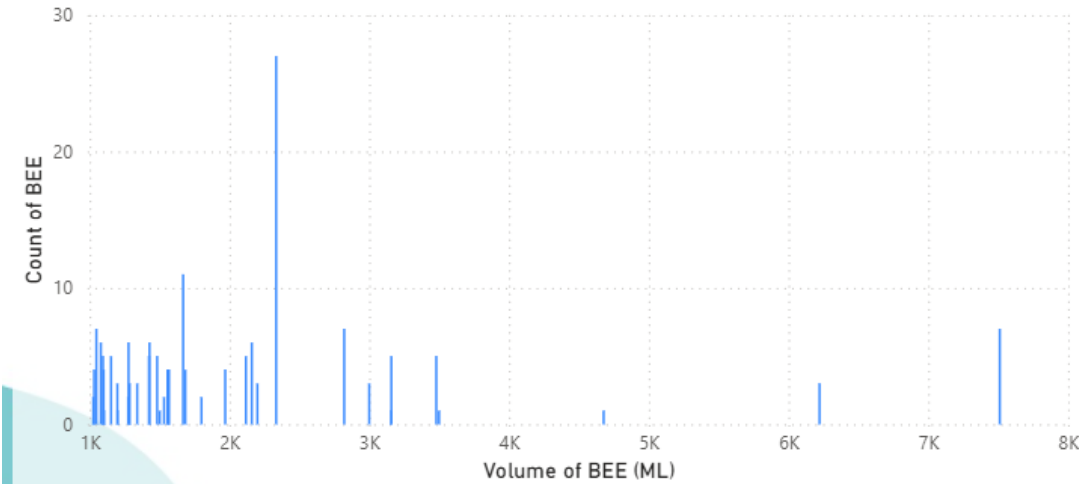


Figure 7 – Groundwater & Rivers water system statistics

## 3.0 Our Meter Fleet

### 3.1 What needs to be metered?

A take and use licence is required to be metered when the conditions of the licence and extraction site meet the criteria of the Victorian Non-Urban Metering Policy (DEECA, Jan 2025). Figure 8 below, taken from the state policy, can be followed to determine if a site requires metering.

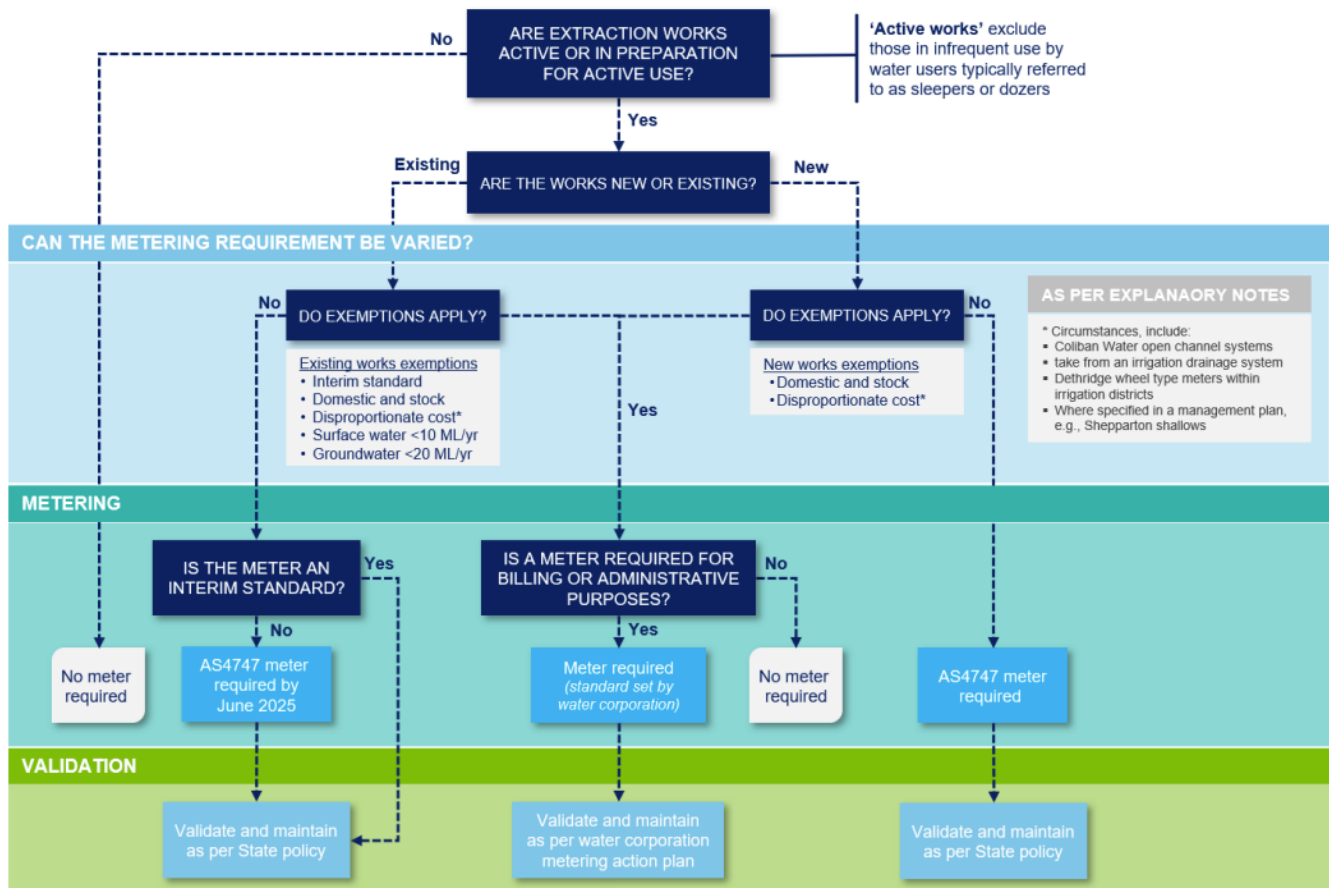
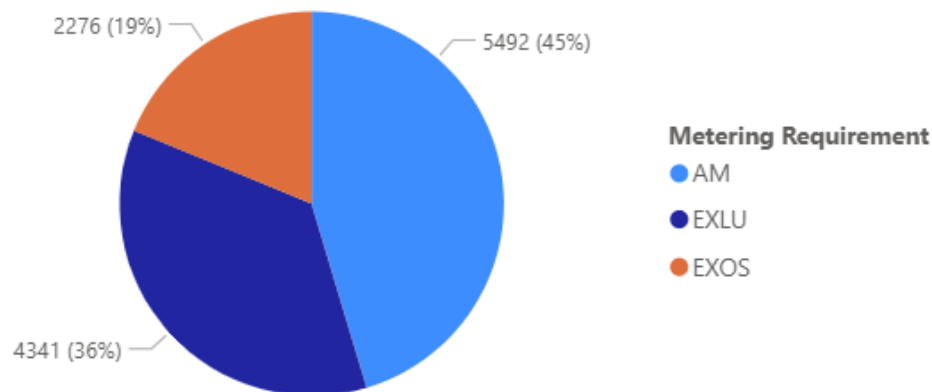


Figure 8 - Process flow diagram of conditions for accurate metering, (Victoria's non-urban metering policy, 2025)

An analysis of SRW's licences shows that of the 11,657 take and use licences it manages for non-urban use, 5492 require accurate metering, 4341 are exempt due to volume thresholds and 2276 are exempt due to the licence type being outside of scope. This is visualised in figure 9 below. It should be noted that some of the sites requiring accurate metering may still be exempt from metering due to cost constraints. SRW does not currently have this data readily available. This is often specific to site conditions and will need to be determined following an inspection program.

### Metering Requirements of Take and Use Licences



AM – Accurate Meter Required, EXLU – Exempt due to volume, EXOS – Exempt due to licence type

Figure 9 -Metering requirement code for take and use licences

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**Action 1:** To develop a Remedial Action Plan for licences that require metering under State policy that are not currently metered. The plan is to identify sites, consider engagement with licence holders and assess financial impacts.

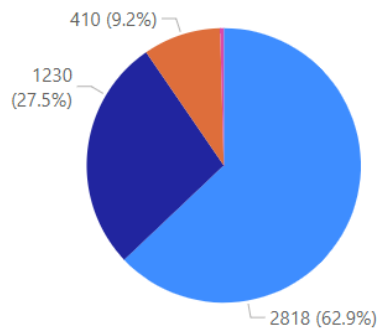
**Action 2:** SRW will start documenting and storing data on sites that meet the 'exempt due to cost' conditions.

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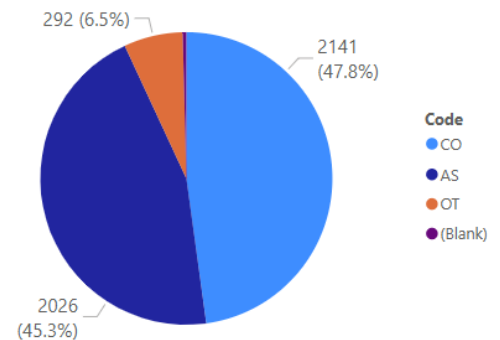
## 3.2 What is currently Metered?

There are currently 4,476 flow meters managed by SRW. When applying the non-urban metering policy meter codes to SRW's current meter fleet, 90.4% of the meters installed are AS4747 compliant or of interim standard. This is based on data stored in our asset management systems. SRW is currently tendering a large capital works program to replace meters identified as non-compliant, reaching the end of their useful life or inaccurate. Figure 10 below shows how our meter fleet's compliance will change following the completion of this project. A large portion of the fleet will be upgraded to AS4747 compliant meters which will result in more accurate data. Whilst this is a significant improvement for the fleet, there is still 6.9% of the meter fleet that is non-compliant and will need to be replaced as a part of a separate capital works program.

How compliant are we currently?



How compliant are we following the meter replacement program?



CO – Contemporary Standard, AS – AS4747 Compliant, OT – Outside Contemporary Standard, (Blank) – TBD following field inspection

Figure 10 - Meter compliance code - current verses following capital meter replacement program

**Action 3:** To complete SRW's capital works program for meter replacements by September 2026

**Action 4:** SRW will develop a business case to replace the remaining 6.5% of its meter fleet that is non-compliant with state policy

### 3.3 What does our meter fleet currently look like?

A key component of state policy is making sure that interim standard meters are replaced at the end of their life with AS4747 pattern approved flow meters. SRW stores and manages data on the age of its meter fleet through its asset management practices. These are discussed further in section 4.1. Figures 11 and 12 below summarises some key statistics around the age of our meter fleet.



Figure 11 - Meter fleet age statistics



When was the current meter fleet installed?

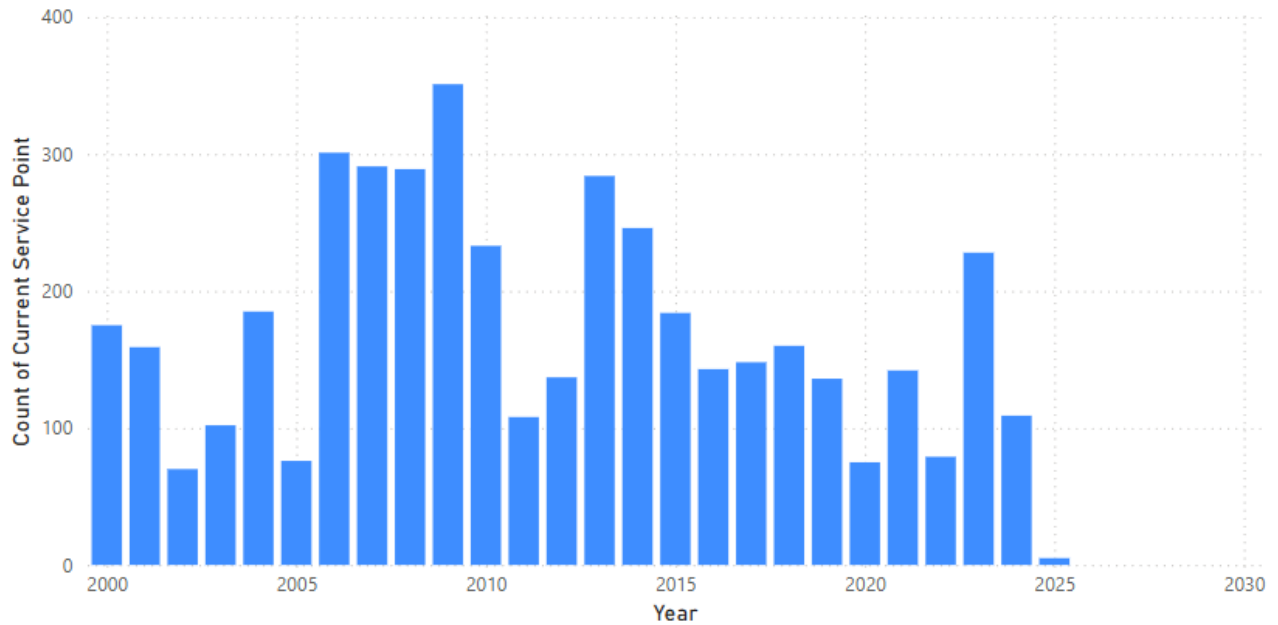


Figure 12 - Number of meters installed each year

The asset data shows that the majority of SRW's meter fleet is in the second half of its useful life. While a lot of these meters will be replaced as a part of the meter replacement program currently being tendered, SRW will need to make sure it has all the checks and balances in place to support its ageing fleet. A key component of this is setting up a robust internal process to check the compliance of the current meter make and model and then ensuring it is replaced with an AS4747 compliant meter. This is to be included in the asset class plan for meters which is discussed further in section 4.1.

There are several different styles of meters used to measure flow in closed pipes. SRW currently uses either mechanical or electromagnetic meters. The number of each type SRW currently has in the field is shown in figure 13.

A mechanical meter uses a mechanical wheel to measure the amount of flow passing through the internals of the meter.

An electromagnetic meter uses electromagnetic sensors that pick up the rate of flow passing through the internals of the meter. Electromagnetic metering is generally more accurate than mechanical metering and the bulk of AS4747 pattern approved meters are electromagnetic meters.

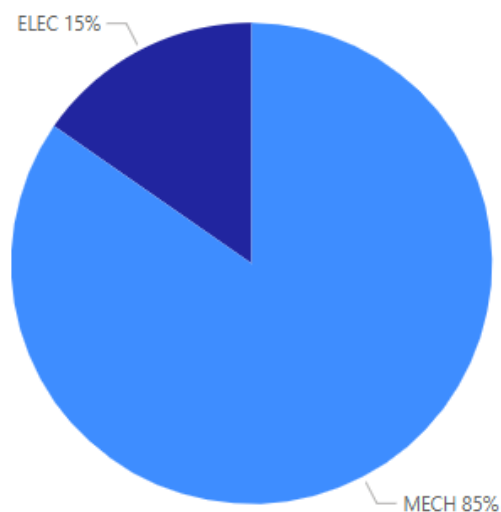


Figure 13 - Electromagnetic verse mechanical meters



SRW tries to reduce the amount of flow meter manufacturers in its asset fleet. By sticking to a reduced number of meter types, it is easier to ensure our Water Management Officers and metering specialists have the appropriate training. The makeup of manufacturers for our current meter fleet is shown in figure 14. The bulk of meters installed are Elster followed by Bermad and Krohne.

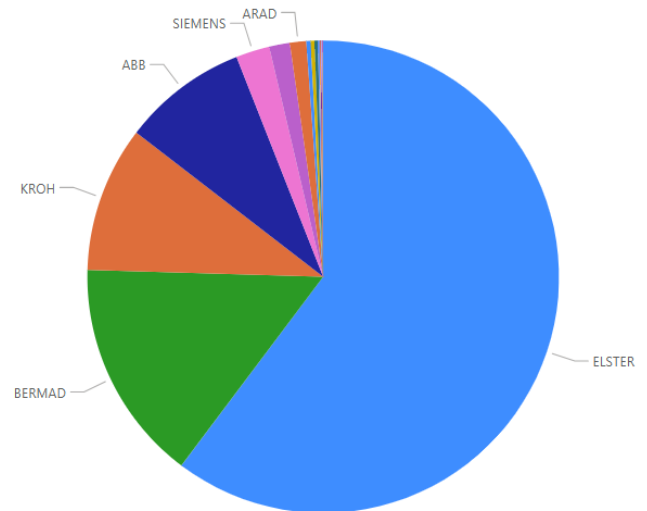


Figure 14 - Meter fleet broken down by manufacturer

### 3.4 What will our meter fleet look like in the future?

SRW is working towards being fully compliant with Victoria's non-urban metering policy. A fully compliant meter fleet looks like the following:

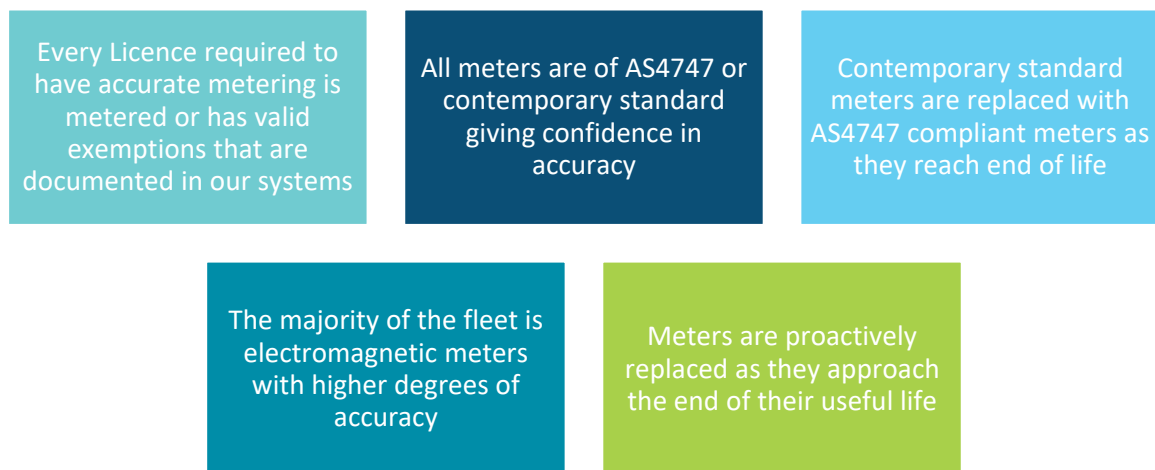


Figure 15 - Meter fleet future goals

# 4.0 Processes to Assure Meter Accuracy

## 4.1 Asset Management

### Asset Class Plans

An Asset Class Plan (ACP) is a document that records the agreed engineered whole of life management plan of groups of asset classes at SRW. They are designed to inform SRW asset management and investment planning. SRW is in the process of developing an ACP for its groundwater and rivers metering fleet.

The asset class plan will contain information on the following assets at each site:

- Flow meters
- Automated Meter Reader (AMR) and associated telemetry infrastructure

The ACP will act as a centralised document for all metering asset management processes once completed. At a minimum, the following information is captured in the plan:

- Required attribute information to be stored against each asset
- Asset criticality profiles & prioritisation tools
- Life cycle strategies – acquisition, planned maintenance, condition assessments, renewals, critical spares & disposal
- Condition assessment methodologies
- OH&S and environmental considerations
- Asset management improvement plans

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**Action 5:** *SRW will finalise asset class plan for Groundwater and Rivers flow meters which will ensure the asset management of its meters and associated telemetry aligns to ISO55000 and state policy for non-urban metering.*

**Action 6:** *SRW will develop a prioritisation tool in line with internal asset management practices such as asset criticality scoring to prioritise future asset management actions of flow meters and ensure value for money across the fleet. This will be built into the Asset Class Plan*

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### Authority AMS

All meter asset information is stored in a software called Authority Asset Management System (AMS) by CIVICA. Once a meter is installed in the field, the meter is set up in SRW's asset register. AMS stores useful information around the make and model, the year of install and the size of the meter.

The information that is required to be kept by SRW under the state policy is as follows:

*Table 2 - Minimum asset data requirements for meters*

Attribute	Description
Service Point	Service point no.
Licence No.	Water share or licence to match water register
ABA	Allocation bank account
Manufacturer	The manufacturer name
Model	The model name
Nominal Size (mm)	DN for fully flowing pipe meter
Serial Number	Meter serial number on meter
Telemetry code	Code to indicate if meter has telemetry and, if so, broadly it's type
Installation Date	Installation date of the meter
VIC Compliance Code	Compliance code of current meter
Meter Requirement	Requirement code for site

## Survey 123 (ArcGIS)

Survey123 (ArcGIS) is used for asset data collection out in the field for flow meters and AMR devices. SRW currently utilises Survey 123 for the following Surveys:

- G&R Meter replacement survey – This is where field staff can flag that a meter needs to be replaced.
- G&R Routine Meter Inspection – a survey for field site inspections
- G&R Telemetry Processing – a survey for the field staff to track changes to AMR on meters

## 4.2 Meter Installations

The way a meter is installed can impact the accuracy of the flow meter. Because of this, flow meters should be installed by a certified meter installer (CMI). Where a CMI cannot be engaged to install a meter, a suitably qualified person will install the meter and SRW will arrange to have the meter installation validated by a CMI prior to the meter data being used. Water Management Officers at SRW are trained as CMI's who can validate these meter installations. Where SRW engages a contractor to perform metering works and installations, a CMI qualification is required and checked as a part of the contractor on-boarding process.

SRW follows the following hierarchy of installation methodologies to make sure each installation is compliant with AS4747 and state policy where possible.

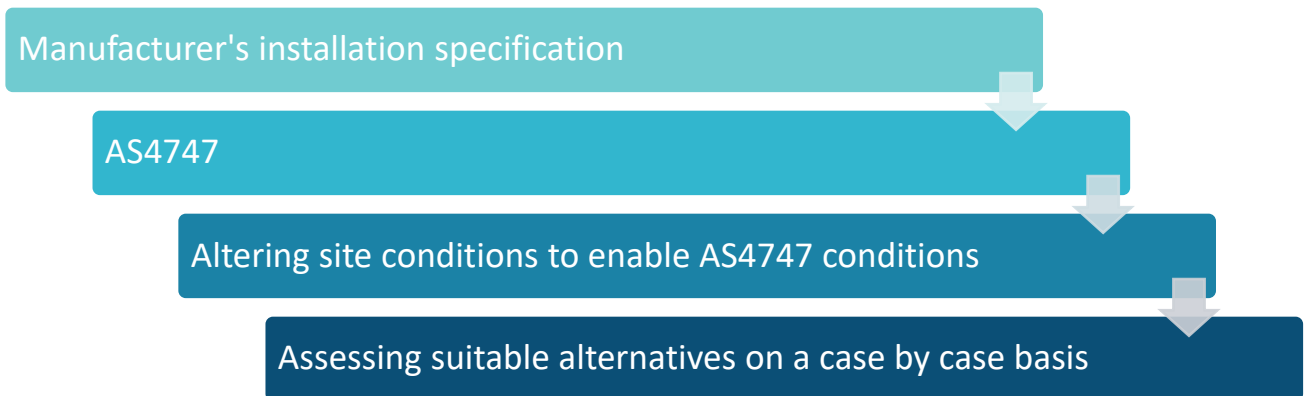


Figure 16 - Hierarchy of controls for compliant meter installation conditions

SRW will only install AS4747 pattern-approved flow meters onto sites requiring accurate metering in-line with state policy.

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**Action 7:** *SRW will develop an engineering standard for future meter installations to ensure compliance with AS4747.*

**Action 8:** *SRW will develop a standard specification for future meter installations to ensure compliance with AS4747.*

**Action 9:** *SRW will review its application processes to ensure correct meter selection and installation procedures are being followed.*

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## 4.3 Meter Tamper Evident Seals

Each meter installation required tamper evident seals to be fixed onto the meter. These seals alert SRW when a meter has been tampered with and opened when it shouldn't have been. Figure 17 is an example of tamper evident seals installed on a SRW flow meter. SRW does not currently store data on tamper seals in its asset register. While SRW has not been capturing this data, all meters will have tamper evident seals installed. This data will now be captured moving forward as inspections of flow meters occur, to be in-line with state policy.

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**Action 10:** *SRW will capture and store data on the tamper evident seals against the flow meter asset in Authority AMS.*

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*Figure 17 - Example of tamper proof seal installed on an SRW flow meter*

## 4.4 Meter Validation

Meter validation is the process of a certified meter installer (CMI) inspecting a flow meter in its operating environment and validating that it has been installed in a manner that is compliant with AS4747. A certificate of validation should be produced with the CMI's details and signature. Validation can provide confidence that the flow meter is behaving to the degree of accuracy specified by the manufacturer. SRW currently validates all its flow meters as they are installed in the field. To be compliant with state policy, SRW also need to re-validate meters on a five yearly basis.

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**Action 11:** *SRW will set up a meter validation register where validation certificates by CMI's are to be stored.*

**Action 12:** *SRW will use a scheduling program to implement a five yearly validation program for meters already installed*

**Action 13:** *SRW will assess the current state of CMI accreditation for its staff and set up a suitable on-going training program.*

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## 4.6 Meter Replacements

As flow meters age over time, they become more susceptible to breaking and issues. SRW encourages customers to report when their flow meter is no longer working so a replacement can be organised. In these cases, a replacement meter is provided to the customer to engage a contractor to install. The installation of the new meter is then validated as discussed in section 4.4. Meters can also be flagged as broken or not working at the time of meter reading or inspection in which case the Water Management Officer works with the licence holder to organise a replacement. The meter replacement processes in place at SRW may change into the future following the development of the asset class plan discussed in section 4.1. All meters flagged for replacement will be replaced with an AS4747 compliant meter. SRW will complete a market scan and technical review of available meters and select a suitable meter type to be used as the preferred replacement meter moving forward.

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**Action 14:** *SRW will select a preferred AS4747 compliant flow meter or meters that will be used to replace existing meters that are flagged for replacement or have reached the end of their useful life*

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## 5.0 Metered Data Management

### 5.1 Approach to Data Management

#### Where does SRW store data related to metering?

Metering and AMR data currently flows across several different internal systems at SRW. Table 3 summarises the type of data and the system in which that data is housed.

*Table 3 - Data systems used by SRW for metering information*

Data	What is it?	Primary System
Meter Asset Information	Information regarding the meter asset. This includes information around the make, model, size of the meter.	Authority AMS
Meter Usage information – No AMR	The totalised volume usage on the meter and the date and time of the meter read	IPM
Meter Usage Information – With AMR	The totalised volume usage on the meter shown over time	Aqualus
AMR Asset Information	Information on the AMR unit including serial number, date of install, pulse rates etc.	Aqualus
Licence Information and Conditions	All information related to licence conditions	Victorian Water Register

### 5.2 Meter Reads

#### Groundwater and Rivers

Meter reads are currently undertaken twice a year by our field officers in their corresponding region. Reads occur in the middle and at the end of the water year. Ad-hoc meter reads can also occur when requested by licence holders or if our telemetry equipment is registering a fault and needs to be checked.

#### Manual Meter Reading

Manual meter reads are recorded in a field app called 'Meter connect' which is a part of the Rubicon software suite. Data flows through from meter connect into IPM where it is stored against the service point and licence number. This data is then used to report against the Victorian Water Register at the end of the water year.

## Meters with AMR

A daily transfer of data occurs between the AMR data storage software Aqualus into IPM. Flow meter usage is stored against the service point and licence number which is then used to report against the Victorian Water Register at the end of the water year. A manual, on-site meter read still occurs for meters with AMR installed. The manual meter read is an opportunity to check that the data we obtain in Aqualus is matching the number on the meter head.

### What happens if the data from AMR doesn't match the manual meter read?

When installed and configured correctly, the data obtained through AMR will match the flow meter. If there is a difference in the data and the value on the physical meter, an investigation is undertaken to identify the cause of the disparity. In most cases, a manual read of the meter will be used to correct the AMR unit.

## 5.3 Internal Audits of Metering Data

SRW will interrogate the meter usage data it collects to pick up on and correct errors. These checks aid us in making sure our data is accurate and reliable. Examples of the types of checks we undertake are summarised in table 4 below.

*Table 4 - Checks & balances to ensure data accuracy*

The Check	What we do
Comparing Asset information across systems	Every single flow meter has a unique identifier that is stored across each system. This identifier allows us to check that identifier in each of our systems to make sure the information matches
Comparing annual usage values to the previous year	A report is run following the completion of in-field meter reads to compare the read against previous year's meter reads. This allows us to find any large discrepancies or cases of human error with meter reading prior to reporting
Comparing meter read to an estimated water use	Our meter reading software provides meter readers with an estimated usage value when they go out to visit a site. This estimate is based on previous year's usage and their total licence volume. Meter readers can use this as a sanity check when out in the field to see if the meter is behaving correctly. Meter readers can flag sites as requiring investigation if there is a significant mismatch.



## 5.4 Automated Meter Reading & Telemetry

Around a quarter of SRW's meter fleet has an automated reading unit (AMR) installed. At SRW, they are referred to as tags. Figure 18 is an example of an AMR unit installed on one of our metered sites.

A Tag is the type of AMR unit that SRW uses to monitor live water usage at metered sites. As water flows through a meter and the usage numbers tick over, it generates a pulse. The number of pulses is tracked by the tag. The tag then sends the number of pulses to a receiver where it is transferred to the cloud. While in the cloud, some extra data processing is done to multiply the number of pulses by the specified pulse rate for that meter. The resulting number is the volume that has passed through the flow meter. This data is available to SRW through a data portal called Aqualus.

State policy requires that tags be installed on every flow meter where accurate metering is required. Around a quarter of SRW's flow meter fleet has AMR installed with planning being undertaken for the remaining sites to have AMR installed. Figure 19 below is a screen grab from our AMR data portal that shows the current number of sites with AMR installed in SRW's region. SRW will continue to follow its capital delivery processes to get AMR installed on each metered site.



Figure 18 - Example AMR Taggle unit

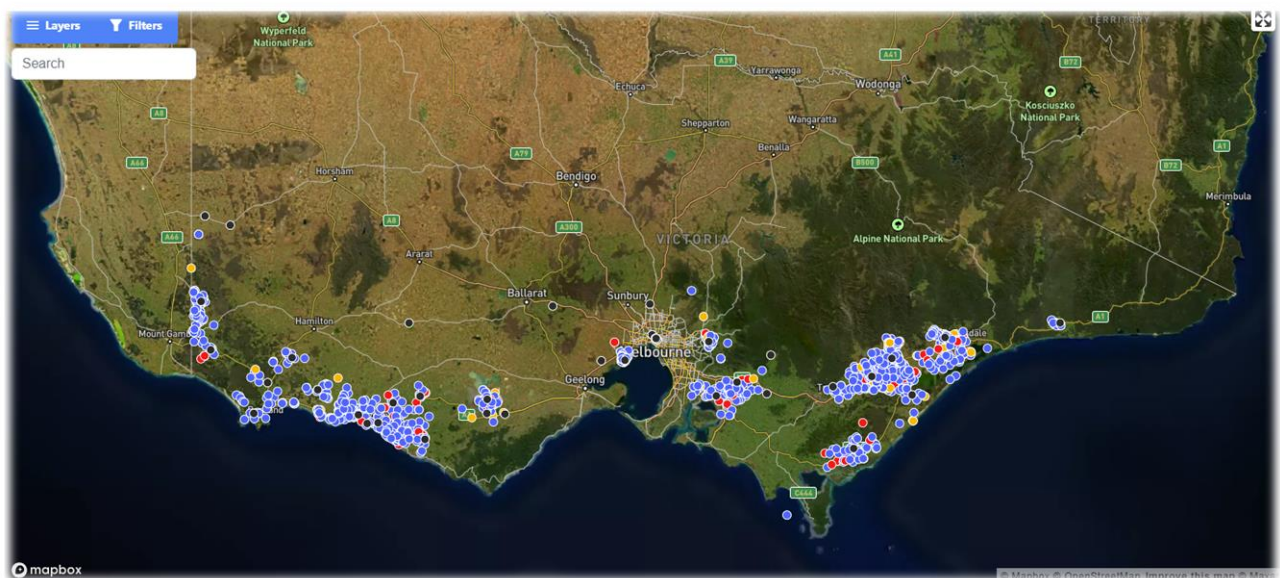


Figure 19 - AMR Taggle units across SRW's service region

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**Action 15:** SRW will follow its capital delivery processes to get AMR units installed on each metered site.

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## 5.5 Annual Reporting

SRW is required to report on the state of its metering and AMR assets to DEECA annually. This data is made publicly available on DEECA's website. The data is used to inform DEECA on how compliant SRW is with Victoria's non-urban metering policy. Annual reporting on the compliance of SRW's meter and AMR fleet enables transparent conversation around metering, data accuracy and compliance.

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**Action 16:** *Each year SRW will complete DEECA's annual reporting requirements in an accurate and timely manner*

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## 6.0 Our Improvement Plan

SRW is committed to achieving full compliance with Victoria's non-urban metering policy. Actions have been identified through out this document that will help SRW achieve this. Figure 20 is a summary of the actions identified within this plan.



Figure 20 - SRW's improvement actions

# 7.0 Glossary & Abbreviations

## Glossary

Term	Definition
Bulk water meter	a meter for measuring the flow under the approved bulk entitlement metering program
Contemporary standard	also referred to as interim standard, and contemporary at the time the meter was installed, is a standard under which an installed water meter is likely to meet the $\pm 5\%$ accuracy range, and which has a manufacturer's certificate of accuracy of $\pm 2.5\%$ and has been installed to manufacturer's specifications
Domestic & stock use	the Water Act 1989 provides this definition of domestic and stock water use: "domestic and stock use", in relation to water, means use for— (a) household purposes; or (b) watering of animals kept as pets; or (c) watering of cattle or other stock; or (ca) in the case of the curtilage of a house and any outbuilding, watering an area not exceeding 1.2 hectares for fire prevention purposes with water obtained from a spring or soak or water from a dam; or (d) irrigation of a kitchen garden— but does not include use for dairies, piggeries, feed lots, poultry or any other intensive or commercial use."
Dozer water licence	a water licence that is regularly inactive for significant periods of time. The term is often used interchangeably with 'sleeper' water licences
High risk take	is defined in this policy as take that is more than 5,000 megalitres average annual usage for an individual service point, excluding take under bulk water metering.
Licence volume	is the maximum volume that the take and use licence holder is authorised to take under that licence during a water season or during any shorter period of take stated in the licence.
AS4747 compliant meter	a water meter that has been either pattern approved or verified in conformance with the processes and procedures outlined in AS4747 – Meters for Non-Urban Water Supply, which sets the technical specifications for non-urban water meters as well as the installation, calibration and maintenance processes required to achieve pattern approval conformance (Standards Australia, 2013).
Meteorological assurance framework	is part of the National Framework for Non-urban Water Metering and sets out the key requirements to make sure there is an acceptable level of confidence in meter performance.
Non-urban water metering	is water metering used as the basis for levying a charge and/or monitoring compliance with an entitlement and/or related resource management activities in a non-urban setting 15 non-urban metering does not include: • stream gauging stations or groundwater infrastructure used for resource monitoring. • meters used in urban supply and distribution systems where water is treated to a potable standard
Pattern approval	is a process for verifying the accuracy of a water meter, where the National Measurement Institute examines the pattern (design) of a meter prototype against the requirements of AS4747.
Take and use licence	is a fixed term entitlement to take and use water from a waterway, catchment dam, spring, soak, or aquifer. Each licence is subject to conditions set by the Minister and specified on the licence.

Validation	inspection and/or testing of the meter and installation by a certified validator to make sure there is enough confidence that it operates within the maximum permissible limits of error of $\pm 5\%$ allowed when installed.
Verification	a process or procedure for independently assessing the accuracy of a meter. This can be done in a laboratory to test the meter only, or in the field to test the meter performance in existing conditions.
Water register	A centralised database used to track water consumption against annual licence limits

## Abbreviations

ACP – Asset Class Plan

AMR – Automated Meter reader

AMS – Asset Management System

AS4747 – Australian Standard for non-urban meters

G&R – Groundwater & Rivers

NMI – National Measurement Institute

MAF – Meteorological Assurance Framework

SRW – Southern Rural Water