

An aerial photograph of a wide river with a dam in the distance. The banks are heavily forested with green trees. The water is a deep blue color. The sky is clear and blue.

Industry Technical Forum on Water Metering and Telemetry

Technical Forum Feedback Report

6 August 2018

Industry technical forum on water metering and telemetry

In March 2018 as part of the Water Reform Action Plan (WRAP) the NSW Government released a consultation paper about water take measurement and metering, and held a series of meetings seeking the community's views on how a robust metering policy could be implemented in NSW.

After consideration of the feedback from community, industry and stakeholders, a draft NSW metering policy for non-urban water metering was released, and the Water Management Amendment Act 2018 was introduced setting up a framework to implement a more robust metering policy.

A copy of the NSW metering Framework can be accessed [here](#)

Consultation with the community on the regulation and policy is scheduled for 27 August – 30 September 2018.

As part of the policy and regulation development process, the Department of Industry-Lands and Water (Department) convened an Industry Technical Forum to seek advice on the technical and operational aspects of the proposed metering policy, particularly telemetry, data requirements and options for in-situ verification of meters. Over 70 people attended, including water users, meter and telemetry manufacturers and installers, relevant state and Commonwealth government agencies, and academics with expertise in hydraulic engineering, data and telecommunications.

The forum was highly constructive and provided practical “on the ground” information that has been used by the Department to shape the metering framework, and ensure the approach will achieve the Government’s objectives, is practical to implement, and importantly is cost effective.



The purpose of the forum was to test the practicality of the proposed requirements and assist the development of the metering regulations and policy to ensure they are practical and do not have unintended consequences. The forum addressed specific discussion questions on requirements around:



Metering particularly in-situ verification



Telemetry data requirements, data format, data security, maintenance and 'black spots'.

The overarching messages from the forum were:

- Certainty is important – there needs to be a clear and credible regulatory system.
- There are many complicated and inter-related aspects – it will be necessary to identify flexible and creative solutions to meet the required outcomes.

- Economies of scale – there are clear opportunities for efficiencies in delivering metering and telemetry services.
- Cost implications – there is a need to minimise/ manage cost implications of the reforms.

Specifically for metering:

- There are technology options available for in-situ verification for a range of meters (including open channel) that are reasonably accurate/ reliable.
- Consideration to be given to the cost effectiveness of verification, particularly in remote areas.
- The practicality of undertaking in-situ verification needs to consider a range of variables (e.g. where infrastructure might be buried) – this should be reflected in fit-for-purpose regulation or guidelines.
- Concerns were raised here may not be enough suitably qualified persons to undertake in-situ

accuracy verification within the proposed staged roll-out timeframes – if new training programs are required they will have lead times.

Specifically for telemetry:

- Data security is important – need to be clear on who owns and manages the data, and whether the water user can access data for their own purposes.
- There are technology options available to overcome communication black spots – but different options have different potential costs.
- Data required to be captured includes at a minimum: the water user, date, time and quantity of water taken. It was suggested that this information should be transmitted daily.

The following provides a more comprehensive summary of the feedback received that was directly related to the questions posed by the Department during the forum.



Telemetry System

Metering: In-Situ Verification

What technologies are available for in-situ verification and how reliable are they?

- A number of technologies, and methods were identified for in-situ accuracy verification including:
 - Velocity: Strap-on Ultrasonic and Laser
 - Dye tracers/salt: dose with something that can be detected, mixing and velocity to be considered
 - Flow-rig: potentially an expensive option
 - Dongle in-situ verification tool
 - E-health check: alarm when out of spec
- Stakeholders highlighted different levels of reliability/accuracy within the range of technologies that were identified and that there are no clear standards that apply.
- It was noted that there is no point verifying a meter if it has not been installed accurately, highlighting the importance of validating existing meters as a first step.
- It was suggested that a flexible regulatory approach was needed that could provide options for differing circumstances and variabilities (e.g. buried infrastructure).

Is in-situ verification of accuracy feasible for all types of installations, and within the timeframes proposed for the five year staged roll out? If not available, is there an effective alternative?

- As a principle, it was noted where water is measured, accuracy can be verified.
- It was suggested most types of installations can be verified, including open channels, however there

may be issues around accuracy/cost associated with large diameter pumps.

- A number of stakeholders noted the need to build a credible and robust in-situ verification regulatory framework that incorporates flexibility, as well as protecting consumers and workers. Consideration should also be given to grandfathering or amnesty provisions where there are exceptional circumstances.
- Cost implications were raised. For example where existing infrastructure may require excavation, or is remote it may be expensive to undertake a single in-situ verification.
- It was also suggested it may be more feasible in some cases to replace a meter rather than test for accuracy.
- A stakeholder noted that open channel verification through ultrasonic and radar technology is cost effective.
- A staged roll-out was suggested as a way of achieving economies of scale by focussing on particular regions (e.g. reduced travel times and greater competition from verifiers).
- There was general agreement that in-situ verification could occur within the five year period provided there are clear rules, a flexible approach is taken, and there is a focus on high risk areas in the first instance.

Are there people in the market with appropriate expertise for in-situ verification? If not, what can be done to fill the gap?

- There was a general view

there is not currently a sufficient quantity of people with expertise to undertake in-situ accuracy verification. However, it was acknowledged that the market will be able to respond in a timely way provided there is a clear regulatory regime established, and sufficient certainty around the requirements.

- It was noted there were some people in the market at the regional level with in-situ verification experience.
- It was suggested that a set of accreditation standards could be established and that Irrigation Australia and Australian Hydrographers Association (AHA) would have expertise in this area.

For irrigation installations where it may not be feasible to install a pattern approved meter in compliance with AS4747, can in-situ verification processes provide an adequate pathway for ensuring these meters are accurate, auditable and verifiable?

- It was suggested that there may be limitations for obtaining pattern approved, AS4747 compliant meters for open channels and large diameter pumps.
- A stakeholder suggested open channels could be verified in-situ to +/- 5% cost effectively using ultrasonic and radar technology. It was also suggested that flow gauging can be used for verification of open channels.



Lateral Move Irrigation System

Telemetry

Data requirements: What are the most effective and cost efficient options for frequency of data capture and transmission? How long should the data be stored within the data logger?

- There was general agreement that compliance with minimum requirements around data and transmission would not be an issue.
- The cost will vary depending on the service provider (e.g. high frequency of data transmission via satellite is associated with a higher cost than say 3G). Options put forward for data transmission include 3G, 4G, satellite,

LoRa data network and broadband. There was general agreement there are a range of options for transmission of data that have varying cost implications.

- There was general consensus that data should be kept for a minimum of one year.
- Data security was raised as an issue, particularly when a third party is involved. Suggestions were put forward that a chain of custody needs to be proven.
- It was suggested that the Government will need to prescribe requirements, content and needs for data as this will determine

the options for the data format and frequency requirements.

- Limits on data logger storage are associated with the Secure Data card (SD card should be larger) and generally there is redundancy in meters (i.e. data is recorded in meter before the data logger).
- It was suggested that the transmission of data could be risk based. For example, it could be required daily at a minimum, with more regular transmission for higher risk areas.



Telemetry System

Data format: In what format does the data need to be collected and/or transmitted? What data protocols are required to ensure that data can be ingested and analysed efficiently by Government, and also accessed by water users for use on farm?

- There were suggestions put forward that the Government needs to issue a data template that prescribes the content and the need for the data, and the market will respond accordingly. This could include user, date, time and water usage as well as condition monitoring data. It was suggested that the regulations should include what is required to be reported and supporting policy could include formats that the data should be provided in.
- It was suggested that the required data format will depend on what part of Government will be using the data.
- There was general agreement amongst stakeholders that the farmer/irrigator should be able to access the data, which will ensure compliance with requirements, as well as provide opportunities for improved on-farm management practices.
- The cost of a smart logger versus a smart system was discussed. It was suggested that a basic and low cost data logger could be used if the system had the 'smarts' (i.e. data is sent back to a smart system that does the analysis).

Security: What are the security risks associated with the transmission of meter data? What measures could mitigate these risks?

- There was a substantial discussion around who would own/manage the data obtained from the meter and telemetry network. It was suggested that the data could theoretically be owned by a number of stakeholders including the service provider, a third party data storage provider or the Government.
- A range of risks/issues were raised depending on who owned/managed the data including:
 - breach of data including tampering with results, theft of commercially sensitive information etc.
 - who is responsible if there is a malfunction, error, or breach of security in data collection and storage?
 - installers, or other parties, manipulating/tampering with the parameters and data outputs (not the physical meter) to falsify results. This could occur at both the local level or more systemically across the entire water data collection network.
- Whilst the risks were acknowledged, there was a general view that any regulatory system should be proportionate to the actual level of risk.
- Mitigation measures suggested included:
 - a certain regulatory regime proportionate to the level of risk.
 - clarification about access to and ownership of data.
- With regard to data access, a number of

stakeholders suggested the farmer/irrigator should be able to access any data collected about their own water usage which could also have significant benefits for on-farm practices.

Maintenance: What is the best practice maintenance for telemetry? What is a reasonable timeframe for telemetry equipment to be repaired?

- Some stakeholders differentiated between physical repairs to the infrastructure, compared to faults, and the need for different regulatory requirements.
- Physical maintenance requirements were primarily identified as solar panel maintenance/cleaning and/or battery replacement. It was suggested maintenance of physical infrastructure should be undertaken every 1-5 years.
- It was suggested that anywhere between 10 business days and up to 3 weeks would be reasonable timeframes for faulty telemetry equipment to be repaired. This takes into account travel time and ordering/repair of parts.
- During the down time, the meter could be required to have a certain amount of storage if the telemetry system failed.

Black spots: What are the options of telemetry systems to operate in mobile network 'black spots' and how does this affect costs?

- There was a general view that transmission black spots can be overcome relatively easily and often cost effectively with current technology.
- A range of alternative options were discussed which overcome black spots and are cost effective.
- It was noted that satellites can cover any area - the key issue is the cost of accessing the transmission network. It was also noted by a stakeholder that data loggers can be adaptable for reporting if there is limited coverage.
- It was also suggested that telemetry requirements should be flexible enough to ensure that they allow a range of transmission providers to ensure flexibility for future technological advances.



Image: Barwon River

More information

NSW Department of Industry
industry.nsw.gov.au/water-reform
Ph 02 9338 6600



© State of New South Wales through Department of Industry 2017.
This publication is copyright. You may download, display, print and reproduce this material provided that the wording is reproduced exactly, the source is acknowledged, and the copyright, update address and disclaimer notice are retained.

PUB17/895