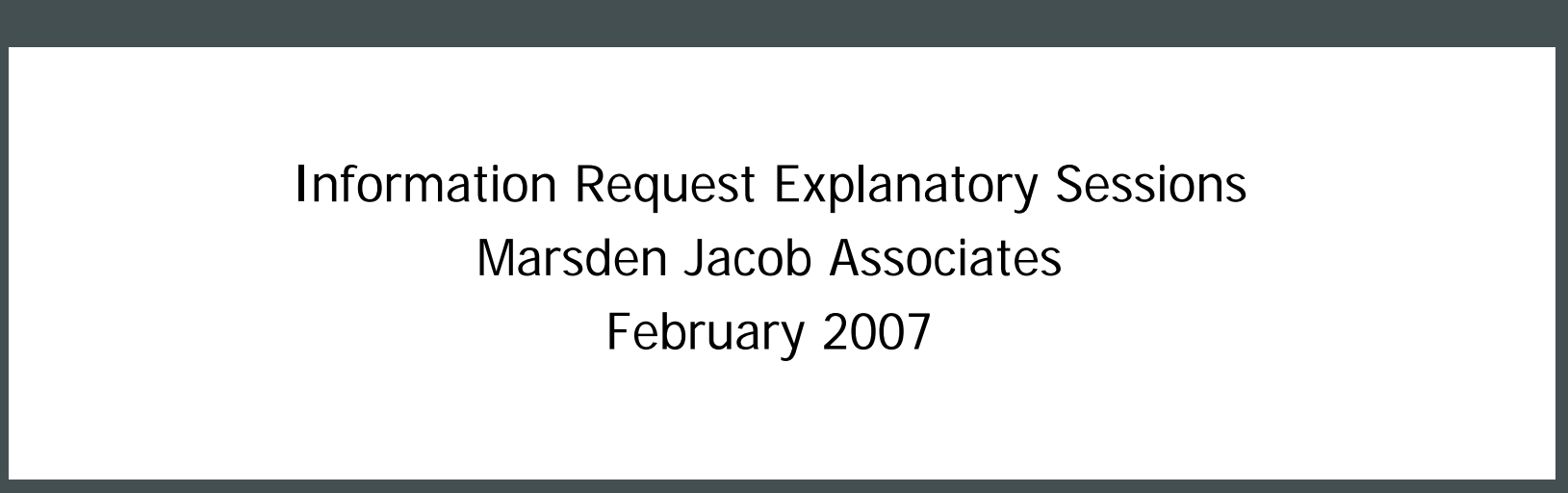




NATIONAL WATER INITIATIVE
METERING AND MEASUREMENT
IMPLEMENTATION PLAN PROJECT



Information Request Explanatory Sessions
Marsden Jacob Associates
February 2007

Agenda

- **Session 1:** Introduction
- **Session 2:** Background to Information Request
- **Session 3:** Info. Request Schedule 1 - Regulatory framework for implementation of metering standards
- **Session 4:** Info. Request Schedule 2 - Cost impacts and barriers to implementation of metering standards
- **Session 5:** Questions and Answers

Introduction

- What Plan Consultant is required to deliver.
- Outline purpose of Information Request.
- Outline process for session and follow-up.
- Outline issued to be covered in session.
- Outline of issues not covered in session.

Implementation Plan Consultants

- Marsden Jacob Associates appointed by DAFF to assist NWI Metering Expert Group deliver a National Meter Implementation Plan.
- Economic consultants with particular expertise in infrastructure and natural resource economics.
- Considerable experience in the water sector Australia-wide.
- Team Members:
 - Dr Jeff Washusen (MJA)
 - Mark Nayar (MJA)
 - Kym Whiteoak (MJA)
 - Technical support provided by Graeme Armstrong (Ecowise)
 - Economic cost-benefit analysis provided by Peter Kinrade (MJA)

Implementation Plan Consultants (cont.)

- MJA is required to develop a plan to assist with implementing new water meter standards across all jurisdictions.
- Output is a detailed implementation plan focussed on actions required by the Australian Government; but also identifying actions required by other jurisdictions.
- Work to date on development of standards appears to assume implementation through removal of exemptions from 'trade measurement' obligations for water meters, with 'meter owners' required to comply with laws governing 'trade measurement' in each jurisdiction.

Information Request

- Seeking information needed to assess and develop recommendations for implementation of the metering requirements.
- Focus on two key areas:
 - Existing institutional arrangements that control and regulate metering standards, including cost recovery.
 - Scale of impact and cost of achieving compliance.
- MJA recognises that major impacts will be in 'bulk water' and 'non-urban' metering – primarily because 'urban water meters' meet existing standards (NMI R 49; AS 3565.1-2004) and installation arrangements have generally been standardised through industry Codes of Practice.
- However, information is required for all water metering to allow consideration of options that would achieve the greatest practicable level of consistency across sectors and jurisdictions.



- This installation (most likely) meets current 'urban' water meter standards.
- But MJA's *ad hoc* inspection identified local urban metering installations that appeared non-compliant.
- MJA also seeking assurances that the urban sector complies with recognised meter accuracy standards.
- Is there justification for water authorities to specify different installation details – as occurs in NSW?

Session Outline and Process

- Stay more-or-less with the distributed agenda.
- Focus on issues contained in the Information Request – as well as queries arising from your reading of the document.
- Seeking to assist understanding of what is required and why.
- Welcome active involvement and discussion.
- Issues raised and responses will be circulated to all Information Request recipients.

- Will not cover issues associated with the Prime Minister's 10 Point Plan other than note that page 8 makes a commitment to $\pm 5.0\%$ in-field accuracy and refers to \$600M in initiatives related to improved metering and data capture *so that water diverted for irrigation more accurately matches entitlements.*

Session 2: Background to Information Request

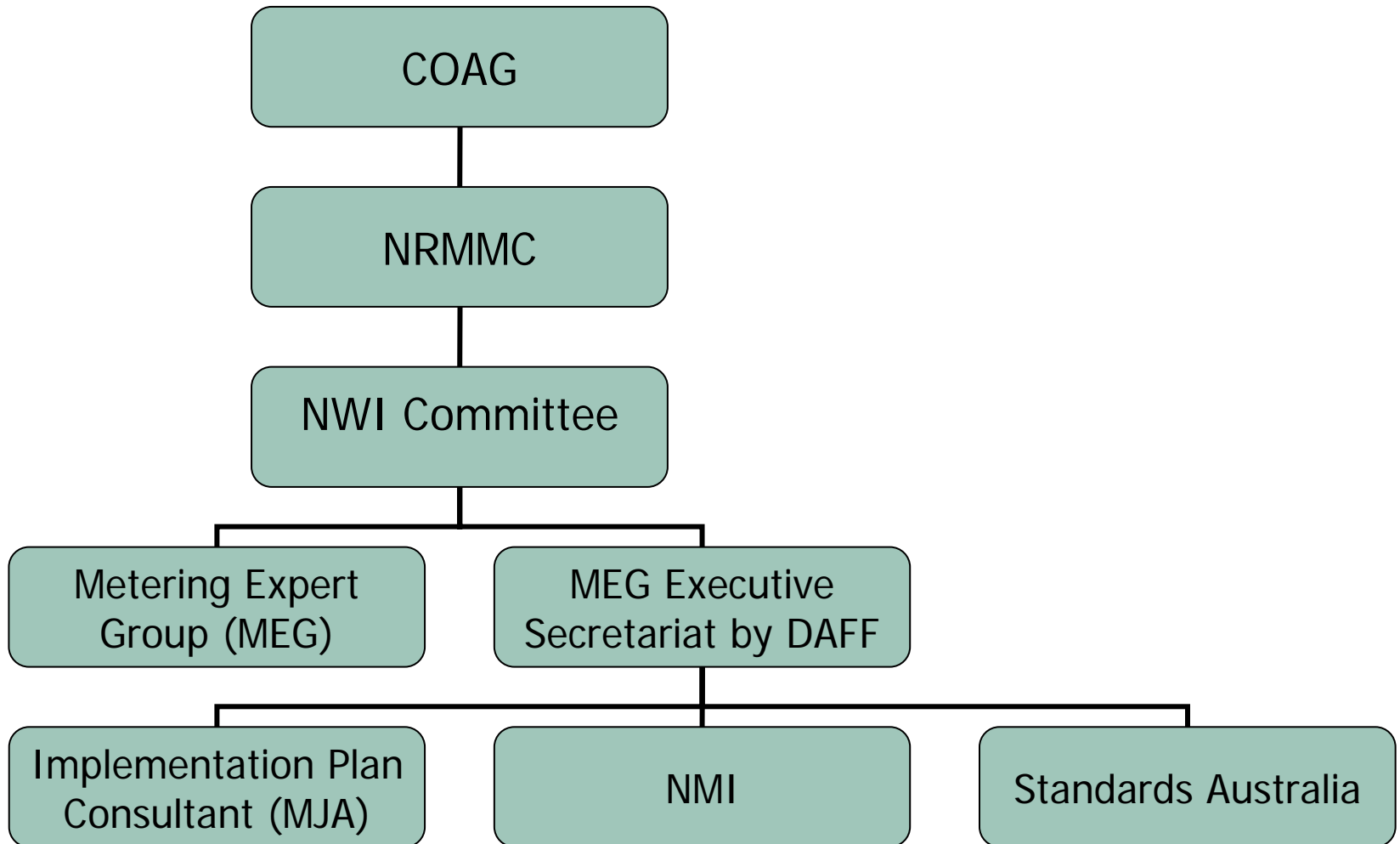
Background to Information Request

- NWI metering requirements
- Development of metering standards
- Metering Implementation Plans

Project background

- Clause 88 of the National Water Initiative specifies that nationally consistent standards and specifications for water metering are to developed by 2006 and applied by 2007.
- Clause 87 specifies that metering should generally be undertaken on a consistent basis in circumstances involving water entitlements, water plans, water trading, water resource disputes and as a response to community demand.
- Draft metering standards and specifications currently being developed by the National Measurement Institute (NMI) and Standards Australia (SA) under the auspices of the Natural Resource Management Ministerial Council (NRMMC).

Project Governance



Progress to date

- NMI and Standards Australia have developed (or are developing) draft standards for 'non-urban' metering – generally based on existing standards for 'urban' metering (NMI R 49; AS 3565.1-2004).
- Documents prepared by the NMI state that a water meter accuracy requirement of $\pm 2.5\%$ in laboratory tests and $\pm 5.0\%$ in field tests is an assumption subject to discussion.
- General consensus appears to be that $\pm 5.0\%$ is a reasonably achievable goal although Dethridge wheels can't meet that standard in practice.
- NMI and Standards Australia have suggested that 'uncertainty' assessment rather than 'accuracy' assessment be applied for some metering arrangements.
- There has been no consistent examination of the potential impact of the proposed standards across all sectors and jurisdictions.

Progress to date (cont.)

- The MEG has identified a range of measurements that are not included in the standards that are being developed.
- The NRMMC agreed in principle to adopt $\pm 5.0\%$ in-field accuracy at its Nov 06 meeting – subject to jurisdictional advice on implementation strategies to be considered at the Apr 07 meeting.
- The NRMMC also agreed that accuracy specifications for ‘bulk water’ off-takes be developed and implemented as a priority – although MJA notes proposed standards do not define ‘bulk water’ and a wide range of technologies is employed in metering ‘bulk water’.
- As noted earlier, the Prime Minister’s statement also makes a commitment to $\pm 5.0\%$ in-field accuracy.

Scope of the Information Request

- The Information Request is seeking estimates of scale and cost associated with bringing:
 - all non-urban metering into compliance with $\pm 5.0\%$ in-field accuracy; and
 - all urban metering into compliance with NMI R 49 ($\pm 4.0\%$ in-field accuracy).
- MJA also welcomes input/views on issues related to the feasibility of achieving compliance over varying timeframes and varying priorities. For example:
 - Resourcing to audit existing metering installations, meter replacement/upgrades, on-going O&M/re-verification; data collection and reporting.
 - Priorities that should follow 'bulk water' and 'irrigation'.
 - Equity between sectors and water users.
 - Meter supplies (given need for NMI pattern approval).

MJA's Tasks

- Identification of barriers to successful implementation of specifications and standards, such as:
 - Cost implications to industry.
 - Cost recovery issues.
 - Operational resourcing by water utilities (and other 'meter owners') to install, maintain and test/recertify technology.
 - Different approaches to setting and managing standards across jurisdictions.
 - Availability of appropriate technologies that conform to new requirements.
- Develop recommendations to address barriers and facilitate implementation.
- Given concept, policy and key details already agreed, MJA is inclined to focus on recommendations to achieve implementation across all sectors in the shortest practicable timeframe.

Tasks (cont.)

- There appears to be consensus that availability of appropriate technologies is the least material issue. Meter manufacturers say accuracy for measuring elements is readily achievable.
- However, MJA expects 'pattern approval' of metering installations is likely to lead to 'rationalisation' of metering technologies and suppliers – as well as installation techniques, re-verification procedures and even operating and maintenance practices.
- That, in turn, requires consideration of issues related to the status of existing metering arrangements that:
 - do not have pattern approval;
 - do not comply with 'acceptable' installation requirements; or
 - require significant (or any) maintenance.

- MJA understands and accepts that there are water metering applications that either cannot practically meet the proposed accuracy/uncertainty standards in a 'black letter' sense.
- MJA also understands and accepts that there are situations where in-situ re-verification will either be physically impossible or excessively costly.
- In addition, MJA understands that the MEG has identified a number of measurement requirements for which standards are not yet being developed.

Nature of costs arising from consistent metering standards

- Depending on the number of non-compliant installations, implementation costs may be substantial.
- Costs are certain to be strongly influenced by:
 - Accuracy standard finally adopted – and the supporting regulatory/compliance regime.
 - Accuracy of existing installations.
 - Grandfathering and exemptions
 - Available technology and technically skilled resources.
 - Scale of activity required to achieve compliance.
- There could also be substantial organisational and resourcing costs – and time – to implement legislative changes and establish regulatory/compliance regimes.
- Further issues not covered in the Information Request relate to the cost of establishing improved data collection and reporting arrangements. This will be dealt with by MJA after March 2007.

Nature of benefits arising from consistent metering standards

- Implementation benefits are also likely to be substantial, but significantly more difficult to quantify.
- The NWI suggests benefits are achievable from:
 - Identifying over-allocated water systems, and restoring those systems to sustainable levels.
 - Facilitating expansion of the trade in water.
 - Increased confidence for those investing in the water industry.
 - Aids more sophisticated, transparent and comprehensive water planning.
 - Assists better and more efficient management of water in urban environments, for example through the increased use of recycled water and stormwater.
 - Managing disputes over water sharing.
- Nobody should assume implementation of the proposed metering standards would not proceed even if compliance costs are large. For example, large investment in improved metering and reporting delivered substantial benefits in the National Electricity Market – although this investment did not deliver 1kWh more electricity to consumers.

Session 3: Information Request Schedule 1 - Regulatory framework for implementation of metering standards

Regulatory framework for implementation of metering standards

- Nature of current regulatory framework
- Current regulatory arrangements
- Possible future regulatory arrangements
- Barriers to implementation
- Estimates of implementation cost and timetable

Institutional/regulatory arrangements

- Existing 'regulation' of metering standards is achieved through a range of controls. These include:
 - Legislation
 - Regulations
 - Industry Codes of Practice
 - 'Meter owner' policies, practices and procedures manuals
 - Pricing and cost recovery arrangements
- The first part of Schedule 1 shows a simplified summary of MJA's initial 'first cut' analysis of existing water sectors that might be subject to differing regulatory detail.
- Detailed information required for every sector in each jurisdiction to confirm degree of consistency, or otherwise, of regulatory arrangements between sectors and jurisdictions.

Current regulatory arrangements

- MJA is to be provided with information from various jurisdictional trade measurement agencies to confirm hierarchy and coverage of existing arrangements specified in the *National Measurement Act* and Regulations.
- These are important considerations in developing a NWI metering Implementation Plan because:
 - COAG has recommended that all trade measurement roles, functions and powers be transferred to the Commonwealth and the Consumer Affairs Ministerial Council has completed a review that supports that recommendation.
 - This matter is to be considered at the next COAG meeting in April 2007.
 - While not addressed specifically in the latest CAMC review, coverage of all utility meters - including water meters - remains on the agenda for trade measurement reform and is considered a priority by some (if not all) jurisdictions.

■ MJA understands that:

- The NMA overrides exemptions applied to water metering established under the uniform *Trade Measurement Act*;
- Queensland has obtained legal opinion that significant applications for water metering are already subject to NMA requirements and legal remedies for non-compliance; but
- Neither the Commonwealth or States/Territories has yet allocated sufficient resources to establish an effective regulatory/compliance regime.

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- MJA's goal is to develop recommendations for future regulatory arrangements that will be effective in maintaining metering standards whilst seeking to minimise regulatory costs and, as far as practicable, reflect current water industry practice where this can be demonstrated to be effective.
 - The Information Request is seeking information that can be used to develop evidence that effective and efficient 'self-regulation' of metering standards exists (at least in some sectors of the water industry).

Possible future regulatory arrangements

- Lifting of exemptions under the *National Measurement Act* and uniform Trade Measurement Regulations is clearly, and logically, a possible implementation path.
- This may be the simplest administrative process, particularly if all trade measurement functions are transferred to the Commonwealth as recommended by COAG (and supported by the recent CAMC review) – and all utility metering comes under a common ‘trade measurement’ framework.
- However, this is not without challenges associated with:
 - Confirmation by COAG of recommendations supported by CAMC;
 - Providing resources for the NMI (or some other agency) to develop and implement an effective compliance framework;
 - Defining any ‘refined’ exemptions in areas where achievement of ‘black letter’ compliance is practically difficult or physically impossible; and
 - Developing a compliance regime that fits with or parallels existing ‘trade measurement’ practices and viable water industry practice.

Possible future regulatory arrangements (cont.)

- An alternative, and equally logical – but possibly more complex – implementation path would be to ‘tinker’ with existing regulatory arrangements in each sector so that the new standards are ‘called up’ in the relevant documents. This also presents challenges associated with:
 - Ensuring proposed standards are effectively called up in all relevant documents – even where these are ‘internal’ entity specific or sector specific;
 - Ensuring development of a uniform ‘compliance culture’ if there are differing regulatory arrangements;
 - Eliminating differences between sectors that might complicate achievement of lowest cost metering installations; and
 - Eliminating differences within and between jurisdictions that might result in differential treatment of non-compliance.

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- A poor third option would be to allow continuation of any of the current forms of imprecise 'self regulation', particularly if this leads to differential treatment of water user meter owners.
 - As a minimum, MJA would recommend that WSPs be required to formalise all existing industry 'Codes of Practice' and policy, practice and procedures manuals that govern any aspect of metering standards into a consistent and accepted and recognised QA or QMS framework.
 - For example, there appears to be no logical reason why different WSPs should be permitted to specify different forms of installation, inspection or in-situ testing as this results in different outcomes for water user meter owners facing similar circumstances.

- A key challenge is to develop a regulatory regime that fosters an explicit 'culture of compliance', and still allows 'compliance' to be assured in circumstances where it is difficult or impossible to achieve 'black letter' compliance with standards specified in the proposed standards.
- A parallel example exists in the National Electricity Rules where compliance with 'black letter' obligations in the NER is explicitly permitted where an entity can demonstrate *Good Electricity Industry Practice* viz:

The exercise of that degree of skill, diligence, prudence and foresight that reasonably would be expected from a significant proportion of operators of facilities forming part of the power system for the generation, transmission or supply of electricity under conditions comparable to those applicable to the relevant facility consistent with applicable regulatory instruments, reliability, safety and environmental protection. The determination of comparable conditions is to take into account factors such as the relative size, duty, age and technological status of the relevant facility and the applicable regulatory instruments.

Barriers to implementation of regulatory arrangements

- Differing interpretations of NWI Agreement.
- Jurisdictional policies on non-metered sectors.
- Legislative timetables.
- Regulatory resources.

Scale and administrative cost impacts

- MJA is seeking input from jurisdictions on their preferred approach to implement nationally-consistent standards.
- Input is required on potential costs for legislative change, establishing/reinforcing/formalising regulatory arrangements and on-going compliance framework.
- Note that MJA would be inclined to recommend that adequate resources must be provided to establish and maintain an effective regulatory/compliance regime.
- There seems little point in developing consistent standards and incurring initial costs to comply and then not ensuring standards are maintained in-service.

Session 4: Information Request Schedule 2 – Cost of metering standards and extended coverage

ToR Implementation Plan

- An assessment of :
 - potential compliance costs for business including a breakdown by jurisdiction
 - possible impediments including potential issues for retrofitting, certifying and replacing existing meters
 - resource requirements for NATA accredited test rigs, in service re-verification and ancillary data collection

Two Cost Information Schedules

1. Cost of implementing the metering standards – Clause 88
 - Cost of upgrading existing fleet of meters
 - Cost of replacing non-compliant meters
 - On-going reverification

2. Cost of expanded meter coverage – Clause 87
 - Unmetered sites
 - Stock and domestic
 - Groundwater
 - Overland flow
 - etc

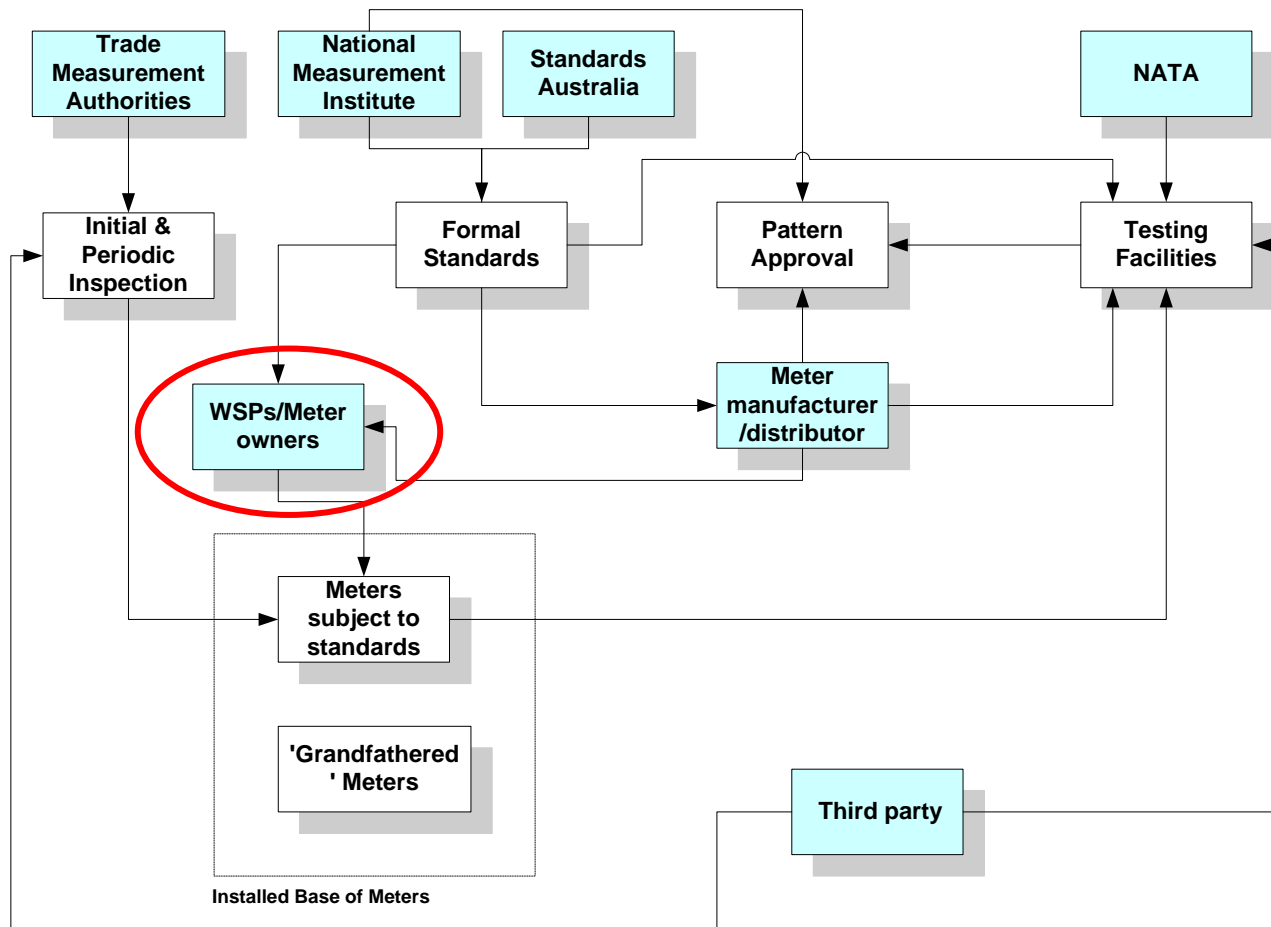
Scope - Meter Standards

- Clause 87 is broadly worded
- For costing purposes, MJA has taken the broadest interpretation
- Urban
 - Residential
 - Industrial/Commercial
 - Stormwater
 - Tradewaste
 - Desalination
- Rural
 - Irrigation
 - Stock and domestic
 - Groundwater
 - Return flows
 - Floodplain harvesting
 - Stream gauging
 - Hillside farm dams

Timing and information availability:

- The information being sought on meters may not be readily available from existing databases of WSPs and NRM agencies.
- MJA understands that estimating the scale and cost of the changes will require substantial judgement and assumptions.
- It is MJA's view that WSPs and NRM agencies are best placed to make reasonable judgements and assumptions.
- Again information is required for all sectors in all jurisdictions. This will permit consideration of merits of developing a consistent approach for introducing new standards across all sectors and jurisdictions.
- Schedule 2 is based on metering capacity and application. This will permit consideration of practicable 'compliance transition' or phase in arrangements.

Context - 'Trade Measurement (NMA) Route'



1. Expanded Meter Coverage

- Identify un-metered sites
- Determine which sites require metering
- Estimate the cost of metering

Sites to be metered

- NWI Agreement clause 87 states:

"The Parties agree that generally metering will be undertaken on a consistent basis in the following circumstances:

- 1. for categories of entitlements identified in a water planning process as requiring metering;*
- 2. where water access entitlements are traded;*
- 3. in an area where there are disputes over the sharing of available water;*
- 4. where new entitlements are issued; or*
- 5. where there is a community demand."*

Number of unmetered sites

- Non-metered - Licensed water users
 - Licensing database
- Non-metered - Unlicensed water users
 - Educated guess

Take jurisdictional policies into account

■ For example: NSW NWI Plan Commitment

“NSW water licences are issued on the basis that the licensee can be called upon to install and operate equipment to measure water usage. In the past, such measurement has been implemented in the regulated systems to a large extent, but not in the unregulated and groundwater systems. NSW has a draft policy which will see some (but not all) of the licences being metered (while other licences will have less direct methods of measuring usage). By targeting high-usage water-users initially, NSW will be able to get accurate measurements of the majority of water used.”

■ For example: Victorian NWI Plan Commitment

- Meters will be installed in all unregulated surface and groundwater systems to meter >90% of diverted water:
- In water management areas, meters to be installed for existing licences of:
 - 10 ML and greater to take & use unregulated surface water
 - 20 ML and greater to take & use groundwater
 - (unless a lesser volume is specified in a water management plan)
- In areas outside water management areas, meters to be installed for existing licences of:
 - 10 ML and greater to take and use unregulated surface water
 - 20 ML and greater to take and use groundwater (unless a lesser volume is proposed by the relevant WA & CMA)
- Consider policy for metering of all remaining existing licences for commercial/irrigation use.
- New commercial/irrigation use licences to be metered.

Cost of a pattern approved meter

- Base assumption is implementation through 'trade measurement' requiring:
 - Pattern approved meter & installation.
 - Initial verification
 - Verify that meter is the approved type and properly installed.
 - Periodic reverification
 - Frequency of testing
 - Type of testing.
 - Meter reading and data collection.

2. Applying Meter Standards to Existing Meter Base

- Estimate which legacy meters are compliant with $\pm 5\%$ error limit (accuracy or uncertainty) and those which are not compliant.
- Estimate the cost of replacing or upgrading legacy meters that are clearly not compliant.
- MJA recognises this task is extremely difficult in the timeframe available, but believes it is essential that the NRMCC receives advice that includes estimate of the scale and cost impact.
- MJA also believes that WSPs (and meter owners) are best placed to make the judgements and assumptions needed to provide estimates of scale and cost impact.
- In the absence of 'industry estimates', MJA will derive its own estimates based on knowledge of the water industry.

Compliant and non-compliant legacy meter installations

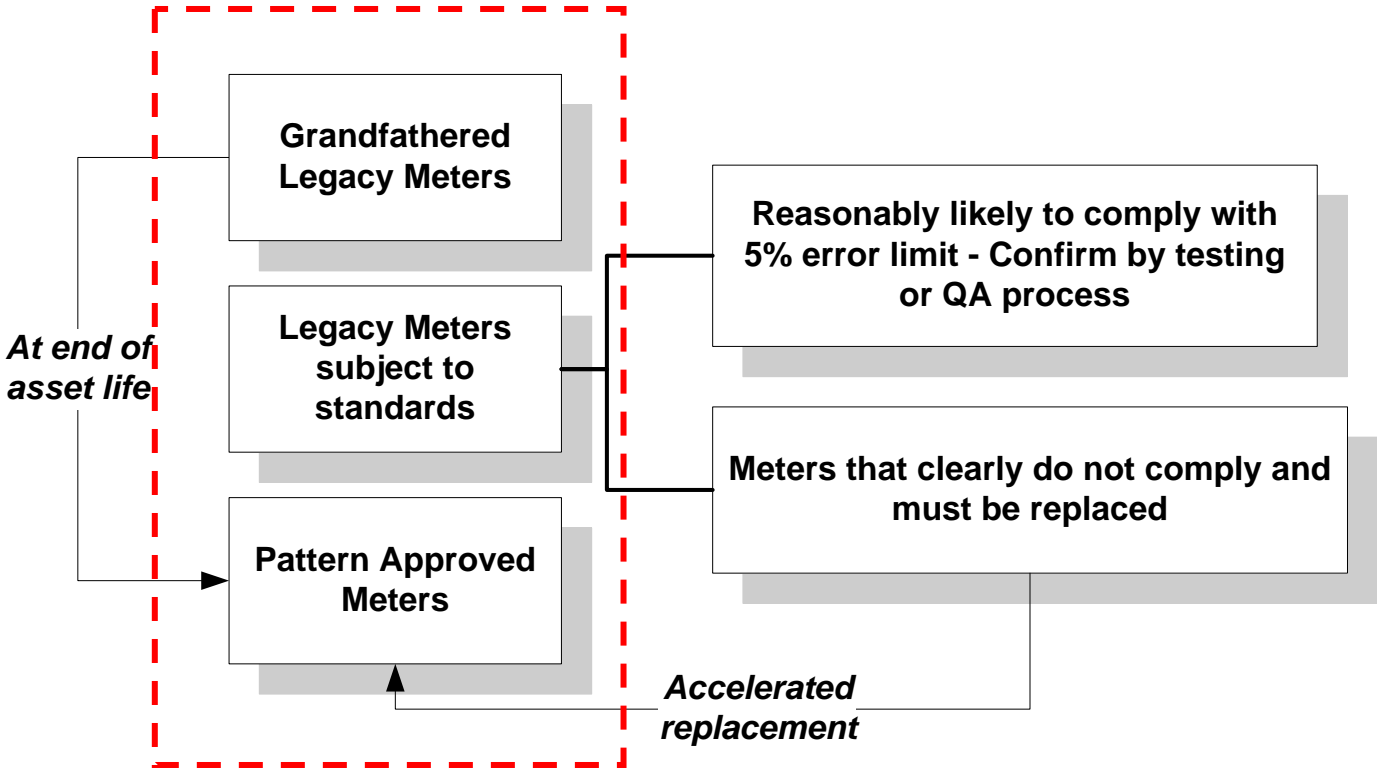
- Some meters and installation in all likelihood do comply with $\pm 5\%$ error requirements.
- WSP is in the best position to assess compliance needs.



Compliant and non-compliant meter installations



Meter 'Fleet'



Quantity of Meters

- Number of compliant meters.
- Number of non compliant meters.
 - By Supply Type:
 - Bulk, gravity irrigation, pressure irrigation etc
 - By Size
 - < 2 ML/day, 2 to 20 ML/day etc
 - MJA has agreed to accept data for the urban sectors based on connection size.

Capital Costs

■ Scope of replacement or upgrade

- Sensor element only e.g. replace float level sensor with a pattern approved ultrasonic device (and ancillary)
- Influence components only e.g. add straight lengths of pipe to a pipe meter to comply with pattern approved installation;
- Full installation e.g. Dethridge wheel and emplacement with a pattern approved doppler meter in a submerged culvert

■ Cost

- Assume base case is implementation through 'Trade measurement' mechanisms
- Capital cost: acquisition, installation, commissioning and initial inspection – pattern approval

O&M Costs

- Across the meter base
- Periodic testing
- Scope of periodic testing
 - Testing of sample of meters in situ or in laboratory
 - Trade measurement standards
 - In-house QA programs
 - Note that MJA's Information Request says we do not propose to collect estimates of in-situ verification and re-verification. However, such information (or views on this issue) is required and input from respondents would be welcome.

Options for Transitioning the Legacy Meter Base

1. No grandfathering or phase-in of standards
 - All meters must comply with metrological $\pm 5\%$ requirement
 - WSPs to commence immediately to upgrade non-compliant meters
 2. Legacy meters grandfathered indefinitely
 - Only new meters must be compliant with the requirements
 3. Existing meters grandfathered but phased out incrementally over 5, 10 etc years
 - Initially only new meters must be compliant with the requirements
 - Once exemptions are lifted WSP must upgrade non-compliant meters
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- MJA will consider other drivers
 - Equity between users over transition period
 - Requirements from NWI Agreement
 - For urban < 4kL/hr meters, option 2 was adopted.
 - Legacy meters exempt (e.g. meters installed prior to 2004).
 - For initial costing assume no phase-in

Feedback/Comments

- Issues/matters to be considered – or excluded from consideration – by MJA in preparation of tasks.
- Further detailed feedback/comments will be sought by circulation of draft reports through jurisdictional MEG members.
- MJA welcomes feedback/comment at any time.

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