



NSW Government

Department of Water & Energy

NSW Water Extraction Monitoring Policy

August 2007

NSW Water Extraction Monitoring Policy

© State of New South Wales through the Department of Water and Energy

ISBN 978 0 7347 5943 6

DWE 07_096

This work may be freely reproduced and distributed for most purposes, however some restrictions apply. Contact the Department of Water and Energy for copyright information.

Disclaimer: While every reasonable effort has been made to ensure that this document is correct at the time of printing, the State of New South Wales, its agents and employees, disclaim any and all liability to any person in respect of anything or the consequences of anything done or omitted to be done in reliance upon the whole or any part of this document.

INTRODUCTION

The accurate monitoring of water extraction from NSW rivers and groundwater sources is essential for the fair and equitable sharing of the State's water.

Monitoring of water extraction:

- ❑ ensures that a scarce and valuable resource is taken according to a person's licensed volume share;
- ❑ protects all individual's rights by preventing "excess" or illegal extraction;
- ❑ ensures licensees are complying with the conditions of their licence;
- ❑ provides an accurate record of how much water is taken, and where and when at the local, regional and state level essential for a range of planning purposes;
- ❑ assists in determining whether environmental outcomes are being achieved;
- ❑ enables water markets and trading to be established;
- ❑ allows the daily flow management in the unregulated rivers and the local management rules in the groundwater systems to be implemented;
- ❑ enables bulk water charges to be based, where appropriate, on water extraction;
- ❑ provides information essential for the Department of Water and Energy (DWE) to monitor, audit and report on the implementation of the water sharing plans.

ROLES AND RESPONSIBILITIES

This Policy sets out roles and responsibilities for DWE, State Water and holders of water extraction licences.

State Water has the responsibility of monitoring water extraction in the regulated system, while DWE has the responsibility in the unregulated and groundwater systems. In some areas, DWE will arrange for State Water to carry out the duties of extraction monitoring; this will be done by way of a service agreement or similar. In this Policy, reference to DWE (or the Department) will also apply to State Water, if State Water has been given this responsibly.

This Policy applies to extraction from water sources in NSW under the Water Management Act 2000 and the Water Act 1912. This includes extraction of water from regulated rivers, unregulated rivers (includes lakes, estuaries) and groundwater sources, and extends to the measurement of return flows under Section 76 of the Water Management Act 2000.

BACKGROUND

While all domestic customers in large towns are metered, as are works for taking water from regulated rivers and some major groundwater sources, most water taken from unregulated rivers and from most underground sources currently is not.

This is because, until recently, landholders taking water from unregulated rivers and the smaller groundwater systems had licences that specified an area that could be irrigated rather than a maximum volume of water that could be taken. This area method provided a simple way to manage water use in these systems when demands were not high. However

with some water sources now fully committed and increasing competition for water, it has been recognised that this management approach is no longer appropriate.

Under the National Water Initiative (to which NSW is a signatory), there is a commitment to measuring the amount of water extracted in the following circumstances:

- i) for categories of entitlements identified in a water planning process as requiring metering;
- ii) where water access entitlements are traded;
- iii) in an area where there are disputes over the sharing of available water;
- iv) where new entitlements are issued; or
- v) where there is a community demand.

Licences on the regulated rivers were converted to a volume basis in the 1980s and licensees were required, as a condition of their licence, to install a meter. Similarly in a number of the highly committed inland groundwater systems, these requirements were also introduced during the 1980s and 1990s. All other irrigation licences across the state on the unregulated rivers and groundwater systems have now been converted to a volumetric share (rather than an area irrigated) licence. Similarly most of the town, industrial and other larger licences specify a volume entitlement or share. Water extraction monitoring needs to be introduced across the state to ensure compliance with these volumes.

There are about 30,000 licences for which water extraction monitoring should be applied. These are split into:

- 6,000 licences on the regulated rivers, with 94 per cent of these already metered.
- 13,000 licences within unregulated river systems, with 1 per cent of these metered.
- 10,000 licences for high-yield bores to extract groundwater, with 34 per cent of these metered.

POLICY PRINCIPLES

The following policy principles apply:

1. Accurate measurement of water extracted has benefits for licensees and will provide the Government with a means of better managing agreed water sharing arrangements.
2. Just as an access licence provides benefits of clearly defined rights to access water, monitoring the water extracted through water supply works is a complementary obligation of the licensee.
3. Measurement systems and monitoring methods must be capable of delivering accurate information at an affordable cost to both the licensee and the Department.
4. Monitoring methods must be appropriate for the scale of the works, the level of water extraction, and the nature of the resource management issues that need to be addressed.
5. This Policy supports the most-appropriate technology for the task at hand, and the wide variety of licences under consideration. Monitoring methods must be able to adapt to changing technology over time.

6. Priority for monitoring is to be given to circumstances identified under the National Water Initiative, including water sources where water sharing plans have been finalised, categories of entitlement that have been identified as being of importance, areas where water-sharing disputes exist, newly-issued licences, or where there is community demand.
7. Water monitoring systems must meet NSW standards, and other national standards as developed, in relation to design, construction and maintenance.
8. Existing non-complying monitoring systems shall be required to meet the standards within an appropriate time.
9. The Policy does not extend to the extraction of water for Basic Landholder Rights. However, when Basic Landholder Rights are taken through a Water Management Act Water Supply Work Approval this Policy applies to the subsequent measurement of water used for Basic Rights purposes and when water extracted through a Basic Rights works enters an extraction system connected to a works approval.
10. If any provision contained in this Policy conflicts with, or contradicts, any policy stated in a management plan or Water Sharing Plan (WSP) made under the provisions of the Water Management Act 2000, then the management plan or WSP shall prevail.

OUTLINE OF POLICY PROPOSAL

While it may be desirable for all water extracted under licences to be metered, it is unrealistic to do this. In particular, for domestic and stock licences, and the majority of licensed dams within harvestable right zones, the installation and overall management costs associated with metering could not be justified. This also applies to those unregulated rivers or low-yielding groundwater sources where most of the licences are inactive, or where there is only infrequent extraction of small volumes of water.

Therefore a risk-based approach to water-use monitoring must be utilised, whereby risks to the natural resource system can be reduced.

Currently water extracted under about 9,300 licences is metered. Over the next 5 years it is proposed to progressively increase this level. This upgrade will start with the large-scale extractors in the priority water sources, before bringing on-line the myriad number of smaller-scale extractors. As well as direct flowmeters, alternative methods of usage-monitoring will be implemented.

This Policy allows for:

- extraction from regulated water sources to be measured by flowmeter, except where exempted by an Operating Plan.
- extraction from unregulated and groundwater sources where considered necessary, such as in most Water Sharing Plan (WSP) areas, stressed water sources (those with limited water availability and very high competition for water), and high conservation value water sources, to be measured by flowmeters.
- the use of other monitoring arrangements where appropriate, such as where demands for water are low, extractions small and infrequent and for domestic and stock licences.

Alternative methods to flowmeters include:

- ❑ calibration of measured electricity consumption against water extraction
- ❑ calibration of a pump's measured operating hours against water extraction
- ❑ calibration of a pump's measured revolutions against water extraction
- ❑ use of a pumping diary to manually record pumping hours
- ❑ combinations of the above

These alternatives to flowmeters require the rating of pump/motor performance against the rate of water delivery, but offer considerable cost-savings because existing equipment can be utilised. However they do have the disadvantage of a much lower level of accuracy than flowmeters, and cannot be considered for use where a high level of confidence is required in the monitoring of water extraction.

The Department will determine which licensees need to be monitored, and the form of monitoring, on the basis of the following:

At the water source level

- Water extractions will be metered in stressed water sources (those with limited water availability and very high competition for water), and high conservation value water sources.
- The WSP areas are the priority areas for the roll-out of this Policy.

At individual level

- Those licence holders who extract sufficient volumes of water to impact adversely on the environment or other licence holders should be monitored.
- Licence holders that want to trade account water must be monitored, preferable by flowmeter, but with the approval of the Department, by electricity, hour or revolution meter.
- Inactive licences or works need not be monitored, but the Department must be notified if the licence and/or the works are to be activated.

OBJECTIVE

The objective of this Policy is to increase the extent of active monitoring of water extraction.

In the regulated rivers, extraction monitoring is generally at an acceptable level, with the vast majority of licences being measured using flowmeters.

For unregulated and groundwater sources, the current level of extraction monitoring is to be progressively expanded, with the aim of having 90% of the total volume of water extracted in each WSP area being subject to active monitoring (by flowmeter or alternative).

When complete, there will be a network of WSPs to cover unregulated water sources and groundwater sources in NSW. The achievement of the above volumetric objective would see a significant increase in extraction monitoring in all parts of the state, coastal as well as inland.

INSTRUMENT STANDARDS, GUIDELINES AND PROCEDURES

The Department, in conjunction with State Water, is currently reviewing and developing an overall package of metering and monitoring standards, guidelines and procedures. The package includes:

- ❑ Standard specifications for flowmeters and monitoring instruments including accuracy requirements.
- ❑ Standard specifications for flowmeter and monitoring instrument sites, including flow-verification sites to allow for checking of the flow rate.
- ❑ Guidelines for the installation of flowmeters.

The package of standards, guidelines and procedures will ensure that future water usage readings are as accurate as possible, will continue to remain so over time and will meet water management needs. These standards will apply to all flowmeters and monitoring instruments (existing and new installations). The standards will be available from DWE offices and are posted on relevant Internet sites.

WHAT DOES THE POLICY MEAN FOR THE LICENSEE?

Under the *Water Act* the licensee will be required to purchase, install and maintain the meter or other monitoring equipment. Under the *Water Management Act*, this responsibility will rest with the water supply works approval holder.

The Department will determine which licences are required to actively monitor water usage, and the method of monitoring to be employed.

1 For licensees who are required to actively monitor water usage by way of a water meter.

The Department will determine which licences are required to install a meter, and will advise the licensee (in writing) accordingly.

The licensee will be required to purchase and install a water meter. The Department will provide the licensee with details of the type of meter required, and standards and guidelines for meter installation.

The licensee will be required to certify that the installation has been undertaken in accordance with the Departmental standards and guidelines and manufacturer's specifications. After the meter has been installed, it will be inspected and checked by a Department-authorized officer.

Note that if the licensee already has a meter installed, then a Department-authorized officer will inspect the site to ascertain compliance with metering and installation standards and guidelines. The Department will advise the licensee of any installation that needs to be replaced immediately, or will advise the licensee of deficiencies that may require attention within a specified period of time.

The licensee will be required to maintain and repair the meter as required by the manufacturer's and/or Department's specifications.

The licensee will be required to record meter readings and other associated data, and forward this to the Department at the specified frequency.

The licensee will be trained by the Department in reading the meter, recording data and submitting this to the Department by Internet, interactive voice recorders or other means.

The licensee will be required to follow the Department's alternative assessment procedures when the meter is taken off-line for maintenance and repairs.

2 For licensees which are required to actively monitor water usage by way of a electricity consumption.

This option will be selected by the Department for licences that already use an electric pump to extract water, and who already have a kWh meter installed by the electricity supply authority for electricity billing.

The licensee will be required to determine (in accordance with Departmental guidelines) the rating relationship between electricity consumption and the volume of water pumped, and to make this rating relationship available to the Department. The licensee will be required to certify that this rating has been undertaken in accordance with the Departmental standards and guidelines.

The licensee will be required to inform the Department of any pipe-layout changes or other alterations that will alter the rating relationship (between electricity consumption and water pumping volume). The licensee will be required to determine the new rating, and to make this rating available to the Department.

The licensee will be trained by the Department in reading the electricity meter, recording data and submitting this to the Department by Internet, interactive voice recorders or other means.

The licensee will be required to observe electricity meter readings and supply these to the Department, or arrange to make these readings available directly from the electricity supply authority to the Department.

If the licensee does not consider that the electricity-consumption method of monitoring water usage is satisfactory, the licensee can elect to install a water meter, and to record water usage using that water meter.

If the Department considers that the electricity-consumption method of monitoring water usage is unsatisfactory, the Department may require the licensee to adopt another method to record water extraction, including the installation of a flowmeter.

3 For licensees which are required to actively monitor water usage by way of a pump operating hour meter.

The licensee will be required to purchase and install a hour meter. The Department will provide the licensee with details of the type of meter required, and guidelines for meter installation.

The licensee will be required to certify that the installation has been undertaken in accordance with the Departmental standards and guidelines and manufacturer's specifications. After the meter has been installed, it will be inspected by the Department to ensure compliance with the licence and installation guidelines.

Note that if the licensee already has an hour meter installed, a Department-authorized officer will inspect the site to ascertain compliance with metering and installation standards and guidelines. The Department will advise the licensee of any installation that needs to be

replaced immediately, or will advise the licensee of deficiencies that may require attention within a specified period of time.

The licensee will be required to determine (in accordance with Departmental guidelines) the rating relationship between hours of pump operation and the volume of water pumped, and to make this rating relationship available to the Department. The licensee will be required to certify that this rating has been undertaken in accordance with the Departmental standards and guidelines.

The licensee will be required to inform the Department of any pipe-layout changes or other alterations that will alter the rating relationship (between hours of pump operation and water pumping volume). The licensee will be required to determine the new rating, and to make this rating available to the Department.

The licensee will be trained by the Department in reading the hour meter, recording data and submitting such observations to the Department by Internet, interactive voice recorders or other means.

The licensee will be required to maintain and repair the meter as required by the manufacturer's and/or Department's specifications.

The licensee will be required to record meter readings and other associated data, and forward this to the Department at the specified frequency.

If the licensee does not consider that the pump operating-hours method of monitoring water usage is satisfactory, the licensee can elect to install a water meter, and to record water usage using that water meter.

If the Department considers that the pump operating-hours method of monitoring water usage is unsatisfactory, the Department may require the licensee to adopt another method to record water extraction, including the installation of a flowmeter.

4 For licensees which are required to actively monitor water usage by way of a pump revolution meter.

The licensee will be required to purchase and install a pump revolution meter. The Department will provide the licensee with details of the type of meter required, and guidelines for meter installation.

The licensee will be required to certify that the installation has been undertaken in accordance with the Departmental standards and guidelines and manufacturer's specifications. After the meter has been installed, it will be inspected by the Department to ensure compliance with the licence and installation guidelines.

Note that if the licensee already has an pump revolution meter installed, a Departmental-authorized officer will inspect the site to ascertain compliance with metering and installation standards and guidelines. The Department will advise the licensee of any installation that needs to be replaced immediately, or will advise the licensee of deficiencies that may require attention within a specified period of time.

The licensee will be required to determine (in accordance with Departmental guidelines) the rating relationship between pump revolutions and the volume of water pumped, and to make this rating relationship available to the Department. The licensee will be required to certify

that this rating has been undertaken in accordance with the Departmental standards and guidelines.

The licensee will be required to inform the Department of any pipe-layout changes or other alterations that will alter the rating relationship (between pump revolutions and water pumping volume). The licensee will be required to determine the new rating, and to make this rating available to the Department.

The licensee will be trained by the Department in reading the pump revolution meter, recording data and submitting such observations to the Department by Internet, interactive voice recorders or other means.

The licensee will be required to maintain and repair the meter as required by the manufacturer's and/or Department's specifications.

The licensee will be required to record meter readings and other associated data, and forward this to the Department at the specified frequency.

If the licensee does not consider that the pump revolution method of monitoring water usage is satisfactory, the licensee can elect to install a water meter, and to record water usage using that water meter.

If the Department considers that the pump revolution method of monitoring water usage is unsatisfactory, the Department may require the licensee to adopt another method to record water extraction, including the installation of a flowmeter.

5 For licensees which are required to actively monitor water usage by way of a pumping diary.

This option will generally be selected by the Department where operation of an on-site recording instrument is not warranted or appropriate.

The licensee will be required to determine (in accordance with Departmental guidelines) the rating relationship between hours of pumping and the volume of water pumped, and to make this rating relationship available to the Department. The licensee will be required to certify that this rating has been undertaken in accordance with the Departmental standards and guidelines.

The licensee will be required to inform the Department of any pipe-layout changes, pump modifications or other alterations that will alter the rating relationship (between pumping hours and water pumping volume). The licensee will be required to determine the new rating, and to make this rating available to the Department

The licensee will be trained by the Department in completing a manual diary which will contain provision for recording of the number of hours that a pump is activated each day, and submitting such observations to the Department by Internet, interactive voice recorders or other means.

The licensee will be required to record pumping hours and other associated data, and forward this to the Department at the specified frequency.

If the licensee does not consider that the pumping diary method of monitoring water usage is satisfactory, the licensee can elect to install a water meter, and to record water usage using that water meter.

If the Department considers that the pumping diary method of monitoring water usage is unsatisfactory, the Department may require the licensee to adopt another method to record water extraction, including the installation of a flowmeter.

6 For licensees which are not required to actively monitor water usage.

Typically these will be small-scale extractors in non-stressed water sources.

There will be no change from the existing arrangement.

However the Department may at some later date require the licensee to implement one of the methods of active monitoring set out above.

BENEFITS TO THE LICENSEE

Licensees will be able to access real-time water extraction accounts, when this new technology is introduced.

Water extractors who have a satisfactory method of monitoring will be able to apply to participate in the temporary water trade market, that is, the trade of annual account water. This type of trade has been available in the regulated river systems since the early 1980s and is the most-common form of trade.

As water becomes more valuable and trading more beneficial, the amount of water being extracted is important information for the management of a commercial business. This should lead to more-optimal production per unit of water input.

Licensees without measurable water extraction incur annual water charges calculated on the basis of licensed entitlement. With the introduction of water-use monitoring, the annual charge may in the future be calculated on a two-part tariff basis (a fixed charge and an extraction charge). For medium and large-scale licences, this may mean a reduction in annual charges when full entitlements are not extracted.

WHAT DOES THE POLICY MEAN FOR THE DEPARTMENT?

There will be a major shift from the manual systems currently used in recording and collecting water extraction data to the greater use of electronic technology. The Department is currently developing a corporate communication system (known as the Water Information eXchange, or WIX) that will use Internet and interactive voice recording systems to collect and administer water extraction data.

The Department will need to determine which licences will be identified for active monitoring of water usage, and the method of monitoring that will be required in each case.

Data provided by licensees will be stored in the corporate databases, and will be available to monitor compliance, analyse patterns of water extraction, plan for future use and determine annual water charges.

For those licences that are required to be subject to active monitoring, the Department will need to advise the licensee of the requirement and to work with the licensee to ensure that any necessary equipment is installed, and to ensure that any necessary observations are taken by the licensee and passed to the Department at the required frequency.

The Department will not maintain a list of specific qualified contractors who can undertake any of the work (such as installation of water meters, or rating of installations). However the Department will list a standard and qualification that such contractors will need to satisfy.

In cases where monitoring equipment fails, or is taken off-line for maintenance or repair, or does not conform to standards, the Department will assess the amount of water extracted under the licence. The assessment shall take into consideration any information made available by the licensee, and may include pump hours, kilowatt-hours and information on crop areas and water storages. There will be an appeal mechanism for assessments of extraction that will be similar to the State Water Customer Service Charter.

The Department will audit the collection of water-use information. Such audits may involve on-site inspections and calibrations of measuring instruments, as well as checking the accuracy and frequency of readings undertaken by the licensee.

BENEFITS OF MONITORING FOR THE COMMUNITY

Active monitoring of a relatively small number of licences is expected to account for a significant proportion of current water extraction, and improve input into future planning processes.

Water can be more-effectively managed and shared between competing interests.

Environmental outcomes sought by the WSPs will be able to be better assessed.

The community will have greater confidence that water extractions are being made in accordance with the terms and conditions attached to licences.

More accurate extraction reports will be able to be prepared for community use.

Two-part tariffs for bulk water charges can be introduced where appropriate, to encourage greater water use efficiency.

Water trading can be extended, increasing returns to regional and the state economy.