



Ministry for the
Environment
Manatū Mō Te Taiao

Proposed National Environmental Standard for Water Measuring Devices

Report on Submissions

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1 Introduction

1.1 Background

In early December 2006 the Minister for the Environment notified a Proposed National Environmental Standard (NES) for Water Measuring Devices under the Resource Management Act 1991 (RMA). The proposal was outlined in the *National Environmental Standard for Water Measuring Devices: Discussion document*. The development of the standard is one part of the Government's Sustainable Water Programme of Action (SWPOA).

Public notices drawing attention to the proposal and the submission period were placed in all major and many provincial papers on 2 December 2006 (a copy of the notice is included in Appendix A of this report). The notice informed people of:

- the subject matter and rationale of the proposed standard
- where and how the proposed standard could be viewed
- how people could make a submission.

The deadline for submissions was 16 February 2007.

During the submission period seven workshops were held on the proposal around the country during December and January.

There was a high level of support in principle for the proposal from the 160 people who attended the workshops and those who made submissions. Questions and concerns centred on the scope of the standard's application, costs to consent holders and the implementation of the standard.

1.2 The proposal

The proposed NES would ensure the accurate and comprehensive measurement of the water extracted from various sources (termed "water takes") to facilitate the sustainable management of New Zealand's water resource. Many elements of the Sustainable Water Programme of Action's implementation package – for example, voluntary transfer of take consents, wider establishment of water-user groups, the management of environmental flows and over-allocated catchments – require users and regional councils to know how much water is actually taken.

The proposed NES would set minimum requirements for the installation and operation of new water measuring and recording devices, including the transfer of data to regional councils. The discussion document proposed that the standard would apply to all water takes that need resource consent. The aim is not to include the household use of water, but to measure the water taken at the first point of abstraction from the resource – be it a river, lake, dam or aquifer.

The box below summarises the specific requirements of the NES.

Summary of the requirements of the proposed national environmental standard

It is proposed that the NES applies to all takes that require resource consents under operative or proposed regional plans. The NES would apply across all regions and all catchments or aquifers, but comments are being sought on appropriate exemptions.

Minimum requirements for water measuring devices

It is proposed that all new pipe water measuring devices installed after the NES comes into force:

- be capable of continuous measurement
- measure volume in cubic metres
- have data storage capability
- have an accuracy standard of $\pm 5\%$
- be capable of recording daily volume
- be fit for purpose
- be tamper-proof and sealed.

It is proposed that all new channel-measuring devices installed after the NES comes into force:

- continuously measure water levels
- have a water-level accuracy of ± 10 mm
- maintain a rating curve to convert water levels to flow
- fit a data logger to store the water-level data.

Installation and maintenance requirements for water measuring devices

It is proposed that:

- installation of water measuring devices be required as a condition of a water take consent
- installation should strictly comply with the manufacturer's installation instructions
- measuring devices should be installed as close as possible to the take point, and prior to the first outlet point
- the accuracy of all measuring devices must be independently verified every five years.

Data recording and transfer requirements for water measuring devices

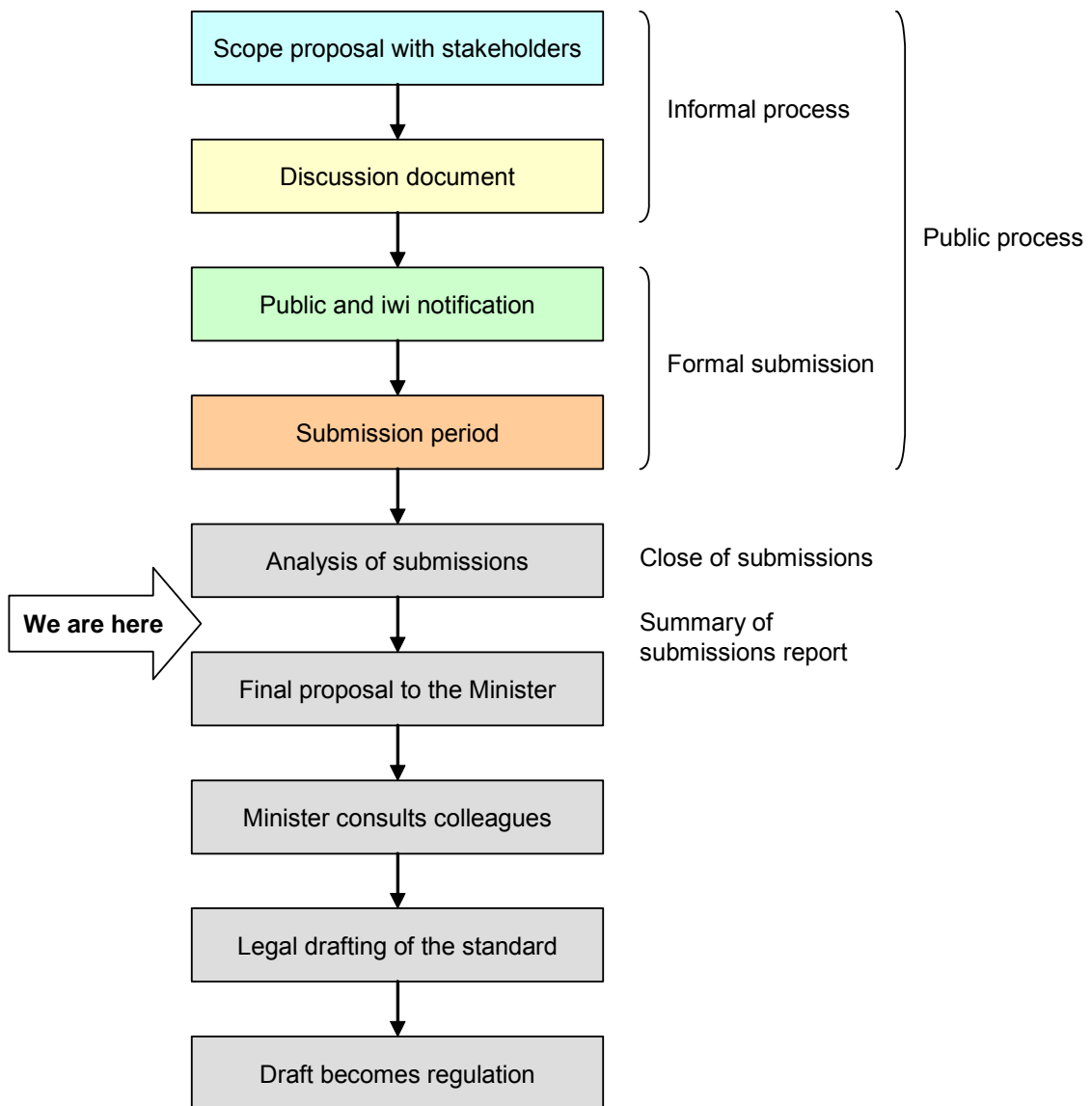
It is proposed that:

- responsibility for recording the water measurement rests with the consent holder
- responsibility for transferring the data to the regional council rests with the consent holder and should occur on at least an annual basis
- data recording should occur at a minimum of daily intervals.

1.3 National environmental standard development process

An outline of the NES development process, including the informal and formal submission process, is shown in Figure 1. The Ministry has completed the public process stage, and the release of this *Report on Submissions* marks the end of the submissions stage.

Figure 1: NES development process



Note that the NES development process differs from the statutory plan and resource consent process in that there are no hearings or appeal provisions as there are during First Schedule consultation processes.

The next steps in the NES development process are as follows:

1. After completion of the cost–benefit report, a final report and recommendation will be presented to the Government. This is expected to occur towards the middle of this year.
2. If there is a recommendation to proceed, and it is approved, the report and recommendations will be published. This report will contain the cost–benefit analysis, responses to submissions and the final recommendation. The proposed standard will then go through formal legal drafting.
3. If approved by the Government, the proposed standard is likely to be introduced later this year.

1.4 Purpose and outline of this report

This document presents an overview of the submissions received on the Proposed NES for Water Measuring Devices.

- Section 2 is a summary of the key themes raised by submitters.
- Section 3 summarises general comments made by submitters.
- Section 4 summarises feedback from submitters on the specific components of the proposed standard.
- Section 5 summarises the responses of submitters on the implementation of the proposed standard.

This report is a mandatory requirement of the NES development process under section 44(b)(ii) of the RMA. The report is intended to provide a concise summary of the views expressed. It is not intended to provide an analysis of those views or recommendations in response to the submissions. This will be done in a separate report, which will be presented to Cabinet later this year.

2 Overview of Submissions

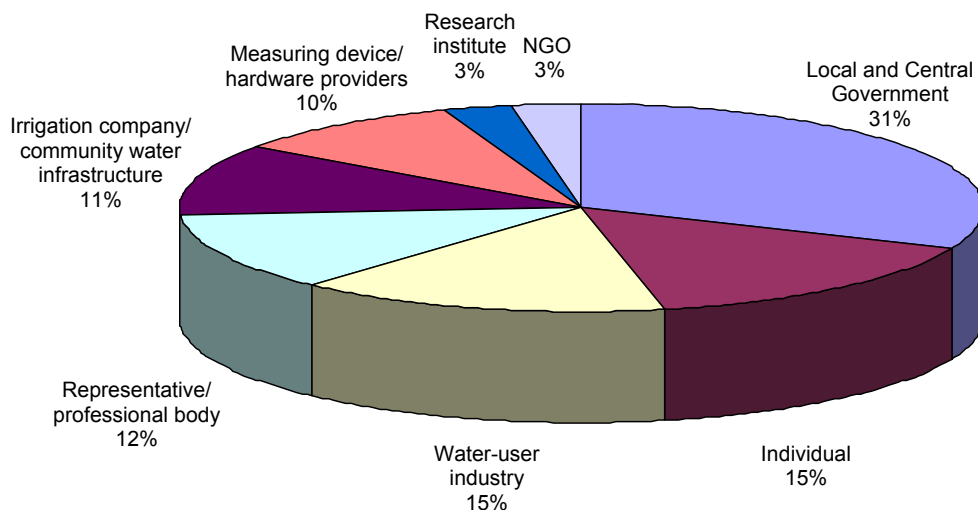
2.1 Summary of submitters' positions

Seventy-three submissions were received. Table 1 presents a summary of submissions by category. A full set of submitters' names and the category assigned to them is provided in Appendix B.

Table 1: Breakdown of submissions, by category

Category	Number (%)
Local and central government	23 (31%)
Individual	11 (15%)
Water-user industry	11 (15%)
Irrigation company / community water infrastructure	8 (11%)
Representative or professional body	9 (12%)
Measuring-device and hardware providers	7 (10%)
Crown Research Institute, academic/research	2 (3%)
Non-government organisations (NGO)	2 (3%)

Figure 2: Breakdown of submissions, by category



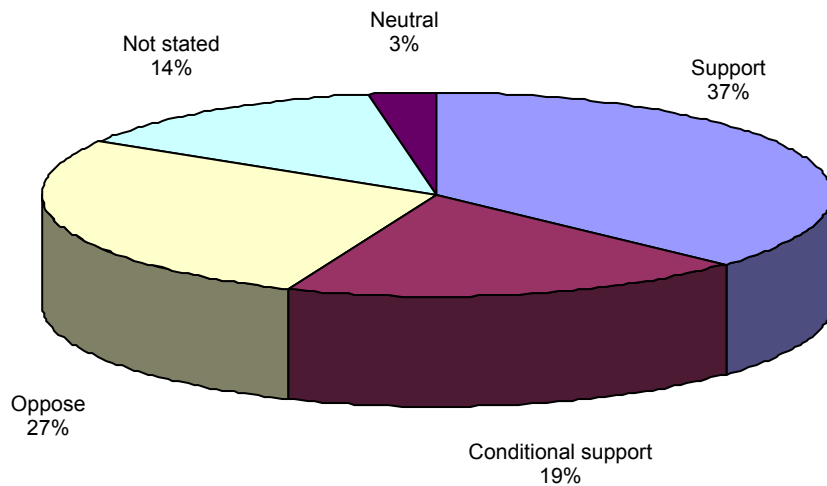
Submissions from local and central government accounted for almost a third (31 per cent) of all submissions. Of the submissions received from the government sector, one was from central government, 14 were from regional councils, five were from territorial authorities and three were from unitary authorities.

There were 11 submissions received (15 per cent) from individuals.

2.1.1 Position of submitters

Submitters' positions were divided into five categories (support, conditional support, neutral, oppose, not stated) according to their position on the proposal. Submitters who did not directly state their position were attributed a position if it was clear from the submission's content and tone. Where the position of the submitter was not obvious, submissions were categorised as "not stated". Figure 3 shows the breakdown of submissions, by position.

Figure 3: Breakdown of submissions, by position



The breakdown of submitters' positions in Figure 3 shows mainly support (37 per cent) or conditional support (19 per cent) for the proposal. There was also significant opposition to the proposal (27 per cent), while some (14 per cent) did not state their position. Two submitters (three per cent) clearly stated their neutrality.

2.2 Key themes analysis

The key themes identified during the analysis of submissions are presented in Table 2, and then discussed briefly in the following text. Key themes were derived from specific submissions on parts 3 to 6 of the discussion document. These key themes were further broken down into sub-themes in order to adequately address the range of submissions received.

Table 2: General key themes: summary

Key theme	Sub-themes
Need for and support for the NES	<ul style="list-style-type: none"> • Support for the proposed NES • Need for the proposed NES • Consideration of alternatives
Standard development and consultation process	<ul style="list-style-type: none"> • Opportunities for stakeholder involvement • Change of title • Lack of information • Definitions and clarity of terms used
Costs and benefits	<ul style="list-style-type: none"> • Adequacy of interim cost–benefit assessment • Burden of costs • Other
Scope and exemptions	<ul style="list-style-type: none"> • Scope • Clarification of scope • Requirement to review existing consents • Exemptions • Regional councils to decide exemptions
Minimum standards for measuring flow in pipes	<ul style="list-style-type: none"> • Continuous measurement • Units of measurement • Data storage capability • Accuracy requirement for pipes • Recording daily volume • Fit for purpose • Tamper-proof and sealed
Minimum standards for measuring flow in channels	<ul style="list-style-type: none"> • Accuracy requirement for channels • Data storage capability • Continuous measurement of water levels in channels • Rating curves
Installation and maintenance requirements	<ul style="list-style-type: none"> • Installation to comply with manufacturer’s instructions • Installation as close as possible • Independent verification of meters • Verification timeframe
Data recording and transfer	<ul style="list-style-type: none"> • Necessity of data • Daily data recording • Method of data storage • Data transfer • Responsibilities of data recording and transfer • Format of data • Consistency of data recording and transfer • Technical practicalities • Further guidance
General/other	<ul style="list-style-type: none"> • Other/general comments
Implementation of the proposed standard	<ul style="list-style-type: none"> • Capacity issues • Implementation timeframe • Meter guidance • Implementation guidance • Industry training • Operational problems • Implementation planning • Other

Need for and support for the NES

The majority of submitters supported the need for an NES for water measuring devices. A number of submitters who did not support the proposed NES suggested a variety of alternative methods.

Standard development and consultation process

There were a number of concerns about the development and consultation process. Further information was requested by some, in addition to the clarification of a number of terms.

Costs and benefits

Many submitters stated that the proposed NES would be costly to implement. A number also made comments about the content of the cost–benefit assessment.

Scope and exemptions

The scope of the proposed NES was commented on by a number of submitters. The proposed exemptions also received extensive discussion.

Minimum standards for measuring flow in pipes

Many submitters made comments and suggestions on the proposed requirements for measuring flow in pipes. The accuracy requirement was one of the most significant sub-themes.

Minimum standards for measuring flow in channels

The proposed requirements for measuring flow in channels attracted a range of comments, in particular about the accuracy requirement.

Installation and maintenance requirements

A number of suggestions were made about the four proposed installation and maintenance requirements. The proposed requirement of independent verification of meters and the related five-year timeframe received comments in a large number of submissions.

Data recording and transfer

A wide range of submissions discussed data recording and transfer. The sub-themes covered everything from data format to technical difficulties.

General/other

Submissions containing comments that were not directly applicable to the alternative themes were included in the general theme category.

Implementation of the proposed standard

A number of questions were raised about the implementation of various parts of the proposed NES. The capacity of the water-meter industry and regional councils was one of the major sub-themes.

3 General Submission Summary

This section summarises submitters' general comments on the proposed NES. More detailed comments on the specific requirements of the proposed standard can be found in section 4.

In addition to the narrative description of submissions, tables have been used throughout the Report on Submissions in order to summarise the main comments made by the submitters. The submitter ID number can be cross-referenced to the index of submitters in Appendix B.

3.1 Need for and support for the NES

This section takes into account comments relating to the need for and support for an NES for water measuring devices.

3.1.1 Support for the proposed NES

Fifty-six per cent of submitters either fully or conditionally supported the need for an NES. The supportive submissions generally acknowledged the importance of obtaining comprehensive data on water takes to manage water resources more effectively. The main points that were raised in support can be placed into two main categories, followed by the category of those who opposed the NES.

Effective water management

Nine submitters saw the development of the NES for water measuring devices as an important step in managing water resources more effectively. Specific comments were that the NES:

- is an important step in understanding water resources
- would underpin a drive towards increasing efficiency of water use through the collection of data
- is important for water allocation and compliance purposes.

National consistency

The development of the NES was seen as an essential means of achieving national consistency in the measurement and recording of water takes. Six submitters said that the NES:

- is a best-practice outcome
- provides a positive method for ensuring consistent recording of water takes at a national level
- is a more effective and uniform method by which to create a more equitable system for water takes.

NES will not provide flexibility

In contrast to the majority of submissions in support of the proposed NES, nine stated that the NES would not be beneficial because it would not allow for local or regional flexibility. The NES was seen as imposing a “one size fits all” approach, which was viewed as an unsuitable method for managing water resources due to regional variations.

3.1.2 Need for the proposed NES

Most submitters, regardless of their position on the content of the NES, supported the general aim of measuring water takes. Many acknowledged the importance of obtaining this data in order to improve the efficiency of water use. Water was recognised as a significant public resource and one that needs to be carefully managed.

One submitter said that the NES is a more effective and uniform method by which to create a more equitable system for water takes. Twenty-two submitters expressed strong support for the NES. Reasons stated included:

- measurements are essential for effective management
- consistency at a national level
- promotion of water conservation.

However, a number of submitters questioned the need for an NES, arguing that:

- existing legislative provisions (in the form of the RMA) are sufficient
- the standard will lead to a “one size fits all approach” and will not acknowledge local variations
- additional regulation and complexity will be created for no substantial reason.

Some submitters considered that the objectives of the NES would be better met by other methods. The main alternative suggestions were:

- greater application of water measuring provisions within the RMA through regional plans
- development of a voluntary standard or code of practice
- creation of a national toolkit to assist regional councils in measuring water use.

3.1.3 Consideration of alternatives

Alternative options were reviewed within the NES discussion document for water measuring devices. It was concluded that an NES is the only option that meets all the stated objectives, but a number of submitters felt that the alternatives were not adequately examined and should be given greater consideration. Another submitter suggested that the money invested in the development of an NES should instead be used to improve irrigation efficiency.

Eight submitters said that existing legislative provisions are sufficient to measure water takes and that the NES is therefore unnecessary. Several of these commented that regional councils are the best qualified to stipulate conditions on measuring water takes, so the NES is superfluous. Five submitters said that guidelines would provide a more appropriate way to meet the stated objectives. One suggested that the Ministry for the Environment engage with Standards New Zealand to prepare and publish a simple voluntary standard instead of the NES.

In summary, the main alternatives to an NES that submitters raised were:

- existing RMA provisions
- regional plan provisions
- consent conditions
- a voluntary standard
- voluntary guidelines.

3.2 Standard development and consultation process

3.2.1 Opportunities for stakeholder involvement

Many submitters expressed discontent that the NES development process had only one opportunity for stakeholders and the public to get involved. Two expressed concern that after the submission process there is no formal process for involvement by industry stakeholders. One submitter cautioned that a lack of public input may mean widespread non-compliance, while three considered that their sector had been excluded from the development process and asked to be involved in future. One submitter thought that the standard has been rushed through and should be stopped until there has been more meaningful dialogue with all stakeholders.

Twelve submitters – notably from regional councils – expressed a desire for further involvement in the future development or implementation of the standard. Three wanted to discuss their submission or issues in more detail. Further involvement was requested, particularly at the regulation drafting and implementation planning stages. Reasons for further involvement included:

- to ensure the NES is workable from an implementation perspective
- to share experience with applying rules and writing consent conditions
- input at drafting stage is needed to reduce the likelihood of technical problems occurring.

Two submitters felt that there were insufficient consultation meetings and noted that the consultation occurred at a busy time of the year for their sector.

Table 3: Summary of submitters' comments about the NES development and consultation process

Comment	Submitter number
Stakeholder involvement was unsatisfactory	27, 28, 30, 68, 58
Further involvement is requested	16, 17, 23, 27, 28, 29, 30, 36, 42, 52, 63, 65
Consultation was unsatisfactory (timing, length and workshops)	28, 30

3.2.3 Change of title

Three submitters said that the title of the Proposed National Environmental Standard for Water Measuring Devices should be altered to reduce any ambiguities and improve clarity. Their suggestions included:

- change to “Proposed National Environmental Standard for Water Measuring and Recording Devices”
- change to “National Environmental Standard for the Measurement of Water Abstractions”
- adjust the title to reflect water flow metering, because it is currently too general.

3.2.3 Lack of information

A number of submitters made comments and suggestions about the information contained within the proposed NES discussion document. Six made reference to more information being needed in the standard. More information was requested by one submitter about what current practice is, and another requested more information about what national reporting needs are.

One submitter said that penalties for non-compliance and the criteria for exemptions needed to be spelt out in the discussion document. It was argued that there was not enough information on takes that are to be measured as part of a resource consent, and more specific and technical details were requested to explain this further. One submitter believed that the cost–benefit analysis indicates that the standard is justified, but that more information is needed to prove this conclusively, while several considered that the interim scoping of the costs and benefits was inadequate.

One submitter considered that the intent of the standard to require the use of data loggers was unclear in the discussion document. Another argued that there needs to be clarity over how the NES will apply in situations where there is little water to meet demand. A request was made for further assessment of the methods for measuring open-channel flow to be undertaken and for a more accurate and standardised method to be included in the final NES.

3.2.4 Definitions and clarity of terms used

Eight submitters said that a number of words and phrases required further clarification or possible replacement. Below are some of the specific comments:

- much of the document refers to volumes of water abstracted. However, with the exception of some groundwater takes, consent conditions are generally written in terms of L/s, m³/s and/or m³/day. These are rates, not volumes.
- a number of terms need further definition, including:
 - over-allocation
 - accuracy
 - rating curves
 - data storage capability
 - net take

- fit for purpose
 - continuous measurement
 - data logging
 - allocation
 - independent verification
- the terms “data recording”, “flow rate” and “water measuring device” together do not imply continuous measurement, as the text in the discussion document does. It was suggested that drawing on existing approaches and acting in a consistent manner is the best approach when dealing with requirements on consent holders arising under the proposed NES (eg, use NIWA’s definition of “continuous”)
 - a consistent definition should be applied to specifications for water measuring devices. It was suggested that the definition of recording in Appendix 1 of the discussion document be amended to provide for manual recording of accumulated total abstraction at nominated intervals.

3.3 Costs and benefits

This section examines comments made about the costs and benefits associated with the proposed NES and its implementation.

3.3.1 Adequacy of the interim cost–benefit assessment

Fifteen submitters considered that the interim cost–benefit assessment in the discussion document was inadequate, and that it tended to underestimate the extent and amount of costs. Several provided cost estimations, quotes and prices for measuring devices and installations with their submissions, and some felt the NES should not be able to proceed without a more rigorous assessment of costs and benefits.

Many submitters considered that the breadth of costs that will be incurred by the standard were not fully considered, and felt that the following elements should be considered in the full cost–benefit appraisal required in the standard’s development process:

- costs of structure and head-works modification
- costs to small consent holders
- costs to the economy as a whole
- costs of the consent review process
- increased compliance costs
- costs of data management, storage, analysis and reporting
- ongoing operational costs to users, including phone and telemetry charges, transfer of data to councils, and verification of meters
- costs to holders with more than one take.

3.3.2 Burden of costs

A few submitters considered that the proposal would have a significant public good component. For this reason, many considered that the public, government or ratepayers should have to pay rather than placing the whole burden of cost on the consent holder. Four submitters expressed concern about increased compliance costs.

Twelve submitters questioned or considered that the costs of the proposal would outweigh the benefits, thus making the proposal difficult to justify. Three felt the costs could undermine the viability of their businesses.

3.3.3 Other

A variety of other points were raised by submitters about the costs and benefits of the proposed NES, including:

- there is a need to take into account the local government Long Term Council Community Plan (LTCCP) planning and budgeting cycles
- the costs of reviewing existing consents are unacceptable because councils cannot recover the costs. There needs to be a way the NES can apply to all consents without formal reviews having to take place.

Table 4: Summary of submitters' comments about the cost–benefit analysis

Comment	Submitter number
The costs and benefits assessment in the discussion document is inadequate	3, 10, 12, 18, 25, 26, 27, 28, 30, 34, 44, 52, 58, 62, 72
The costs of the proposal outweigh the benefits	3, 18, 26, 28, 38, 41, 44, 53, 67, 72, 49, 70
Costs should be borne or partly borne by the Government	11, 18, 34, 36, 39, 68
Costs are a major concern and they are an unfair burden on users	17, 14, 18, 26, 33, 50

4 Submissions on the content of the proposal

This section of the report collates feedback from submitters who commented on specific requirements of the proposed NES as opposed to the more generalised comments covered in the previous sections.

4.1 Scope and exemptions

To ensure that accurate information is gathered about the actual water taken in all catchments, it has been suggested that the proposed NES apply to all water takes that currently require resource consents under operative or proposed regional plans. The NES would apply across all regions and all catchments or aquifers. At present there are three types of water takes for which a resource consent is not required. It is proposed that the NES would not cover these:

- RMA section 14(3)(b,c), which allows takes for an individual's domestic purposes and for animals' drinking water, provided there are no adverse effects on the environment
- RMA section 14(3)(e), which allows takes for fire-fighting purposes
- permitted activity takes that are allowed for in a regional plan.

The discussion document did not specify exemption requirements for the proposed NES, which raised questions about what water takes should be exempted from the requirements and how this process might occur.

Many submitters also commented on the proposed scope: 25 made reference to the scope of the proposal and 15 commented on exemptions.

4.1.1 Scope

The NES would be a minimum standard to be applied to all new resource consents to take water. Resource consents to take water would only be granted if they contained conditions that complied with the standard. All new water consents (including those that replace an expired consent) would have to meet the NES.

Four submitters supported the scope of the proposed NES. One applauded the intention to establish performance standards, and another said the scope was adequate at its inception. One commented that care needs to be taken to keep water use as a separate issue.

The proposed standard was seen by some as not taking into account seasonal flows. One comment was that the size and nature of the take were not adequately considered in the discussion document (ie, whether a take was small or large and whether it was covered by an old or new consent). One submitter believed that all takes should be considered in the scope of the standard, while another stated that the scope of the standard is too broad. One comment was that the standard should consider specifying the volume or rate of water abstraction, and have guidelines tailored to this.

There were also comments on what other aspects the standard needs to consider. The main ideas were that water-rich regions need to be further considered, or have exemptions clarified. One submitter said that the proposed NES needs to specifically address high-volume users. It was argued that implementation prioritisation is missing from the existing discussion document, and there was also a request for a focus on greater flexibility in exemptions.

A number of concerns were raised about how resource consent conditions would be met under the proposed scope of the discussion document. They included:

- the NES extending only to takes that require resource consent (support)
- regional councils can manage takes within their own regions
- recycled water is not considered
- measuring the returns of water to a water body needs to be addressed so that net takes can be estimated.

Permitted activities within the scope of the NES were commented on by 10 submitters. The clear consensus was that there should be flexibility for permitted activities to be measured and monitored. Two-thirds of those submitters identified regional councils as being the specific regulatory authority to do this.

Other comments were that permitted activities should not be metered at all, that permitted activities should not be covered by the NES, and that small takes that are complying with permitted activities should be exempt.

4.1.2 Clarification of scope

Four submitters commented on specific areas of the scope that need clarification. Comments clustered around the standard not being straightforward and the need to clarify who is covered under the standard. A number of submitters said that it is not clear if the NES covers hydro-schemes and coastal takes. One submitter questioned how the electricity sector will be affected. Others said that it needs to be clarified whether each criterion alone is sufficient to justify an exemption, or whether all three criteria would need to be met.

4.1.3 Requirement to review existing consents

Five submitters made varying comments on the requirement to review existing consents without meters so that they comply with the standard. The majority of these did not object to the review requirement, although they did make a number of suggestions. Comments were:

- the timing of reviewing existing consents should be tied to existing consent replacement
- existing water takes and consent holders should be given three years to comply with the application of the standard instead of five
- new consents (not old ones) should require monitoring
- an NES can only be implemented through conditions on consents, and only through a consent review process.

4.1.4 Exemptions

The discussion document posed questions about what water takes should be exempt from the water measuring requirements and how a process for exemptions might work. The following factors were considered to be relevant to assessing exemptions:

- whether the volume of actual take can be estimated easily and accurately
- whether the level of allocation is very small compared to resource availability
- whether the effect on the environment is minor.

Fifteen submitters commented on exemptions. Two expressed support for establishing criteria for exemptions, while two believed there should be no exemptions. One submitter commented they were unsure as to whether each criterion alone was enough for exemption; if not, it was recommended it should be. One suggestion for exemptions was to set the threshold dependent on the size of the take.

Other comments on exemptions included:

- temporary users should be excluded from the requirement to have data loggers
- allow flexibility as there are parts of some regions where permitted activities amount to a large volume of water taken (cumulative effect)
- stock water should not be exempt from measuring
- if takes are constrained through pipe size, metering should not be required.

Table 5: Summary of submitters' comments about scope and exemptions

Comment	Submitter number
Small or temporary takes should not need water measuring devices or metering	22, 34, 30, 66, 71, 72, 73, 8, 38
The need for a water measuring device should depend on the size and nature and take of the water	30, 33, 16, 69
Existing non-adverse large takes and farm takes (with existing consents) should be exempt	21, 37, 72

4.1.5 Regional councils to decide exemptions

Fourteen submitters considered that regional councils should be given the power to make decisions on exemptions, reporting, monitoring, thresholds, measuring and metering requirements. This was considered a more flexible approach able to be tailored to local circumstances.

Table 6: Summary of submitters' comments about regional councils deciding exemptions

Comment	Submitter number
Regional councils should have the power to make decisions on exemptions, reporting, monitoring, thresholds, measuring and metering requirements	16, 18, 21, 51, 18, 52, 66, 37, 7, 10, 38, 54, 6, 59
The requirements for metering should be tailored to local circumstances	18, 72, 35, 36

4.2 Minimum standards for measuring flows in pipes

Submissions on minimum standards for measuring flows in pipes were divided into the seven minimum requirements for all new pipe water measuring devices outlined in the proposal. These are to:

- be capable of continuous measurement
- measure volume in cubic metres
- have data storage capability
- have an accuracy standard of $\pm 5\%$
- be capable of recording daily volume
- be fit for purpose
- be tamper-proof and sealed.

Ten submitters commented on the overall proposed minimum standards for measuring flow in pipes. Seven of these supported the requirements, with one also stating that they supported the fact that neither specific devices nor industry standards were referred to or required. One submitter felt the minimum requirements were too stringent for some takes and suggested that allowances need to be made for different situations. Another referred to the practicalities of the requirements and argued that they had not been able to obtain a price for a meter that met all the requirements.

4.2.1 Continuous measurement

Eight submitters made comments and suggestions on the requirement for water measuring devices to be capable of continuous measurement. One stated that continuous measurement was a key issue and needs to be carefully considered, while two felt that clarification of the term “continuous measurement” is necessary.

It was pointed out that even when measurements are continuous, the data is often only stored at 15-minute intervals. Three submitters suggested that 15-minute measurement intervals are sufficient and that the requirement should be altered to reflect this position. One argued that meters should be capable of continuous measurement.

4.2.2 Units of measurement

The requirement that water measuring devices measure volume in cubic metres was commented on by seven submitters. Three supported the requirement, although one of these said that a time component is essential, while four submitters argued that there was no justification for mandating that water takes be measured in cubic metres. One of these said that volume measurements in cubic metres were not suitable for showing compliance with consent conditions. There were suggestions for alternative units in the form of litres per minute and megalitres per day.

4.2.3 Data storage capability

Eight submitters made comments and suggestions about the requirement for all water measuring devices to have data storage capability. The standard was supported by three, while three said changes were required and that more guidance and clarification in particular were needed about what data storage meant. One submitter suggested that data loggers have a minimum of two years' storage. The data storage ability was opposed by two submitters, who argued that it was an onerous requirement, especially for small users. One suggestion was that the measuring device components (meter and logger) should be dealt with separately.

4.2.4 Accuracy requirement for pipes

The proposed minimum accuracy standard for all new pipe measuring devices within the NES is $\pm 5\%$. Twenty-one submitters made specific comments about this requirement.

Six submitters supported the accuracy standard. However, two made reference to the wording of the standard, suggesting that "*in situ*" be added and that the requirement would be more precise if it read "maximum accuracy error of $\pm 5\%$ ".

On the one hand, four submitters said that the accuracy standard was too high. The main argument here was that the accuracy standard may be suitable in a test situation but is too stringent for in the field. One suggestion was that the standard be altered to $\pm 10\%$. On the other hand, the standard was deemed to be too low by two submitters: one felt the accuracy standard should be more stringent and altered to $\pm 3\%$, while the other said that while the standard was appropriate for most consent holders, it would be too generous for users with large takes.

Three submitters stated that the accuracy standard was too inflexible and that the objectives of the NES would be better achieved by having a variable accuracy standard. Two submitters suggested that the maximum water meter error rates should decline with increasing water takes (ie, reduce the error limit to $\pm 2.5\%$ on consents over 100 L/s).

The practicalities of the accuracy standard were addressed by eight submitters. One said that accuracy levels need to be better defined, and suggested that "statistical uncertainty" was a more easily defined parameter. Difficulties in setting an appropriate accuracy standard were raised by two submitters, who said that water conditions can rapidly affect accuracy. A suggestion was made to nominate flow rates at which meters are required to achieve $\pm 5\%$ accuracy.

Table 7: Summary of submitters' comments about minimum standards for measuring flows in pipes

Comment	Submitter number
The accuracy requirement is supported	16, 23, 55, 69
The accuracy requirement is too stringent	18, 30, 57, 70
The accuracy requirement should be reduced	65, 71
A variable accuracy standard is required	9, 32, 64
An accuracy requirement may not be practical	7, 12, 21, 43, 48, 58, 67, 69
The wording of the accuracy requirement needs alteration	16, 23

4.2.5 Recording daily volume

Seven submitters commented on the requirement for water measuring devices to be capable of recording daily volume. Six opposed the standard for a variety of reasons, including:

- daily volume is too great an interval
- instantaneous measurement is not covered
- the requirement is not suitable for certain takes (eg, from an aquifer)
- the capacity to record daily volume is rejected unless it is imposed by regional councils
- there is no need for the requirement as it could be dealt with at the regional council level (two submitters).

One view was that it is important to record the rate of abstraction as well, not just the daily volume.

4.2.6 Fit for purpose

The requirement that water measuring devices “be fit for purpose” was commented on by 10 submitters. Two supported the requirement in its entirety, four suggested that a clearer definition of “fit for purpose” is required, and two suggested that suitable meters be specified in this section. One submitter argued that the phrase is too broad, and therefore open to differing interpretations, and suggested that the wording be changed to “designed to measure the type of water they are being used to measure”. One submitter said that meters for groundwater takes may be adversely affected by water quality.

4.2.7 Tamper-proof and sealed

Nine submitters made comments and suggestions on the requirement for water measuring devices to be tamper-proof and sealed. Seven opposed this requirement because making such a device “tamper-proof” is difficult, if not impossible, to achieve. One submitter said that only electronic and electromagnetic meters will be secure. Two commented that the practicality of this standard would be improved if the wording is altered to “be as tamper-proof as possible or practicable”. One view was that a method is needed to ensure that meters are tamper-proof.

4.3 Minimum standards for measuring flows in channels

Submissions on minimum standards for measuring flows in channels were divided into four main sub-themes. These sub-themes reflect the four proposed minimum requirements for all new channel water measuring devices, which must:

- continuously measure water levels
- have a water level accuracy of $\pm 10\text{mm}$
- maintain a rating curve to convert water levels to flow
- fit a data logger to store the water-level data.

Five submitters commented on the overall minimum specifications for channels. One supported all the proposed minimum standards for measuring flow in channels, while one said that no standard is defined for determining open channel flow and that this must be included as part of the proposed NES. Further comments and suggestions included:

- regional councils should have discretion to determine technical specifications
- there should be allowances for regional council discretion to determine when flows in channels should be measured.

4.3.1 Accuracy requirement for channels

Twenty-four submitters commented on the channel accuracy requirement of ± 10 mm. Two believed the level of accuracy is appropriate and at a fair and correct level, while 11 felt the accuracy is too low because this level does not translate to a defined flow rate accuracy. Two submitters argued that higher accuracy is required because both the national and international accepted requirement for flow measurement is $\pm 8\%$.

Four submitters considered that accuracy should vary with flow. One believed it to be preferable to have a high tolerance on instantaneous flow rates for water consents, and a total accumulated volume with a lower tolerance. This would allow for the inevitable variations in flow that will occur in pumped systems.

Seven submitters thought that accuracy should be expressed as a percentage of flow, with one saying the use of a level standard is inappropriate; accuracy should instead be expressed as a percentage of volume. Two submitters expressed concern over the size and shape of the channel creating discontinuity. One submitter calculated that the accuracy requirement equates to $\pm 18\%$ at low flows for a partial flume fitted in some channels, so a percentage accuracy standard is more appropriate.

Two submitters specified that accuracy measurements should apply to flow and not water levels.

Table 8: Summary of submitters’ comments about minimum standards for measuring flows in channels

Comment	Submitter number
Accuracy requirements are too low	69, 5, 16, 17, 18, 29, 40, 51, 64, 65, 72
Accuracy should be expressed as a percentage	5, 16, 17, 18, 38, 39, 59
Accuracy should vary with flow	69, 9, 29, 68

4.3.2 Data storage capability

Four submitters mentioned data loggers in reference to minimum specifications in channels. One comment was that a data logger cannot be installed on systems with a pressure-plate measure box (which is common in Central Otago). One submitter said the nature of data recorded must be considered, and another said that requiring loggers at remote sites or those that are affected by variable climatic conditions is not appropriate. Concerns were raised that there is no cell phone coverage in many areas, so manual recording would be the only option and could not be done daily due to access difficulties.

4.3.3 Continuous measurement of water levels in channels

Eight submitters commented on measurement. Three believed alternative methods should be allowed, while three voiced concern that instantaneous measurement is not accurately covered in the standard and needs more definition, and possibly a benchmark point. One submitter supported the requirement for continuous measurement in channels and one opposed it.

4.3.4 Rating curves

Ten submitters discussed rating curves in their submissions. Four believed further clarification is needed on to how to use and apply rating curves to flows and levels. Two submitters expressed concern that the curves will be difficult to maintain, while one supported the specifications outlined in the document.

One comment was that the rating curve will need to be derived by an experienced practitioner. Other concerns were that the cost of maintaining the rating curve may outweigh the benefits, and that the gaugings required to maintain accurate rating curves differ depending on the type of channel, flume or weir used.

4.4 Installation and maintenance requirements

Many submitters supported the installation and maintenance requirements stipulated in the discussion document, and some even considered they should go further. There was agreement that poor installation is the main cause of inaccurate data and correct installation is very important to maintain accuracy.

Two submitters thought that the installation and maintenance section (section 4.4 in the discussion document) should only apply to pipe flows. One saw the need for a separate section for the installation, maintenance and calibration of channel-measuring devices or a maintenance schedule for each device as appropriate. There was also a suggestion that where consent is given to take water from multiple source points, the measuring device should measure the combined flow. Another submitter felt that people putting in new installations for channels should be encouraged to install some form of weir control, because they improve accuracy and can be cost effective. Similarly, a suggestion was that for multiple inflows into channels there needs to be one major measuring point only.

4.4.1 Installation to comply with manufacturer's instructions

There was general support for installations to comply with manufacturer's instructions and to be installed by qualified people. Two submitters raised concerns about the quality of installation and requested that only approved and registered installers install meters. One suggestion was to change the wording to "must be installed by approved personnel".

Many agreed that a certification programme for installers is a good idea and that installation compliance should be checked by councils. One submitter asked for a national code of practice that complies with the proposed standard. It was generally felt that meter accuracy should be calibrated *in situ*, although one submitter asked if this was possible and another stated that there are technical difficulties with this. One submitter considered that meters should be calibrated prior to their first use, while another said that meters that are reading accurately but not installed as per manufacturer's instructions should be accepted within the standard.

4.4.2 Installation as close as possible

Five submitters cautioned that installation requirements should be flexible enough to allow for site variability, which would not compromise the intent of the standard. Several raised practical issues relating to installations (eg, access to a power supply, cell phone coverage, vehicle access, topography). Several considered the standard should read as close as *practicable* and not as close as *possible*. One view was that the installation point standard needs to be broader (ie, as close as possible to the last take point). It was also suggested that this point be deleted and discretion regarding the location of installations be given to regional councils.

Other points raised about the location of installations included:

- installation below ground should be allowed for
- measuring devices should not be able to be bypassed and unmeasured water taken easily
- measuring devices should be installed at an appropriate location upstream of the first outlet, regardless of location to the take point.

4.4.3 Independent verification of meters

There was considerable support among submitters to require independent verification and testing of meters by qualified technicians; indeed, this was considered an essential component of the proposed standard. However, one submitter, while supporting the requirement, questioned its practicality.

Three submitters requested more clarity around what “independent verification” means and who would be qualified to do it. One view was that there are several ways to verify so the method should be left up to the regional council. Five submitters were concerned about the costs of independent verification, or felt it could not be justified.

Three submitters said that there needs to be an audit process for the verification of water meters in the field. Consistency was the main issue raised, and suggestions made to achieve this included:

- a certificate of compliance being issued after inspection
- consistent mechanisms required to ensure measurement compliance.

4.4.4 Verification timeframe

There was variable support for the five-yearly timeframe for accuracy verification. Six submitters considered that five years was too long, while six others considered that five years was too short and should be longer. Most of those who commented on the installation and maintenance requirements considered five years was the right length of time. Finally, two submitters considered that the verification timeframe should be left up to the regional council to determine.

One submitter felt that new sites should be verified after one year and then every five years if no issues are discovered. Other timeframes for verification included:

- annually
- every two years
- every three years (especially in areas with high sediment)
- every four years (if the meter has an appropriate filter)
- every five years, or as the manufacturer specifies (whichever is lesser)
- every five years as a default (councils can be stricter)
- on a random audit basis.

Other points regarding verification included the following:

- a standard should be added to require accuracy verification to occur at the typical or historical flow rate for the system
- the standard should require meters to be accurate at all times
- maintenance inspections should occur a minimum of every two months
- rating curve checks should occur in accordance with guidelines for calibrated flow-measurement structures
- there is a need to ensure that the testing equipment to calibrate meters has an accuracy of $\pm 1\%$ and is certified annually to international standards
- the wording should be changed to “the instrument accuracy of all measuring devices should be independently verified every five years”
- guidelines should be given on the timeframes in which a meter must be repaired in the case of malfunctions (electrical, flooding)
- the verification interval should be suited to the measuring device concerned
- calibration needs to occur onsite.

Table 9: Summary of submitters' comments about installation and maintenance requirements

Comment	Submission number
There is support for installation and maintenance requirements	4, 7, 15, 17,36, 21, 22, 59, 60, 62, 63, 65, 71
There is support for installation to comply with manufacturer's instructions and to be installed by qualified personnel	4, 7, 18, 35, 36, 57, 71
Installation locations should be flexible or as close as practicable	17, 45, 70
There is support for independent verification of accuracy every five years	22, 23, 4, 35, 40, 60, 69, 71
Five-yearly verification is too long – the time should be reduced	7, 13, 23, 29, 52, 57
Five-yearly verification is too short – the time should be extended	12, 18, 25, 30, 34, 39

4.5 Data recording and transfer

A large number of submitters made comments and suggestions about the data recording and transfer section within the Proposed NES for Water Measuring Devices. Their remarks and proposals have been divided into nine categories, with a number of submitters commenting on more than one aspect of data recording and transfer.

Eight submitters commented on the overall requirements within the data recording and transfer section. Seven of these supported the general requirements, while two stated that there may be situations when the requirements will need to occur more frequently. The requirements were deemed to be too stringent for small takes by one submitter, who suggested that manual, paper-based systems that operate on monthly readings would be suitable for some situations. Two submitters said that more frequent recording and transfer should be addressed through individual consent conditions, as specified by regional councils.

Eleven submitters made remarks about the need for the data recording and transfer requirements. The arguments as to why data recording and transfer requirements are not necessary were diverse, and included:

- manual, paper-based systems should be appropriate for small takes (two submitters)
- recording requirements would force a significant number of water abstractors to fit data loggers where they might otherwise not need them
- demand and use of the data will be of little relevance to the water user (two submitters)
- the requirements are unnecessary because existing methods are sufficient for measuring water (two submitters).

One submitter stated that the reasons for collecting data need to be articulated more clearly. Flexibility in the data recording and transfer requirements was sought by one submitter, while another said that alternative methods can and should be used to record data and that these methods need to be acknowledged.

4.5.1 Necessity of data

Five submitters made reference to the necessity of the data the NES proposes to gather. Two felt that water-use data at a national level is not necessary, one believed that electronic data logging is not necessary, and three commented that only sensitive takes should be measured.

One submitter supported the need for the data the NES proposes to obtain, while another believed that all-round measuring is pointless.

4.5.2 Daily data recording

The daily recording interval requirement was commented on by 24 submitters. There was some support for the daily recording requirement proposed, but greater flexibility was advocated in the majority of submissions.

Sixteen submitters said that the requirement needs to be practically achievable and relevant to the scale and source of abstraction, and eight made suggestions about appropriate recording intervals. The suggested intervals ranged from more stringent requirements to less onerous requirements. One view was that the proposed recording interval is appropriate. The comments included:

- daily reporting is often inadequate where use varies significantly over a day, and the standard should be one hour or less
- a 15-minute interval is appropriate
- a daily requirement should be the absolute minimum for smaller takes – reductions should be dependent on consent conditions
- weekly recording is sufficient
- monthly recording is more appropriate as daily is not necessary
- it is nonsensical to require daily logging while only requiring annual reporting
- councils should determine recording intervals
- the daily minimum is impractical and unnecessary for some takes and there is little benefit to be gained from this information (two submitters).

The discussion document posed the question of whether recording intervals should vary with the source of take. A number of different flexible recording intervals were suggested by submitters, including:

- a daily recording requirement for rivers (surface water takes) and a weekly requirement for aquifers (groundwater takes)
- weekly or monthly recording, which is more appropriate in some instances
- more frequent recording for large takes and in times of drought.

Five submitters said that it was essential for the NES to retain sufficient flexibility for regional councils to retain discretion in determining appropriate recording intervals.

Three submitters made specific comments about the wording of the daily recording interval requirement:

- a day should be the maximum interval, not the minimum
- the standard does not need to include the phrase “occur at a minimum of daily intervals”
- the wording should be altered to “daily intervals except where it can be shown that daily volume is constant over a number of consecutive days in which case it can be based on an average daily volume”.

Table 10: Summary of submitters’ comments about data recording

Comment	Submitter number
Recording frequency should be dependent on the scale and source of abstraction	5, 14, 17, 21, 23, 28, 31, 34, 41, 45, 49, 56, 62, 63, 65, 66, 70
There should be alternative recording intervals	12, 25, 28, 29, 30, 34, 41, 48, 63, 64
The wording of the requirement needs alteration	10, 52, 55

4.5.3 Method of data storage

Two options for data-recording methods were outlined in the discussion document: electronic storage on “data loggers”, and a manual, paper-based system for recording and storing information. Ten submitters made comments and suggestions about the data-storage options discussed in the proposal.

The submitters’ stances varied. Five supported a requirement for electronic data storage, whereas three stated that data loggers should not be required in all instances. One submitter said that more flexibility was required in order to determine for each situation which devices should be installed. Another said that data-storage-capable meters can only be justified for some consents where real-time data is imperative.

4.5.4 Data transfer

The discussion document proposed that the transfer of data to regional councils be the responsibility of the consent holder and should occur at least annually. Twelve submitters made a range of comments and suggestions about the data transfer requirements. These statements have been divided into three general categories: frequency, method of transfer and practicalities.

Frequency

Several submitters commented on the frequency of one year. Two said that annual reporting seems appropriate, but that there may be some circumstances that require more frequent transfer of data. One said that annual reporting was inadequate for most compliance monitoring purposes.

Four submitters said that the frequency-of-transfer requirement needs to be altered. Their suggestions for more appropriate intervals included that the frequency of transfer should:

- reflect the level of take activity
- be on at least a quarterly basis
- be relevant to the manner in which the data will be used
- occur no less than annually.

Method of transfer

Two main methods of transfer are addressed in the discussion document: electronic and manual data transfer. One submitter said that electronic transfer can be achieved using telemetry, text message or website reports. A number of others also referred to telemetry as one method of data transfer. One submitter stated that there are limitations on the capacity of telemetered systems, and another stated that manual readings are not desirable due to the ability to falsify this information. This same submitter said that telemetered data capture is preferable.

Practicalities

A variety of practical implementation aspects were addressed by submitters, including the following:

- if data is transferred at 15-minute intervals from the measuring device to a central database, data loggers would not be necessary at each measuring station
- hardware to download data is required
- it is not always practical for consent holders to obtain information and send it to the council
- the data transfer network will require ongoing maintenance in order to avoid loss in data quality.

4.5.5 Responsibilities of data recording and transfer

Thirteen submitters referred to the responsibilities of various stakeholders for data recording and transfer requirements. Six agreed with the proposal and said that recording and transfer should be the responsibility of the consent holder. One said that users could be checked by regular audits in order to ensure they are recording and storing data consistently. One said that transfer of data should not rest with the consent holder but did not suggest an alternative option.

Two submitters stated that joint responsibility was the most appropriate scenario for managing the data recording and transfer requirements. One considered that responsibility for data recording and transfer should be shared between water abstractors and regional councils. Another considered that regional or central government should have primary responsibility for the development and implementation of appropriate systems for the transfer and management of water-use data.

Six submitters said that regional councils should have the greatest responsibility for implementing the data recording and transfer requirements. Specifically:

- three submitters said that the Government should give regional councils the responsibility for how the data is collected and derived
- one submitter said that the NES should impose a requirement on regional councils to manage water-use data in an appropriate manner and to make the accumulated data available.

Table 11: Summary of submitters’ comments about data transfer

Comment	Submitter number
Some form of joint responsibility is appropriate	18, 70
Regional councils should be responsible for data recording and transfer requirements	16, 30, 59, 62, 63, 70
It should be the responsibility of the consent holder	5, 30, 37, 40, 51, 56

4.5.6 Format of data

The format of data recorded and transferred was commented on by six submitters. Their suggestions included the following:

- data should be in a format that is compatible with software being used by regional councils (eg, TIDEDA)
- data should be in an electronic format agreed upon by the consenting authority
- “real-time” water-use data should be able to be publicly displayed, therefore adaptable systems are required
- event-based data is required
- data should be available in a well-known format so that it can be easily analysed (eg, Excel)
- data needs to be easily understood by water users.

4.5.7 Consistency of data recording and transfer

Various components of consistency were considered by eight submitters. Two said that an acceptable level of missing data needs to be defined. Three submitters raised the issue of ensuring consistency between and within regions, and one of these suggested that performance criteria for regional councils could be included in the NES.

Other comments included the need for:

- consistency in reporting
- a national storage system.

4.5.8 Technical practicalities

Five submitters said that there were a number of technical difficulties with the data recording and transfer section. Two commented that there were problems with maintaining an electronic meter and data logger on a portable pump. Other comments covered:

- potential compatibility issues, because a range of water meters are available and consequently a range of meter output types
- data logging being inappropriate and difficult for some takes (ie, where there is no power source)
- the issue of using supplied information for enforcement purposes, which can arise when there is self-monitoring (ie, providing self-incriminating data).

4.5.9 Further guidance

Further guidance or greater clarification about the data recording and transfer sections was requested by five submitters. Their suggestions included:

- tools need to be developed and available to users before the NES is finalised
- councils need to identify their recording and transfer requirements
- concern over how regional councils will receive, manage and make effective use of water measurement information
- support for the development of data management best-practice guidelines
- regional councils should make water-use information available to the public.

4.6 Other comments on the proposal

Six submitters made comments and suggestions about a range of subjects that were not directly applicable to any of the previous sections on the Proposed NES for Water Measuring Devices. Their comments are included below:

- a process for dispute resolution is required. One submitter suggested that this could be part of the guidelines that complement the NES
- the continuation and expansion of business operations should involve charges for water within their management structure (ie, reflect the value of the resource)
- the community in each catchment should form a company to manage water takes (which would be accountable to regional councils)
- the NES should specify that more stringent rules be allowed if a regional council deem it is appropriate
- irrigation should be restricted to the hours of 7pm to 7am to promote the most effective use of water
- the NES should also place a consent condition allocating an annual volume on those consents that do not have such a condition. The annual volume can be determined by the council in consultation with the consent holder.

5 Implementation of the Proposed Standard

Submissions on the implementation of the Proposed NES for Water Measuring Devices were broken down into eight main sub-themes. A large number of submitters commented on the implementation of the proposed NES, with concerns and suggestions ranging from the training of the water meter industry to water-meter guidelines.

5.1 Capacity issues

Thirteen submitters made suggestions and comments about the capacity issues that may arise from implementing the Proposed NES for Water Measuring Devices.

Seven submitters felt that implementing the NES would require large amounts of time and resources, at the regional council level in particular. Reviewing existing consents and ongoing monitoring was seen to be a time-consuming process by these submitters. One submitter suggested that central government resources should be provided to assist the implementation process. An alternative suggestion was that the monitoring requirements should be in proportion to the potential adverse effects.

Two submitters were concerned that sudden widespread implementation would increase the number of unskilled technicians. One suggested that this problem could be alleviated by collating a list of skilled technicians in order to improve implementation. Another considered there was a need for guidance material on installations.

A number of submissions referred to an audit procedure as part of the implementation process. Four submitters argued that there needs to be an audit of the water-metering industry in order to achieve consistency. Specific comments included:

- prospective suppliers should be audited to a certain standard in order to avoid cheap imports from flooding the market
- currently anyone can sell a flow meter – this needs to alter for the NES to be effective.

Table 12: Summary of submitters' comments about capacity issues

Comment	Submitter number
Reviewing existing consents and monitoring will be a time-consuming process	18, 36, 40, 49, 52, 65, 66, 70
An audit process required	1, 48, 57, 71

5.2 Implementation timeframe

The timeframe for implementing the NES was commented on by six submitters, five of whom argued that more flexibility is required. Comments included:

- the NES should only be implemented when existing permits come up for review
- councils should be able to review existing consents to require data loggers when circumstances warrant it
- some locations will find it difficult to comply within the timeframe
- a phased timetable for implementation is the most appropriate, so that those who account for the greatest proportion of water takes are required to comply first.

One submitter commented that the five-year timeframe is too long and that this should be altered to accelerate the implementation process.

5.3 Meter guidance

Six submitters suggested that national guidelines for water meters be required or a list of compliant meters developed. Two submitters recommended that a list of appropriate meters and loggers which would meet the requirements of the NES be developed. One view was that this would ensure that all data storage mechanisms would be compatible with regional council systems. Two submitters said that guidelines to test meters were also required in order to have consistent confirmation that a water meter is fit for the purpose.

5.4 Implementation guidance

Six submitters commented on how regional councils might implement the proposed NES. The majority of these said that more guidance is required in order to clarify the responsibilities of regional councils with regard to implementation. One suggestion was that the NES should require regional councils to establish an annual reporting regime for all water sources to ensure standardisation. Comments from other submitters included:

- the NES could potentially be too flexible in allowing regional councils to choose and specify more stringent requirements
- the process surrounding application for, and granting of, exemptions needs to be clearly specified
- the NES should provide for greater discretion to be exercised by regional councils as to actual metering requirements.

5.5 Industry training

Improving the capacity of those affected by the NES for water measuring devices was addressed by four submitters. Training of both the water-metering industry and those who have water takes was commented on.

One submitter said that a significant number of water users do not have the skills to use computers for data logging, so training is required. Three submitters said that water-metering companies should have standardised qualifications. One suggested that commercial practitioners could be certified by skilled regional council staff. Other specific comments from submitters included:

- companies should have trained personnel and calibration certificates
- a national training programme or certification process is required.

5.6 Operational problems

Three submitters had concerns about the practicality of implementing the NES requirements. Specific problems mentioned included:

- it may not be possible to retrofit a measurement device in a way that achieves the accuracy of the proposed standard
- operational problems for pumped systems are envisaged
- it is false to assert that existing water measuring devices can be easily and cheaply upgraded to data-logging capability.

5.7 Implementation planning

The future direction of the NES implementation process was commented on by two submitters. One suggested that central government form a task force of councils to assist in the implementation of the NES. The other said that the NES needs to be aligned with the best approach for water quantity and quality so that they are compatible.

5.8 Other

A number of submitters made reference to a range of other aspects relating to implementation of the NES, including enforcement procedures and inconsistent approaches. Specific comments included:

- fines should be introduced for non-compliance (or the consent revoked if data is not supplied)
- implementation requirements within the NES are at odds with earlier statements and the consultation workshops.

Appendix A: Public Notice

The following public notice was printed in the following papers on Saturday 2 December 2006: *New Zealand Herald, Dominion Post, The Press, Otago Daily Times, Waikato Times, Northern Advocate, Bay of Plenty Times, Daily Post, Gisborne Herald, Taranaki Daily News, Wanganui Chronicle, Hawkes Bay Today, Manawatu Standard* and the *Horowhenua-Kapiti Chronicle*.

Public Notice National Environmental Standard for Water Measuring Devices Call for Submissions

In accordance with sections 44 of the Resource Management Act (1991) the Minister for the Environment gives notice of the Government's intention to develop a national environmental standard (regulations) for water measuring devices.

The intent of the proposed national environmental standard is to ensure the accurate and comprehensive measurement of water takes to facilitate the sustainable management of New Zealand's water resource. This is consistent with the purpose of the Act in promoting the sustainable management of water as a natural resource. It would do this by:

- setting minimum requirements for all new water measuring devices that are installed; and
- defining situations where water measuring devices are compulsory.

A discussion document outlining the subject matter and rationale of the proposed standard has been produced by the Ministry for the Environment to assist people in making submissions. This document can be viewed at the Ministry for the Environment, 23 Kate Sheppard Place, Thorndon, Wellington and online at www.mfe.govt.nz.

If you would like a hard copy of the discussion document, free copies are available by emailing your request to publications@mfe.govt.nz or phoning 04 439 7467.

Any person can make a submission on the subject matter of the proposed standard. Please include the following information in your submission:

- your name, postal address, phone number and e-mail address (if applicable)
- that you are making a submission on the proposal to develop a national environmental standard for water measuring devices
- whether you support or oppose the proposal as detailed in the discussion document
- your submission with reasons for your views
- any changes you would like made to the proposed standard as detailed in the discussion document
- the decision you would like the Minister for the Environment to make.

You must forward your submission to the Ministry for the Environment, PO Box 10-362, Wellington, or by email to standards@mfe.govt.nz, in time to be received no later than 5.00 pm on Friday 16 February 2007.

Appendix B: Index of Submitters

No.	Contact name	Company	Category
1	Roger Appleby	ABB Instrumentation	Measuring device and hardware providers
2	Alan Wilde	Alan Wilde	Individual
3	Dennis Butler	Alliance Group Ltd	Water-user industry
4	Owen Eason-Savage	Arthur D Riley & Co Ltd	Measuring device and hardware providers
5	Carolyn Blackford	Auckland Regional Council	Regional council
6	Ralph Hore	Blackstone Hill Ltd	Individual
7	Dave Boraman	Boraman Consultants Ltd	Measuring device and hardware providers
8	Brian Stevenson	Brian Stevenson	Individual
9	John Hayes	Brown Brothers Engineers Ltd	Measuring device and hardware providers
10	Jim Newfield	Carter Holt Harvey	Water-user industry
11	Chris Allen	Chris Allen	Individual
12	Dianne Shelander	Christchurch City Council	Territorial authority
13	David Renouf	David Renouf	Individual
14	Andrew Noone	Dunedin City Council	Territorial authority
15	John Mandemaker	Environment Bay of Plenty	Regional council
16	Kathleen Crisley	Environment Canterbury	Regional council
17	Elaine Stuart	Environment Southland	Regional council
18	Lionel Hume	Federated Farmers of New Zealand	Representative or professional body
19	Nick Pyke	Foundation for Arable Research	Crown Research Institute/academic/research
20	Gavin Dann	Gavin Dann	Irrigation company/community water infrastructure
21	Richard Matthews	Genesis Energy	Water-user industry
22	Kerry Hudson	Gisborne District Council	Unitary authority
23	Nigel Corry	Greater Wellington Regional Council	Regional council
24	Tony Shaw	Greater Wellington Water	Regional council
25	Ken Gillespie	Hawkdun Idaburn Irrigation Company Ltd	Irrigation company/community water infrastructure
26	Dianne Vesty	Hawke's Bay Fruitgrowers Association and Hawke's Bay Vegetable Growers' Association	Representative or professional body
27	Eileen von Dadelszen	Hawke's Bay Regional Council	Regional council
28	Xan Harding	Hawke's Bay Winegrowers Association	Representative or professional body
29	Greg Carlyon	Horizons Regional Council	Regional council
30	Ken Robertson	Horticulture New Zealand	Representative or professional body
31	Shelly Pope	IPENZ	Representative or professional body
32	John Raffensperger	John Raffensperger	Individual
33	KW and PW Stackhouse	KW and PW Stackhouse	Individual
34	AE Sutton	Last Chance Irrigation Company Ltd	Irrigation company/community water infrastructure
35	Jeff Watson	Local Authority Environmental Monitoring Group	Regional council
36	Natasha Brava	Local Government New Zealand	Territorial authority

No.	Contact name	Company	Category
37	Wayne Stachurski	Longview Pastures Ltd	Individual
38	Geoff Crutchley	Maniototo Irrigation Company	Irrigation company/community water infrastructure
39	Allison Sutton	Manuherikia Irrigation Cooperative Society Ltd	Irrigation company/community water infrastructure
40	Pere Hawes	Marlborough District Council	Unitary authority
41	Dave Harrison	Meat Industry Association	Representative or professional body
42	Alanya Limmer	Meridian Energy Ltd	Water-user industry
43	Kevin Head	Meter Services	Measuring device and hardware providers
44	Justine Bray	Ministry of Education	Government
45	Kim Schmidt	New Zealand Aluminium Smelters Ltd	Water-user industry
46	Adriaan Van Kersen	Newmont Waihi Gold Ltd	Water-user industry
47	Trevor Newton	Newton Slink Skins	Water-user industry
48	Barry Biggs	NIWA	Crown Research Institute/ academic/ research
49	Treena Davidson	Northland Regional Council	Regional council
50	Sue Murphy	Omakau Area Irrigation Company Ltd	Irrigation company/community water infrastructure
51	Fraser McRae	Otago Regional Council	Regional council
52	John Williamson	Otago Water Users Group	Representative or professional body
53	Neal Gillespie	Pioneer Generation Ltd	Water-user industry
54	MR Butcher	Pipfruit New Zealand Inc	Representative or professional body
55	Graeme Keeley	PPCS Ltd	Water-user industry
56	RD Fenwick	RD Fenwick	Individual
57	Gavin Briggs	Rainer Irrigation	Measuring device and hardware providers
58	Ru Collin	Rakaunui Fruit Company	Individual
59	John Young	Rangitata Diversion Race Management Ltd	Irrigation company/community water infrastructure
60	Karol Helmink	RMLA	Representative or professional body
61	Ross Polson	Ross Polson	Individual
62	Paul Cooper	Rotorua District Council	Territorial authority
63	Jonathan Midwinter	Royal Forest and Bird Society NZ	Non-government organisation
64	Blair Miller	Scott Technical Instruments Ltd	Measuring device and hardware providers
65	Fred McLay	Taranaki Regional Council	Regional council
66	Mary-Anne Baker	Tasman District Council	Unitary authority
67	Isla Whitley	Timaru District Council	Territorial authority
68	Lara Burkhardt	Trust Power Ltd	Water-user industry
69	David Spiers	Waikato Regional Council	Regional council
70	Trevor Daya-Winterbottom	Wairakei Pastoral Ltd	Water-user industry
71	EJ Gilliver	Water Rights Trust	Non-government organisation
72	Nichola Costley	West Coast Regional Council	Regional council
73	Glen Sutherland	Wyndham Golf Club	Irrigation company/community water infrastructure