



Ministry for the
Environment
Manatū Mō Te Taiao

Proposed National Environmental Standard for Human Drinking-water Sources

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Contents

Acknowledgements	iii
1 Summary	1
2 Introduction	2
2.1 Background	2
2.2 Purpose of this document	3
2.3 National environmental standard development process	3
2.4 Objectives of the standard	4
3 Why Do We Need a National Environmental Standard for Source Water	5
3.1 Managing drinking-water from source to tap	5
3.2 How New Zealand manages risks to drinking-water supplies	6
3.3 Ensure that the impact a proposal has on community drinking-water supplies is assessed in resource consent applications	6
3.4 Increase shared understanding between water suppliers, local authorities, resource users and interested parties	7
3.5 Ensure that permitted activity rules consider the risks to community drinking-water supplies	7
3.6 Ensure procedures are in place to protect community drinking-water supplies in the event of an unauthorised discharge	8
3.7 Enable councils to require appropriate action to be taken in the event of an accident or emergency	8
4 The Proposed Standard	10
4.1 Detail of the standard	10
4.1.1 Proposed subject matter of the proposal	10
4.1.2 Grant of resource consent	11
4.1.3 Assessment of permitted activities	13
4.1.4 Communication protocols – unauthorised activities	13
4.1.5 Response to emergencies	14
4.2 What the standard does not require	14
5 Supporting Information	15
5.1 A register of drinking-water supplies	15
5.2 Identifying community drinking-water catchments	15
5.3 Monitoring and reporting framework	15
5.4 Workshops	16
6 Costs and Benefits	17
6.1 Costs and benefits of the standard	17

6.1.1	Central government	17
6.1.2	Regional and local government	18
6.1.3	Drinking-water suppliers	18
6.1.4	Resource consent applicants	18
6.1.5	Public health	19
7	What Next?	21
7.1	Making a submission	21
7.2	Questions	21
7.3	What happens after you have made your submission?	22
	Appendix 1: Definitions	23
	Appendix 2: Types of Activities that Pose a Threat to Source Water Quality	24
	References	29

Tables

Table 1:	Statutory controls that manage risks	6
Table 2:	Relationship between the principal Acts governing drinking-water	8
Table 3:	Initial assessment of costs and benefits from the proposed standard	20
Table 4:	Land use categories, main groups of contaminants associated with that land use and typical contaminant pathways	24

Figures

Figure 1:	Standard development process	3
Figure 2:	Legislative boundaries	9

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1 Summary

We propose for consultation a new national environmental standard for human drinking-water sources.

A national environmental standard is a legally enforceable regulation. The exact wording of this standard will be legally drafted after government decision following this consultation. In essence, the proposed standard will say:

- New consents in drinking-water catchments shall only be granted if the proposed activity does not result in drinking-water being non-potable or unwholesome following treatment.
- Consent authorities will periodically assess the risks within drinking-water catchments to ensure that permitted and unregulated activities do not cause impacts beyond the performance of the affected treatment facilities.
- Resource consents within drinking-water catchments will have a condition that any unauthorised activity be notified to the water supplier immediately.
- Resource consents to take water for drinking will have a condition that requires appropriate action, including turning off the supply, if notified of events or activities that make the drinking-water non-potable.

2 Introduction

2.1 Background

The Ministry for the Environment is working with the Ministry of Health to introduce a “multi-barrier” approach to managing human drinking-water in response to risks presented by potential contaminants. The Ministry for the Environment is proposing a national environmental standard for human drinking-water sources under the Resource Management Act 1991 (RMA).

The proposed national environmental standard takes a pragmatic approach to protecting drinking-water sources, advocating consultative processes to identify and minimise potential cost impacts. The standard formalises practices and procedures already provided for, but that are variably applied, in order to minimise adverse effects on drinking-water sources, and other freshwater systems.

What are national environmental standards?

National environmental standards are regulations made under [sections 43 and 44](#) of the RMA. Standards can be numerical limits, narrative statements, or methodologies that are in a legally enforceable form. These may include standards relating to:

- noise
- contaminants
- water quality, level or flow
- air quality
- soil quality in relation to the discharge of contaminants
- prescribing the methods of implementing such standards.

This proposed standard is a narrative statement.

What is a human drinking-water source?

For the purpose of this standard, a *human drinking-water source* is a natural water body (lake, river or groundwater) used to supply a community with drinking-water.¹

Further definitions are provided in Appendix 1 of this document.

¹ Rainwater has been excluded from this definition. Although rainwater is a significant drinking-water source, it cannot be managed by this standard and has therefore been excluded from the definition. Rainwater, once it is collected on the roof, falls under the controls of the Building Act 2004.

2.2 Purpose of this document

The discussion document has been prepared to:

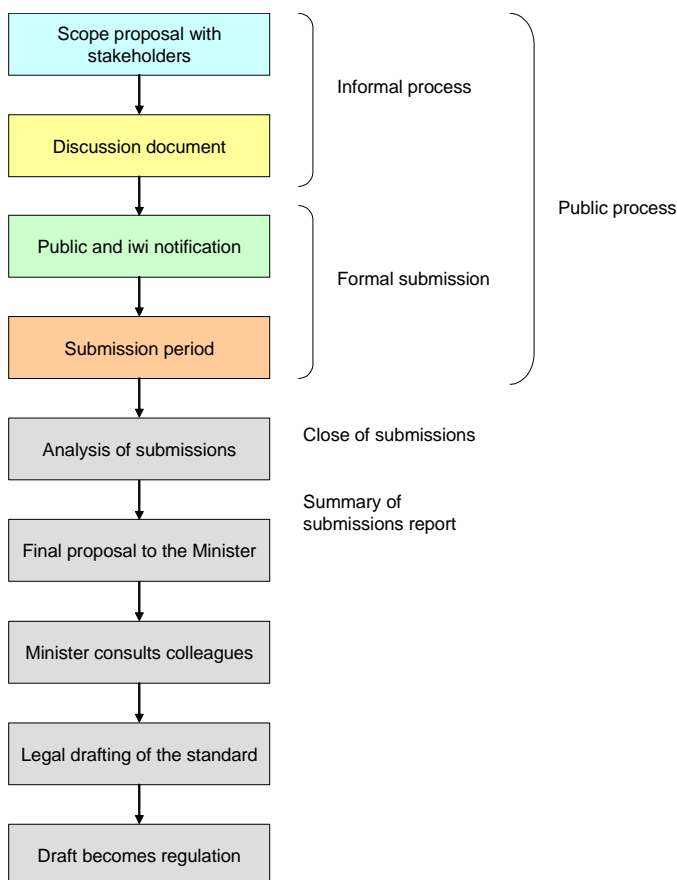
- help you understand the proposal and its potential costs and benefits
- help you prepare questions and feedback for the consultation workshops (see section 7, What next?)
- guide you in making a submission.

To help you formulate a submission, questions are posed on aspects of the proposed standard that we specifically want you to consider, but you are welcome to provide feedback on any aspect of the standard that has not been covered by a specific question.

2.3 National environmental standard development process

An outline of the standard development process, including the informal and formal submission process is shown in Figure 1. The Ministry has already completed the informal submission process, and notification of the standard package through this document is a step in the formal submission process.

Figure 1: Standard development process



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

The submission period is your opportunity to make a formal submission on the standard. An eight-week submission period is provided to enable people to have formal submissions approved by committees or boards. Details on how to make a submission are included in section 7, What next?

A summary of submissions will be published by the Ministry after the closing date.

2.4 Objectives of the standard

The intention of the proposed national environmental standard for source water is to contribute to a “multi-barrier” approach to managing human drinking-water. The national environmental standard will ensure there is a “catchment component” to managing human drinking-water (see Figure 2, Legislative boundaries), making certain there are controls within drinking-water supply catchments. The objectives of the standard are to:

- ensure consideration of resource consent applications includes assessment of the proposals’ impact on community drinking-water supplies
- increase shared understanding between water suppliers, resource users, and regulatory authorities regarding the impact of their activities on other parties, particularly in respect to drinking-water standards
- ensure that regional councils periodically undertake a risk-based assessment of the impact of permitted activity rules on community drinking-water supplies
- ensure communication protocols are in place to protect community drinking-water supplies in the event of an unauthorised discharge
- enable councils to require appropriate action to be taken by drinking-water suppliers in the event of an accident or emergency
- highlight the boundaries between legislated responsibilities, particularly Ministry of Health legislation and the RMA.

3 Why Do We Need a National Environmental Standard for Source Water

3.1 Managing drinking-water from source to tap

Most of the New Zealand population receives safe drinking-water. Comparisons show New Zealand has some of the best drinking-water quality in the world, mainly as a result of the comparative lack of industry.² However, New Zealand does have potential issues with nutrient and microbiological contamination of water, caused in part by our large primary industry base. Risks from microbiological contamination of water by, bacteria, protozoa and viruses are of most interest.

There is currently no specific requirement in the RMA for consent authorities to consider the impact that proposed activities may have on source water in a drinking-water supply catchment. Consequently, there is potential for land use activities or discharges to be consented that reduce water quality at the point of abstraction to below that which the plant is designed to treat. This presents potential health risks to the community and may result in significant costs to the supplier in upgrading treatment facilities.

Part 7 (section 126) of the Local Government Act 2002 requires local authorities to undertake a specific assessment of the quality and adequacy of drinking-water supplies. However, there is no mandated requirement to manage source water quality, which is the aim of this standard.

There is potential for unauthorised discharges (often accidental and unpredictable) to contaminate water supplies. For example, a breach of a discharge consent condition might threaten the water supply. Our proposal will ensure water suppliers are notified of such incidents.

Modern management requires a “multi-barrier” approach to drinking-water supply to minimise the potential for waterborne disease outbreaks in New Zealand.³ This means that if one barrier fails, others will be in place (see Figure 2, Legislative boundaries).

The Ministry for the Environment is proposing a national environmental standard under the RMA to improve how drinking-water is managed at source. This standard will complement Ministry of Health legislation and standards for improving drinking-water supply and delivery, and ensure a comprehensive approach to managing drinking-water from source to tap.

² In recent studies of drinking-water supplies, only 4 percent of the population was shown to be receiving water that was contaminated. However, 22 percent received water that had not been shown to be safe, ie, not monitored or not monitored sufficiently (Taylor and Ball, 2004).

³ The Ministry of Health is proposing amendments to the Health Act 1956 to implement an integrated system of procedures, processes and tools that collectively prevent or reduce the contamination of drinking-water from source to tap, with the aim of reducing risks to public health (Taylor, 2004).

The multi-barrier approach is:

- an integrated system of procedures, processes and tools that collectively prevent or reduce the contamination of drinking-water from source to tap in order to reduce risks to public health.

3.2 How New Zealand manages risks to drinking-water supplies

Overseas outbreaks of infectious disease have resulted from a combination of land use and treatment plant failure. These risks are similar for water supplies in New Zealand. Table 1 shows the legislation that seeks to avoid or mitigate the risk to catchment threats to drinking-water supplies.

Table 1: Statutory controls that manage risks

Risk	Statutes	Controls
Diffuse runoff from agricultural land, including: microbiological, chemical and nutrient contamination	Resource Management Act 1991	Permitted activity rules in plans
Land use activities	Resource Management Act 1991	Consents, plan rules
Direct discharges	Resource Management Act 1991	Resource consents
Water abstraction	Resource Management Act 1991	Resource consents
Unauthorised discharges from consented activities	Resource Management Act 1991	Enforcement provisions
Accidents and emergencies: flooding, accidental spills, accidental spills (eg, tankers containing milk, fuels or hazardous substances), deliberate use of threats to use poisons (eg, the recent 1080 poison scare at Kaikoura)	Civil Defence and Emergency Management Act 2002; proposed amendments to the Health Act 1956	Civil Defence and Emergency Management Group Plans; Public Health Risk Management Plans

3.3 Ensure that the impact a proposal has on community drinking-water supplies is assessed in resource consent applications

While section 5 of the RMA refers to social, economic and cultural wellbeing for people and communities, there is no specific requirement for consent applicants to consider the impact of their proposed activity on community drinking-water supplies. Whilst it can be argued that the definition of environment in the RMA includes public health, there is no specific reference to community drinking-water supplies in the Act. Water suppliers consider that RMA decision makers often struggle to balance concerns with a proposed activity's impacts on a water supply against ecosystems impacts.

This can be critical for human drinking-water management. Two significant examples of drinking-water supply contamination, Walkerton and Milwaukee,⁴ were a consequence of land use activities. There needs to be a mechanism in place to ensure that water supplies in New Zealand are adequately protected. Our proposal will be specific about protection of drinking-water sources.

3.4 Increase shared understanding between water suppliers, local authorities, resource users and interested parties

Roles and responsibilities of councils involved in the management of drinking-water sources are generally well defined. Local authorities control and regulate activities in drinking-water catchments, and water suppliers (usually territorial local authorities, private industry or small communities)⁵ ensure abstracted water is delivered to the consumer in a potable form.

These separate roles are covered under differing legislation, and can result in oversights. It is critical that all the differing bodies involved in drinking-water from source to tap work closely together, and understand the impact of their activities on the other parties.

The provisions for drinking-water values in regional plans are an example of the uncertainty of roles and responsibilities. For example, only six of 16 regional councils or unitary authorities have a comprehensive approach to the management of drinking-water catchments. The other councils have either not addressed the issue, or have done so in a very general way.⁶

3.5 Ensure that permitted activity rules consider the risks to community drinking-water supplies

In New Zealand, agricultural land use is generally a permitted or unregulated activity and there may be no controls in place to manage the effects of diffuse runoff on the environment. The standard will require councils to periodically review permitted activity rules to ensure these activities will not render source water non-potable or unwholesome following treatment.

⁴ In 1993, the city of Milwaukee was affected by a *Cryptosporidium* outbreak, infecting 403,000 people. In May 2000, an outbreak of *E. coli* 0157 affected the small rural town of Walkerton, Ontario, infecting 2000, killing seven, with a further 27 requiring kidney dialysis for the rest of their lives.

⁵ Greater Wellington (Wellington Regional Council) is a water supplier, as well as a catchment manager.

⁶ Ministry for the Environment, 2004.

3.6 Ensure procedures are in place to protect community drinking-water supplies in the event of an unauthorised discharge

Procedures are needed to ensure water suppliers are notified of unauthorised discharges from consented activities (for example, discharges that exceed consented limits) that could adversely affect source water quality. Being advised as soon as possible will enable water suppliers to take appropriate action or advise what steps need to be taken to minimise or eliminate the risk to the supply and/or the community.

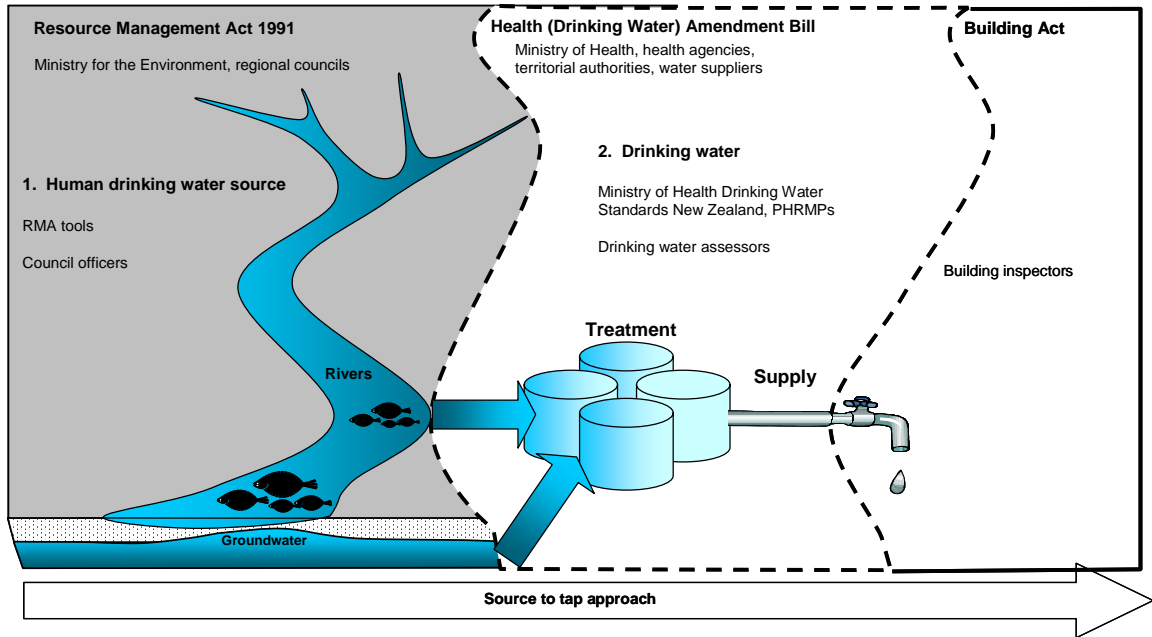
3.7 Enable councils to require appropriate action to be taken in the event of an accident or emergency

There is currently no specific requirement in the RMA for councils to notify or respond to accidents and emergencies that impact on a drinking-water supply. In most cases, council involvement will be as part of emergency planning and response. There may be situations where the scale or severity of the event necessitates cessation of abstraction in the interest of protecting the treatment plant and community health.

Table 2: Relationship between the principal Acts governing drinking-water

	Resource Management Act 1991	Local Government Act 2002	Proposed amendments to the Health Act 1956	Building Act 2004	Civil Defence and Emergency Management Act 2002
Applies to	Water sources – rivers, lakes and groundwater	Supply of drinking-water to the community	Piped supplies and tankered systems	Self-supplied dwellings	Water sources, treatment plants, delivery systems
Tools	Statutory plans, resource consents, national environmental standards	Assessment of the provision of water supplies to communities	Public Health Risk Management Plans, Drinking-water Standards for New Zealand (DWSNZ) (2005), public health gradings	Proposed compliance schedules based on DWSNZ New Zealand Building Code	Civil Defence and Emergency Management Group Plans

Figure 2: Legislative boundaries



4 The Proposed Standard

This section details the proposed subject matter of the standard and what the standard would require in practice.

The intent of the standard is to ensure impacts of catchment activities on drinking-water supplies are considered in regional council and territorial authority processes. The proposal is the result of consultation with stakeholders and consideration by the Ministry's technical working group and is believed to be the most appropriate tool for achieving the desired outcomes.

The Ministry for the Environment is investigating a supporting package to assist with implementation of this standard. This is outlined in section 5 of this document. The combination of the standard and the supporting package are expected to establish best practice management of human drinking-water sources in New Zealand.

4.1 Detail of the standard

4.1.1 Proposed subject matter of the proposal

A national environmental standard is a legally enforceable regulation. The exact wording of this standard will be legally drafted after government decision following this consultation. In essence, the proposed standard will say:

- A consent authority shall not grant a resource consent that renders source water at the point of abstraction for a community drinking-water supply⁷ non-potable or unwholesome following treatment.
- A consent authority will periodically assess the risk to community drinking-water supplies presented by permitted or unregulated activities. The consent authority must be satisfied that source water at the point of abstraction for a community drinking-water supply will not be rendered non-potable or unwholesome following treatment, as a result of a permitted activity.
- Consented activities within a drinking-water catchment should include a resource consent condition that requires the consent holder to inform water suppliers of any unauthorised discharge from that activity. This is to enable the water supplier to take appropriate action to mitigate the risks to public health.
- A consent authority shall include, as part of any consent to take water for the purpose of providing community drinking-water, a condition that requires appropriate action to be taken (including turning off the supply) in the event the consent holder is notified of an accident or emergency that could result in drinking-water being non-potable or unwholesome.

⁷ A publicly or privately owned drinking-water supply that serves more than 25 people at least 60 days of the year. (Note that further definitions are listed in Appendix 1 of this document.)

4.1.2 Grant of resource consent

The standard states that a consent authority shall not grant a resource consent that renders source water at the point of abstraction for a community drinking-water supply non-potable or unwholesome following treatment.

To achieve this, a consent authority must be satisfied that any adverse effects of an application for resource consent on community drinking-water supplies have been assessed and include how any such adverse effects are to be avoided, remedied or mitigated.

The intent of this part of the standard is to increase protection of human drinking-water sources, while retaining flexibility and encouraging local solutions to be reached, through consultation and negotiation. Where an activity is assessed as likely to have an adverse effect on a community drinking-water supply, alternatives may be negotiated between the water supplier, local authorities, the consent applicant and the community. If adequate mitigation cannot be offered or an alternative solution cannot be agreed upon, priority should be given to providing safe drinking-water to the community and the application declined.

Defining a specific level of treatment is problematic and doing so would set a bottom line for source water quality. Feedback on the previously proposed monitoring and reporting standard made it clear that setting such a bottom line was not acceptable. Also, in some situations, for example, Christchurch, water used for human drinking-water does not require treatment, and defining a minimum level of treatment would place unnecessary requirements on these communities. A definition for treatment is provided in Appendix 1 to reflect this intent.

In practice, this will require:

- resource consent applications within a drinking-water supply catchment shall specifically consider the potential impact of their proposed activity on water quality at the point of abstraction for a community drinking-water supply. This includes water supplies that have no existing treatment. Refer to Appendix 2 for examples of the types of activities that pose a threat to source water quality.⁸ This information will guide consent authorities in determining whether drinking-water suppliers are an affected party
- the impact on any down-gradient community drinking-water supplies shall be included in an applicant's assessment of environmental effects
- the water supplier will assess whether their water treatment plant is able to treat the proposed water quality. This assessment should also be undertaken in the event of there being no treatment. This assessment should consider the expected water quality at the point of abstraction as assessed by the applicant, the capacity of their water treatment plant, and comparing the expected treated water quality with the water-quality requirements specified in the Ministry of Health Drinking Water Standards
- prior to granting any resource consent within a drinking-water catchment, the consent authority must be satisfied that the appropriate level of assessment has been undertaken, and that a proposal will not render source water at the point of abstraction for a community drinking-water supply non-potable or unwholesome following treatment

⁸ The catchment definition work being carried out by the Ministry for the Environment will provide further guidance on defining drinking-water supply catchments and activities that may adversely affect them.

- where a resource consent cannot be granted, after taking into account the existing treatment plant capacity, the applicant and the water supplier (and other affected parties) may negotiate alternatives to enable the proposed activity to go ahead
- an application is to be refused where the decision-making body is not satisfied that the activity will not degrade source water quality to a point that down-gradient community drinking-water supplies are unable to provide potable and wholesome drinking-water after treatment, and alternatives cannot be agreed upon
- location of drinking-water supply catchments will be identified by consent authorities and abstraction points will be made available through the Ministry of Health's Water Information New Zealand website.

Drinking-water suppliers understand best the technical capabilities of their treatment facilities, and therefore the source water quality required at the point of abstraction. Therefore, to determine whether or not a proposed activity is likely to impact on a drinking-water supply, communication between the consent authority, the applicant and potentially affected drinking-water suppliers will be necessary.

Communication between these parties will ensure drinking-water suppliers have the opportunity to view the applicant's assessment on the potential impact of their proposed discharge on water quality at the point of abstraction. Water suppliers will then be able to assess whether a proposed activity is likely to affect their treatment process, and may advise on methods for avoiding, remedying or mitigating such adverse effects.

If the water supplier considers that their treatment plant may be unable to treat the drinking-water safely within the catchment as a result of the potential effects of the activity on source water quality, priority should be given to ensuring the quality of a proposed discharge is improved before considering an upgrade to treatment processes, to deal with a reduction in source water quality.

The standard formalises practices and procedures provided for already in order to minimise adverse effects on human drinking-water sources. The standard makes it clear that:

- drinking-water catchment management is addressed through the RMA and not through health legislation
- there is a responsibility under the RMA to ensure that water intended for human drinking-water is not adversely affected by the use, development and protection of natural and physical resources
- activities beyond the abstraction point are within the jurisdiction of the Ministry of Health and no attempt is made to direct these through the RMA.

4.1.3 Assessment of permitted activities

There is currently no specific requirement for local authorities to undertake a risk-based assessment on the impact of permitted activities on community drinking-water supplies.

The standard requires consent authorities to periodically assess whether existing or proposed permitted activity rules in plans present a risk to community drinking-water supplies. This may be during the review or renewal of an existing regional plan, or during a local authority's ongoing monitoring of the efficiency and effectiveness of their policies or rules (section 35(2)(b) of the RMA). To achieve this, councils should: consider existing water quality data from state of the environment monitoring to assess water quality to determine its suitability for treatment, carry out a risk assessment of existing permitted activities within the water supply catchment, and consider the impact of permitted activity thresholds.

In practice, this will require:

- for many, the existing state of the environment monitoring that councils do will be able to assess water quality to ensure permitted activities are not adversely affecting the existing drinking-water treatment plant. The Ministry for the Environment investigates developing guidance in the form of a monitoring framework
- where permitted or unregulated activities are identified as adversely affecting community drinking-water supplies, councils may need to revise their plan rules to avoid, remedy or mitigate these effects.

4.1.4 Communication protocols – unauthorised activities

There is currently no requirement within the RMA to ensure water suppliers are notified of unauthorised discharges that present a risk to the water supply.

The standard states that in the event of an unauthorised discharge from a consented activity within a drinking-water catchment, communication protocols should be in place to ensure water suppliers can take appropriate action to mitigate the risks to public health.

In practice, this will require:

- regional councils and territorial authorities to place a consent condition on any new resource consent that poses a potential risk to a community drinking-water supply, requiring notification of down-gradient community water supplies in the event of an unauthorised discharge to land or water
- regional councils and territorial authorities to include water suppliers in their list of agencies to notify in the event of an unauthorised discharge.

4.1.5 Response to emergencies

There is currently no requirement in the RMA that requires or empowers councils to respond to accidents and emergencies that may impact a drinking-water supply.

The standard states that a council has the ability to require a drinking-water supplier to take appropriate action, including ceasing to abstract water in the event of an accident or emergency that threatens the ability of the treatment facility to provide safe drinking-water to the community.

In practice, this will require:

- councils will have to include in all consents to take water for community drinking-water supplies, provision for councils to declare the source water unsuitable for treatment in the event of an accident or emergency
- in the event of an accident or emergency, the council must notify the drinking-water supplier as soon as practicable. The council and water supplier will determine the appropriate response to the event, which may include discontinuing abstraction until such time as the source water no longer presents a risk to drinking-water supply
- councils, drinking-water suppliers and civil defence and emergency management authorities could work together to identify scenarios that present a threat to drinking-water supplies and what the appropriate procedures should be for each of these scenarios.

4.2 What the standard does not require

The standard does not require:

- a quantitative water-quality standard. This would, in effect, set a national “bottom-line” receiving water-quality standard. Retaining flexibility, so water treatment plants are designed and operated to meet the water-quality needs in that particular catchment, is important
- upgrades to proposals for resource consents or water treatment plants – although these may occur as a result of discussions held during the resource consent process.

5 Supporting Information

The Ministry for the Environment is investigating a supporting package to assist with implementation of the proposed standard. This may include:

- guidance material outlining a tiered methodology for defining drinking-water catchments
- implementation workshops for local authorities and water suppliers.

The Ministry of Health maintains a register of community drinking-water supplies, which is publicly available.

5.1 A register of drinking-water supplies

The Ministry of Health currently administers a list of water supply locations, and is completing a list of all drinking-water supply abstraction points. This information is available through the Ministry of Health's Drinking Water for New Zealand website and could be linked to the users guide and incorporated into council Geographic Information Systems (GIS) databases.

5.2 Identifying community drinking-water catchments

At present, defining source water supply catchments is problematic, especially for aquifers. This, in turn, presents challenges for managing the risks associated with existing and proposed activities in the catchment.

The Ministry for the Environment has commissioned work on developing a tiered methodology on how to define drinking-water catchments. This methodology could be applied to surface and groundwater systems. This will assist applicants and decision makers to assess the potential effects on drinking-water supplies.

5.3 Monitoring and reporting framework

The Environment and Health Ministries developed a monitoring and reporting framework for water supply catchments as part of their earlier work on the national environmental standard for source water. The framework sets out a three-step process for grading water supply catchments: starting with individual contaminants, then classes of related contaminants and, finally, an overall grade for the water. It is based on a combination of qualitative risk assessment and water quality data.⁹

⁹ Nokes and Ball (2004).

5.4 Workshops

The Ministry for the Environment intends to run technical workshops that will cover the detail of the standard and the implementation package. More information will be available on the workshops once the standard is finalised.

6 Costs and Benefits

The Ministry for the Environment has commissioned a Section 32 analysis of the standard.¹⁰ The analysis will be reported in two parts – a scoping report and a full appraisal. This section is based on the scoping report, with fuller quantification during the next phase. It:

- defines the types of costs and benefits that will be incurred as a result of the standard
- stratifies the costs and benefits by affected group and by the situations in which they will be encountered
- identifies key information that could be researched during the consultation phase.

6.1 Costs and benefits of the standard

The costs and benefits of the standard will depend on the changes that it makes to the status quo. The outcome will depend on the way that councils act in respect of consent requirement, their knowledge and regulation of drinking-water sources, and their current protocols for managing unconsented discharges. Costs will typically be incurred as a result of increased activity under the standard, although in some cases increases will not occur because councils and consent applicants are already meeting the standard requirements.

There are six stakeholder groups likely to be impacted by the proposed standard:

- central government
- regional and local government
- drinking-water suppliers
- resource consent applicants
- public health
- emergency management.

6.1.1 Central government

Central government will incur costs through the preparation of the standard, its implementation and monitoring costs. Of these, the implementation costs will probably be the most significant, and will arise largely through the technical assistance programme. An extensive monitoring programme is not likely to be required, because compliance can be measured through existing council auditing processes.

¹⁰ Section 32 of the Resource Management Act 1991 relates to the evaluation of alternatives, benefits and costs associated with proposed changes to plans, regulations, policy statements and so on.

6.1.2 Regional and local government

Regional and local government will be the primary mode through which the standard is implemented. Expenditure will comprise implementation and administration costs.

Implementation costs incurred by regional government will largely arise through the identification and description of drinking-water catchments. While this will be relatively simple for surface catchments, groundwater catchments and their recharge zones can be more difficult to establish. Costs will be incurred by authorities with the need to review permitted and unregulated activities to determine whether they are likely to have an impact on drinking-water sources. If the reviews result in the need to adjust plans, costs could be involved. Local authorities will also need to ensure that communication protocols are in place in the event of an unauthorised discharge by a consent holder.

In *administering* the standard, some costs will increase for regional and local government. As any resource consent is processed, there will be an additional step required to check whether the activity is within a drinking-water source catchment, and where this is true, ensuring that the necessary impacts have been included in the assessment of environmental effects (AEE). Most of these costs are likely to be recovered from consent applicants.

6.1.3 Drinking-water suppliers

Drinking-water suppliers will experience increases in cost in both the implementation and administration phases of the standard. During implementation, the cost increases are likely to be minor and associated with increased consultation with regional and local government.

During administration of the standard, drinking-water suppliers, as affected parties, may receive more referrals for consents. This will largely depend on the location and type of drinking-water source, the activities in the catchment, and current practice with consents. Where an upgrade to treatment processes is negotiated, there may be increased capital costs and an increase in the cost of running the plant.

In some cases, the increased protection offered by direct consideration of impacts on drinking-water supplies will result in savings in treatment costs, particularly for drinking-water suppliers with low or minimal treatment in place.

6.1.4 Resource consent applicants

Some resource consent applicants are likely to face increases in costs as a result of the standard. They will be required to identify whether they are within a drinking-water source catchment, and to show that the proposed activity will not have a significant effect on that water supply. Decision-making bodies will require notification procedures for unconsented discharges.

The additional costs for consent applicants may, in some cases, be limited, simply because most activities that have an impact on water quality would normally be required to demonstrate that the impact is only minor, and drinking-water supplies may be recognised as a value to be protected, regardless of the standard. However, even where this is not the case, the additional thresholds for demonstrating impact on drinking-water supplies may not be large.

Where impacts from a consentable activity are probable, mitigation or prevention costs are likely to be incurred by applicants. The size and scope of these costs is difficult to determine, and may vary from significant, where activities are no longer able to proceed in an area, to low where only minor mitigation measures are required.

6.1.5 Public health

The ultimate aim of the standard is to reduce the risks to drinking-water. The reduction in risk from the proposed measure is difficult to quantify, and the social costs of an outbreak are equally difficult to estimate. Indicatively, the social cost from the Walkerton outbreak¹¹ was estimated at \$287,000 per affected individual, with 2000 people becoming ill.

The reduction in risk will depend on the nature of the activities that will be captured by the standard, and whether it results in a reduction in risk. The nature of the reduction in risk to public health will be investigated further in the full section 32 appraisal.

¹¹ As noted, in 1993, the city of Milwaukee was affected by a *Cryptosporidium* outbreak resulting from a drinking-water filter failure. The outbreak infected an estimated 403,000 people, and led to the death of 120 people. The total financial cost of the outbreak is estimated at US\$96.2 million (NZ\$187.34 million); Corso (2003).

Table 3: Initial assessment of costs and benefits from the proposed standard

Impact	Central government	Regional government	Water treatment plant operator	Resource consent applicant	Emergency management groups	Public
Implementation costs	C+ Preparation of the NES. Supporting package.	C+ Costs of defining drinking-water catchments; review permitted activity rules, some plan changes.				
Resource consent administration		C+ Some increases from ensuring drinking-water taken into account.	C+ Some increased costs associated with receiving a larger number of consents to consider.	C+ Requirement to check drinking-water catchment. Any AEE requirements must be met.		
Treatment costs			C- Decrease where consented activities would have affected water supplies. Potential increase if plant upgrade negotiated.			
Avoidance or mitigation costs				C+ Increase where activity has an impact on drinking-water supplies.		
Emergency management planning			Little change anticipated because operators still have responsibilities under the Civil Defence Emergency Management Act 2002.		C+ Incorporation of drinking-water catchments in plans. Establishing specific communication protocols with drinking-water suppliers.	
Public health outcomes						B+ Reduced risk of compromised water supplies.

Key: C+ = increased costs; C- = decreased costs; B+ increased benefits. All relative to the status quo.

7 What Next?

7.1 Making a submission

Any person can make a submission on the proposed standard. Please include the following information:

1. your name and postal address, phone number, fax number and email address (if applicable)
2. the title of the standard you are making the submission about
3. whether you support or oppose the standard
4. your submission, with reasons for your views
5. any changes you would like made to the standard
6. the decision you wish 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 Monday 28 November 2005.

7.2 Questions

Your submission can address any issue relating to the standard. The following lists questions the Ministry for the Environment would like specific comment on.

- 1(a) Should water suppliers be notified of **all** resource consent applications that occur within a water supply catchment?, or
- 1(b) Should the standard apply only to certain types of resource consent applications?
- 2 Appendix 2 sets out a specific contaminants and pathways related to particular land uses that may impact on source water. Will this help councils establish criteria for determining which activities may adversely affect water supplies, and therefore whether or not water suppliers should be notified?
- 3 Does the standard adequately ensure that water suppliers are notified of resource consent applications that might affect the level of treatment needed to produce water that is wholesome and potable?
- 4 Defining treatment is problematic if we are to avoid setting bottom lines for source water quality and placing unnecessary treatment requirements on some communities. Does the current definition of treatment provide sufficient certainty for the purposes of applying the standard in practice?
- 5 It is proposed that the standard apply to drinking-water sources that provide communities greater than 25 people at least 60 days of the year. Is this an appropriate threshold?

7.3 What happens after you have made your submission?

Once submissions have been compiled they will be considered with regard to developing the final policy package and in preparing the regulations. The Ministry will prepare a summary of submissions, which will be available through the Ministry's website. Hard copies will be available on request.

Appendix 1: Definitions

Term	Definition
Abstraction point	The point at which water that is intended to be used for drinking is abstracted from the source water. The water then comes under the control of the drinking-water supplier (and is therefore subject to the proposed public health legislation).
Catchment	The area from which water for a drinking-water supply is obtained.
Community drinking-water supply	A publicly or privately owned drinking-water supply that serves more than 25 people at least 60 days of the year.
Drinking-water Standards for New Zealand (DWSNZ)	A yardstick to assess the quality of drinking-water. The DWSNZ define the maximum acceptable values (MAVs) of health significant determinands and specify methods for determining whether a drinking-water supply complies with the DWSNZ.
Drinking-water	Water intended to be used for human consumption, food preparation, utensil washing, oral or personal hygiene.
Drinking-water source	For the purpose of this standard, a human drinking-water source is a natural water body (lake, river or groundwater) used to supply a community with drinking-water.
Potable water	Drinking-water that does not contain any determinands that exceed the MAVs set out in the public health legislation.
Raw water	Water intended for drinking that is after the abstraction point but has not yet received treatment to make it suitable for drinking (and is therefore subject to the proposed public health legislation).
Source water	Water intended to become drinking-water but that is still in the catchment (and is therefore subject to the Resource Management Act 1991).
Treatment	The default is existing water treatment processes that meet the requirements of the proposed public health legislation to deliver human drinking-water that is potable and wholesome. In some situations, water may be of sufficient quality that it requires no treatment. Where changes to treatment processes are needed to deal with reduced water quality, alternatives may be negotiated between water suppliers, local authorities, consent applicants and the community.
Water supplier	Any person who, or entity that, owns, or is responsible for operating, a drinking-water supply.
Water treatment process	A chemical, biological, or physical process used to enhance the quality of a drinking-water supply before its distribution.
Wholesome drinking-water	Potable water that does not contain any determinands that exceed the guideline values for aesthetic determinands set out in the public health legislation.

Appendix 2: Types of Activities that Pose a Threat to Source Water Quality

Table 4: Land use categories, main groups of contaminants associated with that land use and typical contaminant pathways

Land use category	Land use sub-category	Main groups of contaminants typically associated with land use	Pathways from land use to aquifer
1. Agriculture	1.1 Arable – irrigated (includes orchards)	Pesticides Fertilisers Nitrate TPH	Rainfall recharge and irrigation via soil, unsaturated aquifer, water table Bores as direct pathway
	1.2 Arable – non-irrigated (includes orchards)	Pesticides Fertilisers Nitrate TPH	Rainfall recharge via soil, unsaturated aquifer, water table Bores as direct pathway
	1.3 Dairying – irrigated – feedlot	Animal waste: nitrates, phosphates, chloride; pathogens include: bacteria, <i>cryptosporidium</i> , viruses (coliform bacteria are indicators of risk of pathogens being present) Pesticide dips and drenches Fertilisers Silage leachate	Rainfall recharge and irrigation via soil, unsaturated aquifer, water table Bores as direct pathway Yard runoff to surface water or groundwater Dip runoff to surface water or groundwater
	1.4 Dairying – non-irrigated – feedlot	Animal waste: nitrates, phosphates, chloride; pathogens include: bacteria, <i>cryptosporidium</i> , viruses (coliform bacteria are indicators of risk of pathogens being present) Pesticide dips and drenches Fertilisers Silage leachate TPH	Rainfall recharge via soil, unsaturated aquifer, water table Bores as direct pathway Yard runoff to surface water or groundwater Dip runoff to surface water or groundwater
	1.5 Other pastoral – irrigated	Animal waste: nitrates, phosphates, chloride; pathogens include: bacteria, <i>cryptosporidium</i> , viruses (coliform bacteria are indicators of risk of pathogens being present) Silage leachate Fertilisers Pesticide dips and drenches TPH	Rainfall recharge and irrigation via soil, unsaturated aquifer, water table Bores as direct pathway

Land use category	Land use sub-category	Main groups of contaminants typically associated with land use	Pathways from land use to aquifer
	1.6 Other pastoral – non-irrigated	Animal waste: nitrates, phosphates, chloride; pathogens include: bacteria, <i>cryptosporidium</i> , viruses (coliform bacteria are indicators of risk of pathogens being present) Silage leachate Fertilisers Pesticide dips and drenches TPH	Rainfall recharge via soil, unsaturated aquifer, water table Bores as direct pathway Yard runoff to surface water or groundwater Dip runoff to surface water or groundwater
2. Forestry	2.1 Forestry – irrigated	Sewage sludge Pesticides Fertilisers TPH	Rainfall recharge and irrigation via soil, unsaturated aquifer, water table
	2.2 Forestry – non-irrigated	Sewage sludge Pesticides Fertilisers TPH	Rainfall recharge and irrigation via soil, unsaturated aquifer, water table
3. Mining and quarrying	3.1 Mining, quarrying, concrete works	Petroleum products (truck, loader and screener fuels) Acid mine drainage	AST leakage, vehicle leakage, rainfall infiltration direct to unsaturated zone, water table
4. Industry and commerce	4.1 Heavy industry and 4.2 Light industry	Foundries: acids, metals, fluxes	Tank leakage, spills, soil, unsaturated aquifer, water table, storm water runoff into surface water or soil
		Brewing: detergents, effluents with high BOD, low pH	
		Ceramics: glaze materials	
		Cold storage: ammonia, CFC, HFC	
		Drum reconditioning: assorted organic and inorganic chemicals, degreasers, detergents, paint	
		Electronics: alkalis, acids, cyanides, oils, metal sludges, methylene chloride, tetrachloroethylene, trichloroethane, acetone, toluene, PCB	
		Fertiliser/agricultural chemical production: superphosphate, ammonium nitrate, urea, pesticides	
		Fish processing: high BOD waste	
		Furniture: paints, toluene, methylene chloride, degreasing sludges	
		Meat and milk processing: high BOD waste, nitrate, pathogens	
Metal cleaning/electroplating: acids, alkalis, cyanide, metallic (Cr) salts, organic solvents, emulsifying agents, surfactants, EDTA, gluconates, antimony trichloride			

Land use category	Land use sub-category	Main groups of contaminants typically associated with land use	Pathways from land use to aquifer
		Paper making: chlorate, chlorine, caustic soda, sulphuric acid, hormone mimics	Discharge of endocrine disruptors to surface water
		Pesticide manufacture and storage: pesticides	
		Printing: solvents, inks, dyes, oils, organics, miscellaneous chemicals	
		Product storage: fumigants	
		Resins: formaldehyde, urea, miscellaneous organic acids, esters, amines and peroxides	
		Rubbers and plastics creation and moulding: organic solvents, oils, organic and inorganic materials (Zn), paint wastes, cyanides, acids, alkalis, sludges, esters, surfactants, glycols, phenols, formaldehyde, peroxides	
		Tanning: Cr salts, lime, sulphuric acid	
		Wood processing: pentachlorophenol PCP, boron, TBTO, CCA, paint sludges, solvents, creosote	
	Wool scouring: detergents, grease		
	4.3 Commercial and community	Car wash: soaps, detergents, waxes	Tank leakage, spills, stormwater runoff to surface water, soil, unsaturated aquifer, water table
		Cemetery: formaldehyde, lawn maintenance chemicals, lead, mercury	
		Defence establishments: disinfectants, human wastes	
		Dry cleaning: tetrachloroethylene, petroleum solvents, trichloroethane, ammonia, phosphoric/hydrochloric acid	
		Hospital: x-ray photographic, infectious, radiological, biological wastes, disinfectants, acids, formaldehyde, miscellaneous chemicals	
Laboratory – school, medical, research: biological wastes, disinfectants, acids, formaldehyde, miscellaneous chemicals			
Laundromat: detergents, bleaches, fabric dyes			
Offices: detergents, solvents			
Photo processing: cyanides, amines, biosludge, silver sludge			
Prisons: disinfectants, human wastes			
Scrap yards: petroleum products, ethylene glycol, PCB, lead, acids, CFC			
Swimming pool: chemical conditioners, human waste			

Land use category	Land use sub-category	Main groups of contaminants typically associated with land use	Pathways from land use to aquifer
	4.4 Transport, storage, utilities	Airport: petroleum products, fire foam (AFFF), deicer (isopropyl alcohol), chlorinated solvent	Tank leakage, spills, stormwater runoff, infiltration into soil, unsaturated aquifer, water table
		Electricity: transformer oil, pole preserver	
		Fuel storage and sale: petroleum products	
		Railway spills: everything	
		Road metal: asphalt	
		Road transport spills: everything	
		Sewer pipe fracture/sewage plant failure/faulty infiltration basin	
		Transport – auto/boat repair: petroleum products, paint, cellulose thinner, ethylene glycol, waxes, tributyl tin	
		Tyre storage: hydrocarbons, PAHs	
5. Open Space	5.1 Open space (used)	Car parks: Petroleum products	TPH in stormwater runoff
		Clay target clubs: lead shot	Dissolution of disseminated lead shot in soil, rainfall infiltration via soil, unsaturated aquifer, water table
		Golf courses: pesticides, fertilisers, petroleum products	Spills, and rainfall infiltration via soil, unsaturated aquifer, water table
		Recreational parks: petroleum products, herbicides, fertilisers	Spills, and rainfall infiltration via soil, unsaturated aquifer, water table
		Sports fields: petroleum products, herbicides, fertilisers	Spills, and rainfall infiltration via soil, unsaturated aquifer, water table
		Stormwater runoff/spills: bacteria, petroleum products, heavy metals, herbicides, fertilisers, pesticides, swimming pool conditioners	Spills, and rainfall infiltration via soil, unsaturated aquifer, water table
6. Residential	6.1 Urban residential	Household waste: paint, solvent, phosphate, bleach, photographic chemicals, pesticides, detergents, petroleum products, animal waste	Spills, stormwater runoff, soil, unsaturated aquifer, water table, leaky sewer reticulation
	6.2 Lifestyle block	Household waste: paint, solvent, phosphate, bleach, photographic chemicals, pesticides, detergents, petroleum products, swimming pool conditioners, animal waste	Spills, stormwater runoff, soil, unsaturated aquifer, water table, leaky sewer reticulation
	6.3 Rural	Household waste: paint, solvent, phosphate, bleach, photographic chemicals, pesticides, detergents, petroleum products, swimming pool conditioners UST: petrol/diesel Well use: siphoning of materials down to groundwater	Spills, stormwater runoff, septic field, soil, unsaturated aquifer, water table Siphoning into groundwater via a well
7. Vacant	7.1 Vacant (disused farmland, building sites)	Illegal dumping: petroleum products, paints, and so on; disused USTs	Spills, stormwater runoff, septic field, soil, unsaturated aquifer, water table

Land use category	Land use sub-category	Main groups of contaminants typically associated with land use	Pathways from land use to aquifer
8. Landfill	8.1 – disused landfills – current landfills	Landfill: human wastes, TPH, nitrates, phosphates, reducing/acid/alkaline leachate, vinyl chloride, CFC, iron, manganese, hardness, chlorinated and aromatic hydrocarbons, PAHs, chloride, sulphate, ammonia	Spills, leakage, stormwater runoff, leachate, soil, unsaturated aquifer, water table
9. Fishing	9.1 Onshore aquaculture	Faecal matter, nitrogen, phosphorus, pesticides, BOD	Tank leakage, on-land waste disposal, soil, unsaturated aquifer, water table
10. Conservation land	10.1 National park	Natural coliforms, including animal faecal matter	Surface water runoff, groundwater

Notes for interpretation of table

Land use activities are considered to be the dominating potential source of surface water and groundwater contamination. These activities have been redistributed into land use groups corresponding to those recognised by Land Information New Zealand and Quotable Value New Zealand. They also allow distinction of land uses into groups characterised by families of potential biological and chemical contaminants. The land use codes have been grouped in this report according to an assessment of the contaminants they could potentially release. For example, non-irrigated and irrigated arable farming land uses have similar practices and materials; however, it is commonly recognised that the ability of potential contaminants to reach the water table is increased under irrigation. Similar logic has been used to separate out or aggregate the various other land uses in the table.

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