

4.2.5 The preferred option

Having considered the available alternatives, a **national environmental standard** is considered the most appropriate means of achieving the policy objective. In this case, regulations are considered more effective for achieving the desired outcome than guidelines or voluntary agreements. In addition, a standard is considered a more appropriate instrument than an NPS because it can be more prescriptive. A national environmental standard meets the policy objective of improving the management of on-site systems more effectively and efficiently than the other available options.

An inspection regime was identified through the initial issues and options work as the most appropriate way to address ongoing failures of on-site systems. The management and maintenance of on-site systems is critical to their effectiveness, but at present there is no general mechanism to ensure this important aspect of on-site wastewater management is carried out.

Further in-depth consideration of the options presented here is contained in the document *Issues and Options for the Management of On-Site Wastewater Systems in New Zealand* (Duffill Watts & King Ltd et al, 2005), available on request from the Ministry for the Environment.

Table 3: Comparison of the different options in terms of their effectiveness in achieving the desired outcomes stated in the policy objective

Criteria	Alternative options that did not satisfy the selection criteria				Preferred option
	Status quo	Non-regulatory measures	Legislative change	National policy statement	National environmental standard
Improves the management of on-site systems	x	~	~	~	✓
Proactively manages risks to health and the environment	~	~	~	~	✓
Clarifies roles and enhances effectiveness	x	x	✓	✓	✓
Reduces the number of failing on-site systems	x	~	✓	~	✓
Has local government input	✓	✓	x	~	✓
Is cost effective	x	~	x	~	~
Applies the polluter pays principle	x	x	✓	~	✓

Key to table:

✓ Meets the criterion x Does not meet the criterion ~ Partly meets the criterion

The main benefits of using a national environmental standard over other options are that it would:

- fulfil the policy objective by providing a framework for proactively managing the risks to human health and the environment from on-site systems
- provide mandatory requirements to achieve the policy objective
- allow for more prescriptive requirements than legislative amendments, and so would be less open to interpretation, and provide more direction and certainty to councils and the public

- be able to be more readily and quickly amended than legislation or plans if later changes are required
- remove any ambiguity over who is responsible for managing failing on-site systems
- provide consistency across all local government jurisdictions on the method of undertaking the inspections and what constitutes a failed on-site system
- give effect to the intent of the Proposed National Policy Statement on Freshwater management and meet the policy objectives of the proposed NPS of enabling the well-being of people and communities, improving the quality of fresh water, addressing freshwater degradation and ensuring effective monitoring and reporting
- be more cost-effective than alterations to legislation or plans.

Questions

4. Do you agree with the policy objective?
5. Is there an alternative approach that has not been considered?
6. Do you agree with the analysis provided in this section?

5 The Proposed Standard

5.1 A 'warrant of fitness' for on-site systems

A national environmental standard is a legally enforceable regulation. The exact wording of this standard will be drafted if the Minister decides to proceed, following this consultation. In essence, the standard will have as its purpose:

[From 1 July 2010] Owners of properties with on-site wastewater systems in locations identified by the regional council will be required to hold a current warrant of fitness (WOF) that confirms their on-site system is functioning properly and is being maintained to an appropriate standard.

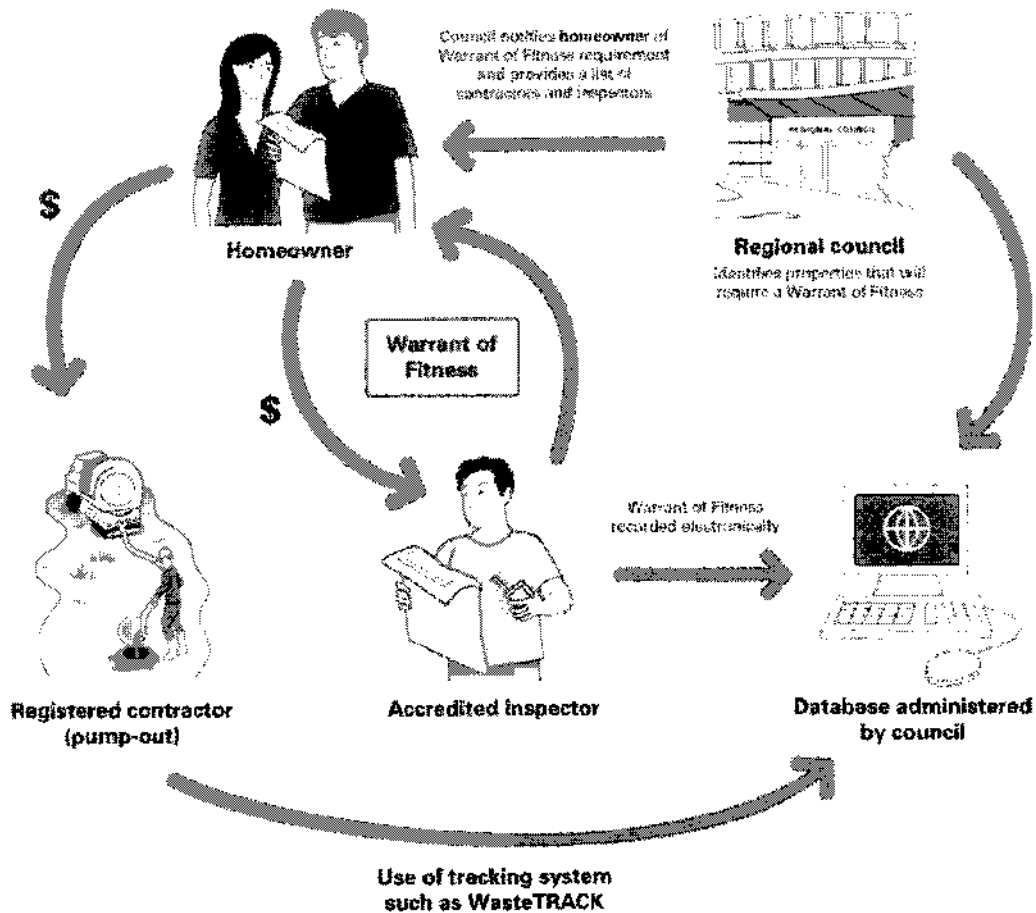
The proposed standard would apply only to domestic on-site systems that are operated as permitted activities under rules in a regional plan. It would *not* include on-site systems servicing businesses, schools, marae, camping grounds, etc. It is assumed that those premises are already monitored by councils under current resource consents. However, your views are sought on whether the proposed standard should cover consented systems or non-domestic on-site systems.

Regional/unitary councils would administer the proposed standard. Each council would be required to undertake an assessment to determine where the proposed standard would apply. The regional council may have to work in conjunction with territorial authorities to gather some of the necessary information. Regional/unitary councils would administer a database of relevant information on the on-site systems, including the outcomes of the regular inspections. They would also be responsible for any follow-up or enforcement action. Regional councils, in agreement with territorial authorities, may transfer their powers to territorial authorities through section 33 of the RMA.

System owners would have the responsibility of ensuring they hold a current warrant of fitness (WOF). They will be responsible for organising and paying for inspections (unless a council chooses to organise the inspections themselves). System owners will also continue to be responsible for the ongoing management and maintenance of their on-site systems. System owners will cover the cost of the WOF inspection as well as continuing to cover the cost of ongoing operation, maintenance and repairs.

Inspectors will be responsible for inspecting on-site systems in accordance with defined criteria on an inspection checklist and accompanying manual. The inspector will issue a WOF where an on-site system passes an inspection (similar to an inspector at a vehicle testing station). The inspector will also be responsible for identifying problems that need remedying to pass a WOF. A fee would be charged for carrying out an inspection.

Figure 6: How the proposed national environmental standard would operate



The WOF system could operate in much the same way a vehicle WOF operates.

- A WOF would relate to a specific on-site system, and would be issued to the property owner.
- A WOF would have an expiry date.
- The owner would have the responsibility for ensuring the system is operated and maintained appropriately throughout the period of the current WOF.
- A system would need to be re-inspected if any modifications to the system or dwelling (eg, additional rooms) occurred.
- The WOF check would be underpinned by an inspector's manual that includes assessment criteria for what constitutes a pass or a fail for each item that requires checking (similar to Land Transport New Zealand's *Vehicle Inspection Requirements Manual*).
- A recognised training course on inspecting on-site systems would be developed for inspectors, similar to that used with inspectors for vehicle WOFs.

To obtain a WOF, an on-site system would first have to pass an inspection check. To pass an inspection, the system would have to achieve a pass for each critical component of a checklist (see Appendix 7). If, during the inspection, only minor maintenance problems were identified (eg. a tank inspection lid was not properly sealed), then a WOF could be issued with recommendations attached. The responsibility for ensuring the ongoing maintenance of a system would remain with the property owner.

A WOF would be valid for three years, with a requirement to be re-inspected on or before the expiry date of the current WOF.

5.1.1 Inspection

The purpose of the inspection would be to check compliance of an on-site system against the main components of an inspection checklist. The inspection checklist would consider the physical condition of a system and look for any problems with the functioning of the system. The person carrying out the inspection would provide the system owner with the results of the inspection (ie. a copy of the checklist). Possible WOF outcomes would be:

- *pass*
- *pass* with conditions or minor remedial works required
- *fail* with substantial remedial works required before re-inspection
- *fail* where remediation is not viable and off-site options need to be investigated.

A timeframe for re-inspection would also be supplied.

Regular inspections would:

- identify on-site systems with critical problems or failures
- help to identify or confirm the causes of problems that may be affecting the household, the environment or the community, and what can be done to fix them
- provide for pump-out based on need, ensuring adequate maintenance is carried out, while avoiding fixed-interval pump-outs that can generate excessive volumes of dilute septage and adversely affect the functioning of a system.

The following key pass/fail criteria will be critical for obtaining a WOF for an on-site system.

1 **Observation, or evidence, of the discharge of wastewater to the ground surface from any component of an on-site wastewater management system**

The discharge may be from drainage pipework, treatment units, land application fields or other sources. This kind of failure creates a direct risk to human health and may allow the discharge of pollutants off-site into neighbouring properties, drains and waterways. Note that the unacceptable discharge of pollutants to groundwater from an on-site system has not been included in these criteria. It is very difficult, and often cost prohibitive, to accurately determine the quantity of pollutants entering groundwater from an individual on-site system. Defining a system as failing due to groundwater contamination is difficult, and the responsibility for developing solutions is often spread among stakeholders rather than focused on the system owner.

If an on-site system fails an inspection, the system owner will be notified of the failure and the reason(s) for it, as identified by the inspector. A failure could be the result of a simple lack of maintenance that requires only minor attention, such as a clogged outlet filter that needs servicing for the system to be operating effectively. A failure may also occur because of more significant problems that may require repairs or replacement to part or all of a system.

If a system fails an inspection, the owner will be given a certain time period, depending on the nature of the failure, to remedy the problem and obtain a WOF. The timeframe for fixing problems will depend on the severity of the problem and the environmental effects the failure is causing (see Table 4 below). If the system is causing severe pollution or poses a significant health risk, the property owner may also face other actions by the regional council under the RMA (such as an abatement notice, enforcement order or prosecution). The system owner will have to show the failures have been remedied to be issued with a WOF. The system would not necessarily require a complete re-inspection – the focus would be on the elements that failed the initial inspection.

If, after the agreed time period, the owner has not remedied the deficiencies and obtained a current WOF, he or she will be in a position of non-compliance. The regional council would then decide how to address the non-compliance. In other words, the situation would default to the existing enforcement regime under the RMA. (If an on-site system is in non-compliance, it is likely that it will also be in breach of a permitted activity rule for the region.)

5.1.2 Enforcement

The proposed standard would be enforced by regional councils. The legal process for non-compliance with a national environmental standard would be to issue an abatement notice under section 322(1)(a)(i) of the RMA or apply for an enforcement order under section 314(1)(a) of the RMA. Prosecution by the council for continued non-compliance with the abatement notice or enforcement order could be a last resort. For example, councils could issue an abatement notice for failure to comply with the requirements of the standard, which could include additional time that may be needed by a property owner to remedy a problem. On the other hand, where an area is scheduled to be connected to a reticulated treatment system in the near future, requiring costly repairs may not be appropriate, so councils need to be able to exercise their discretion.

The specification of a time period within which remedial action is to be carried out would prevent a system owner becoming immediately exposed to enforcement action if their system did not pass the initial inspection. This approach provides flexibility for situations where, for example, a local council is considering reticulation for a community, or where a property owner may not be financially able to address a problem within six months.

Table 4: Examples of possible deadlines to fix problems

Nature of system failure	Deadline for fixing problem
Ponding of effluent and or effluent entering a waterway	Immediately (within 30 days)
Treatment unit scum/sludge capacity full and requires immediate pump-out	Immediately (within 30 days)
Land application system failing and requires remediation or replacement	2 to 4 months
Treatment unit and/or land application system has insufficient capacity to cope with inflows and requires upgrade or replacement	Due to costs, up to six months

5.2 Why target only specific areas?

The option of applying a national environmental standard to every property in New Zealand with an on-site system was considered. However, this option has been discarded because an initial cost-benefit assessment indicated that the costs would significantly outweigh any potential benefits. Applying a standard to 'everyone – everywhere' would put significant pressure on local government and other resources, and it is considered more effective to focus resources on high-priority areas.

It is important here to note the significance of cumulative effects. Although the periodic release of insufficiently treated wastewater (containing nutrients and pathogens) from a single on-site system may pose a health risk to people living in the household, it may not adversely affect the environment or lead to off-site effects. Natural processes such as absorption, assimilation, filtration and die-off of organisms may render the impact of a discharge undetectable. However, when the influence of a number of systems is combined, the cumulative risks to human health and the cumulative effects on the environment can be significant. This is why a refinement of the initial proposal has been developed that would target a national environmental standard, focusing on areas that have known problems with the performance of on-site systems or where there is an actual or potential risk to the environment from on-site systems. This focus is thus on areas where there would be the greatest benefit.

5.3 What the proposed national environmental standard does not cover

The proposed standard does *not* cover:

- the qualification of inspectors – this would be developed separately and sit outside the standard
- cluster systems or decentralised systems – these generally require resource consents, with their own monitoring conditions attached
- hotels, motels, camping grounds, restaurants, schools and marae – these generally require resource consents with their own monitoring conditions attached
- design of on-site systems – this is covered through the Building Act and guidelines (AS/NZS 1547:2000 and 1546 suite of standards; TP58)
- installation of on-site systems – this is covered through the Building Act
- maintenance contracts or servicing – service agents check the internal components, but do not always check the public health and environmental impacts of effluent disposal
- certification/accreditation of on-site systems – SWANS-SIG¹⁵ proposes to act as the national auditing and information storage body (there is a trial site for this in Rotorua)
- decisions on when a community should move to reticulation
- educating property owners about how to operate on-site systems – most councils already have very good educational material.

¹⁵ Small Wastewater and Natural Systems Special Interest Group.

Questions

7. Do you have any general comments about the proposed standard for the inspection and maintenance of on-site wastewater systems?
8. Should the proposed standard apply to private dwellings only, or should it apply to all on-site systems (including consented systems) that treat domestic wastewater, including hotels, motels, camping grounds, restaurants, schools and marae?
9. Do you agree with the inspection interval of three years?
10. Should inspections be coupled with an immediate pump-out?
11. Do you agree with the proposed critical components for the checklist (see Appendix 7)?
12. Should the proposed standard prescribe a minimum level of treatment (eg, secondary) for new on-site systems? (Note: This could have the effect of banning the installation of new septic tanks in favour of treatment systems that provide greater levels of treatment.)

6 Implementing the Proposed Standard

6.1 How will the proposed standard be implemented?

The default position would place responsibility on regional councils to administer the proposed standard, although functions could be transferred to territorial authorities under section 33 of the RMA. The following steps outline how the proposed standard could be implemented.

Step 1. Regional councils identify the areas where the national environmental standard would apply. To do this they may:

- undertake a broad-scale risk assessment of their region that considers a range of factors (see Appendix 3 for more information on what needs to be considered)
- consult with stakeholders within their short-listed areas to make an informed decision on where the proposed standard should and should not apply.

Step 2. The specific areas are gazetted by the Minister for the Environment.

Step 3. Regional councils notify the system owners that they are required to obtain a current warrant of fitness for their on-site system.

Step 4. The system owner arranges for an inspection. Alternatively, the council may choose to schedule the inspection themselves to make efficient use of resources in one area and ensure any outstanding background information on the on-site system is being captured.

Step 5. The inspector carries out an inspection and notifies the owner and the council of the outcome. If a system passes an inspection, the inspector issues the system owner with a warrant of fitness (WOF). The WOF may include recommendations for minor maintenance of the on-site system or formal conditions. If a system fails an inspection, the inspector notifies the owner, gives the reasons for the failure and informs the owner of the actions required to remedy the failure and the time period for doing so.

It will be the system owner's responsibility to arrange for any problems to be fixed. Once the problems have been fixed, the system owner will contact the inspector to confirm this and a WOF can be issued. This may or may not require an additional inspection, depending on the nature of the remedial action.

6.2 Where will the proposed standard be applied?

The standard would apply to specific areas defined by regional councils and gazetted in the *New Zealand Gazette*. It would *not* apply across the entire country, as analysis indicates this approach would be excessively costly and unnecessary where on-site systems don't cause off-site problems (see Section 7 on cost-benefit analysis). The specific areas to be gazetted would be where there are known problems with on-site systems (hotspots), or environments that are at risk of degradation from an increase in on-site systems if they are not maintained properly, such as locations:

- with high numbers of failing systems
- where there is a high risk of environmental degradation or damage from failing systems
- that have sensitive receiving environments
- where the cumulative effects of large numbers of on-site systems degrade the environment, or where there is the potential to do so.

The identification of areas where the proposed standard is to apply would be left to councils. A risk-based approach would give councils the flexibility to apply the standard where it would have the greatest benefit, based on environmental consequences and local priorities. It also provides more effective use of the resources needed to implement WOF inspections in the targeted areas.

Appendix 3 contains various parameters that could be included in a risk assessment as a guide to help councils identify specific areas where the proposed standard could be applied. These specific areas or parts of a region will then be formalised by the Minister for the Environment by notice in the *Gazette*. The process of gazetting will be same as that used for the National Environmental Standard for Air Quality. Councils will have the option to expand the monitoring of on-site systems across the entire district or region if they wish. For example, they may decide to target the most urgent areas first, and then include the remaining areas later to spread costs and resources.

Nearly all the councils spoken to during the development of the issues and options report were able to define areas in their districts or regions where a large proportion of on-site systems are failing (Duffill Watts & King Ltd et al, 2005). A number of these areas are older settlements with ageing systems and small sites, or coastal properties where extensive development is occurring. Next to lack of maintenance high groundwater and poor soils were the most common issues, and it appears that often the system design did not consider these physical environmental constraints.

There are two distinct types of areas that may be identified through a targeted or risk-based approach: hotspots and sensitive areas.

Hotspots are areas with existing problems. A hotspot area could be a community with high numbers of failing systems, or where the cumulative effects of on-site systems are having adverse effects on:

- water quality, through bacterial or nutrient contamination
- amenity, through unpleasant odour or pests
- public health, through surface discharges of untreated or partially treated effluent.

Generally, the drivers for identifying hotspots are concerns around public health or poor water quality. Information may be available through sanitary surveys or complaints, and knowledge of hotspots may be held by either territorial authorities or regional councils. Regional council water-quality monitoring data may also help identify hotspots.

Sensitive areas are where the presence of on-site systems could create an environmental risk. The risk may be the actual or potential (cumulative) adverse effects on water or soils, including those created by current or future development. Sensitive areas would be identified by analysing local environmental conditions to identify areas of potential risk. This is primarily a regional council exercise.

6.3 How will the proposed standard be administered?

Administration of the information gathered under the proposed standard will be important. A database that can track the status of individual systems will be an essential monitoring tool for councils. Ideally, utilising an existing database would be the most effective and efficient option. The Ministry for the Environment is looking at providing a model solution that could be adopted by councils if they choose to, such as the WasteTRACK model that is currently used for tracking liquid waste (see Box 4).

Box 4: WasteTRACK

WasteTRACK is a Ministry for the Environment-supported tracking system that is used to track the movement and disposal of liquid wastes, including domestic septage. The system is an internet-based database with varying levels of access, which allows waste contractors (or potential inspectors) to enter data, and regulatory authorities to view and administer data. Use of WasteTRACK is already a requirement of some councils for transporting liquid wastes, and it provides a model that can be developed for the WOF scheme.

The following web address gives a summary of the WasteTRACK system as it applies to carrying wastes: www.wastetrack.co.nz/

6.4 Who will carry out the inspections?

For the proposed standard to operate effectively there needs to be an adequate pool of suitably skilled (or qualified) inspectors. An inspector will be a competent person, as judged through an industry standard qualification or an accreditation-type process. This will ensure inspectors are accountable and carry out their duties consistently. If the proposed standard proceeds, the Ministry for the Environment will help develop training material for a suitable unit standard-type qualification. The qualification would be supported by a standard checklist and inspector's manual to refer to when carrying out the inspections, to provide a consistent level of competency for inspectors.

The mechanics of just how the inspectors would be involved in the national environmental standard process have been purposely left open to allow flexibility for councils in terms of how they choose to approach this. Having an independent qualification provides consistency as well as flexibility as to who can carry out inspections.

Council officers could become qualified, which would mean the whole process is managed and operated by the council, or the inspectors could be anyone who chooses to become qualified to undertake the work (eg, 'sucker truck' operators, drain layers). However, there is an issue of whether there would be enough people willing, able and qualified to conduct inspections, which in turn could affect competition and the cost of inspections. Adopting this approach would therefore require adequate lead-in time to ensure there were sufficient qualified inspectors.

6.5 When will the proposed standard be implemented?

The proposed standard would provide for a phased implementation of the WOF inspection in each region according to site-specific factors and specified timelines. A deadline for councils to identify targeted areas for gazetting could be **12 months** after the regulations come into force. A timeframe for all systems within targeted areas to be inspected (or hold a WOF) from commencement of standard could be **three years**.

Questions

13. Should the proposed standard apply to targeted areas as proposed, or across the whole of New Zealand?
14. Do you agree with the risk assessment methodology and the proposed criteria for identifying targeted areas?
15. Do you see any problems with the implementation and administration of the proposed standard?
16. What would be an appropriate training level for inspectors/certifiers? Is a unit standard qualification for inspectors an appropriate method for ensuring consistency of inspectors?

7 Costs and Benefits of the Proposed Standard

A preliminary assessment of the costs and benefits of the proposed national environmental standard has been undertaken. The complete analysis will be reported in two parts: an initial scoping assessment, presented in summary here, followed by a fuller quantification after an analysis of the consultation responses and formulation of a final position on the proposed standard.

7.1 Introduction

This section identifies the costs and benefits that would be likely to arise from the Proposed National Environmental Standard for On-site Wastewater Systems. The cost-benefit analysis completed as part of the development process initially considered two options for establishing a WOF-style inspection scheme:

- require all domestic systems to be inspected
- require the inspection of systems located in specific, targeted areas (ie, hotspots and/or sensitive areas).

The initial assessment of the costs and benefits of applying a national environmental standard to every property with an on-site system indicated the costs would far outweigh any potential benefits of such a regime. The costs of applying the proposed standard to 'everyone everywhere' are approximately six times higher than the 'targeted area' approach, but only provide approximately three times the benefit (see Table 5.)

As a result, this discussion document only considers the targeted application of a proposed standard to areas or locations that have existing problems, or where there is likely to be a risk to the environment from existing or new on-site systems. One key point to note is that it has not been possible to quantify the potential environmental benefits of improving the performance of on-site systems. Note also that the costs and benefits are only summarised here: further in-depth analysis of the costs and benefits (COVEC Ltd 2007) is available on request.

Table 5: Preliminary evaluation of options for applying the proposed standard (approximate estimates)

Option	Systems affected (estimated)	Average annual total costs (\$ million)	Potential annual public health benefits (\$ million)	Annual environmental benefits	Benefit:cost ratio (excluding environmental benefits)
Targeted application of NES	42,000	\$3.4-\$5.2	\$0.75-\$3	Unquantified ✓✓	0.20-0.52
Everyone everywhere (DISCARDED)	255,000	\$21-\$31	\$1.5-\$6	Unquantified ✓✓✓	0.064-0.17

7.1.1 Limitations

Most of the costs can be estimated with a reasonable degree of certainty, but many of the benefits cannot be quantified. For example, there are environmental benefits from reducing the discharge of untreated or partially treated wastewater to the environment, but attributing a monetary value to these is difficult. Also, the effects from discharges are often the result of multiple activities, of which discharges from on-site systems are only one contributing factor along with agriculture, discharges from boats, wildlife, etc.

For public health effects, a paucity of data also makes quantification difficult. Estimates are based on opinions given by a number of organisations and technical experts, and provide order-of-magnitude estimates of the public health benefits. Some impacts – including environmental benefits – are outlined but not quantified. A small number of councils currently operate inspection schemes,¹⁶ and data received from these councils has been used to help estimate administration and compliance costs.

Where there is a great deal of uncertainty around estimates of the benefits, they have not been included in the quantitative analysis. However, their significance has been included qualitatively as an indication, and they are discussed further in 7.3.3.

A further evaluation will be undertaken after consultation when a report and recommendation on the comments and proposed regulations (standards) is provided to the Minister for the Environment for consideration. Section 32 of the RMA requires that an evaluation be undertaken of whether, having regard to their efficiency and effectiveness, the methods in the NES are the most appropriate. The benefits and costs of the proposals and the risk of acting or not acting if there is uncertain or insufficient information must also be taken into account.

7.2 Overview of the analysis

The potential impacts of the proposed standard are analysed from the perspective of society as a whole. This includes all impacts regardless of whether they are incurred by, or accrue to, private inspectors, regional and territorial authorities, central government or households. Also, this analysis measures only the *additional* costs and benefits that would be generated by the proposed standard, and which would not occur otherwise, which means that few, if any, additional costs or benefits would be generated in those areas that already operate WOF-type inspection schemes.

Out of an estimated total of 270,000 on-site systems in New Zealand, it is estimated that approximately 15 percent, or 42,000 systems, would be located in areas that are either hotspots with existing problems or areas where there is a high risk of environmental degradation from failing on-site systems (EMS Ltd, 2007). Of these systems, around 2,000 are likely to be located in areas where there is already an inspection system. Consequently, the number of systems used to calculate cost estimates is 40,000.

¹⁶ These authorities include the Far North District Council, Environment Bay of Plenty and Waitakere City Council.

7.3 Costs

7.3.1 Administration and inspection costs

Assuming a three-year period to implement the proposed standard, the cost of inspecting 13,000 systems per year is estimated to be around \$470,000. The initial administrative cost for all councils is estimated to total \$210,000 in the first year of the scheme, which includes work to identify hotspots and sensitive areas. The one-off costs of establishing training and certification for inspectors is estimated to be around \$30,000 (borne by the Ministry for the Environment). The labour costs incurred in training enough inspectors (around 300) would be approximately \$22,000. Approximately 10 full-time equivalent staff would be required for ongoing administration by councils, at a cost of \$800,000 per year. The cost for property owners is estimated at \$35 per inspection,¹⁷ with one inspection every three years.

7.3.2 Compliance costs

Compliance costs include the costs of repair, maintenance and system upgrades that would not occur without the implementation of the proposed standard. Assuming that 15 to 50 per cent of all systems in hotspots fail a WOF inspection, the total estimated compliance costs imposed by this scheme could be around \$2.1 million to \$7.8 million per year for the first three years. These estimates account for the fact that a proportion of systems would need one-off repairs or upgrades to bring them up to the required level. After this initial three-year period, during which all the systems in the targeted areas would be inspected at least once, ongoing compliance would be expected to fall to around \$2 million to \$3.1 million per year.

7.3.3 Total costs

Based on the assumptions discussed above, the total cost of the proposed standard is estimated to range from \$31.9 million to \$48.9 million in current dollars. The largest component would be compliance costs. This equates to an average cost of \$3.4 million to \$5.2 million annually for the next 20 years.

¹⁷ This is based on fees paid in the Bay of Plenty region and is exclusive of GST. This charge would cover all costs, including staff wages, vehicle depreciation, fuel, materials, etc. This analysis assumes inspections would take an average of 30 minutes.

Table 6: Total costs (current dollars, 20-year period)

Cost type	Cost (\$ million)	
	Failure rate:	
	15%	50%
Inspection (property owners)	4.0	4.0
Administration (regional councils)	7.0	7.0
Compliance (regional councils)	20.9	37.9
Total	31.9	48.9
Average (per year)	3.4	5.2

7.4 Benefits

Although on-site wastewater systems located in targeted areas are only around 15 per cent of the total, these systems are likely to account for a much larger proportion of the public health and environmental impacts. This is because the locations have been selected as hotspots based on the relatively significant negative impacts caused by on-site systems.

Because these hotspots are likely to account for a disproportionate level of negative impacts, applying a WOF inspection scheme to this 15 per cent of systems is estimated to lead to a 30 to 50 per cent reduction in the public health costs and environmental damage arising from on-site systems.

7.4.1 Public health impacts

Although it is impossible to accurately determine the precise impact of reduced contamination of drinking-water, recreational water bodies, shellfish and ground surfaces in targeted areas, the magnitude of these impacts could be a potential reduction in public health costs of around \$500,000 to \$3.0 million per year. This is based on assumptions derived from information and opinions obtained from various organisations, including the Ministry of Health, various regional and territorial authorities, the New Zealand Food Safety Authority, Northland District Health Board, NIWA, and various experts who have carried out studies of infections from water-borne and food-borne pathogens.

Cost-benefit analyses of safe sanitation (drinking-water supplies and sewerage) have been evaluated on several occasions but tend to be incomplete because of the standard of notified illness data available for water-borne diseases in New Zealand. In rural areas people often do not seek medical advice for diarrhoea, and overworked rural GPs rarely report notifiable diseases. Yet New Zealand has some of the highest notified water-borne disease rates in the OECD, and such rates are likely to be under-reported by between 10 and 100 times.¹⁸

¹⁸ This fact has been adversely commented on in the OECD's *Environmental Performance Review of New Zealand*, which was released on 5 April 2007.

7.4.2 Environmental benefits

Although the environmental benefits of improving the performance of on-site systems are largely unquantifiable, an attempt has been made here to indicate the likely extent of the impact that on-site systems may be having on the environment. Waterways and ecosystems that become polluted with effluent can suffer adverse environmental effects. For instance, excess algal growth caused by elevated nutrients or the digestion of wastewater can deprive waterways of oxygen. Fish and other aquatic life can die as a result. Reduced contamination from on-site systems as a result of a WOF scheme would provide various benefits, such as increased water-based recreational activity or reduced risk of closure of commercial shellfish farms.

Table 7 provides estimates of the number of waterways located near potential hotspots that have been identified in earlier research. Improving the performance of failing systems in hotspot areas will contribute to improving the environmental quality of these areas.

Table 7: Estimate of waterways in hotspots affected by failing systems

Localised area around systems and nearby stormwater drains	Total number
Groundwater sites	c. 10
Streams	100-120
Rivers	10-20
Lakes	c. 10
Estuaries	10-20
Sheltered marine	40-60
Open coastal	30-50

Source: EMS Ltd, 2007.

Note: The figures in this table need to be regarded with some caution, and should be considered approximate estimates only. These figures are likely to underestimate the number of water bodies potentially affected, because of under-reporting by local authorities (eg. where monitoring is not occurring). This is especially the case for effects on groundwater and lakes.

Preferences for reduced environmental damage

Nutrient inputs from failing on-site systems are generally not in high enough concentrations (in comparison with other catchment sources) to cause substantial adverse impacts. However, they do contribute to the cumulative effects caused by multiple sources that may contaminate a catchment. In some locations, however, on-site systems may generate substantive negative environmental impacts themselves, such as in enclosed water bodies that are sensitive to high input of nutrients from on-site systems in comparison to other sources. Any reduction of this environmental damage would constitute a benefit.

This benefit would arise because many people in society have a preference for reduced pollution and less environmental damage. This preference may exist even if the benefits of a cleaner greener environment are not enjoyed directly. There would be acceptance of the measures being introduced in the knowledge that they would for example help to protect New Zealand's 'clean green' image.

Increased recreational activity

Where recreational areas such as beaches and lakes become contaminated, councils may place signs warning the public of the risks of using these areas. In some cases, beaches may be closed. Even if there is no formal action taken by councils or authorities, communities may become aware of the level of contamination of certain beaches and lakes over time.

The effect of these measures, and increased awareness of contamination, is to reduce the recreational use of these areas. The inability, or unwillingness, of people to use the areas constitutes a cost. This cost may manifest itself in the form of additional time and expense incurred in travelling to alternative areas or, if there are no nearby alternatives, there is a cost in the form of lost enjoyment from not being able to engage in water-based recreational activities at all. To the extent that an inspection scheme would reduce contamination of these areas and thereby increase recreational activities, this would constitute a benefit.

Increased commercial shellfish production

A reduction in the contamination of marine waters used to farm shellfish would reduce the likelihood of the harvesting of shellfish crops being prohibited in affected areas. In some cases contamination may cause delays in harvests; in other cases entire marine farms may be closed or prevented from being established. An example of farm closure occurred at Waikare Inlet in the Bay of Islands. In this case, nine oyster farmers were forced to close their farms in 2001 after traces of the norovirus carried in human effluent were discovered.¹⁹ These farms accounted for 30 per cent of New Zealand's oyster production, a significant proportion of which is exported.²⁰

The farmers subsequently sued the Far North District Council for \$12 million in damages (largely lost output), blaming a nearby treatment plant for the contamination. During the case the Council suggested that nearby on-site systems could be a major contributing factor to the level of contamination. Subsequently, the court found that the treatment plant could not be proven to be the source of the contamination.

Another example is the contamination of the marine area of Papanui Inlet in Dunedin City, which has resulted in the Council prohibiting this area from being used for commercial marine farming.

To the extent that an inspection scheme allowed for greater production from marine farms, the benefit could be substantial, perhaps in the region of millions of dollars.

¹⁹ "No appeal by oyster farmers", *Northern Advocate*, 14 November 2006.

²⁰ "Pollution hit oyster-growers hoping to re-open farms", *New Zealand Herald*, 20 November 2006.

Reduction in disputes

As well as disputes over the contamination of marine farms, there have also been disputes between developers, councils and/or district health boards regarding contamination from on-site systems. Because of the occasional difficulties faced in gathering sufficient evidence that on-site systems are responsible for public health impacts in specific areas, actions by district health boards and/or councils may be challenged in court, for instance by developers. To the extent that a national environmental standard provides support for the actions or policies of district health boards and/or councils and reduces the scope for challenge, this constitutes a benefit in that expensive legal action may be avoided.

7.5 Conclusion

Applying a proposed standard to targeted areas results in an estimated total cost, in current dollars, ranging from \$3.4 million to \$5.2 million per year over 20 years (\$31.9 million to \$48.9 million), the largest component of which would be compliance costs for the owners of on-site systems. To generate a positive net impact for the wider community, a proposed standard would need to create annual benefits of, on average, \$3.4 million to \$5.2 million. Given that the public health benefits alone could be in the vicinity of up to \$3 million per year, a targeted inspection scheme appears likely to be able to provide a net benefit to society.

Questions

17. Have we accurately reflected the range of costs and benefits arising from the proposals for a national environmental standard, and who might bear the costs or receive the benefits?
18. Are there any costs and benefits we have overlooked?
19. Do you have information you would like to see included in the cost-benefit analysis that will be carried out after the submissions are received and analysed?
20. Are our estimates of costs and benefits accurate?
21. Do you have information on costs and benefits that could assist the second stage of our assessment (of the impacts of any final proposals)?
22. Do you have any information on costs and benefits that we have been unable to quantify?

8 What Happens Next?

8.1 Making a submission

Any person can make a submission on the subject matter of the proposed standard. The questions at the end of each section have been gathered together below to help you to organise your responses.

Please include the following information with your submission:

1. Your name and postal address, phone number, fax number and email address (where applicable)
2. The title of the proposed 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 10362, Wellington, or by email to standards@mfe.govt.nz, in time to be received no later than:

5.00pm on 26 September 2008.

Note: your submission is public information and will be subject to release under the Official Information Act 1982.

8.2 What happens to submissions

The Ministry will prepare a summary of submissions. The summary will be available through the Ministry's website, and hard copies will be available on request. Once submissions have been compiled they will be considered during the development of the proposed standard. The Ministry will prepare a report with recommendations on the comments and subject matter of the standard for the Minister for the Environment, including a section 32 (cost-benefit) analysis. The report and recommendations will be publicly notified. If the Minister's approval is given to continue developing the proposed standard, the final wording will be drafted and the proposed standard made into regulations.

Questions

Your submission may address any aspect of the proposed subject matter of the standard. However, the Ministry for the Environment would also greatly appreciate any specific comment you may have on the following questions.

Problems

1. Have the problems been defined correctly?
2. Are there other problems you can think of?
3. What is the magnitude of these problems?

Options

4. Do you agree with the policy objective?
5. Is there an alternative approach that has not been considered?
6. Do you agree with the analysis provided in this section?

Proposed standard

7. Do you have any general comments about the proposed standard for the inspection and maintenance of on-site wastewater systems?
8. Should the proposed standard apply to private dwellings only, or should it apply to all on-site systems (including consented systems) that treat domestic wastewater, including hotels, motels, camping grounds, restaurants, schools and marae?
9. Do you agree with the inspection interval of three years?
10. Should inspections be coupled with an immediate pump-out?
11. Do you agree with the proposed critical components for the checklist (see Appendix 7)?
12. Should the proposed standard prescribe a minimum level of treatment (eg, secondary) for new on-site systems? (This could have the effect of banning the installation of new septic tanks in favour of treatment systems that provide greater levels of treatment.)

Implementing the proposed standard

13. Should the proposed standard apply to targeted areas as proposed, or across the whole of New Zealand?
14. Do you agree with the risk assessment methodology and the proposed criteria for identifying targeted areas?

15. Do you see any problems with the implementation and administration of the proposed standard?
16. What would be an appropriate training level for inspectors/certifiers? Is a unit standard qualification for inspectors an appropriate method for ensuring consistency of inspectors?

Benefits and costs

17. Have we accurately reflected the range of costs and benefits arising from the proposals for a national environmental standard, and who might bear the costs or receive the benefits?
18. Are there any costs and benefits we have overlooked?
19. Do you have information you would like to see included in the cost-benefit analysis that will occur after the submissions are received and analysed?
20. Are our estimates of costs and benefits accurate?
21. Do you have information on costs and benefits that could assist the second stage of our assessment (of the impacts of any final proposals)?
22. Do you have any information on costs and benefits that we have been unable to quantify?

Appendix 1: Definitions

<i>Cluster systems</i>	On-site systems that serve two or more houses, but less than an entire community. The wastewater from each group of dwellings may be treated on-site by individual septic tanks before the effluent is transported through alternative sewer systems to a nearby off-site location for further treatment and ecosystem re-entry.
<i>Disposal field</i>	In most cases this comprises a subsurface 'field drain', such as perforated pipes. The idea is that the wastewater percolates into unsaturated soil at least 600 mm above the groundwater table. This way the wastewater is renovated in the unsaturated soil profile by microbial and physico-chemical processes.
<i>Domestic wastewater</i>	Wastewater or sewage from domestic households originating from toilets, urinals, kitchens, bathrooms, showers, baths, basins and laundries, such as from a dwelling, but excludes stormwater flows.
<i>Environmental performance</i>	The performance of on-site wastewater treatment systems relative to both public health protection and protection of the natural and physical environment.
<i>Escherichia coliform (E. coli)</i>	One of the species of bacteria in the coliform group. Its presence is considered indicative of fresh faecal contamination.
<i>Faecal coliform</i>	Bacteria present in waste from warm blooded animals (mammals or birds) and used as an indicator of pollution in water.
<i>Failure</i>	A situation where the effluent is not treated to a sufficient standard before entering groundwater or surface waters, or where inadequately treated effluent rises to the ground surface (usually near the on-site system). The failure of an on-site system may cause a risk to human health or the environment.
<i>Hotspot</i>	An area with high numbers of (failing) on-site systems within a larger area of low or normal density.
<i>Primary systems</i>	These systems involve separating bulk solids, grease and grit from the main liquid stream. Septic tanks are a well-known traditional example of on-site primary systems. Typical primary systems are either single-chamber or two-chamber septic tanks.
<i>Secondary systems/ advanced on-site systems</i>	These systems involve biological processes to biodegrade the organic contaminants in the wastewater. Secondary treatment processes can include wastewater aeration, such as aerated wastewater treatment systems (AWTS), treatment and filtering media, disinfection, and other technologies. These systems are typically designed, operated and maintained by specialist companies. The disposal field often includes dripper lines and evapo-transpiration beds. Advanced systems are generally used in more 'difficult' sites, such as in poorly drained soils, in close proximity to surface waters, or where there is limited room for the disposal field.
<i>Septage</i>	Liquid or solid material removed from a septic tank, cesspool, portable toilet, or similar system that receives only domestic (non commercial) waste.
<i>Septic tank</i>	Septic tanks comprise two distinct components: a solids settling tank (the septic tank) and an effluent disposal field. The main function of the tank is to allow solids to settle out and scum and fat to float to the surface. The liquid fraction is then drawn off by gravity from a pipe just below the surface of the wastewater. Some septic tanks have multiple chambers to improve solids removal, but the majority are simple single-chamber tanks.
<i>Sludge</i>	The material that settles out of wastewater primary and secondary treatment systems: the solids layer at the bottom of a septic tank.

Tertiary systems The treatment process following secondary treatment can involve the use of sand filters to further improve the removal of organic matter (fine solids) from biological secondary treatment, and the use of disinfection units to remove human intestinal bacteria before treated effluent discharge. Disinfection can be achieved for on-site treatment units via tablet chlorination or ultraviolet light units.

Wastewater Also known as sewage, wastewater includes the water you flush down your toilet and the water that drains from your bathtub, sink, washing machine and many other domestic sources.

Appendix 2: Current Consent Status and Provisions for Maintenance and Inspection of On-site Wastewater Systems

Regional council	Consent status	Maintenance and inspection
Environment Waikato	<p>Taupo: Existing and new systems are permitted activities. However, after 2013 existing systems in the near-shore zone will become controlled. Their status may also change depending on lot size.</p> <p>Region: Existing and new systems are permitted until changes of the site or the system occur. Then the system must be either upgraded to permitted activity for a new system, or a discharge consent applied for.</p>	<p>The owner provides a maintenance certificate to the council every three years for existing systems, and every five years for new systems.</p> <p>New systems are required to be maintained in line with TP58. There are no maintenance provisions for existing systems. Permitted activity criteria for the rest of the region are not specific about what has to be checked, just that the owner is responsible.</p>
Environment Bay of Plenty	<p>Rotorua: Existing conventional systems are permitted. Discharges from new conventional systems are a discretionary activity. Existing and new advanced systems are permitted. Systems located in specific areas will become discretionary after 2010.</p> <p>Outside Rotorua catchments: Existing and new conventional and advanced systems are permitted. However, systems located in certain areas will only be permitted until 2010, after which the consent status will change.</p>	<p>Existing systems are required to have maintenance and performance inspection, an approved certifier, and pump-out every three years. A certificate is issued to Environment Bay of Plenty (EBOP). Existing and new advanced systems are maintained in accordance with the manufacturer's design.</p> <p>Existing and new conventional systems are subject to a maintenance and performance inspection programme, pump-out every three years (six years for new systems), and inspection of the system by an EBOP approved inspector. Existing and new advanced systems are maintained according to the manufacturer's design specifications, including desludging. Records are forwarded to EBOP.</p>
Auckland Regional Council	New and existing systems are permitted.	New aerobic type systems have a programmed maintenance contract. There are no provisions for existing systems yet, but the proposed Air, Water and Land Plan means they will require maintenance.
Hawke's Bay Regional Council	Existing and new systems are permitted. Large-scale systems and systems located in sensitive areas are discretionary.	There are maintenance provisions for existing and new systems.
Taranaki Regional Council	Systems are permitted.	Systems are maintained according to TP58 and the <i>NZ Manual of Alternative Wastewater Systems</i> . There are no inspection provisions within the rule.
Environment Canterbury	Existing and new systems are permitted. Systems located in sensitive areas are discretionary.	Inspection and maintenance are required for all systems. Information is recorded and forwarded to Environment Canterbury (ECAN) upon request. At present, and due to lack of resourcing, ECAN staff do not routinely require these records unless they have been alerted to an issue.
Greater Wellington Regional Council	Existing and new systems are permitted.	The system should be maintained on a regular basis. There are no requirements for records to be kept or sent to the Council. Only the few septic tanks that have resource consent are monitored.

Regional council	Consent status	Maintenance and inspection
Northland Regional Council	Existing systems and existing primary treated effluent into land via deep soakage and rapid infiltration are permitted. New primary treated effluent to land via deep soakage and rapid infiltration is discretionary. Primary and secondary treated effluent from on-site wastewater systems is permitted.	There is a programmed maintenance contract only for secondary systems, and no requirement for records to be kept and/or supplied to the Council. There are no requirements for maintenance and inspection for the rest of the existing or new systems or effluent.
West Coast Regional Council	Discharge from existing and new systems is a permitted activity.	Maintenance should be in accordance with TP58. Systems that have discharge permits are required to be maintained in accordance with the manufacturer's specifications.
Environment Southland	Existing and new systems are permitted	There is a requirement for maintenance, but no requirement for records to be kept and/or supplied to the Council. The Council only monitors consented systems.
Horizons Regional Council	Existing and new systems are permitted, but if systems do not comply with the rule they will require resource consent.	There are no inspection and maintenance provisions linked to the rule.
Otago Regional Council	Existing and new systems are permitted, but if discharge from systems enters water it is a discretionary activity.	There are no inspection and maintenance provisions linked to the rule.
Tasman District Council	Sensitive areas: Systems that have secondary treatment are permitted. If systems do not have secondary treatment they are considered discretionary. Systems located in the Wastewater Management Area are controlled. For properties over 2 ha the activity is controlled; for under 2 ha it is restricted discretionary. Rest of the district: existing and new systems are permitted.	There is a written maintenance and monitoring contract, with an experienced operator. The contract specifies the frequency of maintenance and inspections. A signed copy of the contract is forwarded to the Council. Systems are serviced and inspected not less than every six months. Rest of the district: There are no inspection and maintenance provisions linked to the rule.
Marlborough District Council	Existing systems are permitted. New systems will require resource consent.	Existing and new systems are required to be maintained. The Council is investigating options for co-ordinating pump-outs and disposal of waste. Advanced systems are required to have a maintenance contract on at least a six-monthly basis. Records are required to be kept and supplied to the Council.
Nelson City Council	Existing systems are permitted. New systems are permitted if the lot size is 15 ha or greater. If the lot size is smaller than 15 ha, the new activity is discretionary. New larger-scale systems (industrial/commercial) are discretionary.	Existing systems are required to be maintained in accordance with the manufacturer's specifications. New systems are required to be regularly desludged.
Gisborne District Council	Existing and new systems are permitted. If a sewerage system is available it becomes restricted discretionary. Larger-scale systems are also restricted discretionary.	There are no inspection and maintenance provisions linked to the rule.
Far North District Council		All septic tanks are to be cleaned every three years. Confirmation is to be sent to the Council to be entered into the database. Inspections by the Council are not regular. Aerated systems, composting toilets and other approved systems must be maintained. Proof of maintenance must be presented to the Council within 30 days of maintenance.

Regional council	Consent status	Maintenance and inspection
Waitakere City Council		There is a maintenance and inspections programme. A department of Waitakere City Council pumps out the tank every three years. This is charged for as rural sewage in land rates.
Auckland City Council		Pump-outs are required every three years and a copy of the pump-out receipt sent to the Council within 14 days after the pump-out. An officer of the Council may enter any property and inspect any septic tank to check the condition of the tank and determine whether it has been pumped out in a satisfactory manner.

Appendix 3: Basic Outline for a Risk-based Methodology to Identify Targeted Areas

The parameters for identifying areas of environmental risk may include:

1. climate
2. land slope
3. aspect
4. soil type
5. erosion potential
6. drainage
7. building density and property size
8. groundwater levels
9. groundwater recharge zones and/or groundwater protection zones
10. proximity to waterways, including fresh water and the coastal environment
11. sensitivity of the local environment
12. flood hazard
13. existing buffer zones or rules in regional plans relating to on-site systems.

The criteria for identifying hotspot areas may include:

1. locations with a history of problems with on-site wastewater disposal, identified through sanitary surveys or pollution hotline complaints or monitoring
2. areas identified in plans or strategies as locations for intensification of land use, long-term growth or development, where sewage reticulation may not parallel development
3. communities with a high proportion of on-site systems that use shallow groundwater for drinking-water
4. areas of highly seasonal occupation (relevant especially in attractive tourism spots) and not adequately designed on-site systems to cope with shock loads.

Councils could consider undertaking a broad-scale risk assessment utilising GIS assessment and spatial modelling that considers the range of factors listed above. The development of a risk model would require the selection of parameters appropriate to the specific region (eg, slope, soil types, section size), determination of hazard classes (eg, 10 per cent slope = low hazard), and the application of weightings to each parameter (eg, section size may be weighted as it is more critical to system performance than soil category). In addition, hotspot areas next to the areas of environmental risk need to be considered.

Stakeholder consultation could then be undertaken within these shortlisted areas to allow the council to make an informed decision on where the proposed standard would be appropriate.

Appendix 4: WasteTRACK

What is WasteTRACK?

WasteTRACK is an internet-based database, which consolidates manifest, facility and carrier data to track liquid and hazardous wastes from generation, through transport to treatment or disposal. WasteTRACK is administered under contract to the Ministry for the Environment.

Each time a waste movement is requested by a waste generator (in our case, a household), the waste contractor (septic tank cleaners, suckers and dumpers, etc) creates a tracking form with a unique number that follows that waste from pick-up through to ultimate treatment/disposal. This allows each individual waste movement to be monitored.

WasteTRACK uses the waste contractor as the key operator in the tracking process. Before a contractor can begin using WasteTRACK, information on the operation must be entered into the database so that when a tracking form is being created the contractor can access that information.

There is a list of contractors registered with WasteTRACK, which the household can access via the internet. However, some households do not have an internet-connected computer at home, so if the standard is implemented councils could provide this information. There are around 50 contractors under 'septage waste category' who are actually installing or replacing septic tanks and doing pump-outs.

How does it work?

There are a number of stages, as follows.

1. Waste is produced by a generator household.
2. The household looks up the most suitable contractor from WasteTRACK.
3. The contractor arranges to collect the waste from the house and opens a new tracking system.
4. The tracking form is printed off and given to the driver.
5. The driver places the tracking form in the cab. The driver visits the household and collects the waste and takes it to the appropriate treatment plant.
6. The treatment plant accepts the waste if the tracking form is completed correctly. The plant then logs in and completes their part of the tracking form.
7. The contractor closes the tracking form.

Benefits of using WasteTRACK

The WasteTRACK system:

- ensures the safe transportation of wastes (septic tank sludge) to an approved treatment/disposal facility
- monitors and tracks wastes to prevent unauthorised discharge into the natural environment
- collates information to help central and local government identify priority waste management issues, and to help develop good policy
- provides an even and competitive system for companies in the broader waste management industry.

WasteTRACK has been developed to ensure that it meets these requirements by:

- requiring waste treatment and disposal locations to be approved before being entered into the tracking system
- allowing regulators to monitor the waste transporters that are entered into the system, which reduces regulators' time as they can focus on those businesses that are not using WasteTRACK
- allowing for the information in WasteTRACK to be extracted via reports to assist with waste management and business planning
- requiring all contractors to use WasteTRACK and meet the same standard, which means the industry will operate on a level playing field.

Appendix 5: List of Participants in 2006/2007 Working Group

Heleen Codlin	Hawke's Bay Regional Council
Marc Fauvel (reserve Paul Cooper)	Rotorua District Council
Robyn Floyd	Auckland Regional Council
Ian Gunn	Technical expert
Bianca Sullivan	Environment Canterbury
John Whale (reserve Janine Barber)	Environment Bay of Plenty

Appendix 6: Things You Need to Know About Your Septic System

This list provides a series of questions that, if you can answer, will indicate you have a basic understanding of your on-site wastewater system.

- What type of septic system do you have?
- Where is it located?
- Where is the repair area located?
- Is the septic system working properly?
- Has it been maintained in the past?
- What can you do on a day-to-day basis to keep your system working properly?
- What maintenance is needed in the future?

Appendix 7: Key Components of an Inspection Checklist

Provided below is a broad summary of the key components of a checklist for the inspection and assessment of on-site wastewater management system performance. It is not exhaustive and does not contain the level of detail necessary to fully assess systems. It is provided here as a guide to the possible structure of such a checklist.

- *Property details* – location, owner details, identification/consent numbers, type of facility and estimated occupancy/wastewater generation.
- *Inspection details* – date, time, weather, inspector.
- *Wastewater management system summary* – type of system (treatment, dosing, land application), location (including site sketch and GPS log), management regime (eg, owner maintained, service agent, utility managed), and any relevant discharge consents.
- *Site and soil (environmental) risk factors* – a brief summary of the general site and soil characteristics (section size, slope, soil category, depth to limiting layer).
- *Drainage pipework assessment* – a visual check to determine the condition and configuration of drainage (eg, is greywater separate? where are the different fixtures draining to?).
- *Treatment and conveyance component assessment* – this may include dimensions, estimated or known operating capacity, physical condition of components, treatment process assessment, sludge and scum accumulation, and stormwater infiltration.
- *Land application system assessment* – this may include the dimensions and estimated or known operating capacity, physical condition (vegetation cover, compaction), assessment of the condition of components (broken pipework, pumps and controls), hydraulic failure (observed signs of failure, load testing), proximity to sensitive receptors (such as streams, drains, recreational areas).
- *Summary assessment of performance* – a listing of conclusions on the key performance criteria and a statement of any remedial works required.

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