Your submission to Action for healthy waterways – consultation

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Personal details removed

Reference no: 1787

Submitter Type: Business / Industry

Clause
Proposals as a whole - please refer to questions 1-3 on page 19 of the discussion document

Notes
ESR welcomes the reform and in particular we support the approach to Te Mana o Te Wai. A faster and more consistent planning process would allow improvements to be implemented in a timelier manner. It is important that there is alignment with drinking water regulations and ESR supports a National Environmental Standard (NES) that improves management and monitoring of wastewater discharges and overflows with risk management plans and storm water policy. ESR supports mahinga kai as a compulsory value. We support restrictions in areas which are sensitive to groundwater and surface water pollution. ESR has the science and expertise to support this policy direction across drinking water, groundwater and wastewater science and research. Our science and research supports decision making around the potential effect of water contamination on human health, including food safety e.g. mahinga kai, and recreational water uses. Key ESR research programmes focus on contamination of water, transport of contaminants in soil and water, contamination of storm water and treatment and disposal of wastewaters and the effect on human health. There is a need for nationally consistent approaches, as different organisations will have different levels of knowledge and capacity across all the roles and responsibilities around freshwater management. This would not preclude targeting activities to particular areas. There is a need to adequately invest in the implementation and ongoing management of the proposals; this includes to support iwi involvement, sustainable funding for science support (especially to regional/local authorities); alignment between regimes (e.g. the possible creation of a Te Mana o Te Wai commission and the Drinking Water regulator). There is a critical gap in the omission of groundwater as part of the package. Potentially it is an optional value under s3.7 National Policy Statement-Freshwater Management (NPS-FM), if it is not considered a “potable water supply” and could become severely contaminated which is contrary to the holistic approach of Te Mana o Te Wai. Other actions we think are necessary, include a freshwater science strategy supported by adequate funding, so that important applied research and science can inform decisions and an independent advice service to assist with assessing complex environmental problems and inclusion of a person with microbiological and human health expertise on the advisory panels as noted by the Freshwater Leaders Group report (FLG). ESR has significant capability and capacity in regulation, risk management plans and environmental science to assist in the next phases for management of drinking water, wastewater, recreational water and storm water and the impacts on human health and groundwater ecology. ESR supports giving effect to Te Mana o Te Wai but the lack of clarity on maintaining and improving groundwater quality undermines this framework. A more consistent and a faster planning process. • NES to support delivery of safe drinking water, aligning with drinking water regulations. • NES that improves management and monitoring of wastewater discharges and overflows and risk management plans and storm water policy iwi: Clarifying Te Mana o Te Wai and it hierarchy as a fundamental framework will compel local government to incorporate tangata whenua values in management and policy. This addresses a weakness within the current National Policy Statement –Freshwater Management (NPS-FM, 2017) which places tangata whenua values in a competing structure with other stakeholder interests. Explicit funding needs to be committed within any developed budget to ensure iwi involvement in the new framework (Action for Healthy Waterways, p30) to “improve the ability of iwi and hapū to express their values in freshwater management and planning, and to strengthen and clarify requirements on regional councils to incorporate this information into regional freshwater planning processes”. A coordinated approach: Ensuring that management of drinking water is consistent with, and supports, new drinking water regulations will be important. A standard framework to manage storm water and wastewater will provide more clarity, but it may take longer than five years to implement. Time based targets: Links between farming and reduced water quality are widely acknowledged. Improvement of surface water and groundwater quality through farm management will depend on the sensitivity of the location and the amount of contaminants that are within the vadose zone and haven’t yet entered groundwater. Achievement of the objective is uncertain as contamination in water bodies such as groundwater and estuaries may take generations to restore to health. The relevant timeframe depends on the hydrogeological situation and the lags which occur naturally in the vadose and groundwater system. If the groundwater system has a rapid response (1 – 5 years) then you should see a corresponding improvement. If the groundwater system has a lag of around 70 years (e.g. Taupo) then it will take a correspondingly long time to see changes and changes currently observed will be the result of changes that happened 40-70 years ago. Gross eutrophic zones in estuaries may also contribute nutrients and pathogens to the overlying water body for years after contaminant inputs have been reduced. However, continuing with the current system of competing interests with no clear direction on hierarchy will only result in continuation of the current degradation of water. Groundwater: Groundwater is an important freshwater resource. • 80% of annual river flow volume comes from groundwater • Groundwater provides 40% of New Zealanders’ drinking water (Davies 2001) • Critical in sustaining surface aquatic ecosystems and mahinga kai • Irrigation from groundwater contributes $2 billion to the economy annually Groundwater must be included in any strategy around freshwater management. A whole system approach which is consistent with Te Mana o Te Wai is essential to the delivery of NPS-FM targets. The impact on surface water quality will depend on the quantity of the other water sources which are typically lower in summer, increasing the impact of the groundwater on mahinga kai, surface water ecology, recreational use of and mahinga kai. The lag between land use and aquifer contamination, the diffuse nature of non-point source contamination and the potential for non-uniform contaminant transport in aquifers, hydraulic connections of open framework gravels in Canterbury through which most groundwater flow occurs (Burberry, Moore et al. 2018), illustrate the complexities associated with management of this significant freshwater resource. The proposals in Action for Healthy Waterways (AfHW, p11), seek less pollution of...
rivers, lakes, groundwater and the sea from stormwater, wastewater and farm practices but does not discuss how groundwater is affected e.g. AfHW, p26 needs to discuss the cumulative effects on groundwater across a catchment. Groundwater is not mentioned at all in Section 8 “Improving farm practices” (AfHW) yet land use in some areas has significant long lasting effects on groundwater, while in other areas effects will be mitigated from attenuation and the characteristics of the aquifer. While, groundwater is recognised as part of the Freshwater Management Unit, the draft NPS-FM has little discussion of groundwater and is only mentioned in s.311 (3) c) for environmental flows and in “Table 5 Dissolved Inorganic Nitrogen” with respect to groundwater springs and seepage. Section 3.7, draft NPS-FM has no compulsion for councils to consider protection of the quality of groundwater. Potentially this could be interpreted that unless the groundwater is currently used as a reutilized drinking water supply, there are no bottom line attribute states. It is unclear how the planning process will ensure that groundwater quality is protected for individuals who will be on self-supply in rural areas e.g. many farms in Canterbury region have their own groundwater bore, or where local springs are used to augment water supply. It’s also important to safely guard groundwater for drinking water for future needs. Considering Te Mana o Te Wai principles and community expectations, such an important use of this freshwater resource should include self-supply of drinking water as well as “potable water supply” in Appendix 1B. The draft NPS-FM would then assign target attributes in the planning process and be included in Appendix 2A. Also, climate change challenges (drier in the east/wetter in the west) is likely to drive more reliance of groundwater usage. While quantity is being addressed later, water quality should be addressed in this NPS-FM. A poor understanding of this asset and threats to it (e.g. Emerging Organic Contaminants) will be perilous to the entire freshwater system. Burbery, L. F., et al. (2018). “Study of connectivity of open framework gravel facies in the Canterbury Plains aquifer using smoke as a tracer.” Geological Society, London, Special Publications 440(1): 327-344.

Clause
Impacts and implementation: please refer to questions 4-6 on page 19 of the discussion document

Notes
ESR is working in collaboration with three other science providers of Groundwater science (the Groundwater Platform) and other strategic partners to facilitate the application of science to address immediate local, central government and iwi resource management needs established through the Essential Freshwater NPS and conduct relevant research to identify and meet future challenges including climate change. ESR will also work to ensure its environmental and public health scientists are well informed on both the NPS and Three Water initiatives to ensure coordination, alignment and informed provision of advice The Essential Freshwater policy, draft NPS-FM and the Three Waters Review has made a quantum shift in the deliverables expected of regional councils. There is need for a funding/investment system change in order to meet the designated timeframes e.g. certain/stable funding for required science and research. A coordinated national freshwater science strategy needs to be developed and empowered via departmental investment (sitting alongside the NPS) to ensure that science agencies are able to support councils, iwi and relevant ministries with the necessary applied science/knowledge required for the delivery of NPS objectives. Stable funding at the applied science level possibly managed through the Resource Management Ministries or MBIE can address immediate priorities as required by the NPS. Future proofing of the environment can then be complemented by better alignment of high-level science research funding managed by MBIE (e.g. lessons and information established at the frontline backed by prioritisation statements from Resource Management Ministries can be used to feed into MBIE funding). Sustainable funding and a feedback loop will ensure appropriate capability continues to develop, required science is developed and the science application process moves from project based to strategic. For example, Overseer is a key management tool for many councils and the PCE (2018) review highlighted numerous aspects where new information is required to robustly calibrate and apply the model to support decision making and established frameworks for evaluating environmental models to be used to support regulation. Recommendation 15 of the Freshwater Science and Technical Advisory Group (STAG) also highlights knowledge gaps which impact on effective management of freshwater and the health of ecosystems and human health e.g. recreational water guidelines, national consistency in methods for monitoring, data generation and analysis, applied science and groundwater protection. STAG highlighted that protective measures are required for groundwater quality as rural residents are exposed to higher nitrate concentrations and microbial contamination of groundwater which they use for drinking water. Groundwater is not specifically covered in the draft NPS-FM and there are no attributes or targets for groundwater which is not specifically a “potable water supply” and would come under drinking water source protection, and is open to interpretation with regard self-supply or potential use as a supply. Its omission could be interpreted that groundwater contamination could continue to increase (e.g. microbial contaminants and/or nitrates) in areas that are not existing reticulate potable water supplies. Regional councils’ current need is for science and research that supports policy implementation in the short-term as well as emerging issues such as organic pollutants or climate change. Councils need transparent, robust tools, which are underpinned by science. These are examples of the immediate science and research needs as a result of the Essential Freshwater policies and the 3 Waters review. There are longer-term gaps and needs in determining activities that need to be in risk management plans, level of evidence required for planning decisions and building groundwater capacity, capability and understanding to assess current and historical impacts of contamination and effective mitigation and management. Of critical importance to implementation, is a fundamental understanding of what is happening in a particular catchment so that effective decisions can be made – complete information for every catchment is currently unavailable and requires intense investigative fieldwork to compile, particularly when considering the designated timeframe. Insufficient funding and resourcing of iwi to allow full participation within the short timeframe. New capacity and capability will be required for farm planners, iwi, commissioners and regional council staff. Tight timeframes may require centres of expertise or advice to be available to regional councils, for example as staff build capability in assessment of risks to drinking water and risk management areas, wastewater and stormwater risk management plans and farm plans. PCE (2018). Overseer and regulatory oversight: Models, uncertainty and cleaning up our waterways Wellington.

Clause
Water commission and other comments - please refer to questions 7-8 on page 19 of the discussion document

Notes
ESR sees that there would be benefit in a new independent body would oversee and support implementation of the National Policy Statement, and subsequent NES, including monitoring of the functions and duties e.g. reporting requirements, and provide overview of plans to ensure they give effect to Te Mana o Te Wai. A separation of the roles of the Ministry for the Environment, Regional councils
The current NPS-FW (2017) has mahinga kai as two “other national values to consider” (“safe to eat” and mauri). Te Mana o te Wai was of national significance in the NPS-FM (2017), but Ahw reports that Maori values are not being identified, reflected incorporated or monitored adequately (Ahw, s.3 p30) and Proposal 1 (Ahw, p10) is to strengthen and clarify requirements on regional councils. In order to achieve that goal and improve incorporation of Māori values in regional freshwater planning, it is essential to have at least one compulsory Māori value. KWM (p48) explains Mahinga kai was deliberately chosen as a compulsory value by Te Kāhui Wai Māori
because it is comprised of multi-faceted and integrated indicators that address both kai being safe to harvest and eat, and ensuring the mauri of the wai is intact. If mahinga kai is not a compulsory value, then it competes with all the “other” uses e.g. irrigation, fishing etc., as “Other values that must be considered” (draft NPS-FM, p27). The Draft NES-FM s3.7 (p10), splits the mauri of the water for mahinga kai and water from which it is safe to harvest mahinga kai. The mauri of a water body is essential for gathering mahinga kai. Water may have low indicator bacteria levels, i.e. “safe to harvest”, but the mauri of the water may still be affected e.g. proximity of faecal discharges or intermittent combined sewage stormwater overflows. It could be possible to have “safe to harvest” but mahinga kai would still not be gathered because the mauri of the water is not acceptable. Cultural health assessment is an important component for understanding the mauri of water and suitability of its use for human needs. If mahinga kai is not compulsory, then ‘kai are safe to harvest and eat’ and ‘kei te ora te mauri – the mauri of the place is intact’ must be linked in draft NES-FM. Proposal 2 is to strengthen priority given to tangata whenua values, by having a compulsory tangata whenua value which may, or may not, be mahinga kai. Attributes and target states would then need to be determined for the compulsory Tangata whenua value. This process could take a long time to develop for each Freshwater Management Unit, putting resources of iwi and regional councils under significant time pressure. Therefore at this stage setting a compulsory Tangata Whenua Value at FMU level could make the outcome less definite and doesn’t support the aim of making significant changes to water quality by 2025. Mahinga kai is easy for everyone to relate to, as it is instinctively more holistic than the quantity of fish or concentration of bacterial indicators in the water, where there are existing data and tools available, as mahinga kai is part of cultural health assessment methods, so it could be implemented more quickly than individual compulsory tangata whenua value. It is noted that KWM support tangata whenua value as a supplementary value to mahinga kai being the compulsory value. A compulsory Māori value is a significant change from the current process of consultation with iwi and community which requires council “to consider and recognise” (p11, NPS-FM, 2017). Successful implementation will require adequate funding and national direction to ensure consistent NZ-wide implementation. To participate fully, iwi and hapu will need resources in terms of capability and capacity, but no indication of how that resource will be made available and no budget to support iwi and hapu engagement. It will require investment in research and science to ensure that decisions are robust. A separate body to oversee the process is supported. Clear direction will support faster planning and implementation. Without clear direction the consultation process and the outcomes are likely to remain the same.

Clause
Exceptions for major hydropower schemes - please refer to question 19 on page 36 of the discussion document

Notes
The management of hydro schemes needs to be consistent with Te Mana o Wai as it is a fundamental concept of the NPS-FM. Hydro-generators should have to be transparent and go through a consent application processes to operate outside the national attributes. It allows Regional Councils to put conditions and limits on operations and practices

Clause
Nitrogen, phosphorus, and sediment attributes - please refer to questions 20-21 and 30-35 on pages 52 and 53 of the discussion document

Notes
We support the proposed attributes as relationships between aquatic life and nutrients are based on correlations not direct causation. So in some circumstances biotic indicators may not warn of high nutrient levels e.g. where a nutrient limit prevents nuisance growth but other nutrients may still be high. We support a bottom line for nitrates in groundwater to protect people’s health, where there is no drinking water supply and people are on self-supply and also to protect future use of the resources and use of springs to augment water supply. We support managing sediments, as sediments tend to be an environmental reservoir for faecal indicator bacteria such as E. coli and harmful microorganisms (pathogens such as Cryptosporidium and Giardia) derived from faecal contamination (Devane, Moriarty et al. 2014). After defecation and run off into the aquatic environment, these pathogens can remain infectious for longer periods when protected within the sediment environment. Thus pathogens and E. coli may become available for resuspension into the water column during recreational activities. Devane, M. L., et al. (2014). “The impact of major earthquakes and subsequent sewage discharges on the microbial quality of water and sediments in an urban river.” Science of the Total Environment 485-486C: 666-668.

Clause
Ecosystem health policies - please refer to questions 23-29 on pages 52 and 53 of the discussion document

Notes
We support a national position on fish passage gives clarity. This is important to support the natural life cycle of fish and increase the abundance of mahinga kai. It may be useful to prioritise installation of fish passage requirements in terms of areas of supporting mahinga kai. The length of time would be related to the importance of the fishery and include cultural health. It aligns with protecting endangered indigenous fish. We support protecting remaining wetlands as it is a natural resource for filtration and reduction of harmful microorganisms (pathogens) derived from overland runoff.

Clause
Ecosystem health attributes - please refer to questions 20-21 and 39 on pages 52 and 53 of the discussion document

Notes
We support the proposed attributes as relationships between aquatic life and nutrients are based on correlations not direct causation. So in some circumstances biotic indicators may not warn of high nutrient levels e.g. where a nutrient limit prevents nuisance growth but other nutrients may still be high. We support a bottom line for nitrates in groundwater to protect people’s health, where there is no drinking water supply and people are on self-supply and also to protect future use of the resources and use of springs to augment water supply. We support managing sediments, as sediments tend to be an environmental reservoir for faecal indicator bacteria such as E. coli and harmful microorganisms (pathogens such as Cryptosporidium and Giardia) derived from faecal contamination (Devane, Moriarty et al. 2014). After defecation and run off into the aquatic environment, these pathogens can remain infectious for longer periods when protected within the sediment environment. Thus pathogens and E. coli may become available for resuspension into the water column during recreational activities. Devane, M. L., et al. (2014). “The impact of major earthquakes and subsequent sewage discharges on the microbial quality of water and sediments in an urban river.” Science of the Total Environment 485-486C: 666-668.
Drinking water is otherwise compromised by this loophole. The system, except for individual ‘domestic self-suppliers’ (Cabinet minute - Strengthening the Regulation of Drinking Water, Wastewater and Storm water CAB-19-MN-0332). The intent of ensuring that all who are dependent on someone else for the safety of their drinking water is otherwise compromised by this loophole. There are, no doubt, concerns about the practicability of undertaking risk

Clauses

Swimming - please refer to question 36 on page 53 of the discussion document

Notes

We agree that there is an urgent need to undertake a revised Quantitative Microbial Risk assessment to review the relationship between indicator and pathogens to determine the risk of illness. The advisory groups view is that the draft NPS-FM is an interim holding arrangement until the QMRA is undertaken. E. coli as a single parameter is useful as an indicator of faecal contamination in a waterway. The identification of faecal contamination indicates the potential presence of pathogenic microorganisms that cause disease. It is well documented, however, E. coli alone, does not correlate with all pathogens likely to be present in faecal sources, especially waterborne viruses, and protozoa such as Giardia and Cryptosporidium (Harwood, Staley et al. 2014, Korajkic, McMinn et al. 2018), nor how the ratio of E. coli to pathogens may be different from different sources. The proposed Quantitative Microbial Risk Assessment of recreational freshwater will collect data on the different sources of contamination (e.g. urban, birds, dairy, forest) and the concentrations of E. coli or other indicators, and pathogens which affect humans. This will help determine if there is a differential in risk posed from different sources, given the concentration of indicator bacteria. It would be helpful to reference the Value (and component) in Table 11 of the draft NPS-FM to Appendix 3, as it relates to the target to have an overall improvement in swimability of freshwater across New Zealand, and give directions to use Table 23 for primary contact sites. Table 11 and 23 and their implementation will need to be reconsidered following the proposed QMRA of recreational freshwater. The phrase “predicted average risk of infection” in Table 11 can be interpreted differently. Clarify what it means and a reference to how it was derived. The draft NPS-FM Primary Contact Sites (s3.18) should refer the reader to the guidelines, as the text in the NPS differs from the Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas (MFE, 2003) and doesn’t include the full details of actions to take in the event that concentrations of E. coli are exceeded, e.g. sanitary survey. Referring the reader to the source document ensures that the advice is current. Action plans targeted at specific sources of faecal contamination will require establishing the sources of contamination under different environmental conditions and an understanding of the risk posed by different sources given concentrations of indicator bacteria. Harwood, V. J., et al. (2014). “Microbial source tracking markers for detection of faecal contamination in environmental waters: relationships between pathogens and human health outcomes,” FEMS Microbiology Reviews 38(1): 1-40. Korajkic, A., et al. (2018). “Relationships between Microbial Indicators and Pathogens in Recreational Water Settings.” Int J Environ Res Public Health 15(12). MFE, (2003). Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas. Retrieved from: https://www.mfe.govt.nz/publications/fresh-water/microbiological-water-quality-guidelines-marine-and-freshwater-0

Flows and metering - please refer to questions 37 and 38 on page 53 of the discussion document

Notes

Aquifers are also connected to headwater springs, not just rivers and lakes. There needs to be a recognition that groundwater sustains surface water flows, particularly in the summer periods. Refer to Question 1-3 on groundwater. Water use data is essential to manage a resource – for the regional council and the user. All water use should be monitored – otherwise it is only an estimate. We agree with the Comment by KWM and some FLG that the total volume of water (not just the rate) also needs to be taken into account when deciding where telemetry and reporting is required.

Drinking Water National Environmental Standards - please refer to questions 43-45 on page 56 of the discussion document

Notes

This section is focused on improving the instrument presently available for ensuring agencies with responsibility for environmental management take account of the source protection needs of water suppliers - the NES for Sources of Human Drinking Water 2007 (NES SHDW). Coordination with development of drinking-water standards When the current NES SHDW was developed, it was having to work with drinking-water standards that had already been developed. As the NES SHDW is part of the same “system” as the DWSNZ, i.e., the system to ensure safe drinking water, the two instruments should be developed in a coordinated fashion. The requirements of one should not present difficulties for the requirements of the other. This is particularly important if substantial changes to the DWSNZ are envisaged. The proposed bulleted amendments in the discussion document are appropriate and important. • Risk management areas The use of “upstream-up-gradient” in the present NES SHDW creates impracticable requirements on the consenting authority in situations where a large catchment exists upstream of the abstraction point. This change is welcome provided the methodology for defining this protection zone is robust. The proposal of delineating bespoke risk management areas, where data are available to do this, should assist in reducing the likelihood of generic methodology resulting in an unnecessarily large area for risk management (generic methodologies tend to be conservative). • Type of activities The proposal to identify activities that must be assessed as potential risks is helpful in ensuring that activities not presently covered by the NES SHDW can be controlled by the revised NES SHDW. • Scope In the existing NES SHDW, with the exception of regulations 11 and 12 of the existing NES SHDW, the regulations are designed to protect the sources of supplies serving more than 500 people (for at least 60 days a year). The proposal to lower this population threshold to 25 people is welcome, given it is the smaller supplies that are the most vulnerable to contamination of their source waters because of their limited treatment capabilities and limited expertise in supply operation. However, the 25 people threshold still leaves a mismatch between the supplies protected by the NES SHDW and those proposed to be covered by regulation in the water reform – “all drinking water suppliers be covered by the drinking water regulatory system, except for individual ‘domestic self-suppliers’” (Cabinet minute - Strengthening the Regulation of Drinking Water, Wastewater and Storm water CAB-19-MN-0332). The intent of ensuring that all who are dependent on someone else for the safety of their drinking water is otherwise compromised by this loophole. There are, no doubt, concerns about the practicability of undertaking risk
assessments for all source waters for supplies down to this size. In practice, management of the risks for the supplies serving down to 25 people, may, in many (but perhaps not all) instances, also manage the risks for smaller supplies. Only where there is no other larger supply in the catchment would separate consideration need to be given for a very small supply. • New approach to managing hard-to-treat contaminants A desirable step, but without the detail it is difficult to determine its likely effectiveness. One question that arises is: how will these be identified? • RC and TA controls on land use in risk management areas Necessary if the revised NES is to achieve its purpose. • RC and TA review of plan rules Necessary to ensure that existing rules are consistent with the revised NES.

There is an issue of equity to ensure that the most at risk sources/communities are adequately provided for • Taking account of treatment The current NES SHDW allows account to be taken of the efficacy of existing treatment. While this seems to be fair, it effectively negates the multi-barrier principle. Protection of the source water is probably the most important barrier to hazards reaching consumers, according to Principle 2 of the stated in the Havelock North Inquiry Stage 2 Report: “Principle 2: Protection of source water is of paramount importance Protection of the source of drinking water provides the first, and most significant, barrier against drinking water contamination and illness.” Allowing contaminant levels in source water to rise to levels that a second barrier is, in principle, capable of treating, is effectively to remove the first barrier (source protection - the purpose of the NES SHDW). As a consequence, failure of the second barrier(s) contained within the treatment plant leaves the consumer vulnerable to the unmitigated hazard concentrations in the source water. Taking account of the treatment processes has the potential to allow a “pollute up to” mentality to develop. This was noted during the roadshow presentations after the current NES SHDW came into force, to try to discourage this attitude. • Identification codes (a detail for later consideration) To help in implementing the NES SHDW it would be valuable to ensure that both the drinking-water supply registration contains the appropriate regional council identification code for the source, and similarly that the regional council database contains the drinking-water identification code. Presently, matching the sources often relies on matching grid references which can pose difficulties when there is an error in these data. • The forward-looking nature of the existing NES SHDW The existing NES primarily contains forward-looking regulations. If the NES SHDW's implementation is successful, regional councils do not grant water or discharge permits for new activities, or permit activity rules in regional plans that may degrade source water quality beyond the limits allowed by the regulations. The quality of source waters at the time the NES SHDW came into force was determined by the existing consented activities in the catchment or recharge zone. The likelihood of exceedance of the relevant MAVs depend on the levels of contamination arising from existing activities (i.e., those generally not directly controlled by the Drinking Water NES) and the steps the water supplier is able to take to improve the water quality. Regardless of the magnitude of the activity that the NES SHDW prevents, the absence of that activity in the catchment does not improve the present source water quality. Only when renewals of consents granted prior to the NES SHDW occur is there the chance that the water quality will be improved. This is a difficult problem to address. The RMA allows for the review of consent conditions. Does this provide a possible mechanism by which the NES can gradually achieve improvement in present source water quality, to avoid the wait for consent renewal? • Protozoa The existing NES is based on the results of compliance monitoring of specific determinants. This breaks down with respect to protozoa. The DWSNZ do not require on-going monitoring of protozoa (after the initial assessment of source water quality). Compliance is based on the nature of the treatment processes in place and how well they are being operated. A different approach to managing the risk associated with protozoa from that used in the current NES is needed in the revised NES, unless there are associated changes in the requirements for protozoa compliance in the DWSNZ. (See comment below on coordination of NES and DWSNZ development). • Regional council staff's understanding of public health risks Regional councils do not generally see themselves as having public health responsibilities. The lack of understanding of public health in regional councils was raised on several occasions during the roadshows accompanying the introduction of the present NES SHDW. This concern may still exist. A detailed understanding of public health risks is not required for successful implementation of the NES SHDW, but it is important that council staff appreciate why protection of source waters, and their role in this, is important (see Principle 2 noted above). The document identifies human drinking-water as being in the second priority tier following the health of the water itself. While drinking-water is a secondary consideration in the document, the actions designed to meet the goals of protecting the health of environmental waters, such as keeping stock from waterways, will also have a beneficial effect on the protection of drinking-water sources. Water quantity The existing NES SHDW is concerned with water quality. Insufficient source water also presents a major risk to public health when the served population is unable to maintain personal hygiene (in extreme circumstances). There is a need to control abstracting activities so that they, too, are unable to create a public health risk. This will increase in importance in some parts of the country where the frequency and duration of droughts can be expected to increase with the effects of climate change. • Identification of Relevant Resource consents Granted resource consents should be available for the public to search. Identification of the types of consents should be done in agreement with the HPO. • Consider Potential Risks The risk assessment will depend on the hazards. There would need to be an increase in capacity and capability in Regional Councils to undertake this, as they are primarily experienced in environmental health, or involve Health Protection Officers who work in this area. “If a regional council or water supplier has sufficient data to prove that the default source water risk management areas prescribed in the Drinking Water NES are not appropriate for a particular water supply, then the regulations would allow for bespoke source water risk management zones to be established.” (AfHW, p55) The text should make it explicit that there would need to be in agreement with the new “Drinking Water” Regulator. Unwise a RC regulation may allow that in areas of high nitrates concentrations care givers could be told to provide bottled water for infants. The new Act will have the specifics of the role of the new “Drinking Water” Regulator. It would be expected that appropriate consultation with Māori be undertaken, - a different group of representatives with specific knowledge in drinking water.

Clause
Stormwater and wastewater - please refer to questions 46-50 on page 62 of the discussion document

Notes
Further consultation is acknowledged as being important. It would be expected that appropriate consultation with Māori be undertaken,-a different group of representatives with specific knowledge in water microbiology and human health. Improvements in wastewater and storm water work is supported by the Three Waters Review. Large investment is required in wastewater treatment to renew resource consents in the next decade and likely to require upgrades. An NES is supported for wastewater. Standardised monitoring, reporting and methods for key contaminants and performance indicators is important for determining performance. The impact of a wastewater discharge on the environment is predicted concentrations of contaminants in the discharged treated wastewater and it is important to verify with actual measurements that discharge concentrations and loads are within the parameters used for the predictions. Sampling needs to be frequent enough to provide data on performance of the wastewater treatment plant.
as well as the discharge characteristics. The expected performance of a plant will depend on the types of treatment processes used and its size. Important metrics are: • DO if appropriate to the treatment system • TSS • BOD5 • Bacteria should be specified as E. coli and enterococci for discharge to marine environments, but may require monitoring for viruses or protozoa depending on the sensitivity of the receiving water. • Total nitrogen and nitrate • Phosphorous • Cations if there is discharge to land • Flows - as limits could be achieved by dilution. • Temperature • pH where the environment is sensitive to metals, ammonia or sulphide • Sampling frequency • Frequency and volume of sewage overflows or sewage/stormwater discharges For large wastewater treatment plants, or ones discharging in sensitive receiving environments e.g. shellfish beds, waterbody used for mahi mahi, the following may need monitoring be required • Viruses • Protozoa • Metals • Organic pollutants • Emerging chemical contaminants The NES should include information on sampling • Sampling frequency - taking a sample once a year would not provide useful information on the performance of the wastewater treatment plant • Type of sample - whether it is a grab sample or a composite sample taken over a number of hours Methods should be specified and laboratories should have approved quality systems. The NZ Municipal Wastewater Monitoring Guidelines (NZWERF, 2002) should be used alongside any NES – they may require updating. Receiving environment monitoring of the waterbodies (both surface and groundwater) is critical to determine the effect on the environment. It’s important to consider that discharge may be to land with subsequent and delayed discharge to groundwater which could upwell and affect surface water, or may affect drinking water quality. The NES does not explicitly mention or take into account discharges to land which ultimately discharge to groundwater. National Performance Measures: Nationally consistent performance measures would allow better tracking of performance. Inclusion of “assessing ....the financial performance of the operator”(AHW, p60) needs to be detailed as it may provide excuses for poorly performing plants to continue to discharge unacceptable effluent. According to New Zealand’s Greenhouse Gas Inventory (MFE, 2019) it is the agricultural and energy sector that contribute 90% of our greenhouse gases, so it would seem to be a financial burden to make it an obligation for all wastewater treatment plants to report on annually, except for very large wastewater treatment plants or significant land disposal. Greenhouse gas emissions from wastewater would need to include disposal as soil bacteria can produce nitrous oxide from nitrate, which is a more potent greenhouse gas than carbon dioxide. Reporting on sludge disposal practices would be beneficial, although they don’t go into water they are an important aspect of wastewater treatment and as plants are upgraded the volume of biosolids is likely to increase. Monitoring this aspect would provide good information for future planning. By only considering municipal wastewater, the vast majority of generated “wastewater”, which also has high potential to be contaminated, will not be considered and will still impact freshwater bodies and may pose a risk to human health. UNESCO (WWAP, 2017), state “Most human activities that use water produce wastewater. As the overall demand for water grows, the quantity of wastewater produced and its overall pollution load are continuously increasing worldwide”. Wastewater from rural landscapes - even if not reticulated, dairy farms, food industry, meat works, dairy factories, forestry industry, all sorts of industries, energy production, etc., should be taken into consideration. Stormwater: Combined sewage and storm water overflows contribute pathogens and other contaminants to waterways which lead to degradation. Regulating storm water and combined sewer storm water overflows is critical to improving overall water quality for the receiving environment and giving effect to Te Mana o te Wa. A review of all measurements that are applied in the rest of developed countries for managing and treating storm water including how green structures are going to be managed when they reach a maximum load of contaminants? MFE (2019) New Zealand’s Greenhouse Gas Inventory 1990–2017. Publication ME1411. Ministry for the Environment, Wellington, New Zealand. Retrieved from https://www.mfe.govt.nz/publications/climate-change/new-zealands-greenhouse-gas-inventory-1990-2017 NZWERF (2002) New Zealand Municipal Wastewater Monitoring Guidelines. (D. Ray, Ed). New Zealand Water Environment Research Foundation. Wellington New Zealand WWAP (2017). The United Nations World Water Development Report 2017. Wastewater: The Untapped Resource. United Nations World Water Assessment Programme. Paris, UNESCO.
Notes
AHFW states that a key longer term tool to reduce pollution is “farm planning to support continuous improvement in environmental management”. As a key tool then it will be necessary to have a consistent approach to be effective within a catchment, as the effects of exported contaminants is diffuse and cumulative. Voluntary farm plans would be inequitable, as some farmers would be spending on environmental improvements and others wouldn’t. Farm plans also provide opportunities for people to become more informed about the sensitivity of the environment and how different practices affect losses to the environment. Freshwater Module: The Freshwater component is critical to understanding potential effects and therefore improving practices. However, as the environment is complex the farm management plans need to be supported by an understanding of the local environment and activities within the farm during short periods of time. Rainfall and low temperatures can have a significant effect on movement of contaminants through the environment. The Freshwater module would need to be explicit about groundwater e.g. “address identified risks of on-farm contaminant losses that impact on freshwater ecosystems” and groundwater. Cumulative effects are not explicitly addressed in the Freshwater Module, yet it is particularly important for groundwater as contamination of groundwater lags behind the activities on land and may occur at a distance from the land use and may behave in a different manner to a model owing to preferential pathways.

Soil/tile drains represent a significant preferential pathway for transmission of contaminants to freshwater systems, which often lags rainfall events. Raising awareness of the risk they represent would be beneficial for water quality management purposes and for this reason it could prove helpful to explicitly mention subsurface drainage features should be mapped. The effectiveness of the freshwater module and water management options could be improved if groundwater vulnerability (notably to nitrate) were mapped across farms. Including groundwater nitrate vulnerability assessment in the freshwater module perceptively would enhance water quality outcomes and increase success of achieving long-term goals. Priority should be • areas most affected by contaminants e.g. nitrates and sediment, • land uses most closely associated with degrading water quality e.g. Canterbury. The Freshwater module is an important addition and should be permanent. The draft NES-FM doesn’t specifically discuss priorities or timeframes for farm plans. We disagree that farm plans in the long term would reduce reliance on national regulations and put greater emphasis on farm-level decision making. This supports FLG report that the regulatory regime for the implementation of rules and policies must not be delivered via farm environment plan (FLG, para 63) Capability building will be essential and while being developed could be supported through centres of expertise or advice.

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Clause
Immediate action to reduce nitrogen loss - please refer to questions 58-64 on page 80 of the discussion document

Notes
Option 1 is not very clear. Is it proposing that caps would be implemented in areas where monitoring sites nationally are in the highest 10% or within a Freshwater management Unit, or within a regional council region? No scientific rationale is given for targeting 10%? The map on p47 (AHFW) clearly shows that certain areas are much more heavily impacted than others. It would be better to have a criterion for groundwater or surface water nitrogen above which caps are implemented. What is the significance of this 10% in terms of relative environmental impact/ranking of pollution loads? A properly measured assessment seems more justified for allocating resources. If the 10% is an arbitrary number then a recommendation would be to perhaps apply the 80/20 rule (that 80% of pollution comes from 20% of land-use practices) as AgResearch tested. Option 1 is based on Overseer® which calculates an annual average load. In specifying this as the tool to be used, the recommendations of the review by PCE (2018) need to be implemented to ensure it is robust. For example, PCE notes that this model has been calibrated in two key catchments for dairy i.e. for a specific land use, soil types and climatic conditions. In light soils such as in Canterbury it may underestimate nitrogen losses between 40-60% (PCE, 2018). Overseer® predictions need to be calibrated for more soil/land-use combinations. Investment into field studies measuring true leaching rates to benchmark and verify the Overseer predictions in these specific areas would be add value to the science and robustness of the decision. In some catchments assimilation may be better or worse, than others. Data for assessing the catchment wide losses needs to include type of aquifers, slope as well as rainfall, soils types and the redox status (oxic or reducing) of the groundwater system. The redox status of the underlying groundwater system is a key factor in whether nitrate will be removed or transported unchanged through the groundwater system. Option 2 does provide a useful management tool, but not at the assessment of the catchment level (Option 1). The national nitrogen fertiliser based on crop types will lead to a manageable, enforceable system. A consent process for higher amounts would provide scrutiny and be able to be monitored. These options are for intended for immediate action, but Option 2 requires further work to • determine caps for total nitrogen in fertiliser based on research findings and good management practice. • determine nitrogen caps for higher nitrogen-demanding crops and land uses, so Option 2 isn’t an immediate action. Option 3 Farm-based management plans are important for Best Practice to increase knowledge but the environment is very complex and the costs and time involved in building capacity, “independent auditing” and monitoring could potentially draw out the time it takes to implement, or the farm plans may be inadequate. Enforcement would be difficult. FLG notes that they have become tick lists (para 65). Focusing on Farm Plans without catchment limits being set could also result in poor interventions at a local level, capital investment e.g. in standoff area, where the catchment can’t support the nitrogen load from the stock it carries. RSWS indicates that nitrogen caps wouldn’t apply where nitrogen allocation and management frameworks are in place (or proposed). If the nitrogen caps are at higher than the draft NPSF-FM then they should be changed to be consistent with national requirements as they have been developed without Te Mana o te Wai as the underpinning principle. All the areas where there are high nitrogen leaching and losses need to be managed under the same management regime. It is not clear which areas of Otago and Canterbury are being managed to reduce nitrogen. The relevant timeframe depends on the hydrogeological situation and what lags are naturally in the groundwater system. If the groundwater system has a rapid response (1 – 5 years) then you should see a corresponding improvement. If the groundwater system has a lag of around 70 years (eg Taupo) then it will take a correspondingly long time to see changes and changes currently observed will be the result of changes that happened 40 – 70 years ago. It is not clear what assumptions are made in terms of the nitrogen loading. It is not clear what interventions have been proposed, how they will be monitored, how the complexity of the environment enables regional council to determine who is complying and who isn’t e.g. effects may occur away from a site. FLG (para 65) identifies that it is not clear what evidence there is that farm plans alone reduce nitrogen losses. This statement isn’t clear. “Higher threshold” being a lower nitrogen cap in winter? The thresholds would be calculated based on the ability of the environment to assimilate the contaminants. This is presumably recognising that leaching is more likely in the winter when soil moisture conditions are high and rainfall can result in drainage. Banning certain farming practices from certain catchments considering nitrate vulnerability (related to soil conditions and assimilative capacity of the catchment/underlying groundwater system for nitrate). Whilst they remain to be properly assessed as a viable
nitrogen-management tool in New Zealand, denitrifying bioreactors (that filter nitrate from drainage water or shallow groundwater) are a technological means by which nitrogen losses from a farm/catchment unit might be reduced. They are more effective than constructed wetlands at reducing nutrient pollution loads. Such passive edge-of-field nitrate remediation systems have become standard farming practice in parts of the USA. Policies that enable application of such N-mitigation tools are encouraged. Simple rules which hare easily monitored and enforced where required. A nationwide approach, so areas with nitrogen management would need to comply with national management regimes. It is not clear when the proposed management frameworks would be operational or what the interventions are.

Clause
Excluding stock from waterways - please refer to questions 65-68 on pages 80 and 81 of the discussion document
Notes
Yes keeping stock from waterways, will also have a beneficial effect on the protection of drinking-water sources. Allowing direct defecation into waterways and lakes is inconsistent with Te Mana o Te Wa, introduces zoonotic pathogens which can affect human health, does physical damage to banks of the waterway and rapidly introduces contaminants into the ecosystem. It's inequitable that some farmers meet the cost of protecting waterways on their farms while others don't. It is evident that it is impractical to fence small streams <1m wide. Areas where there are a lot of streams <1m wide or tile drains should be deemed unsuitable for stock. The setback should be consistent with slope and with soil types and rainfall. We do not support exemptions to the stock exclusion from waterways regulations.

Clause
Controlling intensive winter grazing - please refer to questions 69-70 on page 81 of the discussion document
Notes
Nationally set standards are quicker to implement, less prone to litigation, provide more certainty to council and industry and are independent. The proposed industry standards do not consider stock to be excluded form critical contaminant source areas

Clause
Feedlots and stock holding areas - please refer to questions 71-75 on page 81 of the discussion document
Notes
Feedlots produce a huge amount of contamination and should have dedicated waste treatment plants commensurate with the proposed herd size and containment load: • 400 dairy cows produce as much total nitrogen as 10,000 humans • 200 dairy cows produce as much total solids as 10,000 humans • 300 dairy cows produce as much total coliform bacteria as 10,000 humans https://www.ridgetownc.ca/research/documents/fleming_husamin0107.PDF We support the proposal to consent stock holding areas as they create a large amount of pollution and should have effective waste treatment (see amounts of contaminants listed above). They are often near farm houses and people may be using the groundwater as an individual potable water supply. Pasture growth would provide uptake (typically about 40%, (Selbie et al, 2015), but as there is no vegetation leaching to groundwater or runoff will increase. This also only occurs for part of a year but could have a large impact during the period of duration. Overseer is a steady state model and uses time-average inputs from constant management practices and produces average annual outputs. While sacrifice paddocks may of short duration, they will be densely stocked. They should be included as climatic conditions and soil/aquifer characteristics determine the volume and mobility of the contaminants. For policy to be implemented effectively it needs to be clear, easily understood, and monitored so that where necessary enforcement can be taken. Treat stock holding areas and sacrifice paddocks the same. Selbie, D., et al. (2015). “The Challenge of the Urine Patch for Managing Nitrogen in Grazed Pasture Systems.” Advances in Agronomy 129: 229-292

Clause
Other comments on the proposed National Environmental Standards for Freshwater - please refer to questions 76-78 on page 81 of the discussion document
Notes
Are the definitions used in the policies accurate, and if not, how do you suggest improving them- See answer to questions Question 52 Operating “above good management practices” i.e. Best practice? Question 58 10% of the sites with high nitrogen – national or regionally or by catchment? Question 62 clarity around the definition of “higher threshold”. Policy 8.4 “immediate action to reduce nitrogen” A timeframe of 15 years to reduce nitrogen losses by 36% is a long time in which areas which may be severely impacted. Te Mana o te Wa isn’t underpinning policies dealing with nitrogen management. More recognition of contamination of groundwater throughout. See Questions 1-3, 4-6, 7-8, 9-12, 17, 40-42, 20-21, 30-35, 39, 54-58. Contaminant Management: For policy to be implemented effectively need to be clear, consistent, easily understood, and monitored so that where necessary enforcement can be taken. Farm planning is important for understanding the integration of farming and the sensitivity of the environment as production has increased over the year, but we agree with FLG and KWM that it alone is not a good regulatory tool. There are many ways to approach nitrogen management, it will be difficult to monitor and to hold people accountable as in terms of enforcement. RSWS express their concerns about roles and responsibilities. Management of nitrogen needs to be very clear – set nationally while reflecting different catchments. Health risks: Health risks associated with pathogen concentrations in faecal material and the impacts on waterways via land runoff and groundwater infiltration require a mention in this section (Rogers, Donnelly et al. 2011, Givens et al. 2016, Burch et al. 2017, Burch et al. 2018). More research is required into the efficacy of on-farm waste treatment solutions to reduce pathogen concentrations in effluent prior to land application. Costs for waste treatment solutions in relation to pathogen reduction is different to nitrate leaching/runoff considerations. For example, storage capacity of oxidation ponds (and multiple oxidation ponds) needs consideration to allow for holding times to effect reduction of pathogen concentration - which is not a requirement when only looking at nutrient levels. These factors need to be built into the budgeting process for applications for herd expansion. Thereby, farmers will tailor herd size and farm infrastructure upgrades to account for the waste treatment infrastructure budget associated with appropriate pathogen and nutrient reduction levels. Burch, T. R., et al. (2018). "Fate of Manure-Borne