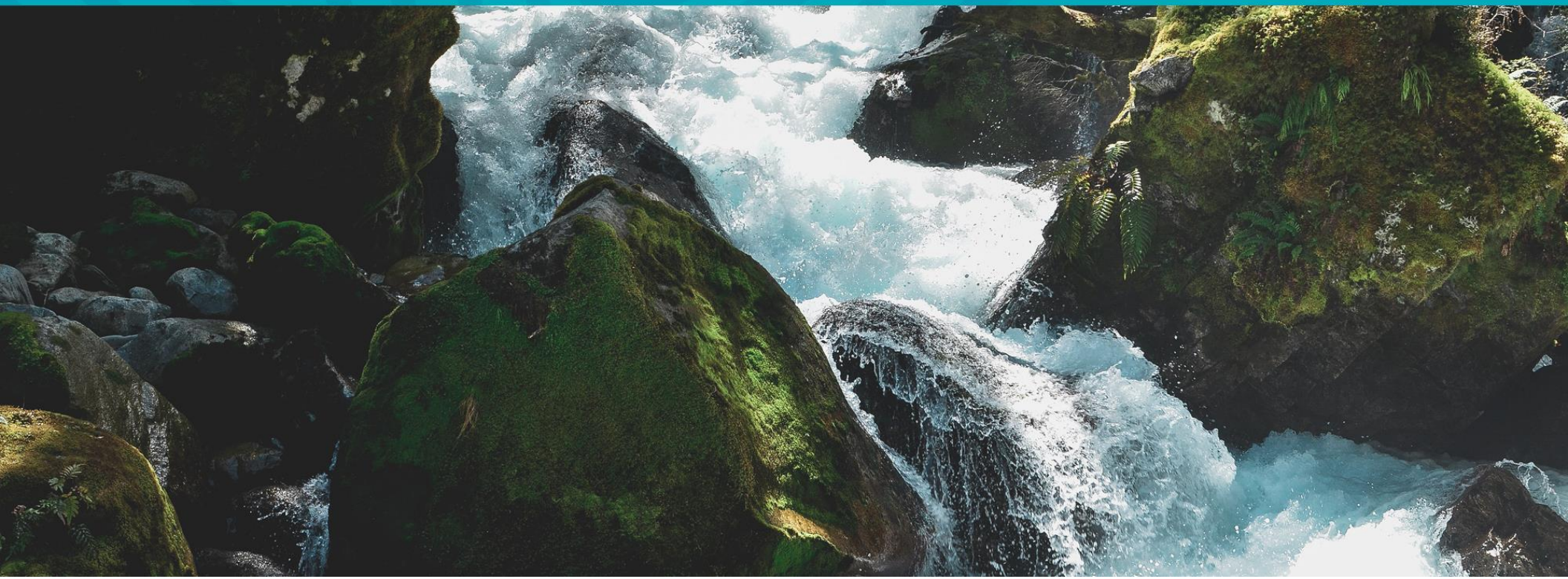
Wastewater Standards Technical Review Group

Wastewater Environmental Performance Standards: Discharge to Land Part II



Karakia tīmatanga

Whakataka te hau ki te uru
Whakataka te hau ki te tonga
Kia mākinakina ki uta
Kia mātaratara ki tai
E hī ake ana te atākura
he tio, he huka, he hau hū
Tihei Mauri Ora!

Cease the winds from the West
Cease the winds from the south
Let the breezes blow over the land
Let the breeze flow over the ocean
Let the red tipped dawn come with a sharpened air
A touch of frost, a promise of a day!
Sneeze, the breath of life!

Scope of report

Feedback on the scope of the report

- The technical review group considered and provided feedback on the scope of the draft report for discharge of wastewater to land.

- The group noted that the draft report focused more on discharge to land rather than beneficial reuse of wastewater for land-based applications. They agreed that the distinction between these two activities would need to be clear.

- The group discussed different applications of discharge to land. There were a wide range of examples discussed, with a continuum between those that were clearly high treatment / beneficial reuse through to low treatment / land discharge. For each, different requirements would need to apply to ensure appropriate treatment and protect public health.

- Taumata Arowai noted a recent report commissioned from Beca on issues associated with beneficial reuse. This will be circulated to the group for their information.

Feedback on the scope of the report

- Examples of different types of discharge to land discussed included:
  - snow making;
  - discharge to subsoil;
  - effluent sprayed by pivot onto land where there is restricted human contact;
  - discharge to rapid infiltration basin;
  - discharge to wetland;
  - discharging to land used for food crops;
  - discharging to land where there is human contact (eg parks or golf courses).

- While the proposed standard will focus on discharge to land, the group agreed that the discussion document should consider beneficial reuse of wastewater, be explicit that it is out of scope, and note that beneficial reuse will be part of the Water Services Authority's future work programme.

- The group noted that it would be useful to define wetlands more tightly and to clarify whether they are considered part of a discharge to land or water – for example, if wastewater ultimately goes to a water body as the receiving environment, then that is discharge to water. They also questioned whether sealed wetlands should be treated differently to unsealed wetlands.

- The group also discussed whether and how a standard would relate to both slow and rapid infiltration applications.

New Zealand context

Feedback on New Zealand context

- The technical review group discussed the NZ context section of the draft report. They noted that the report itself contains limited information about discharge to land in New Zealand and that additional information and examples of specific discharges would be useful, along with further consideration of irrigation (refer recent work by the Land Treatment Collective).

- The group discussed the receiving environment as the critical consideration when thinking about discharge to land and what treatment limits may be necessary and/or appropriate. For example, some soils do not have a high capacity to absorb wastewater so it might be necessary to be specific about which standards would apply in individual locations.

Feedback on New Zealand context

- The group discussed the interaction between treatment requirements and how infrastructure is configured – there was agreement that treatment requirements should focus on environmental performance / outcomes, and infrastructure should be built to achieve these outcomes.
- They noted that while the draft report classified soakage trenches as ‘high rate’, this was not necessarily accurate as in these situations there would be an additional seepage consent.
- The group discussed examples where cost of discharge to land was a significant driver for decisions. Some examples were discussed where the community priority has been discharge to land but this involved a significant cost (purchase of adequate suitable land is often unaffordable).
- In situations like this, the council and community has to consider benefits and trade-offs between discharging to land or discharge to water, and this has sometimes led to inability to make decisions about the best option to implement.

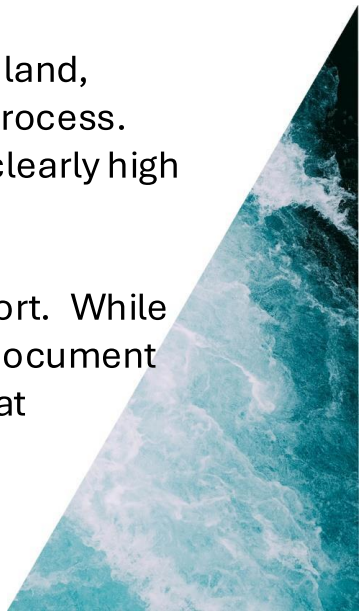
International Practice

Feedback on international practice

- The primary focus of discussion for the section on international practice was that the approaches outlined in the draft report predominantly focus on beneficial reuse of wastewater, rather than discharge to land.

- This led to a broader discussion about different ways that wastewater could be discharged to land, including types of beneficial reuse together with discharge where land provided a treatment process. There were a wide range of examples discussed, with a continuum between those that were clearly high treatment / beneficial reuse through to low treatment / land discharge.

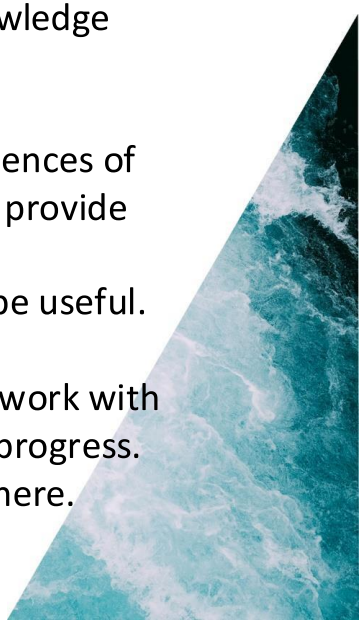
- These examples are discussed further in the previous heading relating to the scope of the report. While the proposed standard will focus on discharge to land, the group agreed that the discussion document should consider beneficial reuse of wastewater, be explicit that it is out of scope, and note that beneficial reuse will be part of the Water Services Authority's future work programme.



Iwi and hapū perspectives and case study insights

Feedback on iwi and hapū perspectives and case study insights

- Noted that while iwi and hapū have a strong preference for discharge to land rather than discharge to water, in some situations, discharge to land is not feasible and may be dependent on the existing arrangements.
- A range of land-based solutions and new technologies are being employed 'at-place' to reduce the effects on the land before discharging to waterways, where discharge to land is not an option. The group acknowledge these innovations.
- The group acknowledge that while the case studies do not fully capture the unique and varied experiences of all hapū and iwi groups across New Zealand, through the prioritisation and selection process they do provide meaningful and useful guidance to the development of national standards. Members identified the opportunity for further examples, such as the Te Anau wastewater treatment arrangements, would be useful.
- Taumata Arowai previously reached out and engaged with Te Ao Marama for the Te Anau WWTP to work with them on a case study of Te Anau, however due to their capacity constraints at that time this did not progress. Some group members may be able to provide information on the sub soil discharge approach used there.



Recommendations in draft report

Feedback on recommendations

- Discharge to land standards are for using the land as part of the treatment process – the standards will need to be clear about the mechanism and type of land being discharged to, to be consistent with the approach for other standards.
- The draft report proposes discharge standards for BOD and TSS, with all other contaminants set through the RMA consenting process. The group noted that setting treatment limits at place in this way will not drive consistency, which is the desired policy outcome.
- The group discussed the tension between standardisation and "at place" considerations such as soil type and profile, or proximity to a waterbody or groundwater.
- There was general agreement with the approach of setting standards in relation to environmental performance rather than pipework (infrastructure) requirements.
- The group noted that the draft report refers to a "permitted national baseline" for application of nitrogen. However this is the synthetic nitrogen cap and assumes the land is being fertilised and cropped.

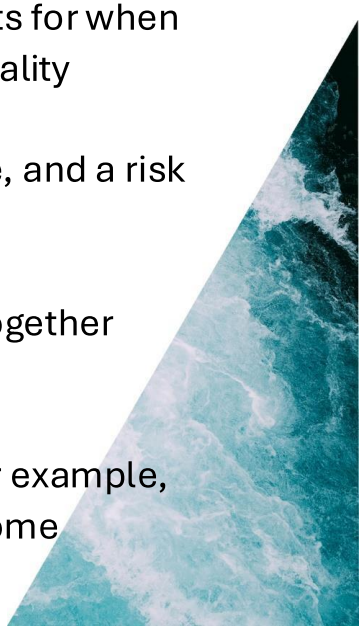
Feedback on recommendations

- The group discussed the options around two approaches for standards-setting.

- The first was a **receiving environment approach**, particularly regarding nitrogen loading and nitrate leaching, with standards applying through at downstream monitoring areas in groundwater and surface samples.
  - similiar to how landfill leachate is monitored – network of monitoring bores.
  - would allow for nuance in soil type by setting limits for effects downstream rather than limits for when the wastewater hits the land (noting there would need to be consideration of end of pipe quality requirements to meet downstream standards).
  - possible challenges could include missing the plume or picking up a plume from elsewhere, and a risk of buying land and later finding out it is not suitable.

- The second was a **hybrid approach** where there are contaminant limits for specific soil types, together with the receiving environment approach above.

- The group noted that the hybrid approach would be useful to promote a less risky approach – for example, where areas have leaky soils that make downstream monitoring less reliable. They noted that some consents already align with this approach.



Feedback on recommendations

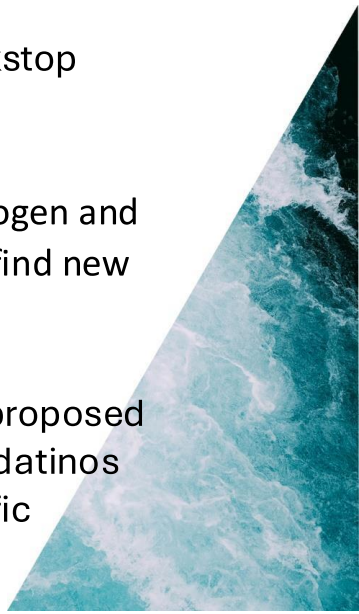
- The group discussed a need to align requirements for discharge to land and water to not incentivise against discharge to land. For example, if downstream monitoring is introduced for land, we may need to do the same for water. This area requires further consideration.

- There was a discussion about how to include broader parameters such as adequate depth of soil – this is very important and should be considered at outset when designing discharge to land arrangements. We may need to revert to RM process where contaminants (particularly nitrogen) exceed certain level of saturation of sites.

- The group discussed review periods or limits for how long discharge to land can happen for, or backstop approaches (for example requiring annual testing for heavy metals).

- The group also discussed options for bioremediation which could help to avoid accumulation of nitrogen and ensure there is a certain layer of unsaturated zone. They noted it would be difficult for operators to find new land if retirement was mandated.

- When discussing emerging contaminants, the group agreed there should be alignment with the proposed biosolids standard where guidance will identify emerging contaminants and include recommendatinos about how and when to monitor (for example, if a contaminant of concern is indicated in a specific location due to industrial activity).



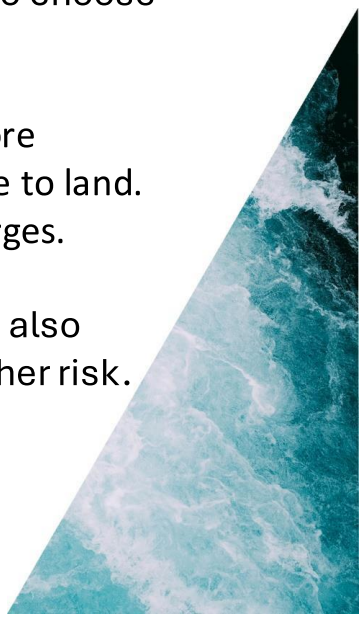
Feedback on monitoring and reporting

- The group discussed reporting requirements that align with discharge to water proposals – these include immediate breach reporting, monthly publicly available reporting (against the consent conditions) and annual reporting on trends.

- The group considered whether there may be an opportunity for reporting on discharge to land to be less frequent than reporting on discharge to water, because of differences and lower risk for how the public use land (e.g., not swimming in it). They noted that less frequent reporting may incentive people to choose discharge to land.

- For the discharge to water standard, the group discussed monitoring relative to size e.g. requiring more intensive monitoring for big plants. This could be replicated for more intensive / larger scale discharge to land. They noted that the addition of a periodic soil monitoring requirement could be helpful for all discharges.

- The group noted that monitoring and reporting may need to include variation in soil type. The group also discussed targeting monitoring during winter when groundwater is higher/soils saturated and higher risk.



Potential proposals for discussion document

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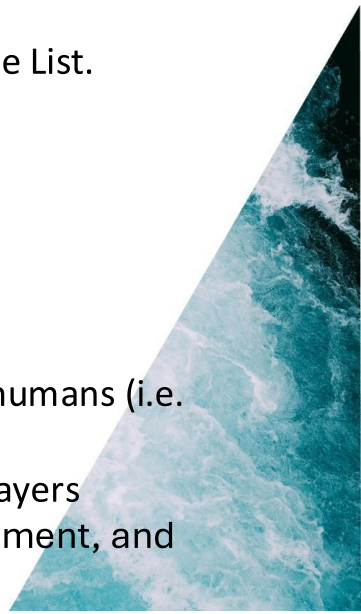
- Taumata Arowai will release a discussion document outlining Government proposals for wastewater environmental performance standards in March. These proposals could include a discharge to land standard.

- We propose that the discharge to land standard will **not** apply to:
  - Land with a slope >X
  - Specified soil types (i.e. heavy clay soils, very porous soils)
  - Unsaturated zone <Y
  - Buffer zone of <Z meters from nearest surface water body, property boundary and/or house
  - <W metres upstream of a bore used for human or stock drinking water
  - Wāhi tapu, wāhi tūpuna, and sites that may be listed on Rārangi kōrero/New Zealand Heritage List.

- We propose that the standard will provide that wastewater **cannot be applied** when:
  - Ground is saturated – must avoid ponding of wastewater
  - Ground is frozen or covered in snow
  - Areas to prone to flooding

- The standard will also need to specify stand-down periods between application and contact with humans (i.e. on a golf course) or grazing by stock.
- We will consider how standards will take account of risk of groundwater mounding and confined layers
- We will also need to include commentary on mix and match situations in the discussion document, and more broadly.



Potential proposals for discussion document

- Proposed framework below, noting that further work will be required to develop the numeric limits.
- Nutrient limits may be higher based on vegetation growth and the needs of the plants. Vegetation classes could be specified.
- After discussion with TRG, BOD and TSS limits have been removed. These parameters will be important for some processes but are not as relevant when assessing environmental impacts.
- Need to consider whether rapid rate infiltration is also included as a separate category

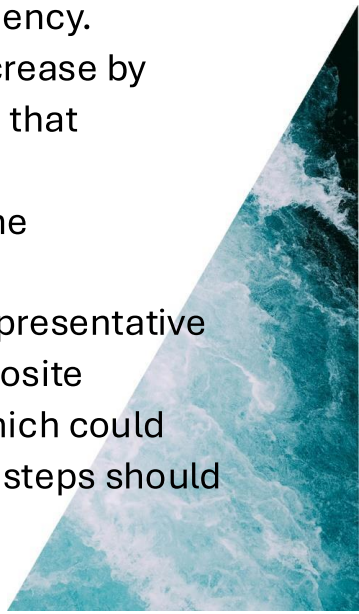
Disposal location / method		Mass load TN	Mass load TP	E.coli
Recreation spaces (i.e. golf courses)	Above ground			
	Sub-surface			
Cut and carry agriculture	Above ground			
	Sub-surface			
Vegetation (little to no human contact) i.e. forest, shrubs etc.	Above ground			
	Sub-surface			

Where proposed options falls into more than one category above, i.e. forest used for recreation the more stringent of the standards for each parameter should be applied.

Potential proposals for discussion document

Monitoring

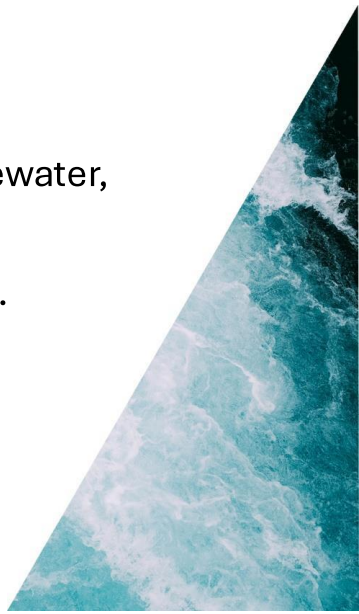
- We propose that three types of sampling will be required:
  - **Treated wastewater quality** – ensure compliance with classes identified above. Some parameters may need to be tested more frequently – i.e. pathogens where direct human contact is possible.
  - **Receiving environment quality** – groundwater monitoring, need to specify standard approach to identify appropriate upstream and downstream bores – number of bores may be based on application field size.
    - Will require groundwater modelling to establish. Sampling will then be on a set frequency.
    - Standard will need to specify receiving environment quality – i.e. total N must not increase by more than x downstream as a result of the application. This should be a trigger value that requires further investigation (set out in guidance).
    - Steps to be taken should exceedances continue, and the source determined to be the wastewater should also be outlined.
  - **Soil sampling** – Testing over longer timeframes (i.e. 2 – 5 years). Testing will need to be representative of the disposal area and number of soil samples based on field size. Could include composite sampling for larger areas. Testing will primarily look for accumulation in the soil profile which could exceed the holding capacity of the soil. Guidance on triggers for further investigation and steps should a problem be identified could all be outlined in supporting guidance.



Potential proposals for discussion document

Monitoring (contd.)

- Best practice would be that receiving environment and soil sampling be undertaken prior to the wastewater application as a baseline. Only applicable to new land application areas, not sites which are being reconsented.
- Guidelines which support the standards could also provide an indication of the other parameters that would likely need to be tested to drive consistency in the absence of a wider suite of standards. These would include:
  - specified heavy metals
  - specified contaminants of emerging concern (i.e. PFAS, microplastics etc)
- Guidelines could also provide an indication of sampling frequency. May need to include wastewater, receiving environment and soil sampling.
- Guidelines could provide options around bioremediation or broader land management issues.



Potential proposals for discussion document

Reporting

- Compliance requirements will be consistent with discharge to water:
  - 90th percentile
  - No one sample can exceed the standard by more than 100%
- Aligned with the discharge to water approach, standard will require:
  - Prompt reporting of non-compliances to regional council and available on public website operated by the operator.
  - Reporting of laboratory results within one month to regional council and available on public website operated by the operator.
  - Annual report summarising monitoring results from the year and relevant trends over the timeframe sampling has occurred.

Close

Karakia whakakapi

Unuhia, unuhia
Unuhia ki te uru, tapu nui
Kia wātea, kia māmā
Te ngākau, te tinanga
Te wairua I te ara tangata
Tīhei Mauri Ora

Draw on, draw on
Draw on the supreme sacredness
To clear, to free the heart
The body, and the spirit of people
Sneeze, the breath of life!