

**BEFORE THE INDEPENDENT HEARING COMMISSIONERS
FOR GISBORNE DISTRICT COUNCIL**

IN THE MATTER of the Resource Management Act 1991

AND an application for resource consent from Gisborne District
Council (the Applicant)

FOR overflow discharges from the municipal wastewater network

**SUPPLEMENTARY STATEMENT OF EVIDENCE
(ECOLOGICAL AND HUMAN HEALTH EFFECTS)**

**JULIET ROSALIND MILNE
FOR THE CONSENT AUTHORITY**

14 July 2021

INTRODUCTION

Qualifications and experience

- 1 My full name is Juliet Rosalind Milne. I am currently employed as a Resource Management Scientist at the National Institute of Water and Atmospheric Research (NIWA) in Wellington. I have held this position since May 2016.
- 2 Prior to joining NIWA I held the positions of Team Leader Environmental Science (2007-2016) and Surface Water Quality Scientist (2005-2007) at Greater Wellington Regional Council where I had oversight of the Wellington Region's coastal and freshwater science and monitoring programmes. Between 1999 and 2005 I held several positions at the Otago Regional Council spanning freshwater science, and consenting and compliance of municipal and industrial discharges to land and water.
- 3 I hold a Bachelor of Resource Studies in Ecology and Environmental Monitoring and a Master of Applied Science in Resource Management (first class honours) from Lincoln University. These degrees were conferred in 1997 and 1999, respectively.
- 4 I am a member of the New Zealand Freshwater Sciences Society and the New Zealand Association for Resource Management.
- 5 My relevant expertise and experience include:
 - (a) provision of technical advice on consenting, compliance and policy development in relation to stormwater and wastewater discharges to land and water, including technical advice on the monitoring and consenting of global stormwater discharges across the Kāpiti Coast District and metropolitan Wellington, and wastewater network overflows from Hutt City;
 - (b) design, operation and reporting of freshwater and coastal monitoring programmes, including assessment of the suitability of water quality for contact recreation purposes;
 - (c) review of freshwater and/or coastal water quality monitoring programmes for Otago Regional Council, Horizons Regional Council, Nelson City Council and West Coast Regional Council;
 - (d) lead author of a 2017 discussion paper for the regional sector on recreational water quality monitoring and reporting in New Zealand; and
 - (e) member of the ESR-led project team engaged by the Ministry for the Environment in 2017 to inform the review of the freshwater component of the national microbiological water quality guidelines.

My involvement in the applications

- 6 I was engaged by Gisborne District Council's regulatory arm in August 2020 to provide a review of technical reports relating to ecological and human health, and to provide advice on these matters to Mr Whittaker to support his s42A Officer Report.
- 7 Specifically, my review considered the following technical reports appended to the *Gisborne Wastewater Network – Overflow Discharges Resource Consent Application and Assessment of Effects on the Environment* (the application) dated 17 June 2020:
- (a) Appendix H: Ecological Effects of Wastewater Overflows report – prepared by Coast & Catchment Ltd;
 - (b) Appendix I: River water quality monitoring report – prepared by 4Sight Consulting;
 - (c) Appendix J: Scour Event Modelling: Poverty Bay – prepared by MetOcean;
 - (d) Appendix M: Quantitative Microbial Risk Assessment report – prepared by Streamlined; and
 - (e) Appendix N: Emerging Organic Contaminants (EOCs) report – prepared by Streamlined.
- 8 My review included consultation with the following technical experts within NIWA:
- (a) Dr Helen Macdonald (Numerical Modeller with ~10 years of research and consultancy experience in ocean physics and modelling) in relation to Appendix J;
 - (b) Dr Rebecca Stott (Environmental Health Microbiology Scientist with ~20 years of research and consultancy experience in health-related water microbiology) in relation to Appendix M; and
 - (c) Dr Jenni Gadd (Aquatic Chemist with a PhD in Chemistry and ~20 years of research and consultancy experience in the sources, toxicity and treatment of urban contaminants) in relation to Appendix N.

Code of Conduct

- 9 I acknowledge that I have read and am familiar with the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014, and agree to comply with it. I confirm that this evidence is within my area of expertise, except where I state that this evidence is given in reliance on another person's evidence. I have considered all material facts that are known to me that might alter or detract from the opinions I express in this evidence.

SCOPE OF EVIDENCE

- 10 I prepared the technical memorandum *Ecological and human health effects relating to Gisborne District Council's wastewater network overflows* appended to the s42A Officer Report. This supplementary statement of evidence should be read in conjunction with that technical memorandum.
- 11 This supplementary statement addresses additional matters of relevance to ecological and human health effects. Specifically, my statement covers:
- (a) matters arising from the statements of evidence from the applicant's technical experts;
 - (b) the latest iteration of the applicant's proposed consent conditions; and
 - (c) other matters arising during the hearing.

MATTERS ARISING FROM THE APPLICANT'S EVIDENCE

Hydrodynamic modelling – Dr Brett Beamsley

- 12 Dr Beamsley's modelling demonstrates that under strong onshore S-E winds, the wastewater overflow plume entering Tūranganui-a-Kiwi/Poverty Bay via the Tūranganui River will be held close to shore along Waikanae Beach and towards the Waipaoa River mouth. In these conditions, dilution is predicted to be lowest and enterococci indicator counts may exceed recommended guidelines for primary contact recreation for up to several days under the current 2-year and especially 10-year wet weather discharge scenarios (refer to Figures 7 and 8 of Dr Beamsley's evidence). The modelling also shows low dilution rates along Kaiti Beach under strong N-W winds.
- 13 While I agree that swimming and collection of kai are unlikely in wet, windy weather, other contact recreation activities may occur. In particular, Midway/Waikanae Beach and Kaiti Beach are popular with kite-surfers, with The Gisborne Herald describing them as *"the two most popular spots for kite surfing"*.¹
- 14 I visited Gisborne over 11-13 September 2020 where I observed kite-surfers in the water following rainfall and during S-E winds. September 11th was characterised by intermittent heavy rain and strong S-E winds. On the morning of the 12th, under a moderate S-E wind, there was a significant number of kite surfers present at Midway/Waikanae Beach (near MetOcean modelling site 9, Figure 1) as well as three people fishing at the mouth of the Tūranganui River (near site 4).

¹ [Shooting the kite surfing breeze – The Gisborne Herald](#) – accessed 7 July 2021.



Figure 1: Aerial image of MetOcean’s modelling points with key surface water bodies also labelled. The Waipaoa River enters Tūranganui-a-Kiwi/Poverty Bay to the left of the Site 1. Base image from MetOcean’s report (in Appendix J of the application).

- 15 This observation highlights the need for effective communication of potential health risks to recreational groups that access the shoreline at Midway/Waikanae Beach and Kaiti Beach in conditions when dilution of the river plume is reduced. This is important because it is expected to take some years before the Applicant’s reduction in overflow events and discharge volumes will be realised.

Ecological effects – Dr Shane Kelly

- 16 I agree with Dr Kelly that despite a history of modification, the lower reaches of Gisborne’s rivers and streams support a number of native freshwater fish species. These species include the nationally ‘At Risk-Declining’ longfin eel (*Anguilla dieffenbachii*), and species of kai moana value such as cockle (*Austrovenus stutchburyi*), pipi (*Paphies australis*), grey mullet (*Mugil cephalus*) and black flounder (*Rhombosolea retiaria*). Dr Kelly’s technical report also notes that ducks, gulls and wading birds are found in and around the lower river reaches.
- 17 Dr Kelly (paragraph 24 of his evidence) notes that “the potential for substantial (most likely short term) impacts from dry weather overflows cannot be discounted if they make their way into streams and watercourses”. I agree and while I accept that the Applicant has proposed a collective range of measures to minimise the risks of such overflows from reaching surface waters, as noted in my technical memorandum, dry

weather overflows have reached a small waterway previously with detrimental effects. This is revisited at paragraph 21.

River water quality – Dr Peter Wilson

- 18 Dr Wilson's evidence notes that the National Policy Statement for Freshwater Management (NPS-FM) 2020 has introduced a more stringent national bottom line for ammonia toxicity (annual median and maximum of 0.24 and 0.4 mg NH₄-N/L, respectively) than that which is specified in the Tairāwhiti Resource Management Plan (TRMP) for the Urban Freshwater Management Unit (annual median and maximum of 1.3 and 2.2 mg NH₄-N/L, respectively). The latter aligns with the NPS-FM national bottom line as it stood in the 2017 amendments to the NPS-FM 2014.
- 19 It is assumed that the TRMP will be updated to align with the NPS-FM 2020 bottom lines at some point in the future. In any case, Dr Wilson notes that ammoniacal nitrogen concentrations did not exceed 0.4 mg/L in any of the monitored wet weather events that coincided with wastewater overflows.
- 20 I consider that it is dry weather overflows (DWOs) reaching the city's rivers or streams that pose a more likely risk of ammonia toxicity to aquatic life. In Table 5 of his evidence, Dr Wilson notes that DWOs are unlikely to exceed the annual median or maximum ammonia toxicity objectives (of the TRMP), *"even when discharging into one of the smaller waterways."* However, the (more stringent) NPS-FM 2020 bottom line maximum of 0.4 mg/L may be exceeded if an overflow of 2,000 L enters a small waterway.
- 21 Overall, I agree that the potential for adverse effects on aquatic fauna from ammonia toxicity (and/or severely reduced dissolved oxygen concentrations) are likely to be limited to a worst-case scenario in which a large volume DWO enters one of the smaller tributaries. As noted in my technical memorandum, while the likelihood of a large volume discharge entering a stream in dry weather is low, it has occurred in the past. In March 2015, a DWO entered the Walnut Stream over a prolonged period. The discharge coincided with low stream flows and high water temperatures, resulting in the death of eels and other aquatic life, most likely due to water column concentrations of dissolved oxygen and ammonia reaching lethal levels.
- 22 In terms of microbiological water quality, background concentrations of faecal indicator bacteria in the rivers and streams in wet weather are already at levels that likely pose an unacceptable risk to human health for primary contact recreation activities. However, wet weather wastewater overflows add to that contamination, thereby increasing the potential health risk downstream. Dr Wilson states that this effect is most pronounced in the Taruheru River where enterococci concentrations

downstream of the overflow point during two monitoring events were double the maximum concentrations recorded during routine background sampling in the absence of overflows. While I agree that the rivers are unlikely to be suitable nor used for recreation during wet weather events (with or without wastewater overflows), as noted at paragraphs 13 and 14, parts of the downstream coastal waters they flow into may be (e.g., Waikanae and Midway beaches).

- 23 The DWO desktop water quality assessment provided by Dr Wilson in Attachment D of the applicant's first s92 response illustrated that a worst-case 2,000 L of untreated wastewater entering both the larger rivers and smaller streams under median flow conditions would lead to instream enterococci concentrations above the action (i.e., unacceptable risk) level of the MfE/MoH (2003) national microbiological water quality guidelines for recreational contact. I noted in my technical memorandum that the action guideline would also be exceeded at both the stream and river sites if they were to receive even half of that volume. In actual fact, using Dr Wilson's figures, 100 L (at the median, not the maximum, enterococci concentration) is enough for a small waterway at median flow and 600 L is enough in the Taruheru River at median flow. In other words, a worst case volume overflow during summer flows does not need to occur to render the receiving waters unsuitable for recreation. Further, wastewater could – in calm conditions at least – remain on or near the surface of the receiving waters for a considerable period of time, therefore posing a potential risk to recreational water users some distance upstream or downstream (depending on the waterbody and if it is tidal).

Quantitative Microbial Risk Assessment (QMRA) – Dr Chris Dada

- 24 Dr Dada's assessment demonstrates that, overall, the risks to human health from recreational activities such as swimming attributable to the overflows are low or below observable levels (at the 5 river and 9 coastal water point locations shown in Figure 1) under the current and future wastewater overflow scenarios modelled. Risks to human health from the consumption of shellfish are higher, although the risks are projected to decrease significantly under future wastewater overflow scenarios compared with the current 2- and 10-year ARI scenarios.
- 25 As pointed out by Dr Dada (in paragraph 31 of his evidence), the QMRA results represent only the *increment in risk* that can be attributed to the overflow discharges. The actual risks to human health from contact recreation and shellfish collection in Tūranganui-a-Kiwa/Poverty Bay are higher when other existing contaminant sources are considered – notably the (continuous) Gisborne Wastewater Treatment Plant (WWTP) discharge and wet weather runoff from rural land and via urban stormwater discharges entering the rivers. Therefore, it is important that any Health Risk Management and Communication Plan seeks to convey to the public the complete

picture of microbial risk, not just that arising from overflow discharges (i.e., the community needs to be aware that recreation along Waikanae/Midway and Kaiti beaches may at times be unsafe in wet weather irrespective of the existence of overflow discharges).

- 26 Dr Dada comments on various notifications and health warning signage that the Applicant employs as part of its risk mitigation measures and refers to these efforts (para. 32) as being “...*highly effective with respect to mitigating risk associated with primary and secondary contact recreation*”. Dr Dada also refers (para. 35) to reinstating and improving permanent warning signage, stating “*These efforts are highly effective with respect to mitigating risk associated with shellfish gathering.*” I am not sure what evidence exists locally to confirm how effective health warning signs are at deterring shellfish collection (or contact recreation) but given the Applicant’s strong reliance on health warning signs and other messaging to mitigate risks to human health associated with wastewater overflows, their effectiveness should be assessed.
- 27 While I strongly agree that signage must form part of risk communication and management, in my past experience as the manager of a large recreational water quality monitoring programme in the Wellington Region, health warning signage is frequently ignored; if someone wants to swim (or collect kai), then they will do so, especially in hot weather (Figure 2). Therefore, I support the adoption of a wide range of notification and communication methods, and a periodic review of their effectiveness. I comment on this further at paragraphs 38 and 39.
- 28 I have recommended (in my technical memorandum) the establishment of a comprehensive Health Risk Management and Communication Plan. In my view, this Plan should not only address dry and wet weather overflows, but also microbial risks in the context of the Applicant’s entire wastewater and stormwater infrastructure and the upstream catchment. As noted by the several of the Applicant’s experts, it is difficult to disentangle the effects of other discharges from the wastewater and stormwater infrastructure. Therefore, an integrated, holistic approach to risk communication is required. I consider such an approach is consistent with the Applicant’s integrated management plans (referred to in the evidence of Dr Dada) and the aims of the Gisborne District Council’s Tūranganui-a-Kiwi Water Quality Enhancement Project overseen by the Wastewater Management Committee (referred to in the evidence of Mr David Wilson).

Video: Wellingtonians ignore warnings of wastewater leak and swim in harbour

Nov 24 2017 • SOURCE NEWS



Wellington residents are being warned by the City Council to avoid swimming in the area near Victoria St following a wastewater leak.



The Council and Wellington Water have posted signs at the waterfront warning people to avoid swimming in the area. Source: NEWS

Tweet



The Dominion Post @DomPost 18 Dec 2013
 People are still diving off the #Wellington waterfront platform despite health risks. [stuff.co.nz/dominion-post/...](http://stuff.co.nz/dominion-post/)

Swimmers regard warning signs as a load of sewage

Taryn Unger • 11:38, Feb 20 2014



SIGNS OF DISDAIN: Daniel Flynn, 21, isn't worried about council signs advising not to swim at Waiwhakaiti Beach.

Figure 2: Media coverage illustrating examples in Wellington City (top) and New Plymouth (bottom) of recreational users actively ignoring health warning signage about potential health risks arising from wastewater inputs. Similar examples have been observed in other parts of the country (e.g., Milford Beach in Auckland and Caroline Bay in Timaru).

- 29 I note that Dr Dada supports the recommendation in my technical memorandum to extend the Applicant's current water quality monitoring to include collection and analysis of shellfish flesh for enteric viruses following an overflow event. Assuming consent is granted, then I recommend an initial survey is conducted in the first year of consent. I comment further on this monitoring at paragraph 34.2.
- 30 I concur with Dr Dada's reasoning for not undertaking an epidemiological study to assess human health risks associated with wastewater overflows. I note that the current national microbiological water quality guidelines are also risk based and, in the case of freshwaters, were determined from a QMRA.
- 31 Dr Dada outlines available information on overflows and non-enteric or non-respiratory infections among recreational users, with a focus on the risk of skin infections. This follows comments in my technical memorandum of reports in the media that waka ama members have experienced sores, skin rashes and infections after contact with river water. I have consulted with Dr Rebecca Stott (NIWA microbiologist) and she concurs with Dr Dada that the probability of infection from *Staphylococcus aureus* (the species of pathogen most commonly associated with skin infections) is low. Nonetheless, overall, the risk of infection could be expected to be higher if someone with cut, scratched or otherwise broken skin came into direct contact with a wastewater overflow.

Emerging Organic Contaminants (EOCs) – Dr Michael Stewart

- 32 I concur with Dr Stewart that information on the potential effects of EOCs and analytical testing capacity will continue to improve over the 20-year consent term sought by the Applicant. I therefore support Dr Stewart's recommendation to review the priority list of EOCs within 10 years of any consent commencing, including measuring on four occasions the EOCs on the revised priority list in both dissolved and particulate phases of influent to the Gisborne WWTP. This information should be used to update the current state of knowledge on ecological risk and human health consumptive risk from EOCs in coastal/marine species.

CONDITIONS

- 33 I make the following observations with respect to the Applicant's updated conditions provided in the appendices of Mr Mayhew's Statement of Evidence (dated 25 June 2021):
- 34 **Monitoring protocols**
- 34.1 For clarity, the minimum requirements of all monitoring protocols should be specified in the consent conditions. These requirements were outlined in my technical

memorandum and include the location of wet weather overflow sampling points, when and how these are sampled, and laboratory test details. Guidance is also needed on selection of upstream and downstream sampling locations in dry weather under different tidal states and how to determine when sampling should cease (the updated dry weather protocol tabled during the hearing by Mr Kanz as Appendix 2 lacks detail on sampling and does not define what “impacted water quality” is to know when sampling should cease – presumably this means that indicator bacteria concentrations exceed the MfE/MoH (2003) surveillance guideline for enterococci).

34.2 I also recommend that:

- the monitoring protocols are written as ‘stand-alone’ documents to prevent the need for reference to other documentation (e.g., in relation to water sample collection and sample dispatch to the laboratory, or for notification of affected parties).
- the suite of receiving water quality sampling sites in wet weather overflow events should be extended to include the coastal beaches adjacent to the Tūranganui River mouth which may be impacted by the discharge plume and recreation may still occur (i.e., site 9 at Midway Beach, and Kaiti Beach). These sites need only be sampled for microbiological indicators.
- in-river water quality testing during dry weather overflows includes turbidity as an indicator of the aesthetic impact of the overflows and conductivity as an indicator of salinity.
- the Applicant’s dry and wet weather overflow incident forms are updated to include (categorical) classifications of tidal state, river flow, and wind direction and intensity at the time of sampling, and recording of the presence of gross pollutants associated with the discharges (e.g., sanitary products). These observations are important for understanding the actual and potential effects of the overflow discharges. Alongside rainfall, soil moisture and groundwater levels should be added to post-incident reporting of wet weather overflows.

35 Virus assessment

35.1 Condition 16 should commence within 12 months given the importance of kai moana to the community. More detail on the types of shellfish to be collected and the timing of collection are also required. I agree with Dr Dada (in paragraph 76 of his evidence) that sampling should target where bivalve shellfish collection occurs over several weeks, after at least four overflow events.

35.2 Sampling should be undertaken of both shellfish flesh and the overlying water column and the results compared against existing baseline microbiological data held by

Gisborne District Council. A suitably experienced environmental scientist should design, evaluate and report the results of the sampling within three years of the consent commencing. A 2017 report prepared by ESR² for Gisborne District Council may provide guidance on sample design. The sampling results should be reported to the community (see paragraph 36) and fed into the Health Risk Management and Communication Plan (see paragraph 38).

- 35.3 Without evidence that health warning signage is an effective deterrent to shellfish collection, I do not agree with excluding sampling from sites where permanent health warning signage is in place.

36 Community Consultation or Liaison Group (CLG)

- 36.1 The Applicant has questioned the purpose of such a group, with Mr David Wilson noting (in paragraph 57 of his evidence) that there are already avenues for public participation through accessing consent reports, DrainWise, the Wastewater Management Committee and Council's Long Term Plan (LTP) process. The rationale for a specific CLG is to provide a dedicated forum in which relevant stakeholder groups (e.g., kite surfers, recreational fishers) and interested submitters and other members of the public are able to engage annually (e.g., prior to annual consent reporting) with the Applicant to specifically hear about progress with the wastewater overflow reduction programme. This would also provide an opportunity to share a summary of monitoring results, including those of shellfish virus testing, outline proposed priorities for the coming year, and invite observations and feedback from residents.

- 36.2 Similar CLG-type conditions exist on consents for other global discharges associated with wastewater and stormwater infrastructure (e.g., Christchurch City Council overflows, Wellington City stormwater discharges). Such conditions aim to promote public and stakeholder engagement in tracking consent performance, complementing the statutory responsibility of councils to monitor and enforce consent compliance.

37 DrainWise

- 37.1 Given the Applicant's heavy reliance on the DrainWise education and awareness programme to reduce the incidence of DWOs (that arise primarily through fatbergs and foreign objects being out down the wastewater system), it would be prudent for the Applicant to expand its current review (referred to in paragraph 73 of Mr Kanz's evidence) to include an evaluation of its effectiveness to date in reducing occurrences

² Panthos, O. (2017) Recreational shellfish safety monitoring: A review of the current monitoring programme and methods. *ESR Client Report No. CSC170* prepared for Gisborne District Council. 32 p.

of blockages and whether or not there is merit in approaches that target specific groups, localities (e.g., problem catchments) or behaviours.

37.2 A suitably qualified and experienced social scientist should advise, oversee and report on this assessment, with the results used to amend the content of the existing programme as appropriate. The assessment should seek to differentiate between an awareness and understanding of DWOs and their causes, but primarily focus on whether changes have been made to past practices and behaviours that have likely contributed to DWOs.

37.3 The DrainWise website also needs to be reviewed. The existing website is focussed on wet weather overflows and lacks even a description of the existence and causes of dry weather overflows (Figure 3).

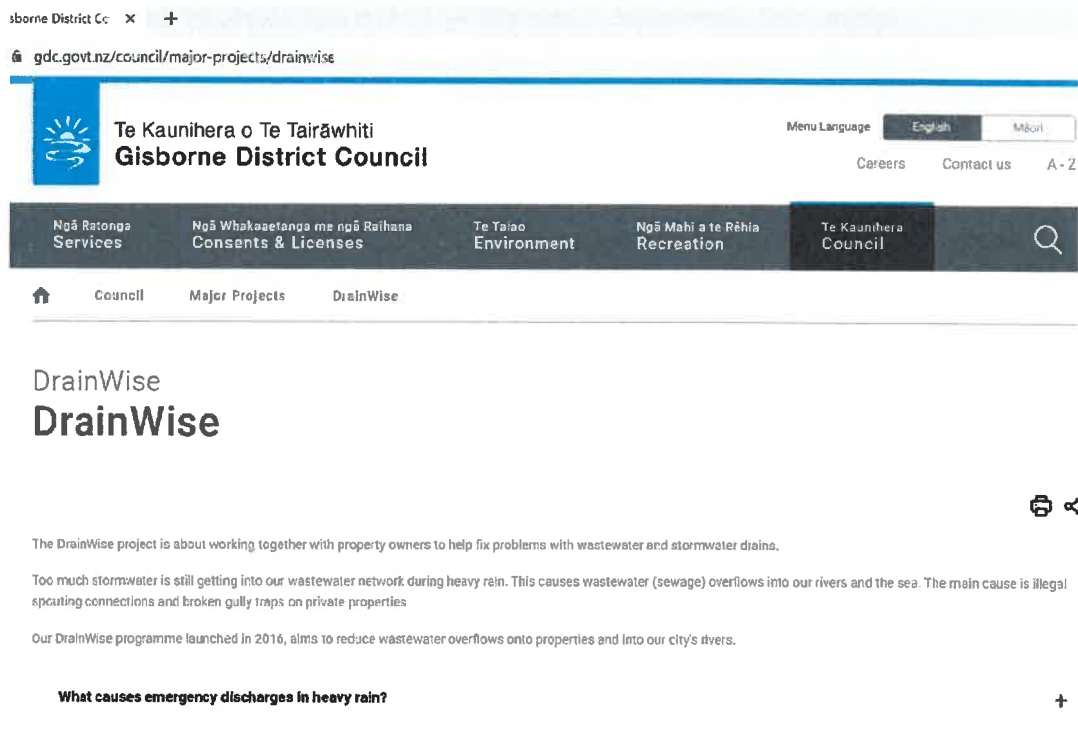


Figure 3: Screenshot of part of the home page of the Applicant's DrainWise website (accessed 13 July 2021). There is no mention of dry weather overflows on this page other than a passing reference to the current consent application.

38 Health risk communication

38.1 The Overflow Discharge Communications Plan (Appendix F of the application) is focussed on wet weather overflows and is primarily based around notifying potentially affected or interested parties of overflows. I recommend that it is replaced with a more comprehensive Health Risk Management and Communication Plan that is

expanded to include proactive messaging around where and in what conditions, risks to human health are greatest.

- 38.2 I wish to clarify the intent of 'forecasting' microbial risk that I recommended in my technical memorandum. While the Applicant employs a range of communication measures to warn recreational users of potential health risks during wastewater overflows, an incomplete picture of risk is being communicated. This is particularly the case in wet weather when other sources of faecal contamination from the Applicant's infrastructure (e.g., stormwater) as well as upstream of the urban area, can render the water unsuitable for recreation and shellfish gathering. As the technical assessments and hydrodynamic modelling have provided useful insights into the influence of wind, tides and rainfall on microbiological water quality in the lower river reaches and Tūranganui-a-Kiwa/Poverty Bay, this information could be used to improve current communication of health risk from its narrow focus on wastewater overflow occurrence so that it better represents (or ideally 'forecasts') actual overall microbial risk. This means that communications would include messaging around increased microbial risks from recreation in wet weather at Waikanae/Mid Way Beach in SE winds and at Kaiti Beach in NW winds.
- 38.3 Recognising that wastewater overflows are not the only – nor the most frequent – source of microbial contamination, the 'forecasting' and notifications should be a joint effort with other parts of Gisborne District Council (e.g., science, environmental health, catchment management). As noted at paragraph 28, this initiative would seem to be consistent with the aims of the Gisborne District Council's Tūranganui-a-Kiwi Water Quality Enhancement Project. Moreover, adopting a whole-of-catchment approach would help ensure that recreational users are better informed of all conditions in which microbial water quality may pose an unacceptable risk to human health.
- 38.4 Given the Applicant's strong reliance on health warning signs and communication through social media, email, etc. to mitigate risks to human health associated with wastewater overflows, the effectiveness of the suite of these communication measures should be assessed. Similar to the recommended review of the effectiveness of DrainWise, this assessment should be designed and reported on by a suitably qualified and experienced social scientist, with the results used to refine the Health Risk Management and Communication Plan.

39 Reporting

- 39.1 The Applicant's revised annual (condition 28) and five-year (condition 29) reporting now includes most of the additional items recommended in my technical memorandum and Mr Whittaker's s42A report. However, in my view it is not

appropriate to limit assessment of overflow trends in relation to rainfall when the evidence of Ms Bosworth and Mr Aiken indicates that other factors, notably soil moisture and groundwater levels, likely also influence overflow occurrence.

39.2 Further, rather than only report the causes of overflows, the effects on ecological and human health should also be considered by summarising river flow, tide and wind conditions, alongside rainfall. I therefore recommend (for the 5-yearly reporting at least) a requirement for a suitably qualified and experienced environmental scientist to assess all monitoring results, including analysis of these results against rainfall, wind, tide, river flow and other factors of relevance to wastewater overflows (e.g., groundwater levels).

40 Kopuawhakatapa Stream

40.1 I note from Mr Kanz's evidence (paragraphs 79-82) that investigations are already progressing into identifying and remedying the source(s) of chronic faecal contamination in the stream. I do not consider that this negates the need for a specific condition committing the Applicant to investigations, with a requirement that investigations and progress reporting (as part of annual reporting) continue until such time as faecal contamination arising from the wastewater network is remedied.

MATTERS ARISING FROM THE HEARING

41 The Commissioners indicated a possible preference for consent conditions to include performance indicators based around environmental outcomes and posed the suggestion of a key performance indicator (KPI) around no fish deaths. I consider that such a KPI could be feasible if appropriately worded (e.g., it may not necessarily be possible to conclusively attribute a fish death to a wastewater overflow).

42 I also consider that a KPI could be included around ensuring that there are no gross visual pollutants along streambanks arising from the discharges.

SUMMARY AND CONCLUSIONS

43 The conclusions outlined in my technical memorandum remain unchanged. The application is comprehensive in terms of the extent of technical assessments and I

largely agree with the conclusions of the assessments relating to ecological and human health effects. However:

- 43.1 I do not agree that dry weather overflows can be considered an infrequent (i.e., rare) event;
- 43.2 I am of the view that dry weather overflows have the potential to cause more than minor adverse effects on human health in the smaller watercourses if a relatively modest volume of wastewater was to enter the water;
- 43.3 I consider that the Applicant could do more to ensure that its mitigation practices are as effective as possible, including adopting a more integrated approach to managing and communicating the human health risks associated with discharges from its infrastructure; and
- 43.4 There is a need for a suite of consent conditions that have a greater level of specificity than those offered by the Applicant.



Juliet Milne

14 July 2021