

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of **PROPOSED PLAN CHANGE 1** to the Waikato Regional Plan – hearing of **BLOCK 2** topics

AND

IN THE MATTER of the hearing of the submissions by **WATERCARE SERVICES LIMITED** in relation to **BLOCK 2** topics

STATEMENT OF EVIDENCE OF GARRETT JOHN HALL

1. INTRODUCTION

- 1.1 My full name is Garrett John Hall. I am a Technical Director - Environments at Beca Limited ("Beca").
- 1.2 I outlined my qualifications and experience and my commitment to comply with the Environment Court Expert Witness Code of Conduct in my evidence in chief ("EIC") to the Block 1 hearings dated 15 February 2019.

Purpose and scope of evidence

- 1.3 The purpose of this evidence is to provide water quality evidence to support Watercare's primary and further submissions on Plan Change 1 ("PC1").
- 1.4 My evidence addresses:
- (a) Centralisation of point source discharges (Section 3);
 - (b) Seasonality (Section 4);
 - (c) Urban growth – implications for discharge consents (Section 5);
 - (d) Beneficial environmental effects of treated wastewater discharges (Section 6);
 - (e) Offsetting (Section 7);

(f) Protecting versus restoring water quality (Section 8); and

(g) My conclusions (Section 9).

1.5 A summary of my evidence is contained in Section 2.

2. **SUMMARY OF EVIDENCE**

Centralisation of discharges

2.1 There is a general trend throughout New Zealand towards centralising treatment processes at new larger WWTPs. This trend is likely to continue in the Waikato Region notwithstanding the physical constraints of some existing WWTP sites, which may require new discharges of treated wastewater at new locations.

2.2 When assessing the effects of the renewal of existing consents, with the possible cessation of existing discharges and replacement with a new more highly treated discharges, PC1 should in my view enable the resource consent process to consider the overall effects of the change (i.e. considering the positive effects of the ceased discharges against adverse effects of the new discharge).

Seasonality

2.3 The existing policies in PC1 do not contain any recognition of seasonal variation. This is an important consideration for the discharge of municipal wastewater which has been recognised in the Pukekohe Wastewater Treatment Plant ("WWTP") discharge consent and others throughout the Waikato Region. The potential (indeed, likelihood) therefore arises for the PC1 limits to be directly imposed on resource consents without the crucial recognition of the differing seasonal effects of treated wastewater discharges.

Urban development

2.4 Given the continuing urban development in the Waikato River catchment, there is a need to recognise that, as urban development occurs, the area of land serviced by wastewater (and water supply/stormwater) networks will increase, along with an increase in the loads of contaminants requiring treatment.

2.5 In the case of greenfield development, rural land uses are replaced with urban land use, with a general reduction in losses of contaminants to

groundwater, but with an increase in stormwater and wastewater discharges. In my view, the PC1 policy framework fails to adequately recognise this and should be amended to enable a holistic view of the implications of land use change on total contaminant loadings discharged from a catchment.

Beneficial effects

- 2.6 In relation to the activity of taking water, the concept of 'net take' is currently recognised and provided for in the Waikato Regional Plan ("WRP"), but not specifically within PC1. Taking the example of a municipal water take from and wastewater discharge returning to the same body of surface water, the net take can, in simple terms, be calculated by taking the discharge volume of the water take and subtracting the associated volume of treated wastewater discharged back to the surface water body.
- 2.7 Whilst the discharge of treated wastewater to surface waters is quite rightly focussed on assessing the actual and potential adverse effects of the activity, there are also beneficial effects of discharging wastewater to surface water including benefits to flow, and the ability of downstream waters to assimilate contaminants, in downstream receiving environments. It is my view that the PC1 policy framework should recognise these potential beneficial effects of discharges of treated wastewater.

Offsetting

- 2.8 In the Pukekohe WWTP resource consent project, given that the upgrade to the WWTP will result in an improvement to the water quality of the receiving water body (the Parker Lane Stream) both compared to the existing effects of the discharge and the upstream water quality, there was no need to consider additional offsetting measures to achieve consistency with the Vision and Strategy for the Waikato River.
- 2.9 However, I do recognise that offsetting may be required for a range of reasons on other wastewater discharge projects. For this reason, I support the proposed amendment recommended in Mr Scrafton's evidence to provide a new discrete policy on offsetting that recognises offsetting measures may be proposed to contribute towards the protection and restoration of the health and wellbeing of the Waikato and Waipa Rivers.

Protecting versus improving water quality

- 2.10 Appendix D of the section 32 Report for PC1 provides the rationale for each Freshwater Management Unit ("FMU") and states the desired state for each site and whether the current 'high quality' of water will be maintained or whether an improvement in water quality is required to meet this desired state. In line with this requirement, and to provide greater clarity to resource consent applicants and Waikato Regional Council ("WRC") processing officers, I support the change recommended in Mr Scrafton's evidence that distinguishes between the need to protect water quality where it is high and the restoration of water quality where it is less than high quality.

Position of Reporting Officer

- 2.11 I note that the Reporting Officer recommends Policy 11 be amended to require the adoption of the Best Practicable Option ("BPO") as a minimum noting that an applicant may need to choose to either pay these costs or undertake a different activity to achieve the Vision and Strategy. I understand the concerns that the Reporting Officer is responding to is a scenario where the BPO is not consistent with the Vision and Strategy.
- 2.12 I note that the definition of the BPO of the Resource Management 1991 Act ("RMA") uses the term 'financial implications' rather than costs, which refers to a community's ability to afford a specific option. Needless to say, many communities have a 'limited ability to pay' for wastewater infrastructure and in the Mangawhai Wastewater Scheme, there is a recent example of poor council decision making resulting in the Kaipara District Council getting into significant financial difficulties which resulted in the removal of councillors and appointment of commissioners.
- 2.13 Given the above, there needs to be a clear recognition of the financial implications of options when considering what constitutes the BPO.

3. CENTRALISING MUNICIPAL POINT SOURCE DISCHARGES

- 3.1 There is a general trend throughout New Zealand towards the upgrading of WWTP technologies and resultant treated wastewater quality. In some locations, rather than the upgrading of several smaller WWTP's of older technology types (generally oxidation ponds), there is a trend towards centralising treatment processes at new larger WWTP's with conveyance of wastewater to these centralised locations.

3.2 There are a number of examples in the Auckland Region, as follows:

- (a) Watercare is proposing to centralise the treatment of wastewater from Warkworth and Snells Beach in a new WWTP located at Snells Beach (with the closure of the Warkworth WWTP and discharge to the Mahurangi Harbour);
- (b) Wastewater from the Hibiscus Coast area is now centrally treated at the Army Bay WWTP (with oxidation ponds at Orewa and Waiwera being closed); and
- (c) in the south-west Auckland Region wastewater from Kingseat, Clarks Beach, Glenbrook and Waiuku will be centrally treated at a new WWTP at Waiuku (with the closure of three WWTP's and associated discharges to the Manukau Harbour).

3.3 This trend is likely to be followed in the Waikato Region, notwithstanding the physical constraints of some existing WWTP sites, which may require new discharges of treated wastewater at new locations.

3.4 Given the above, PC1 should in my view, make suitable provision to enable the overall effects of the change (i.e. considering the positive effects of the ceased discharges against adverse effects of the new discharge) to be considered via the resource consent process. This type of approach would be most appropriate for the contaminants Total Nitrogen ("TN") and Total Phosphorus ("TP") through a nutrient balancing approach or a catchment wide nutrient loading approach. In some jurisdictions, for example the United States, this type of consideration is called the Total Daily Mass Load ("TDML") allocated across a catchment. Mr Scrafton has recommended this be considered as part of Policy 12.

4. **SEASONALITY**

Pukekohe WWTP TN and TP seasonality limits

4.1 The seasonality effects of discharges, i.e., differentiating between summer and winter effects and related consent limits, are recognised in several discharge consents in the Waikato River catchment. However, such effects are not currently recognised or provided for in the objectives for PC1, nor the policies. These matters were addressed in my block 1 evidence.

PC1 recognition of seasonality

- 4.2 The explanatory note in Section 3.11.6 of PC1 states the following in relation to seasonality:

"The achievement of the attribute targets in Table 3.11-1 will be determined through analysis of 5-yearly monitoring data. The variability in water quality (such as due to seasonal and climatic events) and variable response times of the system to implementation of mitigations may mean that targets are not observed for every attribute at all sites in the short term"

- 4.3 I consider this to be an acceptable method to account for seasonal variation between years; however, it does not account for variation between summer and winter within a single year, as is provided for in many discharge consents, including the Pukekohe WWTP consent. If the PC1 5-yearly targets are applied to winter discharge scenarios, for example, then this would:

- (a) Not accurately assess environmental effects - as discussed earlier, algae grows to a much greater extent in summer conditions and much lesser extent in winter; and point source discharges have greater influence in low flow (summer) conditions when rainfall/runoff from land use is much less; and
- (b) Potentially require WWTP's to achieve low winter nutrient limits that are not justified on an environmental effects basis - with subsequent significant capital and operating cost implications. This is because biological wastewater treatment processes take much more energy and inputs (i.e. chemicals) to work efficiently in low temperatures during winter conditions.

- 4.4 For the reasons just outlined, I consider that amendments should be made to the policies of PC1 to include a mechanism which recognises and provides for the seasonality effects of municipal wastewater treatment plant discharges (between summer and winter) to ensure the short and long term water quality targets are not applied to assess winter scenarios in an inappropriate way. Mr Scrafton has recommended this be considered as part of Policy 12.

5. URBAN GROWTH – IMPLICATIONS FOR DISCHARGE CONSENTS

- 5.1 Given the continuing urban development in the Waikato River catchment, there is a need to recognise that, as urban development occurs, the area of land serviced by wastewater (and water supply/stormwater) networks will

increase, along with an increase in the loads of contaminants requiring treatment.

- 5.2 In the case of greenfield development, rural land uses are replaced with urban land use, with a general reduction in losses of contaminants to groundwater, but with an increase in stormwater and wastewater discharges. For example, it has been estimated that the 'average' Waikato dairy farm has losses of 36 kg N/ha/yr and 0.5 kg P/ha/yr and sheep and beef 13 kg N/ha/yr and 0.3 kg P/ha/yr (Hudson *et al.*, 2015). This compares to a typical figure of 8 kg N/ha yr for urban land uses (Environment Waikato, 2007).
- 5.3 In my view, the PC1 policy framework fails to adequately recognise this and should be amended to enable a holistic view of the implications of land use change on total contaminant loadings discharged from a catchment. Mr Scrafton has recommended this be considered as part of Policy 12.

6. **BENEFICIAL ENVIRONMENTAL EFFECTS OF THE DISCHARGE OF TREATED WASTEWATER TO WATER**

- 6.1 In relation to the activity of taking water, the concept of 'net take' is currently recognised and provided for in the WRP, but not specifically within PC1. Taking the example of a municipal water take from and wastewater discharge returning to the same body of surface water, the net take can, in simple terms, be calculated by taking the discharge volume of the water take and subtracting the associated volume of treated wastewater discharged back to the surface water body.
- 6.2 The concept of net take recognises the value, in terms of hydrological effects, of returning treated water (wastewater) to the same water body. However, net take is only referenced in Section 3.3 of the WRP (water takes) and is not recognised in Section 3.5 (discharges) or the PC1 provisions.
- 6.3 Whilst the discharge of treated wastewater to surface waters is quite rightly focussed on assessing the actual and potential adverse effects of the activity, there are also beneficial effects of discharging wastewater to surface water including benefits to flow, and the ability of downstream waters to assimilate contaminants, in downstream receiving environments.
- 6.4 It is my view that the PC1 policy framework should recognise these potential beneficial effects of discharges of treated wastewater. Mr Scrafton has recommended this be considered as part of Policy 12.

7. **OFFSETTING**

7.1 In the Pukekohe WWTP resource consent project there was no need to consider additional offsetting measures to achieve consistency with the Vision and Strategy for the Waikato River because the upgrade to the WWTP will result in an improvement to the water quality of the receiving water body (the Parker Lane Stream), both compared to the existing effects of the discharge and the upstream water quality.

7.2 However, I do recognise that offsetting may be required for a range of reasons on other wastewater discharge projects. Such a scenario may be that a proposed improvement in wastewater treatment technology for an existing WWTP may only be achieved at significant costs and there may be greater environmental benefits achieved elsewhere in the catchment through offsetting interventions (such as the retirement of erosion prone lane). For this reason, I support the proposed change included within Mr Scrafton's evidence to provide a new discrete policy on offsetting that recognises offsetting measures may be proposed to contribute towards the protection and restoration of the health and wellbeing of the Waikato and Waipa Rivers.

8. **PROTECTING VERSUS RESTORING WATER QUALITY**

8.1 Appendix D of the section 32 Report for PC1 provides the rationale for each FMU and states the desired state for each site and whether the current 'high quality' of water will be maintained or whether an improvement in water quality is required to meet this desired state.

8.2 In line with this requirement, and to provide greater clarity to resource consent applicants and WRC processing officers, I support the change recommended in Mr Scrafton's evidence that distinguishes between the need to protect water quality where it is high quality and the restoration of water quality where it is less than high quality (with reference to Table 3.11-1).

9. **POSITION OF REPORTING OFFICER**

9.1 I note that the Reporting Officer recommends Policy 11 be amended to require the adoption of the BPO as a minimum and notes that an applicant may need to choose to either pay these costs or undertake a different activity to achieve the Vision and Strategy¹. I understand the concerns that

¹ Paragraph 1108, Section 42A Report – Block 2

the Reporting Officer is responding to is a scenario where the BPO is not consistent with the Vision and Strategy.

9.2 I note that the definition of the BPO in the RMA refers to 'financial implications' rather than costs, which refers to a community's ability to afford a specific option. Needless to say, many communities have a 'limited ability to pay' for wastewater infrastructure and, in the Mangawhai Wastewater Scheme, there is a recent example of poor council decision making resulting in the Kaipara District Council getting into significant financial difficulties which resulted in the removal of councillors and replacement with appointed commissioners.

9.3 The Auditor General's overview of the Mangawhai Wastewater Scheme inquiry states that²:

"After 20 months of carefully collecting and analysing evidence, this inquiry has made some clear findings about what happened. The positive findings are that:

- *the decision that Mangawhai needed a reticulated wastewater scheme was well founded; and*
- *the wastewater scheme that has been built works effectively and has appropriate capacity for population growth.*

The other findings are more sobering.

Overall, KDC has ended up with a wastewater scheme that works, but it has come at a significant cost. The fact that we cannot put a precise figure on that cost is indicative of KDC's poor management.

KDC's records did not contain good or systematic information on the total amount spent. However, our best estimate is that the total cost was about \$63.3 million.

The overall costs are not just financial. They include a failed council, councillors who have been replaced with commissioners, the departure of a chief executive, a severely damaged relationship between the council and community, an organisation that has needed to be rebuilt, and much more."

9.4 Given the above, there needs to be a clear recognition of the financial implications of options when considering what constitutes the BPO. Mr Scafton recommends a number of changes to Policy 11 and I support these changes.

Garrett John Hall

3 May 2019

² <https://www.oag.govt.nz/2013/mangawhai>

References

Environment Waikato (2007). Proposed Waikato Regional Plan variation 5 – Lake Taupo Catchment (Hearings Committee Recommendations Version). Environment Waikato Policy Series 2007/09.

Hudson et al, (2015). Review of historical land use and nitrogen leaching: Waikato and Waipa River catchments. NIWA Client Report HAM2015-135.