IN THE MATTER	of the Resource Management Act 1991 (the Act)
AND	
IN THE MATTER	of a hearing of application by Tararua District Council to Horizons Regional Council for APP-2005011178.01 for resource consent in relation to the discharge of treated wastewater from the Eketahuna Township into the Makakahi River, a discharge to air (principally odour) and a discharge to land via seepage, Bridge Street, Eketahuna.

REPORT TO THE COMMISSIONERS

DR BRENT COWIE (CHAIR, MR REGINALD PROFFIT AND MR PETER CALLANDER

STATEMENT OF EVIDENCE OF TABITHA MANDERSON, SENIOR RESOURCE MANAGEMENT PLANNER

14 MARCH 2017

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1 INTRODUCTION

1.1 My name is Tabitha Manderson. I am a Senior Resource Management Planner with the consulting firm Opus International Consultants Limited (Opus), a firm specialising in engineering, environmental science and planning. My qualifications are a Bachelor of Agricultural Science (Massey University), Post-Graduate Diploma in Environmental Agricultural Science (Massey University) and a Master of Applied Science (Natural Resource Management) (Massey University). I have undertaken various Post-graduate papers Planning (Massey University). I am an Associate Member of the New Zealand Planning Institute. I have completed the Making Good Decisions programme, and am a current certificate holder.

1.2 I have over 17 years' experience in planning and resource management. I have been employed by Opus as a Senior Resource Management Planner since October 2007. Since joining Opus I have been engaged in various roles, including providing assistance to various Councils to process consent applications as well as preparing consent applications on behalf of clients. I previously worked for Horizons Regional Council in several roles including over three years as a Consents Planner. As a Consents Planner I processed a diverse and complex range of Land Use Consents, Discharge Permits and Water Permits, including those that were decided at Hearings. I have assisted Tararua District Council with a number of Resource Consent Applications, including other applications associated with other wastewater treatment plants in the Tararua District. I have also assisted a number of other Territorial Authorities with preparing consent applications relating to wastewater treatment plants. I also regularly review consent applications prepared by other planners employed by Opus. I have also worked for the Ministry for the Environment, Taranaki Regional Council and the Wanganui District Council.

1.3 I confirm that I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note. I agree to comply with the Code of Conduct. Except where I state that I am relying upon the specified evidence of another person, my evidence in this statement is within my area of expertise. I have not omitted to consider any material facts known to me that might alter, or detract from, the opinions that I express.

1.4 I was engaged in 2014 to assist Tararua District Council prepare the consent application. I have had no direct involvement with Consultation undertaken by TDC to date, other than attending the pre-hearing meetings and responding to any queries from submitters.

1.5 In this report I have provided:

- An outline of any areas where I disagree with the planning evidence provided by Ms Morton in her circulated Section 42A report;
- Some additional areas of assessment for the panel to consider in their decision making process;
- Commentary on the consent conditions in the Section 42A report;
- Commentary on some matters raised in submissions; and
- A recommendation to the Panel.

1.6 In preparing this report I have considered the Section 42A reports prepared by Ms Fiona Morton, Senior Consultant Planner Logan Arthur Brown, Freshwater and Partnerships Manager (Horizons Regional Council), Tim Michael Baker, Groundwater, Deborah Anne Ryan, Air Quality. I have considered the submissions received through the notification process. I have also considered the evidence prepared by Dr Olivier Ausseil, Aquanet and Mr John Milton Crawford Wastewater Engineer for the applicant. I have also considered the memorandum attached to my evidence, from Roger MacGibbon (Opus Consultants) regarding wetlands (Appendix I).

1.7 I have visited the site and am generally familiar with the surrounding area. I am familiar with the provisions of the Resource Management Act 1991 (the Act) and the Regional One Plan.

1.8 I do not provide a description of the proposal or the site as I consider this is adequately addressed in the application and the Officers Section 42A reports.

2. BACKGROUND AND CHANGES TO APPLICATION

2.1 It is acknowledged that there have been a number of changes proposed to the activity, and I believe it is useful to comment on my understanding of the intention of these as it does have some bearing on the policy assessment given below.

2.2 The original application proposed a rock filter be constructed as part of the discharge, however engineering details were not provided. This was in part due to the intention to seek feedback as to what would be appropriate, both from consultation and engineering feasibility. The discharge location point, and nature of the land leading to it, required consideration of what could be installed to meet the relevant One Plan policies and potentially meet concerns of some submitters. The intention was, and I believe still is, to achieve overland passage of the treated wastewater.

2.3 It was stated in the original application that a tephra filter may be installed if required. I understand from TDC in 2016 the potential funding source for the Tephra filter was no longer available to them, so was no longer able to be considered part of the upgrades within the constraints of the funding identified in the annual plan at this time. The original application also relied somewhat on this in the assessment against One Plan Policy 5-11.

2.4 Following on from the various pre-hearings, I understand that TDC then began initial discussions to determine if an alternative discharge location could be found. The purpose of the alternative discharge location would be several fold; allow for a more ideal monitoring site to be selected; and potentially allow for a solution that would better meet the requirements of Policy 5-11. It is my understanding TDC CEO Blair King will address the panel at the hearing with further updates regarding this potential discharge site (Option 2 on attached map).

2.5 It is discussed in the various Section 42A reports, and other evidence that changes to the discharge location restrict the level of scrutiny and therefore certainty that can be given to the proposal. I note that for both discharge location options, the receiving environment remains the same.

3. SUBMISSIONS, PRE HEARINGS

3.1 I have read the original submissions, and do not repeat a summary of them here as they are provided in Ms Morton report.

3.2 As noted by Ms Morton, 3 pre-hearings have been held and I understand a report pursuant to section 99(5) is to be supplied to the panel.

3.3 In Section 14 of my evidence below I make some comment on recommended conditions and the degree to which I consider they address some of the specific relief sought in the submissions.

4. ASSESSMENT – SECTION 104

4.1 In Section G of Ms Morton's Section 42A report she outlines the matters in Section 104 that are relevant to the application. I concur with the matters identified by Ms Morton and I do not repeat them here.

4.2 In addition to the technical s42A reports I have also considered the evidence prepared by Dr Ausseil and Mr Crawford.

5. ACTUAL AND POTENTIAL EFFECTS ON THE ENVIRONMENT

Effects on Surface Water Quality

5.1 It is acknowledged that more certainty regarding potential effluent quality has been requested on a number of occasions. Since the most recent section 92 response some additional work has been done, based on recently acquired flow data in particular. This is reflected in the evidence of Mr Crawford and Dr Ausseil. Dr Ausseil has presented an update of the March 2015 Aquanet report based on new flow data leading him to amend some of his conclusions in relation to the current discharge's contribution to in-river DRP and SIN loads during low river flows.

5.2 Both Dr Ausseil and Mr Brown are of the opinion that there is currently an adverse effect occurring, based on changes in the QMCI data being greater than 20%. Though there is a difference of opinion as to the degree to which One Plan Targets for other determinands are exceeded

for some parameters, based on a difference in how calculations were undertaken (para 5.8 and 5.10 Dr Ausseil evidence).

5.3 Dr Ausseil details in para 5.4 of his evidence there is no significant changes in water clarity, total suspended solids (TSS), water temperature, water pH, scBOD5, and Particulate Organic Matter (POM) in the upstream and downstream sites in the Matahaka. And accordingly is of the opinion that there is no significant adverse effect in relation to these downstream of the existing discharge.

5.4 *E.coli* concentrations are statistically different between upstream and downstream sites, and has not always met the One Plan targets for the existing discharge. Based on the technical evidence it is my understanding that the discharge would contribute to *E.coli* concentrations.

5.5 Mr Brown in his evidence concludes that the One Plan targets for SIN or DRP are not met downstream of the WWTP, but the ammonia target is met. The Makakahi River meets the targets for all three determinands, while the Ngatahaka Stream does not meet the SIN or DRP but does meet the ammonia target.

5.6 Dr Ausseil in his evidence does not agree with Mr Brown, he concludes that the One Plan SIN target is met both upstream and downstream of the discharge site in the Makakahi River, but largely exceeded in the Ngatahaka Creek. Dr Ausseil also considers that the DRP Targets are met at all three sites, but acknowledges that the downstream site has higher DRP concentrations.

5.7 The most recent data (and effluent flow) analysis has allowed Dr Ausseil to assess contaminant loads from the existing WWTP under different flow conditions. In particular for low flow conditions (when the Makakahi River is below half median at Hamua) he calculates the discharge would contribute approximately 37% of the SIN and the Ngatahaka Creek approximately 60%. For DRP during low flows the discharge contributed 70% of the load, with the Ngatahaka Creek contributing 13%.

5.8 From the Aquanet Report, periphyton biomass measured between 2013 and 2016, showed an increase between upstream and downstream sites on 16 out of 24 samples. Chlorophyll a concentrations for the upstream site met the One Plan targets for all but one of the samples, downstream of the WWTP was exceeded on three occasion and on two occasions within the Ngatahaka Creek.

5.9 In regards to macroinvertebrate monitoring results for the sites. Reductions of greater than 20% of QMCI scores are recorded between the Makakahi upstream and downstream sites, which exceeds the One Plan target. Both Mr Brown and Dr Ausseil are of the opinion this is evidence of a significant adverse effect. I also agree with Ms Morton that this is the appropriate standard to have on a consent condition.

5.10 Dr Ausseil discusses the known mechanisms that can result in changes to macroinvertebrate communities. A number of the mechanisms, such as the increase in periphyton, could be contributing to the measured changes in QMCI. The relative contributions of SIN and DRP during low flows as a result of the existing discharge need to be considered. Dr Ausseil goes on to discuss that as there is no modelling tool available to potentially determine effects from the discharge, no firm conclusion can be drawn at this time. The change in discharge point, to allow for a physical separation from the Ngatahaka Creek is the only way to enable a direct measure of the discharge.

5.11 Based on the evidence prepared by Mr Crawford, Dr Ausseil has commented on the future discharge in relation to some specific water quality parameters. My understanding based on Dr Ausseil's evidence is that as UV treatment of the wastewater is proposed, the effects of the discharge on in-river E.coli concentrations will become relatively minor.

5.12 DRP and POM would be expected to reduce. The proposed upgrades do not specifically address reducing nitrogen concentrations or loads in the discharge.

5.13 A question remains with regards to determining certainty around the ecological effects of the discharge, Dr Ausseil lists in para 6.3 of his evidence the two key questions that are currently not answered. His

recommendation is for a period of monitoring to occur to determine if a significant adverse effect is occur, and dependent of the answer to that allow for sufficient time for a solution to be developed, if required. This is reflected in the conditions in Appendix 1 of Ms Morton's 42A report. I note however that timing will likely need to take in to account construction and commissioning of the proposed upgrades (this is discussed further below).

Effluent Quality

5.14 The evidence of Mr Crawford describes the existing wastewater treatment system and current levels of performance. He provides an analysis of flows based on recently available data, and discusses various flows and possible influences of inflow and infiltration contributing to peak wet weather flows.

5.15 Due to lack of influent data, Mr Crawford has calculated plant loadings based on engineering texts and sets out his assumptions used. In Table 5 of his evidence he presents a breakdown of pollutant removal performance for 2016. He is of the opinion that the current pond system produces good results in comparison to other pond based systems in New Zealand. He also discusses how the potentially high inflow and infiltration could impact on concentration results.

5.16 In paragraphs 4.6 to 4.14 Mr Crawford discusses how the existing pond configuration treats various bio-chemical parameters. He discusses that most of the SIN leaving the treatment plant is in the form of ammonia-N. Both Dr Ausseil and Mr Brown note that ammonia-N is currently below the One Plan target. Mr Crawford also discusses that to further remove ammonia and total nitrogen would require a fundamental different form of treatment and outlines that costs associated with this would exceed $1M. He is of the opinion that such expenditure would not be justified, based on the known effects on the receiving environment in the opinion of Dr Ausseil.

5.17 The evidence of Mr Crawford discusses potential changes to effluent quality, based on known upgrades at this time. He presents proposed effluent standards following the implementation of upgrades in Table 6 of

his evidence. I use this table to update the conditions presented in Appendix 1 of Ms Morton's 42A report. Mr Crawford has made various recommendations in relation to the upgrades (para 6.8) which I have reflected in an additional recommended condition.

Timing for upgrades

5.18 Mr Crawford presents an outline of timing that would be required, in his opinion, to complete the proposed upgrade work (para 7.40). This includes time taken for detailed design (which includes a targeting influent monitoring programme), tendering for works and construction of works, and that following construction a period of commissioning is required to optimise the plant. Based on this, I have recommended an additional condition which would provide certainty regarding upgrades occurring within reasonable timeframes. I consider this will be a key component in providing certainty, both in regards to constructing and commissioning the new plant but also to allow for sufficient time for in-river monitoring to occur within what I consider to be a suitable duration of consent.

Discharges to Air

5.19 Ms Morton describes the potential effects on odour in paras 57 to 63, based on the evidence of Ms Ryan. The evidence of Ms Ryan discusses that the plant has not historically had any adverse effects as a result of air discharges. Mr Crawford also discusses in his evidence the various forms of discharges to air that are potentially produced during waste water treatment plants such as Eketahuna.

5.20 Ms Ryan lists a number of conditions which she believes would be appropriate as conditions on consent, these are reflected in the conditions presented in Appendix 1 of Ms Morton's 42A report. Mr Crawford is of the opinion that continuous dissolved oxygen is not appropriate, and sets out his reasoning in paras 7.33 to 7.39. I consider that the alternative set out by Mr Crawford is appropriate and have recommended an alternative condition accordingly.

5.21 Subject to the imposition of the recommended conditions, I am of the opinion that the potential effects from the discharge to air will be no more than minor.

Groundwater

5.22 The Section 42A report of Ms Morton discusses the evidence of Mr Baker in relation to groundwater. No additional specific evidence has been prepared in relation to groundwater, so I am therefore also guided by the evidence of Mr Baker. I consider it appropriate for a monitoring programme to be established by way of conditions, to ensure that groundwater quality is demonstrated to be maintained.

5.23 I do however question the validity of the conditions presented in Ms Morton's evidence, specifically Condition 3 and Condition 8. Condition 3 is written as an absolute (lining must be installed), and Condition 8 anticipates non-compliance with the requirement to line the ponds. The Conditions are not written as an either or. I am unclear as to whether Ms Morton has included Condition 8 on the basis that lining of the ponds may not occur (for whatever reason).

5.24 Mr Crawford does present an opinion as to whether lining of the ponds is practical and whether it would result in the best environmental outcome, given that the ponds have been in existence for some time and that the process of relining the ponds could in itself lead to effects on the ponds performance. If requested to do so, I can provide an opinion on this matter in relation to planning matters as consent was sought for discharge of seepage to ground.

Recreation and amenity values

5.25 I am not aware of any reports completed to confirm the recreational uses of the area. I agree with the opinion of Ms Morton that a recreational survey would be an appropriate way of addressing this.

Cultural Values

5.26 I generally agree with the description of effects on Cultural Values discussed in the 42A report of Ms Morton, and that evidence presented at the hearing by Kahungunu ki Tamaki nui-a-rua, TRToNW and RTnaR will assist the Commissioners in assessing these effects.

5.27 I do discuss what matters raised in the submissions of Kahungunu ki Tamaki nui-a-rua, TRToNW and RTnaR may be able to be addressed further in my evidence in section 14 below.

5.28 As Ms Morton has noted in her 42A report, none of the iwi submitters sought a decline for the application but other relief was sought. Evidence in relation to conditions should help in forming an opinion whether effects on Mauri can be mitigated.

6. NATIONAL ENVIRONMENTAL STANDARDS AND NATIONAL POLICY STATEMENTS

6.1 I agree with paragraphs 73 to 75 of Ms Morton's evidence.

7. NATIONAL POLICY STATEMENT FOR FRESHWATER MANAGEMENT

7.1 I agree with paragraphs 76 to 84 of Ms Morton's evidence.

8. REGIONAL ONE PLAN POLICY STATEMENT

8.1 I agree with Ms Morton that the correct planning instrument in respect of assessing objectives and policies is the One Plan – Plan Change 1 (2016).

Chapter 2: Te Ao Maori

8.2 I agree that the Objectives and Policies of Chapter 2 are relevant.

8.3 No Cultural Impact Assessment has been commissioned at this stage for the Eketahuna site that I am aware of.

8.4 I note that the relief sought in submissions from the three iwi groups requested included, among other matters, having access to monitoring data, that further monitoring be undertaken and that investigation of alternatives be undertaken.

8.5 The forum proposed during the pre-hearing meetings (and forming part of the recommended conditions) allows for engagement with the community and iwi which I consider would go some way towards meeting the relevant Objectives and Policies identified in Chapter 2 and is in line with the requested relief to be kept informed (submissions 3, 9 and 12).

8.6 I agree with Ms Morton that evidence presented by iwi submitters at the hearing could help with further assessing this objective and supporting policies.

Chapter 3: Infrastructure and Energy

8.7 I am in general agreement with Ms Morton's assessment of the Chapter 3 Objectives and Policies.

Chapter 5: Water

8.8 In relation to Policy 5-4 which required enhancement where water quality is not met, the evidence of Mr Brown is that targets are not currently met for SIN and DRP downstream of the current discharge. If the Commissioners agree with Mr Browns evidence this Policy applies. However, Dr Ausseil in his calculations determined that the targets for SIN and DRP are met downstream of the discharge, which would mean that Policy 5-3 is the relevant policy.

8.9 However, both experts are in agreement that in relation to the current situation a change in QMCI of greater than 20% has been occurring, which requires Policy 5-4 to be considered.

8.10 The evidence of Mr Crawford outlines potential improvements in effluent quality following the proposed upgrades, and has recommended appropriate effluent standards. This demonstrates that water quality, for at least some water quality parameters, in particular DRP and *E.coli*

should be enhanced by the proposed upgrades. But it is acknowledged that there remains uncertainty around quantifying the potential improvements at this stage.

8.11 In regards to Policy 5-3 I agree with Ms Morton that this Policy is relevant. I have not seen evidence that would suggest the discharge, current or future, would result in the One Plan Targets being exceeded where they are currently being met.

8.12 Subject to the ponds being lined, I agree with Ms Morton that at the least groundwater quality will be maintained compared to the current situation. Lining ponds to the permitted activity standard of $1x10^{-9m/s}$ would reduce a potential source of contamination. Mr Crawford raises the point of whether this would be the most cost effective mechanism if looking at in river effects. I would anticipate that further monitoring would need to be done if the ponds were not to be lined, to ensure that groundwater quality would be at a minimum maintained.

8.13 Regarding Policy 5-9 a and b. My understanding is that Mr Brown and Dr Ausseil are in agreement that the current discharge, contributes to an effect on the life supporting capacity of the Makahaka. The mechanisms resulting in the existing observed change are not, in the opinion of Dr Ausseil, fully understood. The imposition of a condition with an appropriate standard and monitoring, as well as recognition that improvements to some water quality parameters should occur once the proposed upgrades are complete does, in my opinion, give regard to the Schedule B values.

8.14 In relation to Policy 5-9 c, with regards to best management practice, I note the opinion of Mr Crawford that the current ponds are performing well and that the additional treatment processes will provide for a pragmatic standard that is financially achievable for TDC. I am comfortable to rely on this expert opinion in relation to treatment, as I do not have other expert evidence to consider.

8.15 Policy 5-9 d addresses the need to allow reasonable time for improvements, Mr Crawford has outlined a timeline associated with

robust design and commissioning. I consider this appropriate, and have recommended a condition based on this.

8.16 Policy 5-9 f, some further certainty has been provided with the recently assessed effluent flow data. The lack of certainty in relation to the final discharge point does not, in my understanding, contribute to uncertainty with regards to effects – the receiving body is the same. It is my understanding that while discharge location Option 1 creates greater challenges in terms of monitoring, this does not necessarily constitute the potential for greater effect (but rather more difficulty to ascertain effect).

8.17 Policy 5-9 g I am in general agreement with Ms Morton, but do note that the applicant has presented in the application reasoning for the proposed upgrades. I understand that Blair King intends to present further background as to the process of determining upgrades to date. I also note the recommended condition 5 of the general conditions which will require ongoing investigation in to BPO matters.

8.18 I agree with Ms Morton that Policy 5-11 is a pivotal policy in the One Plan. It is also acknowledged that the current discharge does not meet this policy.

8.19 Currently there are two options which could constitute overland flow, if designed correctly. It remains critical to this application that a pathway be found. Currently there are two options that are being considered by the applicant. With both options it is my understanding the intent is to find some form of overland passage. The option of a wetland system is anticipated for both options.

8.20 Policy 5-11 also provides no quantitative guidance as to the size of the area of land over which treated human sewage must pass. The policy refers to land passage, not treatment. But I think it is important to consider the intent of the Policy, which I understand is ultimately to address the Mauri of the receiving water.

8.21 The condition in Appendix 1 of Ms Morton's evidence presents a mechanism for this Policy to be met, with a deadline of 2 years to find a

feasible option. I agree that this is an appropriate mechanism given the level of information currently available.

8.22 In considering whether a wetland would constitute overland flow I have considered the definition of land[1] in the RMA, which includes land covered by water. In addition the definition of a wetland under the RMA *includes permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions*

8.23 Based on the above definitions, and provided they are correctly designed, a wetland has the potential to meet Policy 5-11.

8.24 Attached in Appendix I is a memorandum from Roger MacGibbon regarding treatment wetlands. Depending on the design and functionality of a wetland, it is possible that a wetland can provide effective treatment of some parameters. The application does not currently propose to rely on any additional treatment that may be provided by a wetland. Sufficient work has not been done in this respect yet. However, I think that this element of what additional treatment a wetland may provide is appropriate to be incorporated into the further investigative work. In my opinion this is captured in the intent of Condition 5 whereby the Applicant is required to investigate alternative discharges to continue to investigate BPO.

8.25 I note in para 108 Ms Morton is of the opinion the applicant is best placed to consult to determine an appropriate method of protecting the Mauri of the water. Given the submissions raising concern in this regard, I am inclined to agree. However, I am also of the opinion that either of the discharge points proposed has the potential to be designed to meet clause (ii). Overall, subject to the imposition of the recommended conditions I am of the opinion that Policy 5-11 can be met and is not an impediment to the consent being granted.

Chapter 7 - Air

[1] Land – (a) includes land covered by water and the air space above land; and…..

8.26 I concur with the assessment provided by Ms Morton in paragraph 109.

9. REGIONAL PLAN – ONE PLAN

Chapter 14 – Discharges to Land and Water

9.1 Ms Morton has identified additional Objectives and Policies that require consideration. I agree that these are relevant and provide some further discussion below.

9.2 In relation to para 112 of Ms Morton's 42A report, I have also provided an assessment against Chapter 5 in paras 8.8 to 8.25. My conclusion is that the application is not inconsistent with policy 5-9, based on new data analysis in the evidence of Mr Crawford and Dr Ausseil, and noting that the policy requires that regard be had to the matters listed. In my opinion regard has been had to those matters. In addition for Policy 5-11 I am of the opinion that there are a number of pathways available in order to meet Policy 5-11.

9.3 Responding to the question in para 115 of Ms Morton's evidence. I am not aware that additional work has been done in regards to Policy 14-4 (b) and (c).

9.4 I agree with the assessment of Policy 14-8 in relation to monitoring. I recently became aware that the effluent flow is metered and I understand telemetry is installed.

9.5 As noted by Ms Morton in para 118 an assessment of the NPS-FM 14 is required by Policy 14-9. The matter of the adverse effect on the life supporting capacity of the Makahaka is outlined in the effects section, the extent to which the discharge will avoid this effect is not able to be determined with full certainty at this stage. However, of note is that upgrades are proposed, and further monitoring is also recommended that would be used to help refine if further upgrades are needed. In relation to the health of people and adverse effects, it is my understanding that the proposed upgrades will improve disinfection provided which would contribute to avoiding adverse effects on the health of people and the community.

Chapter 15 – Discharges to Air

9.6 I agree with Ms Morton and her assessment against Chapter 15 Objective and Policies.

9.7 In considering consent duration and Policy 12-5. Ms Morton discusses the relevant criteria. In response to the criteria set out in (ii) the application on page 27 notes the asset value at that time was $650K[2] and in addition the annual plan identified $810K for upgrades for the plant. The TDC 10 year plan, identifies the Gross replacement cost of the Eketahuna Scheme as being $3.752m.[3]

9.8 I agree that review conditions are an appropriate tool and should be used.

Chapter 12 – General objectives and policies

9.9 In para 127 Ms Morton discusses the uncertainty regarding a number of matters. Recently acquired data has, in my opinion, allowed for some greater certainty to be determined in relation to discharge volumes and quality as is presented in Mr Crawfords evidence. Also, an indication of a timeline for design and procurement is presented. I have recommended a condition reflecting Mr Crawfords timeline to provide more certainty with regards to ensuring work is done to meet appropriate milestones. While I acknowledge there is uncertainty in regards to the discharge location, the applicant is not relying on additional treatment that may be provided, with two options being considered, I note that the receiving environment is the same for each location and it is my understanding that while Option 1 would create greater challenges in terms of monitoring, I am not aware that there would be a greater difference in terms of effect based on evidence I have seen to date.

9.10 Based on the timelines for design, procurement and construction, plant commissioning and then sufficient instream monitoring it is my opinion that a term of seven years is more appropriate to enable this to be carried out.

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[2] For the ponds

[3] Email, Rob Green, 11/3/2017. Attached as Appendix II

Rule Framework

9.11 I agree with the rule assessment that consents are sought as Discretionary Activities

10. OTHER MATTERS

10.1 The Manawatu River Accord was outlined as a relevant other matter in the application, and is discussed in Ms Mortons evidence. Accordingly, I am of the opinion that the Commissioners can consider economic costs. Mr Crawford has presented some costs associated with configuring a plant to deal specifically with nitrogen.

10.2 I understand Blair King is to present, among other things, economic facts to the panel. The value of the asset and funds already identified for upgrades are identified in para 9.7 above.

11. SECTION 105

11.1 As noted in the application alternatives have been considered, in accordance with section 105.

12. SECTION 107

12.1 As noted by Ms Morton the existing discharge has not been reported as having resulted in the effects detailed in 107.

13. COMMENTS PROPOSED CONDITIONS

13.1 Ms Morton usefully provides a suite of conditions, earlier versions of which had been circulated following the pre-hearing. Below I set out some proposed changes and additions, based on the evidence of Mr Crawford and Dr Ausseil. I have attached a full set of conditions as appendix III, with proposed changes or additions underscored and a number of comments that I would anticipate Ms Morton may wish to respond to.

14. RELIEF SOUGHT IN SUBMISSIONS

14.1 I comment, in general terms, about the relief sought by submitters that I believe are addressed by the current recommended conditions.

14.2 Term. A number of submitters requested a shorter term. The matter of appropriate term was discussed at pre-hearings. I agree with Ms Morton that there was not defined agreement from all parties. However, it is my understanding that there was some general agreement around a shorter term. Based on the expert evidence provided to date a term of 7 years is currently recommended taking into account the practicalities of the design and construction of a new plant in particular. I do not go so far as to say a term of 7 years would be agreeable to all submitters.

14.3 Assessment of the degree of human (recreation) use downstream. A condition has been recommended that a recreation survey be undertaken, which in my opinion is in keeping with the relief sought.

14.4 Monitoring of influent and effluent flows. A number of the recommended conditions will only be able to be achieved with appropriate meters in place.

14.5 Additional monitoring, including macroinvertebrates. Monitoring is proposed which should address this relief sought.

14.6 Investigations into alternative treatment and disposal options to inform the permit holder's decision on the best practicable option for treatment and disposal from the Eketahuna WWTP. The applicant has agreed to the establishment of a forum that will be provided with the findings of the feasibility study for alternative methods of treatment and discharge.

15. PART 2 ASSESSMENT

15.1 In Section P of her 42A report Ms Morton sets out the approach as confirmed by the High Court in relation to Part 2.

15.2 I agree with this assessment, and in a similar manner, based on the evidence currently available do not undertake a Part 2 analysis. I can also present a Part 2 analysis if required by the Commissioners.

16. CONCLUSION

16.1 Lack of relevant data specific to the Eketahuna situation has created some uncertainty with regards to potential effects. Recently acquired data has allowed for some further refinement of assessment, but it is acknowledged that there are some areas where uncertainty remains. In particular, the question of what may be driving the existing changes in QMCI which is considered to be resulting in an adverse effect. In the absence of a suitable model for predicting effects, ongoing monitoring will be critical to determining this.

16.2 In order to gather specific information a programme of detailed design, then construction and commissioning is in the opinion of Mr Crawford likely to take up to 32 months. From that point Dr Ausseil considers that 3 years of monitoring the receiving environment would allow for a range of climatic conditions to be assessed. In addition, this work can be used to refine what would need to be investigated for alternative method of treatment and disposal.

16.3 That there are cultural effects as clearly identified in the submissions received. Evidence presented at the hearing should help with refining how these effects may potentially be mitigated. There is a mechanism to address some of the relief sought by the respective iwi groups in the recommended conditions.

16.4 Ensuring that all upgrades and monitoring is undertaken is crucial to gathering information. I have recommended conditions requiring milestone reporting to meet this end.

16.5 In my opinion the proposal is not inconsistent with the relevant Objectives and Policies of the One Plan, acknowledging it is challenging to form an opinion with regards to the policies that relate to Te Ao Maori and further evidence from iwi submitters at the hearing should assist in assessing

the objectives and policies contained in Chapter 2 of the One Plan in particular.

16.6 Subject to the amended Conditions I remain of the opinion that the consent can be granted.

17. RECOMMENDATION

17.1 That subject to appropriate conditions imposed in accordance with Section 108 that the application be granted for a term of 7 years.

Tabitha Manderson

14th March 2017

APPENDIX 1

Memorandum

To	Tabitha Manderson
Copy	
From	Roger MacGibbon (Ecologist)
Office	Hamilton Environmental Office
Date	10 March 2017
File	
Subject	Wastewater polishing wetlands

Wetlands can be used effectively to “polish” treated wastewater before it enters natural waterways but the design, configuration and management of the wetlands is critical to their successful performance.

Wetland systems can be very effective at extracting nitrogen and reducing extant faecal pathogen concentrations. However, they are not effective at removing phosphorus and their overall performance will be compromised if the wastewater flowing into them has a high suspended solids content and is still biologically active (ie, requires further treatment).

To perform optimally in extracting nitrogen wetlands need to be shallow, flat-bottomed and fully vegetated with a solid bed of sedges, rushes and grasses. Water must come into contact with, or pass through organic material (living or decaying plant material) for the denitrifying bacteria to function at maximum. This cannot occur in wetlands that are deep and/or have areas of open water.

Methodology for the design of a wastewater treatment plant wetland

The design of any wetland that will function to treat or “polish” water-borne contaminants will vary depending on the following factors:

- Influent flow rates and variations (highs and lows)
- Composition of the influent including: nutrient content (esp N and P), suspended solids, BOD, DO, heavy metals and pH.
- Discharge water quality expectations (eg. as defined by consent conditions).
- Wetland site soil type, hydrology and topography.

Wetland volume (water retention time), wetland width to length ratio, wetland depth, organic content on the wetland bottom, wetland plant species used, the spacings of the plants established in the wetland, and the timing of wetland construction and planting are all critical aspects in designing an effective wetland and will vary considerably depending on the site characteristics.

My approach to wetland design is to accurately determine all of the site and hydrological factors, then calculate the wetland dimension and plant requirements to function optimally, and then apply the requirements to match or fit the site characteristics.

Wetlands are effective tools for the management of nitrogen and faecal pathogens but are considerably less effective at managing high sediment loads, high phosphorus concentrations, and only partially treated, biologically active wastewater that is still undergoing biological breakdown. If sediment, phosphorus and biological activity levels are high, and/or the discharge through the wetland is likely to generate flood flows or drought, then additional features may need to be added to the design to safeguard the wetland performance. Sediment detention basins, overflow flood channels or weirs to create multiple bays may need to be incorporated.

APPENDIX II

Tabitha Manderson

From: Rob Green <rob@greeninfrastructure.co.nz>
Sent: Saturday, 11 March 2017 3:59 p.m.
To: Tabitha Manderson
Subject: TDC stats

Hi Tabitha,

You were after some stats on the TDC. I have extracted these from the 10 year plan, the Infrastructure Strategy and the Wastewater Asset Management Plan

District area = 4360 sq km
Population 17,225
Population was decreasing at 0.5% per year for the 12 years to 2014.

Population is aging.

Looking forward the Infrastructure Strategy suggests a static population with people leaving being replaced by incoming migration from persons returning to the district, or attracted by lifestyle opportunities aided by the broadband rollout etc.

Details of wastewater schemes below.

Location	Property Connections	Pipe length (km)	No of pump stations	Treatment plant	Gross replacement cost ($) June 2014
Dannevirke	2,661	37.5	7	3 ponds, 9.2 ha	23.844m
Pahiatua	1,123	17.8	3	3 ponds, 4.1ha	10.476m
Woodville	675	13.1	1	2 ponds, 2.9 ha	8.799m
Eketahuna	220	6.5	2	2 ponds, 0.4 ha	3.752m
Norsewood	70	3.2	2	2 ponds, 0.06 ha	1.090m
Pongaroa	69	3.4	2	2 ponds, 0.32 ha	1.093m
Ormondville	39	3.5	3	2 ponds, 0.22 ha	0.925m
Total	**4,857**	**85**	**20**	**16 ponds**	**$49,980,925**

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APPENDIX III

Condition Schedule APP-2005011178.01 – Eketahuna Wastewater Treatment Plant
General Conditions Applying to all Permits

Descriptive Specification

1. The activity authorised by these permits shall be undertaken in general accordance with the concepts, parameters, drawings, specifications, statement of intent, proposed mitigation measures and other information supplied in the application received on 1 April 2015 and supplementary documents received.

    a. On 11 December 2015, being a response to the s92 further information requested of June 2015; and
    b. On 27 February 2017, being a response to the s92 further information request of November 2016.

    Where the application is inconsistent with the requirements of the conditions, the conditions will prevail.

2. The wastewater discharge authorised by these permits shall be limited to:

    a. A maximum 12 month rolling median (midnight to midnight) discharge of 640 cubic metres.
    b. A maximum peak flow discharge of 2,000 cubic metres over a 24 hour period wet weather flow.

Predevelopment Milestones

2a The Permit Holder shall finalise the details of the Treatment Plant, and the treatment process to be used to treat wastewater so it will meet all the conditions of Permit xxxx. The Permit Holder shall prepare an RFP to call for a design for the Treatment Plant within two months of the commencement of these permits. As a minimum the RFP shall specify the minimum effluent standards to be achieved, and detail requirements for monitoring influent flows and characteristics. As a requirement, the RFP shall specify that final design of the process improvements necessary to meet the effluent standards and a procurement strategy shall be completed within 13 months of commencement of these permits. The Permit holder shall ensure that a contract is awarded for the design and construction of upgrades to the WWTP within four months of the final design and procurement strategy. The contract shall include milestones details to ensure all upgrades are installed at the plant no later than 12 months from award of construction contract.

No later than 11 months following award of the construction contract the Permit Holder shall forward details of a plan for the Commissioning phase of the upgrades and details of performance testing to be undertaken. Performance testing, including making seasonal adjustments, shall be undertaken in parallel with the receiving water investigations required by Condition xx.