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Primary evidence submitted for Block 1 hearings

Waikato Regional Council Proposed Waikato Regional Plan Change 1 –

Waikato and Waipa River Catchments

Summary Statement

1. Thank you for the opportunity to submit on the Waikato Regional Council's proposed Plan Change 1. Our names are James Reeves and Amy Taylor, and together with our three children we farm in the Waingaro Road Bridge sub-catchment, part of the Waipa River Freshwater Management Unit. I have a Masters degree majoring in Economics and International Trade from the University of Waikato, while Amy has a Bachelor of Soil Science from Massey University. In addition to the farming operation, both of us have employment off-farm, and it is from these backgrounds that our submission was developed.

2. Our property is 66 hectares and is farmed in conjunction with an 85 hectare lease block owned by the same family but under two different legal entities, also in the catchment, with a small part of both lease blocks sub-leased to a vegetable grower. The blocks are a mix of flat and rolling country, with some steeper faces, on which we operate a mixed farming enterprise that constantly changes according to where we see opportunity. Large wetlands run through and border each block, in conjunction with both ephemeral and permanent streams. Over a number of years, and as budget allows, both ourselves and the family owning our lease blocks have been gradually fencing off and planting these streams and wetlands, while also planting specimen trees over our properties.

3. Our property has been in the family for nearly 50 years, and it is our aim that this should be passed on to our children. We wish to leave them a property that is not only a beautiful place in which to live, but also one on which it is possible to make a sustainable living.

4. We agree that current trends in water quality need to be addressed within the timeframes chosen, and that continuing with the status quo is not an option. We also agree with the principles outlined in p103 of the S42A report, particularly that every part of the community will need to do their part. However, we also believe that the way in which the rules have been framed will ensure that some will be asked to do far more than others, especially when one considers their relative impact on water quality. While this matter is better left until the Block 2 Hearings, it is worth noting at this time that this runs contrary to the aims of the S32 Report, and in particular its emphasis on equitable outcomes.

5. After a thorough analysis of the Section 42A Report that deals with the topics to be covered under the Block 1 hearings, our evidence will cover the following topic areas:

    a. Water clarity and water quality targets as a whole
    b. Economic analysis and the Section 32 report for Plan Change 1
    c. FMUs and sub-catchments
    d. Matters agreed and matters disagreed
    e. Appendix

    We also welcome the opportunity to discuss policies and rules at a later date, during hearings for Block 2 following the next Section 42A Report.

6. We continue to have issues with water clarity and water quality targets as a whole. We would suggest changes or amendments to the proposed targets that are more appropriate

methods of assessing these. Further, the analysis done for the CSG in preparation for PC1 did not go into depth looking at the definition of swimmable and fishable, nor did it clearly explain where we currently lie on the spectrum, nor does it even clearly define what constitutes a water body. Short term and 80-year targets at a sub-catchment level have been set. Individuals need to know what their target is, why they should be aiming at this and where they currently lie.

7. We completely disagree with the use of water clarity as a target. As we explained in our original submission, scientific analysis of water clarity conducted for PC1 conceded that it is likely that clarity may worsen over decades as mitigation techniques such as riparian planting mature, and that clarity can be severely impacted for decades by such events as the Tunawaea slip that occurred in native bush in the Waipa catchment in the 1990s. We believe that other methods of analysis should instead be used that offer a more precise indicator of the impacts of point and diffuse contaminant discharge on water clarity and ecosystem health. Using clarity as a measure is inconsistent with the types of mitigations that need to be used to improve water quality.

8. The Waikato Regional Council (WRC) is deserving of praise for setting in place the structure from which a large amount of work has been done in preparing the information that underpins Plan Change 1. In our preparation of this submission, we have now read more than 2000 pages of reports, minutes, submissions and other related material, all of which has clearly been produced in a highly professional manner designed to inform decision-making.

9. However, it is our contention that despite these efforts, the information relied on by the CSG and TLG in making recommendations of the proposed rules was incomplete, particularly as regards economic and social modelling. It is our opinion that this has meant an incomplete dataset upon which the WRC based their decisions about the proposed rules, and also means that the Section 32 (S32) requirements of the Resource Management Act 1991 have not yet been met.

10. For reasons we outline in section (b) of this document, we fundamentally disagree with the S42A comment at p288 that: “the Officers consider that the modelling undertaken is fit for purpose, in that it has informed an assessment of the costs and benefits of PC1, as required to be assessed and reported on under s32 of the RMA.”[1]

11. As we will point out, and based on WRC-derived figures and reports done for HRWO (that we believe still understate the total costs significantly), achieving water quality objectives could potentially wipe $13 billion dollars from agricultural land values, cost more than 5000 jobs, reduce regional GDP by 5% or more, increase rates for every individual by anywhere between 10-30%, and decimate towns throughout the Waikato that are heavily reliant on agriculture. Such potential impacts demand an incredibly thorough analysis of the likely

[1] Section 42A Report: Proposed Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments, Waikato Regional Council Policy Series 2019/04, p50.

costs and benefits, and we do not believe the work done thus far comes anywhere close to doing so.

12. Section 32(1)(c) of the RMA states that any s32 evaluation report must: “contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal.” Section 32(2) states that this assessment must identify and assess all benefits and costs and, where practicable, quantify these benefits and costs. Given the potential impacts, we do not believe the s32 Report conducted for Plan Change 1 has met these standards, and therefore that a further s32 Report must be commissioned that does meet these standards.

13. Clarity and certainty of rules and laws are two key aspects of our justice system. As an adjunct to this, good policy can only be made if it is underpinned by good data. It is all about informed decision-making. Unclear or incomplete data can lead to less than optimal decisions and perverse outcomes. The community deserves to have decisions made where the costs and benefits to individuals within that community of those decisions are well understood. It is not enough merely to recognise some parts of the community will bear “significant costs”. These must also be quantified.[2]

14. We believe that the information relied on by the CSG and TLG in making recommendations of the proposed rules was incomplete. It is our contention that this has meant an incomplete dataset upon which the TLG and CSG based their decisions about the proposed rules. We will explain where these holes lie in the dataset, both in terms of the information that was produced and in the information that should have been produced.

[2] Cf PC1-8688, Summary of Decisions Requested to Proposed Waikato Regional Council PC1.

Water quality measures

16. Any planned rule change must be consistent with, and give effect to, Te Ture Whaimana o Te Awa o Waikato, the Vision and Strategy for the Waikato and Waipa River, in accordance with the terms of the Waikato-Tainui Raupatu Claims (Waikato River Settlement Act) 2010. The principle of health and wellbeing reflects the overarching purpose of the settlement, which is to restore and protect the health and wellbeing of the Waikato River

17. The ideal expressed in Healthy Rivers Wai Ora (HRWO) was for water quality in the Waikato and Waipa rivers to return to their state as at December 1863, the date when Crown forces occupied Ngaruawahia, the home of the King and the political centre of the Kingitanga. While the historical Crown actions are expressed in the Act, returning water quality levels to their 1863 levels as a target was not. However, this has been accepted as the ideal. What water quality levels actually were in 1863, and most importantly what water quality trends were at the time is a matter of conjecture, although attempts have been made by the WRC to model these.

18. However, this submission is fully supportive of the Healthy Rivers Wai Ora (HRWO) goal of having the Waikato and Waipa rivers swimmable and fishable along their entire length. However, we believe that basing rules, regulations, and compliance around nebulous targets such as 'swimmable' and 'fishable' creates uncertainty. If you desire that someone achieves a goal, then this goal needs to be clearly set out. I need to know what my target is – on an individual level, not at sub-catchment level.

19. We support the regular and ongoing monitoring of nitrogen, phosphorus, and *E.coli* levels within each sub-catchment to assess ongoing trends in these areas, and to use this data as the basis for determining the relative health of the rivers. We agree that any rules should be based around the relative levels of these contaminants. But we disagree with using clarity as one of the measures of water quality, for reasons we note below.

20. The reports underpinning PC1 do not explain how the short term and 80 year targets contained in Table 3.11-1 were derived. Does achievement of the short term targets mean the river will be swimmable and fishable, or will this not occur until the 80 year targets are met, or will this be achieved somewhere in between? Is the river currently swimmable and fishable?[3] The analysis done for the CSG in preparation for PC1 also did not define 'swimmable' and 'fishable' in terms of levels of the four contaminants, nor did it clearly explain where we currently lie on the spectrum in each FMU. Without explanation short term and 80-year targets at a sub-catchment level have been set. These must be far better articulated in PC1 – we need not just need to know what my target is, but also why we should be aiming at this and where we currently lie.[4]

[3] Cf PC1-8456, Summary of Decisions Requested to Proposed Waikato Regional Council PC1.
[4] Cf PC1-8688, Summary of Decisions Requested to Proposed Waikato Regional Council PC1.

21. Swimmable and fishable are currently defined in Scenario 1 as "Swimmable in all seasons for microbes and clarity. Water quality supports ecological health."[5] However, we believe the targets must be better defined, and then linked to the targets set out in 3.11-1. As an example, people currently take watercress from streams and rivers in the catchment, whitebait from the river mouth, trout from the upper reaches of both rivers and consume them, apparently with no ill-effects. Does this mean one of the targets – fishable along their entire lengths - has already been met?

22. The confusion around definitions used for what constitutes a water body must be cleared up. There is no clear definition currently stated in PC1. We suggest using the same definition as that used in the National Policy Statement for Freshwater, that being a continually flowing waterbody with a bed of one metre width or greater. This speaks to clarity of regulations. If one is to be required to take some action in or around a water body, should we not first define what this is?

23. Clarity and certainty of rules and laws are two key aspects of our justice system. While the proposed rule changes are reasonably clear, the intent behind them is not. What defines swimmable and fishable limits or targets for nitrogen or sediment leaving farms, main tributaries, and sub-catchments? Are these defined anywhere, and if so how were these limits derived? The debate must first be had about what levels we need to get to before we can debate the appropriateness of rules designed to get there. As it currently stands, the proposed rule changes do not provide this certainty or clarity. Stakeholders still have no real idea what will be required of them in the future.

24. Water clarity has been identified as a key water quality attribute of interest, and TLG Report *Waikato River suspended sediment: loads, sources & sinks* notes that ultimately, erosion from catchments is the ultimate source of sediments (although this excludes stormwater runoff from urban environments, another key source of sediment entering rivers). Landslides and streambank erosion are the dominant process of sediment generation, particularly in the Waipa catchment.

25. In the S42A Report at p612, the officers themselves concede that sediment is only one contributor to water clarity. While changes in sediment loads impact on water clarity, so too do other factors. This gives the perverse situation that while sediment discharges from point and diffuse sources may go down, potentially water clarity may actually worsen. The situation is further complicated by acts of God, such as the massive 1991 Tunawaea slip in native bush on the Waipa River, which scientists believe will contribute to increased sediment loadings for decades to come[6]. Individuals and the community deserve more accurate measures of their impact on ecosystem health than that.

[5] *Evaluation of scenarios for water-quality improvement in the Waikato and Waipa River catchments*,p15.
[6] *Waikato River suspended sediment: loads, sources & sinks*, p12.

26. Studies would suggest that sediment loss from pastoral land falls somewhere between that lost from native forest and pine forest, even allowing for streambank erosion from stock. A study conducted on central North Island pumice soils concluded:

> "Annual rates of sediment export were small by New Zealand standards and were crudely estimated at 27, 22, and 40 t/yr/km for the native forest, pasture, and pine forest catchments, respectively…. The average concentration from the pasture catchment was about midway between that from the pine forest and native forest catchment. This was probably due to the net effect of highest erosive power (i.e., highest peak flows, surface runoff, and stock disturbance) modified by the stabilising effect of luxurious channel grass growth."[7]

27. However, the key issue why sediment should not be used as a measure of water quality is that sediment levels may become worse before they get better, and that this process may go on for decades. The *Waikato River suspended sediment: loads, sources & sinks* report notes:

> "Headwater pastoral streams have become narrower due to the input of sediment from recent catchment disturbance. This sediment became readily stored in channels due to the high light conditions which promotes the growth of pasture grasses on exposed in-channel bars as well as on stream banks. A number of studies have suggested that this stored sediment could be released (over a number of decades) if these channels are revegetated in tree species (as is often done during riparian rehabilitation efforts) due to the shading effect of a riparian tree canopy inhibiting the growth of groundcover vegetation."[8]

28. Thus the very actions that will potentially be required of landowners – that being riparian planting of waterways – will increase the amount of sediment in the Waikato and Waipa rivers, potentially for many decades. Therefore, using water clarity as a key indicator of water quality improvement is flawed, as it is inconsistent with actions deemed as necessary for long-term water quality improvement. Increases in sediment loads may actually indicate improved water quality. Basing regulation on sediment levels therefore must not happen.

29. We do not suggest that sediment levels should not continue to be monitored – at some point way off in the future, potentially beyond the timeframes envisaged by this Plan Change, improvement in sediment levels will occur. However as one study prepared for the TLG pointed out: "People appear to assume clear water means low levels of bacteria and contaminants and vice versa but the monitoring data tells us this is not always the case."[9] We recommend an alternative water clarity measure is used that offers a better indication of ecosystem health.

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[7] *Hydrology and sediment regime of a pasture, native forest, and pine forest catchment in the central North Island*, A. Dons, Department of Scientific and Industrial Research, 9 April 1987), p16.

[8] *Waikato River suspended sediment: loads, sources & sinks,* Healthy Rivers Wai Ora Report No. HR/TLG/2015-2016/2.4, 8 December 2015, p7.

[9] *Non-market values for fresh water in the Waikato region: a combined revealed and stated preference approach*, p14.

Economic Modelling

30. As a necessary part of the process, an economic report about the potential impacts of HRWO was commissioned by the TLG and CSG to inform decision-making. While we have no issue with the manner in which the economic modelling was conducted, we would argue that the modelling did not go anywhere far enough. Further, the economic and social implications of PC1 are potentially of such a magnitude as to warrant an immediate significant further investment by the WRC in commissioning additional reports whose aim must be to examine these implications, and the impacts on sub-regional, regional, and national economies and communities.

31. The S42A Report pp280-293 outlines the received submissions on the economic impacts of PC1 and the economic modelling that was conducted for it. At p288 the Officers state that they consider "the modelling undertaken is fit for purpose, in that it has informed an assessment of the costs and benefits of PC1", and that as such had met the requirements of s32 of the RMA. They also note that what was done was more comprehensive and informative than many similar RMA policy development exercises. At p291, it is noted: "Section E.2.7 of the s32 Report states that there was significant data collection, analysis and modelling undertaking [sic] to support PC1."

32. We completely disagree with this assessment and, with the greatest of respect, suggest that it demonstrates the general lack of understanding that exists of the potential economic consequences, both to individuals and the wider community, of trying to achieve the water quality objectives of HRWO.

33. We would agree that, having been involved with a handful of major Plan Changes, such as those implemented in the Rotorua Lakes by the Bay of Plenty Regional Council and Variation 5 in Lake Taupo, that the modelling that was done for PC1 is better than we have seen before. But this is to damn PC1's modelling with very faint praise since, to the best of our knowledge, no economic modelling was conducted for these other Plan Changes. In our experience this is the first time we have seen an attempt to actually quantify, in dollar terms, what the costs and benefits of a plan change might be, so the bar was set very low. The modelling done thus far falls far short of what we believe s32 of the RMA demands, and what the community should have expected would have been done if they were aware of the full significance of what was proposed.

34. We are of the opinion that understanding the full economic and social implications of the proposed rules is the most critical component of PC1, and that failing to produce such reports is a failure of the WRC's regulatory duties under S32 of the RMA. Just as importantly, an incomplete data set presents the very real risk of poor decision-making through mis-informed debate. The necessity for wide-ranging economic analysis of individual and societal costs associated with this plan has already been pointed out by the authors of the main economic report done thus far for HRWO when they said: "Using costs

as a measure of the suitability of alternative management plans is commonplace because of the *central importance of societal cost when designing environmental policy*".[10]

35. The rules should be designed to allow the greatest gains for the least cost. When all these gains have been realised, then the next cheapest options for making gains should be employed, and so on, either until the desired outcomes have been achieved, or the costs to individuals and the community of implementing the rules outweigh the benefits gained from them. As examples, it may be more cost-effective for a dairy farmer to pay a drystock farmer to retire land and plant trees to reduce sediment loads, and for the dairy farmer to be able to account for this, but mechanisms such as this ('offsetting') cannot be used by diffuse dischargers.

36. One of the key omissions from the economic analyses of Plan Change 1 is a detailed report on the impact on sub-regional, regional, and national economies of the proposed rules. Instead analysis contents itself with using loss of farm profitability and value added, and merely commenting about the potential social impacts of this, as a proxy. It is our opinion that this not only massively understates the true costs of HWRO, but severely understates the potential impacts of the proposed rules on individuals and communities.

37. Our initial submission outlined peer-reviewed overseas studies that indicate agriculture's contribution and importance to economic development is usually undervalued, as most reports normally fail to properly account for the backward and forward linkages with agroindustry, the services and trade sectors, and, in general, the rest of the economy. The key point is that agriculture's contribution to sub-regional, regional and national GDP can only really be understood if one takes into account the through-economy flows of money generated by the sector. Such flows begin on-farm with all the industries servicing the sector (such as farm machinery or accountancy services), and continue downstream. Farmers generating profits will spend some of such profits in their local and regional communities. The raw products they produce will then be taken and used by businesses, with profits (and wages) from these industries then also further spent in the community.

38. Economists term this the 'multiplier effect', where dollars earnt in one sector flow through the rest of the economy, and would argue that multiplier effects in primary sectors are larger than any other sector of the economy. While the economic modelling conducted for HRWO did look at some aspects of this – the 'value-added' impact of changes in on-farm profitability, we believe this understates the true impact of changes, as indicated in our initial submission. For every dollar gained or lost from the primary sector, we estimate that an additional $4-5 dollars will be gained or lost from the wider economy.[11]

[10] *Evaluation of scenarios for water-quality improvement in the Waikato and Waipa River catchments*, p7. Emphasis added.

[11] *More than food on the table: Agriculture's true contribution to the economy*, Inter-American Institute for Co-operation and Agriculture, p xv.

39. It is undeniable that the movement towards achieving water-quality improvement will have negative flow-on impacts in both the regional and the wider NZ economy, in terms both of jobs lost and the reduction in value-added – largely profits that would otherwise have been made by downstream industries, including processing, utility, retail, service, and transport sectors. The *Evaluation of scenarios for water-quality improvement in the Waikato and Waipa River catchments* identifies that achievement of just 50% of the water-quality goals outlined in HWRO with constrained land use would cost $221million in lost value-added, and lead to the loss of 2389 jobs in the Waikato region. The cost to the wider NZ economy of achieving these goals is estimated to be $438million and 4684 jobs.[12] If one considers simply the projected lost profits from farming, the reduction in value added, and the dollar value of the lost jobs in the Waikato region of achieving only 50% of the HRWO goal, this amounts to $500-550 million removed from the regional economy every year.[13]

40. Economic analysis for HRWO failed to take into consideration the dollar value of employment lost to the regional and national economy, and what the cumulative impact of these job losses would be. The below table indicates what additional impact this would have. Note that these figures do not account, as we believe they should, for a much higher multiplier effect, and that these are only modelled up to the point of achieving 50% of the water quality goals. Achieving 100% would come with significantly higher costs:

Annual Financial Impact of Achieving Scenario 1 Goals ($m)[14]			
Waikato Region			
	10% of S1	**25% of S1**	**50% of S1**
Reduction in farm profit	26	68	229
Reduction in value added	101	164	221
Value of job losses	50	82	100
Annual $$ lost to economy	**177**	**314**	**550**
New Zealand			
	10% of S1	**25% of S1**	**50% of S1**
Reduction in farm profit	26	68	229
Reduction in value added	212	339	438
Value of job losses	96	157	197
Annual $$ lost to economy	**334**	**564**	**864**

[12] *Evaluation of scenarios for water-quality improvement in the Waikato and Waipa River catchments*, pp39-45.

[13] Total estimate will differ based on average wages, but using 2015 average wage of $42000, this adds $100 million to the annual cost

[14] Figures taken from *Evaluation of scenarios for water-quality improvement in the Waikato and Waipa River catchments*, Tables 2, 13, 16, 17. Dollar value of job losses based on 2015 Statistics NZ average wage.

41. The WRC's *Waikato Regional Economic Profile* estimates the Waikato Economy to be the 4th biggest in the country, generating 8.5% of national GDP. NZ GDP in 2015 was $140 billion, and 8.5% of this is $12 billion. So to put the HRWO-modelled impact of this into perspective, a reduction of $550 million represents a 5% reduction in the size of the regional economy. And $550 million less income per year also substantially reduces the tax take, both at a national and regional level – so that means either higher taxes or a reduced level of services.

42. The assumption is made that long time-frames would be put in place to allow 'adjustment', but what is never considered in the analysis is what this adjustment might look like or the time-frames involved, both to individual stakeholders and the wider community. Certainly though, the adjustment period will be considerably shorter for those stakeholders in Priority 1 catchments.

43. The key point in all of this is not so much the economic costs in and of themselves, but that we had to make these calculations ourselves, using data from the WRC's own economic modelling done for PC1, but then adding in data and statistics from other reputable sources. This was done in order to give a clearer and more thorough picture of the true annual costs of PC1. But this only looked at costs to the agricultural sector and direct services. As such it doesn't go anywhere near far enough in examining the individual and sub-regional social and economic impacts of the proposed change.

44. Individual and community-wide social impacts of the proposed changes are not examined by the HWRO reports, except in very general terms. However, the way the rules are currently proposed, and the implications hinted at in the economic modelling in terms of where these impacts may fall, suggest that a much greater degree of social and economic modelling should have been conducted to inform the debate. This is particularly so given that community social and economic impacts will not be equitably spread, but inevitably will fall the heaviest on those communities heavily reliant on the agricultural industry. The work done for PC1 identified this as an issue, but no study was conducted that attempted to understand the sub-regional impacts:

45. "Communities that are already in decline, will be more affected by a decrease in jobs, which influence population decline and can have flow on effect of a loss of key services such as schools, healthcare, stores and shops... The dairy industry is the most affected by the large number of job losses in scenario 1, and people 18-40 years being important to some parts of the industry. So a loss in this sector may impact on this working age population in the area. This is especially so in the Upper FMU. How close a community gets to a tipping point will depend on how close it is now… impacting most particularly on Tokoroa and the surrounding areas, which has existing high levels of deprivation and so a change will have a compounding effect for that community".[15]

[15] *Integrated Assessment Two: Achieving water quality for swimming, taking food and healthy biodiversity. Assessment of Scenario 1 steps 10%, 25% and 50% from case 1 of modelling round two*, p8.

46. A reasonably well researched aspect of increased unemployment rates across the world is the impact that this has on the social fabric of communities, yet this aspect of the proposed rules has been untouched by the analysis done thus far. Again, it is about the community having a clear picture of the total costs and total benefits of proposed regulations. It is very difficult to make good policy without such information, plus with such information central and local government have a clear picture of the likely consequences and impacts, and so can begin planning to mitigate or minimise such impacts well ahead of time.

47. It is true that studies were conducted by the WRC that looked at social, environmental, economic and cultural impacts of the proposed rules. The difficulty we have with such studies is the methods used to express outcomes. In its report *Integrated Assessment Two: Achieving water quality for swimming, taking food and healthy biodiversity. Assessment of Scenario 1 steps 10%, 25% and 50% from case 1 of modelling round two,* a team assessed the impact of the Plan Change on some key social, environmental, economic, and cultural indicators, and ranked these on an impact scale of 1 to 5, with 1 being low impact and 5 being high impact.

48. The study found that there would be a negative impact on vibrant and resilient communities, with these impacts unevenly shared across the Waikato, and that the impact was ranked at -3 if achieving 10% of Scenario 1, rising to -4 at 100%. The study concluded that differing support measures would be critical to assist in the change and reduce unintended negative consequences.[16] Note however that further description of these potential unintended negative consequences followed, and no support measures of any kind have been taken into account in any of the economic or social modelling done thus far. Meanwhile, on the scale the authors developed, employment impacts ranked -4.5 on the +5 to-5 scale.

49. Obviously, these measures indicate negative consequences across a range of indicators, and the results of this study were used in the S32 analysis of the rules. Yet such information is effectively useless since it doesn't inform the community about actual, quantifiable costs. They have nothing against which to compare this rating scale. Effectively this means such reports are either disregarded or under-valued. What does -3 on a social scale actually mean for an individual community? What does an uneven share of impacts across the Waikato actually mean for individual communities?

50. How can this panel make recommendations to the WRC when none of us has a clear understanding of what this Plan Change will actually mean for the Waikato Community? That is why quantifying impacts in a language everyone can understand – usually dollars and cents – is so critical for a Plan Change with the potential for such wide-reaching effects.

[16] *Integrated Assessment Two: Achieving water quality for swimming, taking food and healthy biodiversity. Assessment of Scenario 1 steps 10%, 25% and 50% from case 1 of modelling round two,* p9.

51. As has been signalled by the analysis so far conducted by the WRC, achieving 100% of Scenario 1 will bring massive change to the face of the Waikato. Economic modelling suggested that in order to bring this about, a huge amount of land currently in pastoral agriculture – either sheep and beef or dairy – would need to be replaced with plantation forestry. This has potential implications for the wider Waikato regional economy, and New Zealand as a whole, purely from an amenity value perspective. This is an area that has not even been addressed by the analysis done thus far.

52. As currently written, the proposed rules will largely impact one sector – the agricultural sector. We are firmly of the belief that agriculture is, to a large degree, responsible for the degradation of water quality in the Waikato catchment (point source discharges, including industry, urban sewerage, and stormwater run-off, are the other key polluters), and thus must be responsible for its share of the clean-up costs. However, what this share equates to can only be understood if we also price the unpaid-for benefits from agriculture the wider community receives.

53. Those benefitting from an activity without paying for it are termed 'free riders' in economic terms. Diffuse sources of contaminants have, until now, effectively not had to pay for the environmental degradation their activities have brought about. PC1 is designed to address this issue in the farming community. Yet the flip side of that equation – the benefits that the wider community derives from agriculture without paying for it - have not been addressed at all. This is inequitable, simply because (notwithstanding water quality) the community has benefitted from agriculture in the region in the past. We have all been happy to accept these benefits but now only one sector is largely being asked to pay the costs associated with this development. What we don't know is the level of inequity because no attempt has been made to quantify the additional benefits derived from pastoral agriculture.

54. We are generally of the belief that the economic modelling that was done to inform this process was well conducted. However, we believe a few glaring errors were made that means the stated costs of HRWO in the modelling are severely understated.

55. The first issue is that analysis of the costs of mitigation included modelling mitigation practices as 'assets'. By doing so, the modellers were able to follow standard financial practice and, rather than expressing the up-front capital cost of this mitigation, instead convert this capital cost to annual equivalent payments at an interest rate of 8% over a payback period of 25 years (and included in this a maintenance cost component).[17] By definition an asset produces revenue over the lifespan of that asset (deemed to be 25 years in the model). However, no evidence was produced showing that such mitigation measures such as fencing waterways, riparian planting, or edge of field mitigation produces any additional revenue. As such this type of mitigation should instead be considered sunk costs and the capital costs of them not be converted to annual equivalent payments, with only the

[17] *Evaluation of scenarios for water-quality improvement in the Waikato and Waipa River catchments*,p10.

maintenance costs treated in such a manner. This would dramatically change the cost structure of the model.

56. The second issue to raise concerns the cost structures of mitigation technologies that were utilised by the model. These were not clearly spelt out. In particular, stream fencing costs will differ widely, depending on the calculation of how much fencing is required, and the costs associated with building a fence. Comments appeared in both the economic analysis and the S32 analysis to the effect that the per metre cost of such fencing was derived from WRC staff. With the greatest of respect we believe this information should have been derived from professional fencers. In terms of length of fencing, we have no way of knowing the accuracy of the data.

57. There are other cost areas that the analysis did not consider but should have been included in the modelling. While the report did consider the impacts of the costs of various mitigation activities on average farm profits, some costs were not considered. As an example, the cost of developing an average Land and Environment Plan – a requirement for all farms greater than 20 hectares under the proposed rules - has been estimated at close to $4700 per farm.[18] Potentially these plans will need to be re-done at regular intervals to both ensure they remain accurate and to account for changes in contaminant discharge rules. Then there are the ongoing transaction costs which were also not accounted for.

58. After the economic modelling was completed and initial submissions were due, an additional study, part funded by the WRC, was done to understand what the actual costs of implementing the various mitigation options would be. These varied wildly from farm to farm, dependent on topography, size, and stock classes utilised. The average implementation cost for sheep and beef farms was $138000, while for dairy farms this was $41000. However, some farms will have to spend upwards of $250000 (and some potentially more than $750000) under planned rules.[19] To put this into perspective, sheep and beef farm profits over the past 25 years, and after taking 2004-05 as the base year and adjusting for inflation were[20]:

    1990s average = $44800
    2000s average = $65100
    2010s average = $88200

59. In particular, this study attempted to quantify the costs to the average farmer at an individual level so that it was clearly understandable. The result being that the average sheep and beef farmer, in order to fully meet the requirements under the proposed rules (and these costs were largely due to fencing waterways and adding or extending reticulated water supplies), will have to forego nearly one and a half years of profit. To the best of our knowledge this study, while publicly available, was not widely disseminated. Again however,

[18] *Farm Environment Plan Project*, p5.
[19] *Farm Environment Plan Project,* Report to Waikato Federated Farmers prepared by Phil Journeaux of AgFirst Waikato, 4 November 2016, p5.
[20] http://www.beeflambnz.com/news-events/media-releases/2016/march/sheep-and-beef-farm-profits/

it points to the flaws in the original economic modelling. This is the type of information that should have been included in the original work.

60. The third issue is that the model never considered that farmers must be in a financial position strong enough that they are able to finance the cost of these mitigation measures in the first place. Expecting an individual to perform certain mitigations brings with it the presumption that they are able to pay for this up-front, but the pastoral sector is already one of the most heavily indebted in the entire economy. Some individuals may simply not be able to afford the expected costs of mitigations, and the banking sector's appetite to help fund such mitigations will not be great, particularly given that these will only be sunk costs.

61. This goes hand-in-hand with the fourth flaw in the economic modelling that was conducted – the failure to make an in-depth assessment of the impact on land values to both individuals and the community of the proposed rules. The S32 analysis of Plan Change 1 suggested that land values are driven by the highest value use, not actual use, and potential impacts could occur on land values for some industries.[21] However, no dedicated work was done by HRWO in this area. Yet such are the potential individual and community ramifications of declining land values that this is a major oversight that must be addressed urgently.

62. Potential change in land value:

Potential Change in Land Values Achieving 100% of Scenario 1 expressed in 2016 dollars [22]		
	$ billion	$ billion
	Current value	**Value at 100% of S1**
Dairy	17.248	2.703
Drystock	6.666	5.951
Horticulture	1.160	0.424
Forestry	1.440	4.017
Total Land value	**26.514**	**13.095**

63. The table above is a rough approximation of the impact of achieving 100% of the water quality outcomes of Scenario 1. The figures have been arrived at by taking average per hectare values for the various land uses in the Waikato catchment, and simply multiplying these by the current total hectares in use to arrive at current total value, and the expected hectares in each land use at 100% of Scenario 1 (with these figures expressed in 2016

[21] *Proposed Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments: Section 32 Evaluation Report September 2016,* p183.

[22] Figures derived from multiplying the hectares under each land use in both the current state and 100% of Scenario 1 contained in Figure 8 of *Evaluation of scenarios for water-quality improvement in the Waikato and Waipa River catchments* (p31), by per hectare farm prices reported by the REINZ and obtained from http://www.interest.co.nz/rural/resources/farm-sales. Note no reported sales of forestry blocks took place in the Waikato, so the national average was used. Note also that forestry block figures will contain not just bare but planted blocks, so the forestry land value at 100% of S1 almost certainly overstates the value of this land.

dollars). Note that these figures do not account for the impact of mitigation costs on farm profitability. If, as the economic modelling would suggest, farm profitability declines across the sheep and beef and dairy sectors, we would expect this to have a further negative impact on land values.

64. The key change between current value and value at 100% of Scenario 1 is the massive decline in total dairy farm values. This is due to the hundreds of thousands of hectares that the model suggests is necessary to be retired from dairying and shifted into forestry – a hectare of forestry land being worth only a fraction of that of a dairy farm. Overall, total agricultural land values will potentially halve in value.

65. As alarming as they are, these total values obscure the impact on individual landowners. To achieve 100% of Scenario 1 requires a massive change from high-discharging land uses such as dairying and horticulture into less intensive, and so less polluting, land uses such as sheep and beef and forestry. For an enormous number of farmers, this means farm values will plummet because they will now reflect a lower value land use. For comparison, imagine the impact on homeowners if they were told they faced a 50% decline in their house values.

66. The major problem with this is that even while land values decline, the amount of debt held by these landowners will, in all likelihood, increase. Average implementation costs on sheep and beef properties will be equal to 1.5 times their average annual profit, and these costs need to be paid up-front. Expecting farmers to be able to pay these costs based on cashflows is nonsensical. The vast majority will need to borrow to do so. The banking sector will baulk (as they should) if they are asked to finance mitigation actions at the same time as they will see declining equity values on-farm.

67. Equity levels plummeting while debt increases is not a good recipe for individuals or communities. While the HRWO has built in long time frames, supposedly to allow 'adjustment', we must consider how this adjustment would work. Imposing land use constraints in the short term impacts land that could otherwise move to a more intensive land use – the switch from sheep and beef to dairying for example. Currently this land is valued based on the higher value land use. Imposing constraints means land values will begin to drop to the lower value land use. In the longer term, when the HRWO plan is for unconstrained land use change, land values will also begin to reflect the profit that can be generated from that land. As all analysis conducted suggests large declines in on-farm profit, regardless of land use, this will also begin to be reflected in land prices.

68. The true cost to individuals and communities can only be calculated based on the costs imposed by proposed nutrient management regime, lost annual profitability and the decline in land values. Small datasets of this type of information are readily available through the experience of farmers farming under nutrient caps in the Lake Taupo and Rotorua Lakes

districts.[23] While these datasets need to be treated with caution because of their small sample sizes, analysis conducted by the WRC ignored these real-life examples of the financial impacts. Just as important is an analysis of the social impacts. Such decreases in equity puts severe mental strain on individuals, families, and communities. The risks that these pose have also not been addressed.

69. The fifth major flaw in the economic modelling conducted for HRWO is that the model, concentrating as it did on a simple input/output farm model, failed to include other costs to individuals and the wider public.

70. One cost that was not considered, but is of interest to everyone in the community, is the potential increase in rates that will be required. The amount that every ratepayer will be required to pay - whether urban or rural – will increase substantially. This is for two main reasons: the first is the impact of declining land values. The second is due to the additional reporting, monitoring, and compliance resources that will be required by the WRC if the proposed rules are implemented – with HRWO estimating a minimum of 16.5FTE employees will be required, to say nothing of the additional expense in systems to manage the information generated by the proposed regime. Neither the costs of this additional resourcing, nor the potential rates increase necessary to pay for this, have been considered in modelling.

71. The total capital value used for rates calculations in the WRC region is $120 billion, and based on this $41 million in rates was collected last year. Again based on land values, agricultural landowners would have contributed around 22% of this, or approximately $9 million (agricultural land values being around $26 billion). Based on the expected decline in land values this contribution would be expected to halve. This $4.5 million shortfall can only be made up by increases in everybody's rates. To make up the shortfall, rates would need to increase by an average of 10% for each of the 196000 ratepayers in the Waikato. However, given the large land value reductions that will be experienced by farmers, their actual rates bill, even after the rates adjustment, will probably end up a little lower than now, such is the decline they may experience in land values. Thus this rates increase will fall upon urban ratepayers, with actual increases probably closer than 15% per ratepayer – and this just to maintain current rates take.

72. These increases will not just occur to WRC ratepayers, but to all District Council ratepayers as well, with declining land values for farms having a much larger impact on ratepayers in those District Councils where rural capital values currently make up a large percentage of the total capital value. In these areas – such as the Waikato District Council or the Waipa District Council, the average rates increase across all ratepayers to account for the decline in farm land values and maintain current rates takes could be anywhere between 15-40%.

[23] For example, see such reports as: *The Lake Taupo Catchment Experience*, Beef and Lamb NZ, June 2015, or *The Effect of Environmental Constraints on Land Prices*, Phil Journeaux, AgFirst Waikato Ltd, or *Land Values in the Rotorua area and Lake Rotorua catchments*, Telfer Young Ltd, 2015. These (and others) all show the negative impact on land values of environmental constraints, particularly constraints on land use change.

Given the potential scale of the impact, this sort of information must be conveyed to the general public, but has been ignored by current modelling.

73. However, this doesn't even begin to consider the budgetary increases that will be necessary to collect, store, and manage the data associated with Plan Change 1, that will also impact on rates. A report for the WRC done by Dragten Consulting estimated the costs start at approximately $1.6M per year, and rise to approximately $3.0M per year by year 10. Full time equivalent staff numbers increase from 7.5 FTEs in year 1, through to 16.5 FTEs by year 10.[24] Thus at a minimum, an additional $3 million (or about a 7.5% increase) will need to be added to WRC ratepayer's bills. The S32 analysis also discusses the need for far more robust sets of data to inform decision-making as to the allocation of nutrients after the 10 year period is up. To gain this information the WRC will need to spend considerable sums of money gathering and analysing large data sets. This expense is nowhere to be seen in the various reports, but should also have been included.

74. The next issue with the modelling is that it never considered the impact of the rules on point source dischargers. Data from the Section 32 Evaluation Report suggests that point source dischargers (largely industry and urban centres), while only making up 2% of the land area contribute 7% of the total nitrogen and 18% of the total phosphorus[25] that enters the Waikato River and its tributaries. In any equitable contaminant discharge allocation scheme, these emitters will be required to massively decrease their contaminant discharges, which implies hugely costly upgrades of stormwater and wastewater treatment systems, with resulting impacts on ratepayers. Yet modelling never even considered these potential costs.

75. The last key oversight of both the HRWO economic modelling, and the S32 analysis conducted by the WRC, is the failure to undertake a detailed assessment of the financial benefit to the community of the proposed rules. It is not enough simply to state in words what the benefits (or costs) will be. Rather this must attempt to quantify, to place a dollar value, on these benefits – as required under S32(2)(b) of the RMA. Quantification of the likely benefits was conducted by the TLG and CSG. However, the results of this weren't even used in the economic analysis.

76. One report looked at recreation values that would accrue from achievement of the various steps along the path to Scenario 1, analysed the potential outcomes of achievement of HRWO, and concluded that there would be no change in recreation use even if 50% of Scenario 1 was achieved, and only at 100% of Scenario 1 was there an increase in their recreation indicator. Further, the report also concluded there would ultimately be no net

[24] *Healthy Rivers Wai Ora Plan Change 1. Regulatory Implementation Implications,* Report prepared for WRC by Dragten Consulting, 24 June 2016, p27.
[25] *Proposed Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments: Section 32 Evaluation Report*, September 2016, p60.

change for fish and eel populations, even at 100% of Scenario 1, while expecting little to no change in pest weeds and fish living in the rivers and their tributaries.[26]

77. In *Non-market values for fresh water in the Waikato region: a combined revealed and stated preference approach*, an attempt was made to place a dollar value on the increase in cultural and recreational values that would occur with improvements in water quality in the Waikato catchment.[27] This study determined that the total value derived from users of the Waikato and Waipa river systems was in the range $28-91 million per year if a 30% reduction was made in the total amount of nitrogen and phosphorus entering the rivers, and/or if median water clarity at Hamilton improved from 1.6m to 2.5m.[28] The report also detailed the number of other studies that have been conducted that attempt to measure the dollar value derived from the Waikato catchment, noting that a non-market value of $1376 per household per year was received. Of this, only 32% of the value to the community was made up in factors that the rural sector will be directly responsible for with the proposed Plan Change (fishing, swimming and water quality). However, an additional 35% of the value (landscape values, ecosystem health, and biodiversity) will be captured by the wider community as a result of the improvements made if achieving 100% of the water quality targets.[29]

78. This is worthy of additional study. Again, it speaks to the issues associated with 'free riders' mentioned in our submission above. The agricultural sector will be expected to pay the lion's share of the costs associated with achievement of water quality targets. However, by doing so the WRC expects that the rest of the community will receive benefits over and above those that the Plan Change is designed to address. This speaks to the equity of the proposed rules. Is it fair for one sector of the community to bear most of the costs of the rules if other sectors receive additional benefits from doing so? An equitable solution would suggest either the rural community should be able to recover these additional benefits in some way from the rest of the community, else the wider community must pay an equitable share of the expected costs (which would include the significant proportion of the community of Waikato catchment users that do not live in the region).

79. From an economic perspective, the reason we should attempt to quantify such things is all about the trying to decide on the most efficient allocation of resources. We need to understand where the breakeven point of environmental regulations lies – where the cost of one additional dollar invested in improving river health equals one dollar of benefit received by the community – and this is arguably the whole point behind Section 32 of the RMA. It is too easy otherwise to go round and round in circles arguing from one point of view or

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[26] *Integrated Assessment Two: Achieving water quality for swimming, taking food and healthy biodiversity. Assessment of Scenario 1 steps 10%, 25% and 50% from case 1 of modelling round two*, p15-37.
[27] *Non-market values for fresh water in the Waikato region: a combined revealed and stated preference approach,* Waikato Regional Council Technical Report 2014/17, pvii.
[28] *Non-market values for fresh water in the Waikato region: a combined revealed and stated preference approach*, pix.
[29] *Non-market values for fresh water in the Waikato region: a combined revealed and stated preference approach*, p4.

another, but bald figures of costs and benefits (backed up by robust peer review of how these were derived) are much harder to simply ignore.

80. From the current research conducted for HRWO, the maximum level of identified benefits at 100% achievement of water quality objectives is valued at approximately $90 million per year. Even forgetting for a moment those cost areas identified in this submission as having been left out of the analysis of total costs, the economic modelling identifies lost farm profits alone totalling more than $700 million per year. We believe that such a situation would be incredibly wasteful of resources. To draw an analogy, would you spend $7 on a good that you only receive $1 of value from?

81. The WRC had the opportunity to put what cost modelling it had done alongside the modelled benefits of improved water quality, to allow a direct comparison between the two. This would have allowed the wider community to easily weigh up the costs and benefits, and thus to come to a considered judgement. This has not been done up to this point.

82. S32(2)(a) and (b) of the RMA demands that the WRC not only identifies and assesses the costs and benefits of the environmental, economic, social, and cultural effects of the proposed rules, but also it is required to quantify these costs and benefits. As our submission shows, the WRC has only done a small part of this job so far.

83. At some point in the future we will reach a plateau where it doesn't matter what mitigation is conducted, no further water quality improvements will be possible with current technologies regardless of spend. "Further mitigation may be possible in some locations in the catchment, but it will not help attain further water-quality improvements. This highlights the limited efficacy of some mitigations; for example, the limited tools available for reducing *E.coli* incidence."[30]

84. This points towards two key ideas: firstly, that we should account for the diminishing marginal return from mitigation actions; secondly, that we should also be concerning ourselves with the efficient allocation of resources – in other words, are the costs assessed in the model to implement the proposed rules the most efficient way to spend this money? Will the community achieve the maximal return from the dollars expended or are they better directed elsewhere? If we will receive a better outcome someone else, then do we need to think about changing the proposed rules?

85. It is this second question, in particular, that the modelling fails to answer. In so doing it again fails the requirements under S32(1)(b) and (c) of the RMA. As an example, some farmers (particularly those on extensive sheep and beef farms) under the proposed rules will be forced to spend huge sums of money expensively fencing off waterways – in some cases into the hundreds of thousands of dollars. Yet it may be that for a fraction of this cost they could contribute to some other form of mitigation, potentially not even on their own property,

[30] *Evaluation of scenarios for water-quality improvement in the Waikato and Waipa River catchments,* p18.

that would achieve the same, or better outcomes, yet this is not allowed for under the proposed rules.

86. The rules that are developed to achieve the water quality targets, both those in Plan Change 1 and in any further plan changes going forward, should aim, as much as possible, for the most efficient allocation of resources. We know that as we get further along the water quality spectrum towards Scenario 1 that the cost to achieve a one unit improvement in water quality will increase – we experience diminishing marginal returns. What we don't know is whether the rules as they are currently expressed achieve the best return from the dollars spent, because none of the mountain of reports conducted for HRWO even considered this – and yet this is a legal requirement on the WRC under the RMA.

87. Such an analysis necessarily needs to start from a perspective of what exactly needs to occur if Scenario 1 water quality goals are to be met (which also requires these goals are defined properly). Then all possible mitigation or attenuation possibilities must be examined from a cost perspective. After this has been completed that we then have the ability to choose the best options that achieve the various steps towards our water quality goals. It is only after this that the final step, to frame rules and regulations that will achieve this, should be taken.

88. To conclude, there have been no estimates or modelling of the equity of the proposed rules, and the modelling of costs of the rules have significant blanks. This includes: ongoing costs to ratepayers of the policy and likely effects; impact of social costs on rural communities; impact of social costs on rural service towns; impact on land values and resulting viability of farm businesses given the historically high debt levels in the pastoral sector; expected levels of rates increases; and impact on the regional economy. Because of these oversights, both the economic modelling done for HRWO and the S32 analysis conducted by the WRC have not met the level required under the RMA given the scale and significance of the proposed rule changes.[31]

89. Currently, we know the goals we want to achieve. However, we have not examined the costs of all potential mitigation and attenuation possibilities. Due to its incompleteness, we also have seriously flawed economic and social data. This gives us no ability to truly differentiate between the various options that will achieve our goals, or to make informed decisions about which options give us the most equitable and optimal outcomes. We also have no understanding of the trade-offs we will all be forced to make in order to achieve our goals. With the greatest of respect, this is a ridiculous position from which to frame rules and regulations that will determine how we, our children, and our children's children, will live.

[31] Cf PC1-8688, Summary of Decisions Requested to Proposed Waikato Regional Council PC1.

Section 32

91. The key idea behind Section 32 of the Resource Management Act, and the reason Regional Councils are required to prepare and publish an Evaluation Report, is the idea of trade-offs. Win-win solutions, particularly regarding the environment, are rare. Far more often individuals and societies are required to make decisions to try and achieve a balance between two desirable but incompatible features. We are required to make a compromise, to trade the benefits (or costs) we receive from one option off against the benefits (or costs) we receive from the other.

92. In order to make the best or the most favourable trade-off – the one where the most value (or least cost) is gained - both individuals and societies require a clear idea of what it is they are trading off. As an example, the response to any survey that asks people the simple question: "would you like better water quality?", will be yes. In this question, nothing is being traded, respondents only see a benefit, so the answer is easy. However, if the question is: "would you like better water quality, but the cost to you annually will be $1000?", then all of a sudden not only are you requiring people to make a trade off, but you are giving them a clear idea of what this trade-off entails.

93. The better that the detail of the transaction is understood, the better individuals and society are able to weigh up the positives and negatives of each outcome – for example an even better question would be: "if you pay nothing, water quality will not change, but if you pay $100, water quality will improve by 25%, if you pay $500 water quality will improve by 50%, and if you pay $1000 water quality will improve by 80%. Which option offers you the best compromise?"

94. The quality of the information presented will determine the quality of the decision that is made. Plan Change 1 presents us with a trade-off: on the one hand we will benefit from better water quality. On the other hand achieving this will only be at a cost. Section 32 of the RMA describes how a Council should go about assessing these benefits and costs - and it is important to mention that S32 specifically states that these costs and benefits should be quantified, which means they should be measured and then expressed in terms that enables an easy comparison. If you want a community to make informed decisions, this measurement should be in a language that all members of the community understand. This is the reason we believe that, where possible, all costs and benefits of the proposed plan should have had a dollar value assigned to them.

95. We have detailed some of the areas where analysis for this Plan Change should have been conducted. Effectively the WRC has not given the community all the information it requires, in a readily understandable form, that allows a fully informed decision about the trade-off between the benefits of improved water quality and the costs of doing so. Even the way the rules themselves have been drafted have been influenced by this lack of quality information.

96. If the wider community truly values high quality water, then the consequences of rules required to achieve this will be that additional investment will be required in stormwater or sewerage treatment that costs ratepayers more, and that the production of vegetables, dairy, meat, or indeed many other products will be compromised in some way forcing up prices, and that a particular sector or sectors will see job losses. This is simply the cost to achieve our community goals. However, it cannot be understated just how important it is that the community understand what these costs will potentially be.

97. Thus it is our contention that in their s32 Report the Waikato Regional Council has failed to provide either individuals or the wider community the quality of information that is required to make a good decision on PC1, especially in light of the scale and potential significance of the effects that should have been anticipated if the proposals are implemented. This is even more so if one considers the full implications of Healthy Rivers Wai Ora.

98. The wider community must understand the true costs and benefits of the trade-offs involved in this Plan Change. The development of data and information that allows people to understand these trade-offs is the true intent of Section 32 of the RMA. The only conclusion that can therefore be made is that the WRC has not yet completed its statutory requirements under the RMA.

99. As part of the S32 analysis performed in accordance with the Resource Management Act 1991, the WRC assessed the effectiveness of the options in achieving the objectives of the proposed Plan Change. The key criteria of effectiveness, as identified by the WRC to be used for this assessment, were assessing the level of equity and the fair distribution of impacts of the proposed rules, and in addition ensuring the proposed rules allowed for flexibility and intergenerational land use.[32] However, this is one of the key holes in the S32 analysis. Nowhere in the analysis is a discussion of where the main impacts would fall, whether this was a fair distribution of these impacts, or whether this was equitable. In fact, the CSG's policy selection criteria, noted in *B.9.2 Appendix 2* of the S32 Analysis does not mention equity or the distribution of impacts at all.

100. Another key failing of the S32 analysis is that, aside from minor references only, it does not assess the economic implications of the current proposals or the long term implications of HRWO. As noted in this submission, the Report also does not attempt to put a dollar value on the environmental, social, and cultural value derived vs the social and economic cost of the proposed rules, despite some of this information being available through the various reports commissioned by the CSG and TLG.

101. One of the requirements of the RMA is that any evaluation report must contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposed Rule

[32] *Proposed Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments: Section 32 Evaluation Report September 2016,* p7.

Change. Given the huge impacts Plan Change 1 will have, with economic modelling predicting up to $800 million wiped from annual farm profits to achieve the objectives desired by HRWO, the level of detail contained in the S32 analysis does not meet either the standard required by the RMA, or that required by the WRC itself. This submission has attempted to identify the areas where more detail is required. Other areas where we believe the S32 Report is substandard are discussed below.

102. The S32 Report noted: "There will need to be more information gathered and technology developed in order to be able to set limits and targets at a property level. Therefore the first stage is realistic for landowners to start understanding and make social and economic changes for the future."[33] However, one of the issues is that the proposed rules will set targets and limits at a property level. Admittedly these will, in all likelihood, not be the final limits. Nevertheless it is difficult to reconcile a report that notes it needs more information to be able to set targets, and rules that do exactly that.

103. The S32 Report failed to adequately assess the efficiency of the proposed rules against the desired objectives. Efficiency, at least in economic terms, is about the best outcome with the least dollars spent – effectively meaning a cost comparison between different potential policy options and those that are proposed. Nowhere in the S32 Report is this analysis to be seen.

104. Objective 2 is to maintain social, economic, and cultural well-being in the long term. All the modelling done thus far would suggest that economic well-being will not be maintained in the long term, but will instead be hugely degraded. And while the whole community is expected to be impacted to some degree, the financial costs will largely fall on a small minority of the community. Objective 4, that being people and community resilience, will be severely degraded in some areas.

105. The modelling suggests that the environmental benefits that will accrue will be massively outweighed by the economic costs, with these being more than 700% greater than the expected social benefit. No modelling has been conducted on the social costs of the expected large job losses that will occur, largely in smaller communities in the Waikato region, where the potential impact could be devastating. While the reports do consider the need to allow for a staged approach to enable people and communities to undertake 'adaptive management', the S32 Report did not outline what this might look like, or the costs of doing so.

106. The most appropriate mitigation actions are those that will be water quality-effective and cost-effective, both socially and economically. This is the key area where the proposed rule changes as they stand fall down, and thus the key failing of the S32 analysis conducted by the WRC. As an example, by explicitly stating that all farmers must fence off all waterways,

[33] *Proposed Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments: Section 32 Evaluation Report September 2016,* p87.

the rule changes, while meeting the requirement of water quality-effective, does not meet the bar of cost-effectiveness.

107. The intent of taking a staged approach to water quality improvements recognises there is a need to move forward with some caution in light of gaps in current knowledge. The S32 Report acknowledges this is so, but despite the clear paucity of data as to the efficiency and cost-effectiveness that fencing off small streams and drains on steeper hill country will have on water quality outcomes, but clear knowledge that this would be an expensive proposition for many hill country farmers, this is the only hard-and-fast rule that has been selected. Little or no assessment of the viability and effectiveness of other options was considered.

108. Rules, and any allocation of nutrients, must be based on hard data, and is a key policy of HRWO. The S32 Report noted that in order to prepare for the future, information had to be collected and research undertaken to support this allocation, as there currently exists a paucity of hard data on which to base any proposed allocation scheme, or, for that matter, the proposed rules covering the next ten years.

109. The S32 Report identified where the information gaps lie, yet failed to outline the programme of work involved that would be required over the next ten years to fill in these holes, and the costs associated with this work. This oversight needs to be corrected as quickly as possible, firstly to enable a more accurate picture of costs associated with the proposed rule change, secondly to assess how impacted parties will respond to the potentially massive change thrust upon them, and thirdly to assure all stakeholders that any resulting allocation scheme will be based on fact-based information. It is only with such information on board that realistic assessments can be made and rules formatted that will achieve the desired outcomes at least cost to individuals and communities.

110. As another report noted: "Baseline loads of each contaminant vary by sub-catchment and FMU [Freshwater Management Unit]. Cost-effective mitigation relies on implementing diverse mitigation strategies to differing degrees for different contaminants across space."[34] Until we understand the scale and scope of the problem at a sub-catchment level, we cannot use a one-size-fits-all rules approach, because differing catchments have different needs, and differing mitigations will work differently in different catchments. We must first gather the information, understand what the problem is, then implement strategies that offer the most cost-effective mitigation.

111. Section 32(1)(c) of the RMA states that any s32 evaluation report must: "contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal." Section 32(2) states that this assessment must identify and assess all benefits and costs and, where practicable, quantify these benefits and costs. This submission has attempted to quantify these costs and benefits and have concluded that they are of such a potential magnitude

[34] *Evaluation of scenarios for water-quality improvement in the Waikato and Waipa River catchments*, p57.

and scale as to demand a full review of the modelling that underpins the S32 Report. This modelling currently is sub-standard and does not match, to any extent, the potential scale of the impacts of HRWO. Therefore, we do not believe that the s32 Evaluation Report conducted for Plan Change 1 has met the standards laid out in s32 of the RMA, and therefore that a further s32 Report must be commissioned that does meet these standards.

FMUs and sub-catchments and Section 3.11

112. The Mangaheka sub-catchment, of which our property forms a part, has been placed in with the Waipa at Waingaro Road Bridge sub-catchment. This sub-catchment contains numerous sub-sub-catchments, on both sides of the Waipa River. It is difficult to see how water quality monitoring conducted at the Waingaro Road bridge will be able to determine the effectiveness of mitigation efforts in a group of sub-catchments like our own. Potentially, efforts to mitigate contaminants in the majority of these sub-catchments could be over-whelmed by lack of efforts in other sub-catchments. Even if all farmers are farming to their individual FEPs, we will struggle to identify which are the problematic areas within this sub-catchment group since they are not being monitored individually.

113. The 52 water quality monitoring sites are fine if all you are interested in is describing current state and trends in water quality. However, if you want to understand the impacts of mitigations at an individual or sub-sub-catchment level, then this type of monitoring is inappropriate. Yet this type of monitoring is important. Ideally representative sub-sub-catchments would be chosen throughout the various FMUs, and effectively used as test beds for the impact of current and future mitigations, with water quality trends closely monitored. The WRC could then take the results of these and feed them into the Overseer model to improve its accuracy under Waikato conditions, with lessons learned from the mitigations promulgated amongst the wider community.

114. While we agree with the Officers view at p143 of S42A that focusing on sub-catchments risks taking the 'eye off the prize', we think this is a risk worth taking. It is only at sub-catchment level that mitigations will be put in place to achieve whole-of-catchment water quality goals. Officers use the example of a constructed wetland at p138 where pooling resources among different groups may lead to a more effective and less costly outcome than mitigations done on their own properties. However, rules as they are currently written would not allow individuals to include this wetland in their FEP, and certainly Overseer as it currently operates would not be able to adjust for this wetland in individual farmer files.

115. We are generally not supportive of a sub-catchment approach to setting appropriate water quality limits and targets, or of those submissions that seek to replace FMUs with sub-catchments. We believe that this would demand too much of the WRC from a regulatory management perspective as it would be very complex to understand and manage, and so support the Officers recommendations at p487. However, we are very much in favour of the WRC concentrating on chosen sub-catchments from an operational and data-gathering and disseminating perspective. We believe that the supporting documentation to PC1 should include information to this effect.

116. We agree with the Officers' comments at p488 of the S42A Report not to recommend the relief sought by Oil Companies. The achievement of water quality goals will take a concerted effort from all parts of the community over long time frames. PC1 does not predominantly apply to farming activities – on a per hectare basis, far and away the worst contaminant discharges into our waterways come from urban and industrial sites. Point

source discharges take up less than 1% of total land area, but contribute 7% of total nitrogen and 16% of total phosphorus entering our waterways (to say nothing of the heavy metals, hydrocarbons and other pollutants that find their way into water). We are all in this together.

117. We also agree with the Officers rejection of the submission point from DoC and WRC that all lakes within the region are identified by an FMU (p491). Key lakes within the catchment have already been identified. Failure to do so risks perverse outcomes. For example, given the broad definition of a lake in the RMA, it is entirely conceivable that a detention pond, built specifically for the purposes of trapping sediments and other contaminants before water is slowly released, would no longer be able to be constructed. This would therefore remove a proven mitigation technique from the toolbox.

Matters agreed:

118. We agree with the proposed amendments to Section 3.11-1 set out at p630 of the S42A report.

119. We agree with the Officers at p262 not to include the new value proposed by Hamilton CC and Watercare. We agree in particular that the rivers are not always an appropriate receiving environment, particularly for un-treated waste or stormwater.

120. We agree with the proposed amendment to Objective 1.

121. We agree with the proposed amendment to Objective 5.

122. We agree with the Officers preference to delete Objective 6 and instead rely on Objectives 1 and 3 to ensure the Whangamarino wetland is protected.

123. We agree with the Officers recommendation to not include any new objectives in PC1 – we have more than enough to be going on with!

124. We agree with all amendments to Chapter 3.11 contained in pp495-497. We further agree with the officers recommendations at p488 to not accept the relief sought by the Oil Companies. We are all in this together.

125. We agree with the proposed amendment to Policy 14 (p651).

Matters disagreed:

126. We disagree with the Officers comments at p285. Only some of the costs have been 'recognised' and even then not all of these have been quantified. The modelling undertaken is woefully insufficient given the import to individuals and the wider regional economy. For the reasons we have already outlined, this runs contrary to the requirements of s32 of the RMA. Further, because of the lack of adequate modelling, this has meant both the CSG, TLG, and the wider community have not been able to make truly informed decisions about PC1.

127. It is our contention that in their s32 Report the Waikato Regional Council has failed to provide either individuals or the wider community the quality of information that is required to make a good decision on PC1

128. We disagree with the Officers comments at p288 when they describe the modelling as 'fit for purpose' and that it meets the requirements under s32 of the RMA.

129. We disagree in part with the proposed amendment to Objective 2. In particular, we believe the *Reasons for adopting Objective 2* should be retained, as we do believe it provides additional clarification about how the outcomes will be achieved, and the duty of the WRC to minimise social disruption during the transition.

130. We disagree in part with the proposed amendment to Objective 3. In particular, we believe some of the *Reasons for adopting Objective 3* should be retained. Doing so adds clarification to the objective and defines how the Objective will be achieved.

131. We disagree with the proposed amendment to either delete Objective 4, or otherwise to amend it as per p423 of S42A, excepting that we would retain certain parts of the proposed amendment where clarity is improved. We disagree with the Officers comments that the Objective does not describe an outcome or future state and so should be deleted. Rather we believe that the Objective places both individuals and the Regional Council on notice that while we need a staged approach to ensure the least possible dislocation, at the same time we must all recognise that future plans will need to address the need for further contaminant reductions. Further, it signals to the WRC of the need in this first stage to begin developing the frameworks under which contaminant discharges will be managed in future plans and signalling this to stakeholders, which then allows stakeholders to begin preparations for this future state. Even though we are of the firm belief that the WRC should have conducted much better economic and social cost modelling for PC1, this Objective also gives them 'wriggle room' to allow this modelling to be conducted during PC1 timeframes.

132. We disagree with the Officers comments at p552 that water quality targets should not be included in Table 3.11-1 for sites that do not have current data. The WRC has committed to set up and monitor all 74 sub-catchments, and will therefore soon be able to establish

current states of each contaminant. Even without knowing what possible reduction in contaminants may be required, individuals and communities deserve to know, at the very least, what the 80-year target is.

133. We disagree with the assessment of the officers at p612 that Table 3.11-1 not be amended to remove visual clarity as a measure and replace it with a more appropriate measure. We accept that clarity is seen by the general public as a measure of perceived "swimmability". However, sediment loads are not a good indicator that mitigations are being put in place to improve water quality. Indeed, water clarity will potentially get worse because of mitigation, and not see improvements for decades. Further, sediment loads from farms make up only one part of total sediment, which itself is only one contributor to visual clarity.

Appendix I: Relief Sought

134. What constitutes a water body must be defined in PC1. We suggest using the same definition as that used in the National Policy Statement for Freshwater, that being: *a continually flowing waterbody with a bed of one metre width or greater*.

135. PC1 should note a commitment from WRC to improving the dataset that underpins Overseer, and that, when new versions of the program become available, these will be used.

136. We seek the following commitment from WRC: *Within two years the WRC will complete further analysis of the full economic and social costs and benefits of HRWO. Social analysis must include quantification of the likely costs and benefits at both a sub-regional and regional level, including assessment of the sub-regional social and financial impact of job losses. Economic analysis must also include an analysis of the impacts on land values, rates implications for both WRC and District Councils, employment, and a more thorough analysis of the total costs of HRWO. This includes not just better modelling of on-farm costs, but the likely cost implications of potential improvements to point source dischargers, including upgrades to waste- and storm-water systems that industry and urban centres will be required to make to achieve water quality objectives.*

137. *The Section 32 Evaluation Report be re-done by the WRC following a thorough and complete analysis of the likely social and economic costs of PC1 and HRWO as detailed in p134 above.*

138. The amendment to Objective 2 should be accepted in part. We would like the *Reasons for adopting Objective 2* to be retained.

139. We disagree in part with the proposed amendment to Objective 3. In particular, we believe some of the *Reasons for adopting Objective 3* should be retained. We believe this Objective should read:

Actions put in place and implemented by 2026 to reduce diffuse and point source discharges of nitrogen, phosphorus, sediment and microbial pathogens, are sufficient to achieve the short-term water quality attribute states in Table 3.11-1.
Reasons for adopting Objective 3:
Objective 3 sets short term goals for a ten year period, to show the first step toward full achievement of water quality consistent with the Vision and Strategy. The effort required to make the first step may not be fully reflected in water quality improvements that are measurable in the water in 10 years. For this reason, the achievement of the objective will rely on measurement and monitoring of actions taken on the land to reduce pressures on water quality.

140. We believe Objective 4 should be retained, and not deleted, and that some but not all of the amendments should be accepted (see our reasoning above in Matters Disagreed). We believe it should read as follows:

A staged approach to reducing contaminant losses enables people and communities to continue to provide for their social, economic and cultural wellbeing in the short term while:

a. *Taking action to achieve the attribute states for the Waikato and Waipa Rivers in Table 3.11-1; and*
b. *Recognising that further contaminant reductions will be required by subsequent regional plans and signalling anticipated future management approaches that will be needed in order to meet Objective 1*

Reasons for adopting Objective 4

Objective 4 provides for a staged approach to long term achievement of the Vision and Strategy. It acknowledges that during the 80 year journey, the first stage must ensure that overall costs to people can be sustained. In the future, a property level allocation of contaminant discharges may be required. Objective 4 seeks to minimise social disruption in the short term, while encouraging preparation for possible future requirements.

141. Supporting documentation to PC1 should include a firm plan from the WRC of the approach it will take to improving the dataset that underpins the Overseer model (in particular what impact current mitigation techniques have on contaminant discharge that are not currently included in the model), and how this will be achieved by 2026, including a commitment to updating the model ahead of PC2.

142. Table 3.11-1 should be amended to include water quality targets for each attribute for each site.

143. Table 3.11-1 should be amended to remove clarity as a measure and replace it with a more appropriate measure.