

**BEFORE COMMISSIONERS APPOINTED
BY THE WAIKATO REGIONAL COUNCIL**

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of the First Schedule to the Act

AND

IN THE MATTER of Waikato Regional Plan Change 1- Waikato and
Waipā River Catchments and Variation 1 to Plan
Change 1

AND

IN THE MATTER of submissions under clause 6 First Schedule

BY **JAMES GORDON LIVINGSTON REEVES AND
AMY LOUISE TAYLOR**
Submitter

**STATEMENT OF EVIDENCE OF JAMES GORDON LIVINGSTON REEVES
BLOCK 3 - 5 July 2019**

Preamble

1. Thank you again for this opportunity to address the Hearings Panel. Forgetting the subject matter for a moment, we would firstly like to take the opportunity to acknowledge the respect and empathy shown to us by the Commissioners during this process.
2. We would like to change things up a little, and start with a short powerpoint presentation that is a pictorial look at stock exclusion from a practical perspective – showing a couple of different sites on our property and how they are managed. As to our Block 3 Evidence, we have taken a slightly different approach to that of earlier Hearings. We have tried to avoid diving into the detail of the Policies and Rules that we covered in Blocks 1 and 2. Rather, we have chosen to take a birds-eye perspective of PC1 – to examine PC1 in light of the goals of both the Vision and Strategy, and the Plan Change itself, and to attempt to be as objective as we can in the process.
3. The Vision and Strategy, underpinned by the 2010 Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act and the 2012 Ngaa Wai o Maniapoto (Waipa River) Act, is to restore and protect the health and well-being of the Waikato and Waipa Rivers. The Vision is “for a future where a health Waikato River sustains abundant life and prosperous communities who, in turn, are all responsible for restoring and protecting the health and wellbeing of the Waikato River, and all it embraces, for generations to come.”¹ The ultimate measure that the Vision and Strategy has been achieved is that “the Waikato river will be safe for people to swim in and take food over its entire length.”²
4. A number of objectives were developed from the Vision and Strategy, among them:³
 - The strategic importance of the Waikato River to New Zealand’s social, cultural, environmental and economic wellbeing is subject to the restoration and protection of the River.
 - The Waikato River is degraded and shouldn’t be required to absorb further degradation as a result of human activities
 - Requiring caution about any decision that, in particular, may result in serious or irreversible damage to the Waikato River, but otherwise may result in adverse impacts
 - To recognise and avoid the adverse cumulative effects, and potential cumulative effects, of any activities undertaken within the Waikato and Waipa River catchments.
5. To achieve the Objectives, a number of strategies were required to be implemented, including:
 - Establishing the current health status of the River
 - Developing targets for improving the health and well-being of the River
 - Developing and implementing a programme to achieve these targets
 - Encouraging and fostering a ‘whole of river’ approach
 - Ensuring that cumulative adverse effects on the River of activities are appropriately managed in statutory planning documents

¹ *Vision and Strategy for the Waikato River*, Waikato River Authority, p4.

² *Vision and Strategy for the Waikato River*, Waikato River Authority, p2.

³ *Vision and Strategy for the Waikato River*, Waikato River Authority, p6.

6. On this basis, Plan Change 1 (PC1) was developed. PC1 proposes the beginning of what promises to be a series of changes in Regional Plans over an 80-year timeframe, designed to achieve rivers that are “swimmable in all seasons for microbes and clarity. Water quality supports ecological health.”⁴ PC1 is designed to cover an initial ten-year timeframe, and has as its goal:

“Preparing for future requirements on what can be undertaken on the land, with limits ensuring that the management of land use and activities is closely aligned with the biophysical capabilities of the land, the spatial location, and the likely effects of discharges on the lakes, rivers and wetlands in the catchment....[and] to put in place and implement the range of actions in a 10 year period that will be required to achieve 10 percent of the required change”⁵

7. Policies and rules developed for PC1 have been aimed squarely at reducing contaminants from diffuse sources – in the main pastoral agriculture and commercial vegetable production. It is proposed that municipal and point source dischargers will be required to review their discharges when their current consent terms expire. The intent is to require all resource users to make a start on reducing contaminant discharges, for the WRC to monitor progress, and then to use this (and other) information to inform any future potential allocation of nutrients.
8. PC1 developed six Objectives, and from this various policies and rules that are designed to achieve these Objectives. Accompanying this, a Section 32 Evaluation Report (S32) was conducted. The S32 required that the provisions of the plan needed to be both effective and efficient. To be effective the provisions needed to have a level of equity and a fair distribution of the impacts, while also allowing for flexibility and intergenerational land use. To be efficient it had to identify the environmental, social, economic and cultural costs and benefits, and must aim to optimise environmental, social, and economic outcomes.⁶ Meanwhile, it was deemed important that the provisions also be proportional, where those contributing the most to the problem should also contribute the most to solving it.⁷
9. In summary, the Policies and Rules of PC1 must deliver on the Objectives and Strategies laid out in the Vision and Strategy document. They need to be manageable for the WRC to implement. They must be fair. They must be equitable. They must be proportional. They must meet the goal set out for the initial 10-year timeframe of PC1. They must optimise, as much as possible, environmental, social, and economic outcomes. Finally, they must prepare the way for potential property-level allocation limits in Plan Change 2 in 2026. Will they achieve these outputs? The remainder of this document is dedicated to answering this question.

⁴ *Evaluation of scenarios for water-quality improvement in the Waikato and Waipa River catchments*, p15.

⁵ *Proposed Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments*, p10.

⁶ *Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments Section 32 Evaluation Report*, Waikato Regional Council, 2016, p7.

⁷ *Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments Section 32 Evaluation Report*, Waikato Regional Council, 2016, p171.

“...during the first stage of Plan Change 1 implementation local and regional communities have the ability to provide for their social, cultural and economic wellbeing, and that any mitigation actions undertaken are both cost-effective and water quality- effective.”⁸

Pricing the Environment – Who Pays?

10. To examine whether the proposed PC1 will achieve all its specific outcomes, it is necessary to understand what it is this Plan Change is actually trying to do. From an economics perspective, PC1 is trying to price environmental degradation, and then determine who should pay the price to improve the situation. This is the theory of externalities, and it is worth stepping back and examining the theory in light of the Policies and Rules of PC1.
11. Simply put, an externality is either a cost or a benefit impacting a third party (or parties) who did not choose to incur that cost or benefit. As a consequence, this cost or benefit is not priced. In recent decades, particularly as awareness of our impact on the environment has come to prominence, so too have attempts at internalising the impact of these externalities.
12. Difficulties arise not just trying to price externalities, but then to have the person responsible for the externality either pay for the cost of the externality, or receive payment if the externality is a benefit. In general, the preferred method is to tax the producer of a negative externality and use this money to fix the issue, or to tax the person(s) receiving the benefit and transfer this money to the producer.
13. The seminal paper describing how to approach externalities was written by R.H. Coase, titled “*The Problem of Social Cost*” and first published in 1960.⁹ He defined a new approach to the issue, and explained how we had approached the problem from the wrong direction:
14. *“The traditional approach has tended to obscure the nature of the choice that has to be made. The question is commonly thought of as one in which A inflicts harm on B and what has to be decided is: how should we restrain A? But this is wrong. We are dealing with a problem of a reciprocal nature. To avoid the harm to B would be to inflict harm on A. The real question that has to be decided is: should A be allowed to harm B or should B be allowed to harm A? The problem is to avoid the more serious harm... To give another example...[imagine] the contamination of a stream. If we assume that the harmful effect of the pollution is that it kills the fish, the question to be decided is: is the value of the fish lost greater or less than the value of the product which the contamination of the stream makes possible.”¹⁰*
15. In the case of Healthy Rivers, the issue of externalities and how they should be dealt with is complicated by the legislation that underpins the Vision and Strategy. Mr Coase would argue that to ensure the most efficient allocation of resources as

⁸ Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments Section 32 Evaluation Report, Waikato Regional Council, 2016, p96.

⁹ R.H.Coase, *The Problem of Social Cost*, The Journal of Law and Economics, Vol III, October 1960, pp1-44.

¹⁰ R.H.Coase, *The Problem of Social Cost*, p1.

well as dealing with the issue of water quality in the catchment, two questions must be answered:

- 1) is the value of the degradation of water ways in the Waikato and Waipa River catchments greater or less than the value of the products, produced by agriculture, horticulture, urban and rural-based industry, and the investment in regional infrastructure made possible via taxes paid by these industries, which the degradation of the waterways has made possible?
 - 2) is the value of the additional ecosystem services provided by agriculture – landscape amenity values of benefit to both New Zealanders and international tourists – greater or less than the value that would have otherwise been derived if these were not present?
16. The Vision and Strategy demands that we must improve water quality in the Waikato catchment. We argued in our original submission (at pgs 22-23) that the WRC's own analysis, flawed though we believe it to be, had identified that the loss in profits alone to the pastoral sector would potentially top \$700 million, while the additional value derived from achieving 100% of the Vision and Strategy would be \$100 million. Using Coase's method, to avoid the more serious harm we should wait until the harm done by the various sectors is outweighed by the value derived from improved water quality (with the knowledge that further degradation would probably see water quality more highly valued by the community, and that it is entirely possible that the community currently undervalues water quality).
17. However, the legislative back-drop and the Vision and Strategy itself demand that, effectively regardless of costs and benefits, we must improve water quality. Thus question 1 above requires re-framing, and needs to read something along the lines of: how do we devise practical arrangements that will help to correct the defects in water quality caused by individuals and groups within society, ensuring that we account for the relative levels of degradation and the costs and benefits that have and will accrue, while doing so in a manner that minimises harm and that ensures we give effect to both the legislation and the Vision and Strategy?
18. In an ideal world, analysis of question 1 above would take into account the results of question 2 above. An industry or sector may not just produce negative externalities. It may also (and at the same time) produce positive externalities – value that another party derives from the activity of that industry, but does not pay for. In the case of the Waikato catchment, the wider community does and will derive additional value, over and above improvements in water quality, from the aesthetics and increased biodiversity that occurs from such mitigations as riparian planting and wetland restoration. According to WRC reports, the wider community already receives benefits along these lines from the agricultural sector.
19. 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.¹¹ This study determined that the total value derived from users of the Waikato and Waipa river systems was in the range

¹¹ *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.

\$28-91 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.¹² The report also detailed the number of other studies that have been conducted that measured the dollar value derived from the Waikato catchment in its current state, noting that a non-market value of \$1376 per household per year was received. Of this, fishing, swimming and water quality made up \$449 of the value, while \$481 was made up of landscape values, ecosystem health, and biodiversity.¹³

20. Thus 32% of the increased value to the community of better water quality will be made up in factors that the rural sector will be directly responsible for under the proposed Plan Change (fishing, swimming and water quality). The remaining 68% of the value will be captured by the wider community as a result of the improvements made.
21. Those who provide these environmental benefits should receive the value of these benefits from those who receive them, just as the community expects those who cause environmental degradation should also be the ones who should pay to fix them. Economic efficiency would demand that it is irresponsible to purely account for negative impacts of an activity without also factoring in the positive impacts – this is analogous to a government taxation policy that only looks at revenue, without any regard for the expenses incurred achieving that revenue. Those positive impacts, over and above water quality improvements, should have been accounted for in the PC1 process.
22. *“Agriculture’s multi-functionality indicates that it can also deliver valued non-food functions, many of which cannot be produced by other economic sectors. Much of the `natural’ biodiversity in Europe is the result of centuries of farming, which has created and shaped both landscape and countryside. There are many other positive side-effects of agriculture, including aesthetic value; recreation and amenity; water accumulation and supply; nutrient recycling and fixation; soil formation; wildlife, including agriculturally beneficial organisms; storm protection and flood control; and carbon sequestration by trees and soils.”¹⁴*
23. It is undeniable that pastoral agriculture and commercial vegetable production are, to a large degree, responsible for the degradation of water quality in the Waikato catchment (along with point source discharges and stormwater run-off). The Theory of Externalities would demand that these industries must be held responsible for a share of the clean-up costs. However, what this share equates to can only be understood if we understand not just the share itself, but also price the unpaid-for benefits from agriculture the wider community receives.

¹² *Non-market values for fresh water in the Waikato region: a combined revealed and stated preference approach*, p1x.

¹³ *Non-market values for fresh water in the Waikato region: a combined revealed and stated preference approach*, p4.

¹⁴ Jules Pretty et al, *Policy Challenges and Priorities for Internalising the Externalities of Modern Agriculture*, Journal of Environmental Planning and Management, Vol. 44 Iss. 2, 2001, p264.

24. The role agriculture plays in the provisioning of ecosystem services has already been recognised in countries such as the United Kingdom, where land owners receive payments from central government for the ecosystem services they provide. PC1, at least in its current form, has implicitly ignored these positive externalities. It fails to account for the positive environmental outcomes already provided by the agricultural sector, as well as the additional value that will be derived by the wider community by measures that will be taken on-farm to improve water quality. From an economics perspective, this will inevitably lead to inequitable outcomes and unfair distribution of impacts.

Trade offs

25. Positive and negative externalities are only one part of the broader economic picture. We would argue that positive externalities should have been explicitly recognised in PC1, just as negative externalities have been, and that the failure to do so has led to uneven Policies and Rules. However, these are just part of a bigger issue. This is the general lack of understanding of the trade-offs that are inherent in a Plan Change of this magnitude.
26. We spent some time in our original submission, and in our Evidence for the Block 1 and Block 2 hearings, discussing this idea of trade-offs and going to some lengths to point out that none of us have any real idea of what these trade-offs will be under PC1, and what was required to be done so that we are able to better understand what is involved. We would reiterate that point here.¹⁵
27. Sections 32(1) and (2) of the Resource Management Act are specifically about the trade-offs that will be involved in any Plan. The reason regulatory bodies are required to produce and publish S32 Evaluation Reports, and quantify the benefits and costs, is so that the community gets a better understanding of the potential trade-offs that will occur. If we understand the trade-offs, we can better judge whether a plan will be efficient, effective, and appropriate - whether it will meet the goals and objectives that it is designed to do in the most optimal manner. And the results of such an analysis should be delivered in a manner that is easy for the community to understand – in other words, where practicable, dollar values should be assigned to the costs and benefits of each trade-off.
28. There remain serious flaws and gaps in the economic and social cost modelling that underpins the S32 Report.¹⁶ This meant that the S32 Report could not adequately assess the social, economic and cultural costs and benefits of the proposed Provisions, nor could it adequately assess whether these Provisions optimised environmental, social, and economic outcomes. It did not provide the community with the information it must have in order to understand the trade-offs.
29. To further complicate the issue for the community, key information regarding the current and desired state of water quality in the catchment is missing. As we discussed in the earlier Hearings, the community simply has not been provided with the information about the size of the contaminant bucket, either at a sub-catchment or whole of catchment level, or who is contributing what to the bucket, apart from

¹⁵ In particular, see Sections 3 and 4 of Reeves and Taylor, James Gordon Livingston and Amy Louise, Submission 71614.

¹⁶ Section 3, Reeves and Taylor, James Gordon Livingston and Amy Louise, Submission 71614, pp7-24.

the percentage of nitrogen and phosphorus that point sources contribute – and even then this information is flawed as it does not consider contaminant loads that enter the rivers from stormwater municipal systems. We have no idea how much of each contaminant needs to be removed from the system in order to achieve the goals of PC1 - let alone the end goal of the Vision and Strategy - nor who should be responsible for what.

30. Such information is critical in understanding the trade-offs, and therefore to properly assess the effectiveness and efficiency of the proposed Provisions. We do not know whether the Provisions are fair, equitable, or proportional. We have effectively all been left in the dark, groping for the right path to travel, without fully understanding where that path will lead.

Will PC1 achieve its goals?

31. To assess whether Plan Change 1 will achieve what it is designed to achieve, we had to first understand what these goals are. As set out in the S32 at p7, (and leaving aside for a moment the issues of fairness, equitability, and proportionality) in the first instance the Policies and Rules were designed to achieve a 10% improvement in water quality over a 10-year timeframe. At the same time, it had also to prepare for future requirements and possible property-level nutrient discharge allocations in later plans. Implementation and monitoring of plans by the WRC had to be manageable, and finally the Policies and Rules, once implemented, should aim to optimise environmental, social, and economic outcomes.
32. While it is difficult at this stage to be certain of the absolute value, we are of the opinion that the Provisions of PC1 will achieve decreases in the four key contaminants, and thus water quality will improve. Key in this regard are the Rules dealing with the 75th percentile N emitters, commercial vegetable growers, those pertaining to Farm and Environment Plans (FEPs), and the stock exclusion rules.
33. Requiring pastoral sector entities above the 75th percentile N emitters (based on their Nitrogen Reference Point (NRP) to immediately reduce their levels to below the 75th percentile will reduce the amount of N leached from pastoral agriculture. Meanwhile, requiring all commercial vegetable growers to reduce their N emissions by a minimum of 10% will add to the cumulative impact. Although absolute levels of reduction are complicated somewhat by lag factors and what happens to N below the root zone, we can be confident that these Rules as currently expressed will see a reduction in the potential amount of N that could reach waterways. This will be further enhanced by the proposed stock exclusion rules and those pertaining to FEPs.
34. While having some positive (but as yet unknown) impact on reducing N, stock exclusion from all waterways regardless of slope will also have positive (but again unknown) impacts on the other three contaminants. Phosphorus, sediment and E.coli enter waterways both via overland flow paths and direct deposition through stock in streams. Rules that enforce waterway fencing will prevent direct deposition. At the same time, and depending on fence setbacks, the un-grazed areas on the sides of waterways will also act as filters to trap contaminants before they reach water.

35. The impact on water quality of Rules pertaining to FEPs is both a totally unknown quantity, but also potentially the area that will have the greatest positive impact. This is because FEPs will achieve two important outcomes. Firstly, they will improve the knowledge of critical source areas, and what and how contaminants enter waterways on individual properties. Secondly, they will detail the different mitigation strategies that could be employed to deal with the observed issues.
36. To achieve its goals PC1 must also prepare for future requirements and possible property-level nutrient discharge allocations in later plans. Hence Policy 7 was developed to explicitly deal with this. We note that while the S42A authors have recommended that this Policy be deleted in its entirety, the S32 report commented: "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."¹⁷
37. There are two key issues here. The first is that all the data that has been developed to date would suggest that PC1 as it currently stands will not achieve the desired long-term water quality state. It was only designed to be the first step in what is anticipated to be an 80-year process. The second is that there is general acknowledgement that we don't yet have the information required to fully inform any potential allocation framework when PC1 ends in 2026.
38. The S32 outlined the information the WRC would require ahead of any allocation scheme prior to 2026: "In order to prepare for allocation based on land suitability, two types of information will need to be gathered – land management information, in terms of both land use practices (such as fertiliser use, stocking rate) and mitigations that have been implemented, and information on the effect on water quality of these land use practices."¹⁸ Leaving aside the debate about whether land suitability should be the basis for any allocation scheme, and regardless of whether or not Policy 7 is deleted, does PC1 provide enough certainty that the goal of preparing for future requirements and possible property-level nutrient discharge allocations in later plans will be met?
39. Certainly, FEPs will provide the WRC with the land management information it indicates is required. However, it is difficult to see how these will provide enough data, over long enough time-frames, about the impact land use practices and mitigations will have on water quality. PC1, in and of itself, will not provide all the information required to prepare for the future, and so this goal will not be met.
40. In any case, we would argue that much of the information still required stands outside PC1. We have already discussed the holes in the datasets that were used to inform PC1 – holes with the economic and social cost modelling, with the potential trade-offs, and even data such as understanding what the current bucket of contaminants is, where it comes from, and where it must get to. Suffice it to say, these holes must necessarily be plugged well ahead of any future allocation framework.

¹⁷ *Proposed Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments: Section 32 Evaluation Report September 2016*, p87.

¹⁸ *Proposed Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments: Section 32 Evaluation Report September 2016*, p129.

41. One area we do believe PC1 will meet its goals is in the manageability of implementation and monitoring of the Plan– with the obvious codicil that implementation and monitoring are appropriately resourced by the WRC, and that enough qualified individuals exist to manage the processes of developing and auditing FEPs and NRPs on-farm within the timeframes desired.
42. In particular, we would point out that a properly developed FEP, that contains clear steps and timeframes for addressing critical source areas and applying mitigations, should be particularly easy to monitor (even if ease of implementation on-farm will differ from farm to farm). Gathering and collating the FEP data by the WRC will be a more onerous task, and manageability or otherwise will depend on the quality of the infrastructure that is used for this purpose. On balance, and again presuming this area is properly resourced, there is no reason to believe that this should not be successfully accomplished.
43. Answering the question of whether PC1 will optimise environmental, social, and economic outcomes once the Policies and Rules are implemented, is a far more divisive question. As we noted in our original submission, we are of the opinion that this is an area where the S32 analysis failed badly.¹⁹ As an example, when discussing all Rules and Policies pertaining to catchment-wide rules, FEPs, and NRPs, the Report simply baldly states: “Optimises outcomes by addressing most cost-effective interventions first and allowing for tailored risk-based approach.”²⁰ No more detail follows this statement.
44. To the question of whether the provisions within PC1 will optimise environmental outcomes, the answer is uncertain. Our Evidence in Block 2²¹ detailed three studies done in the Waikato, two of which were for the Healthy Rivers programme, showing wetland restoration and/or construction can be expected to be a more effective mitigation than stock exclusion. If the rules were to be based purely on efficacy, wetlands would be the mandated method of mitigation, not stock exclusion.
45. On the other hand, because stock exclusion is mandated in the Plan, with all properties expected to have fenced either some or all waterways on their properties by 2026 (depending on whether the property is in a priority catchment), then the Plan can at least guarantee that water quality improvement is underway. As wetland creation, and other mitigations, are not mandated but instead will play part of the individual farm FEPs, and each FEP will contain different mitigations and timeframes, then this guarantee cannot be made.
46. Optimised social outcomes are also difficult to assess. This paper has already discussed that community benefits will accrue such as improved aesthetic and biodiversity values, when various mitigation options are put in place – although as already noted the value of these positive externalities derived by the community will not be returned to those who provide the value. These increases in aesthetic and biodiversity values was picked up in the S32 analysis, with the same analysis also suggesting improved recreation (i.e. in or on the water) values. However, WRC

¹⁹ See Section 4, Reeves and Taylor, James Gordon Livingston and Amy Louise, Submission 71614, pp25-32.

²⁰ *Proposed Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments: Section 32 Evaluation Report September 2016*, p172.

²¹ Statement of Evidence of James Gordon Livingston Reeves- Block 2, paragraphs 17-21.

reports conducted for Healthy Rivers suggests there will be no improvement in recreation values, even when far greater improvements are made in water quality than the 10% goal of PC1.²²

47. There will also be potential negative social consequences. The S32 report suggests a reduction in regional employment of up to 0.4%,²³ which equates to just over 860 jobs, as a result of PC1. At the same time, excluding stock from all waterways by 2026 and the sheer costs associated with this will have negative social impacts on families in that situation. Given the above, it is difficult to see how PC1 optimises social outcomes.
48. It could be argued that PC1 will optimise economic outcomes. The huge body of work that will be necessary, both on- and off-farm, will mean an economic boom for the likes of fencing contractors, plant suppliers, accountants, farm consultants, agricultural contractors, reticulated water equipment suppliers, and those entities contracted by WRC to conduct assessments and the like associated with PC1. However, these outcomes were not part of the economic modelling conducted for HRWO prior to PC1.
49. Instead, modelling conducted ahead of PC1 focused on the economic impact on farm profitability, downstream agricultural processing industries, and employment. The assessed economic impact of PC1 is an annual reduction of \$177 million, which includes reductions in on-farm profits of \$26 million, with the remainder reductions in value-added and the expected job losses that will occur.²⁴ Importantly, however, these figures do not include the on-farm costs of implementing PC1. As we noted in our original submission at p19, the study that did assess the costs of preparing and implementing PC1 in the region put the average implementation cost for sheep and beef farmers at \$138000, and \$41000 for dairy farmers.
50. PC1 does not optimise economic outcomes, and we state this forgetting for a moment the expected implementation impacts mentioned in the previous paragraph. In order to optimise economic outcomes, we need to be getting the biggest bang for our bucks. All other things being equal an optimal outcome is the one with the highest possible environmental and social outcome for the monies invested. The provisions of PC1 – stock exclusion in particular – make this impossible to achieve.
51. The aim of a FEP is to identify critical source areas, then plan and implement both management and infrastructure changes designed to mitigate contaminant risk, and do this at the lowest cost. Rationally, the activity that will deliver the best environmental outcome per dollar invested will be given the highest priority, then the next most effective, and so on. There is no ‘one-size-fits-all’. The mitigation(s)

²² *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, Healthy Rivers Wai Ora Report No. HR/TLG/2015-2016/6.3, p15-37.*

²³ *Proposed Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments: Section 32 Evaluation Report September 2016, p171.*

²⁴ Graeme Doole et al, *Evaluation of scenarios for water-quality improvement in the Waikato and Waipa River catchments, Healthy Rivers Wai Ora Report No. HR/TLG/2015-2016/4.2, Tables 2, 13, 16, 17.*

that work best on one property may not be as effective as other mitigation(s) on another property. Mandating stock exclusion from all waterways, regardless of farm type or topography, guarantees that we cannot achieve get the best environmental and social outcome for the monies that are required to be invested.

Fairness and Equitability

52. We described in our initial submission that before we could debate the appropriateness of the rules, we needed first to be made aware of where we are now; who is contributing what. Without such information, any discussion about the fairness and equitability of PC1 is necessarily something of a subjective matter, rather than the objective matter this should have been.
53. As we have described, PC1 is aimed squarely at the agricultural sector, at diffuse contaminant dischargers. Until now the only sectors that have had to manage contaminants under resource consents have been point source dischargers – largely industrial sites and municipal treatment plants. PC1 is intended to bring all emitters effectively under the same consents-based umbrella.
54. So, are the provisions of PC1 fair and equitable? A dictionary would define 'fair' as treating people equally without favouritism or discrimination. Meanwhile equitable is defined as dealing fairly and equally with all concerned. By these definitions, on balance PC1 is neither fair nor equitable.
55. The Vision and Strategy is about restoring and protecting the health of the Waikato and Waipa Rivers by reducing the amount of contaminants that enter the Rivers. It seems sensible therefore that in order for regulations to be fair and equitable, this means that the rules should treat all polluters of the river in the same manner. These sectors are all contributing to the same problem, and so should all be expected to contribute to repairing the damage done in the same manner. There shouldn't be different rules for different individuals and groups.
56. But this is exactly what PC1 has done. It deals with point source dischargers differently to the way in which it deals with commercial vegetable growers, which is different again to the way in which it deals with pastoral agriculture. Leaving aside any debate about the impacts of the rules, having different regulations for different sectors by definition means PC1 will be unfair and inequitable. (As an aside, by the same token this means that the regulations in place prior to PC1, by not including diffuse dischargers, effectively meant these were also unfair and inequitable to those groups that were expected to manage contaminants under a consenting process). Again, the key point is that the issue that must be dealt with is the same across industry sectors – we must reduce contaminant loads entering the Rivers. If the issue is the same, and the outcomes we desire are the same (reduced levels of contaminants), then shouldn't the rules be the same?
57. Unfairness and inequity extend not just across sectors, but to individuals and entities within sectors as well. Take the 75th percentile rule as an example. This rule is aimed squarely at pastoral industry farms, in the main dairy farms, with very high rates of N leaching. Looked at from one perspective, targeting the highest polluters first would appear to be the right thing to do, under the principle that those who pollute the most should pay the most. These farms must immediately reduce the amount of N they leach to below the 75th percentile.

58. From another perspective though, even though these farms must lower the amount of N they leach, this is still some orders of magnitude higher than other pastoral farmers will be able to do, so they will continue to contaminate water at much higher rates than the average. Meanwhile every other pastoral farmer must remain at or below their individual NRP. Effectively this means those with low NRPs are discriminated against in favour of those with high NRPs. Fair and equitable rules would suggest all pastoral farmers be able to leach the same amount of N.²⁵
59. Potential unfairness and inequity may also result from the implementation of PC1 rules. This is as a direct result of no clear indications from the WRC about the outcomes that will be required on individual properties to achieve the 10-year and 80-year Vision and Strategy goals. The most obvious example is the stock exclusion rule, whereby farmers must put in place a mitigation measure that will prove hugely expensive on some properties, without the knowledge of what they are contributing to the problem, or what actual impact this will have on improving water quality. Potentially for much less investment they could achieve the same or better outcomes.
60. By the same token, an individual property may have very low contaminant discharges, below the levels necessary to achieve the 10- or 80-year targets, due to having already put in place management practices and contaminant attenuation methods. It would be unfair and inequitable if these properties could not increase their discharges up to these targets. But because we don't know what these targets are – because farmers have no idea what the 10- or 80-year targets mean at an individual property level – this becomes impossible. In these circumstances, unfairness and inequity in the rules is inevitable.
61. One of the key reasons FEPs were chosen as the preferred method during modelling was that the modelling showed the necessary improvements to achieve PC1 targets were achievable using this process. However, during this modelling one key assumption was made: “practices that are selected are consistent in that they involve changes to the farming operation, but do not involve large up-front capital costs and are more focused on the refinement of an existing system.”²⁶ However, a number of farmers within the catchment will be forced to make large up-front capital investments due to the blanket stock exclusion rule.
62. By the WRC's own definition, in order for PC1 to be considered an 'acceptable' Plan it was required to have a “fair distribution of impacts.”²⁷ Yet after stating this, the rest of the S32 Report virtually ignores any investigation of whether the impacts of the Policies and Rules would be fair. As a case in point, the stock exclusion rule makes this goal impossible to achieve. Large, usually less intensively farmed,

²⁵ To muddy the waters even further (pun intended!), and looking ahead at potential allocation schemes, is it fair and equitable to base allocation at a sub-catchment level, if this means that farmers in one sub-catchment receive a higher discharge allowance than farmers in another catchment? Similarly, allocating discharges on the basis of land suitability is also flawed – why should one entity be able to discharge more simply because their land type has different characteristics than another?

²⁶ Graeme Doole et al, *Evaluation of scenarios for water-quality improvement in the Waikato and Waipa River catchments*, Healthy Rivers Wai Ora Report No. HR/TLG/2015-2016/4.2, p16. Emphasis added.

²⁷ *Proposed Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments: Section 32 Evaluation Report September 2016*, p123.

properties will be hugely impacted by this rule, despite the extensive nature of their farming practices usually meaning they are less damaging to the environment. They will have to make a huge up-front capital investment in fencing and reticulated water, and do so for an unknown gain to water quality. Fairness and equitability are not well served by this rule, and certainly PC1 cannot claim that its Rules will ensure a fair distribution of impacts.

Proportionality

63. One of the areas we were very keen to address in our initial Submission and subsequent Evidence was the idea of proportionality. Proportionality was seen as a fundamental principle underpinning PC1. The Plan had to take this principle into account, and it was directly addressed in the S32 analysis: “this principle of proportionality is evident in the policy requiring reductions to be commensurate to the current degree of discharge (that is, those discharging more must make greater reductions).”²⁸
64. This principle has already been tested via the judicial system. We note in the Submission by Counsel for the Waikato Regional Council at p30 that implicit in the Supreme Court decision in EDS v King Salmon is that any protection or restoration must be proportionate to the impact of the application on the catchment.
65. Yet to ensure proportionality, it must necessarily be tested. To conduct this testing, we need to know the relative impact of the activity on the catchment. It is not enough simply to say one sector contributes this amount, and another sector contributes this amount. In order to test proportionality, we need not just to look at one sector vis-à-vis another, but what occurs within a sector – we need to be able to see the impact of different entities undertaking the same activity.
66. Again, the information required is lacking in the PC1 process, and represents arguably the Plan’s greatest flaw. We have already commented that this means discussions about various issues, including proportionality, will not be as objective as they should be – even if, as is the case with this section, the discussion is tempered with data that was made available through the PC1 process.
67. The intent of PC1 is for all to make a start on reducing discharges of contaminants. The point was made that point source dischargers have already made their starts, and that one of the goals was to ensure that diffuse dischargers begin doing the same. PC1 also made a start on trying to put in place Policies and Rules that explicitly aim for the goal that those discharging more must make greater reductions, via the 75th percentile Rule and those impacting commercial vegetable production. The question is, have these provisions ensured that the impact on each farm or activity is proportional to its impact on the catchment?
68. Before we begin to answer this question, a brief note about how impact is measured. We discussed in our Block 2 Evidence²⁹ our belief that in order to understand the bucket of contaminants, where these contaminants are coming from, and in what proportions, all entities needed to be measured using the same

²⁸ *Proposed Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments: Section 32 Evaluation Report September 2016*, p171.

²⁹ Statement of Evidence of James Gordon Livingston Reeves- Block 2, paragraphs 35 and 50-52.

baseline – in the case of N this is Overseer, and the output is expressed as kgs/N discharged per hectare. Without all dischargers being referenced against the same baseline it becomes even more problematic to address issues of proportionality. This holds true even if, as is the case with Overseer, the baseline model used is flawed. We would also add that all outputs should be measured – the example we use is that, to the best of our knowledge, municipal stormwater flows are not even measured for the amount of contaminants they add to the River systems, despite a clear understanding that this does occur. The principle is simple – all known sources of contaminants should be accounted for.

69. But back to the question of whether impacts are proportional based on impact on the catchment. If we firstly consider intra-sector proportionality among diffuse dischargers, we must conclude that the Provisions will not ensure that the impact on each farm is relative to its impact on the catchment.
70. In the commercial vegetable sector, all entities in this sector are required to make a 10% reduction in the amount of N they discharge (based on their individual NRP figure). Yet within this sector there will be some with a higher NRPs relative to others. As all must reduce N discharge by 10%, those starting with lower NRPs will be relatively worse off. Certainly, such a rule is dis-proportional relative to their individual impacts on the catchment.
71. Similarly, the Rules pertaining to pastoral agriculture may also prove dis-proportional. While it may be argued that the targeting of those over the 75th percentile ensures that those discharging more must make the greatest reduction, if we look at the remainder of individual entities within the sector, it becomes clear that the Rules are again dis-proportional.
72. In this instance the Rules simply state farmers must keep dischargers at or below their NRP – the argument can be made that ‘holding the line’ is enough because the 75th percentile group will be reducing their discharges. However, those farmers that have already put in place mitigations against nitrogen loss on their properties are at a clear disadvantage to those farmers with no mitigations in place. These farmers, whom will start with higher NRPs (all other things being equal) will be able to intensify their operations so long as they also put mitigations in place at the same time to manage the extra contaminants, whereas this option is denied the individual(s) that have already put mitigations in place (and incurred the costs of doing so). This leaves us with the situation that individuals whose impact on the environment was worse to begin with will be able to offset the costs of mitigation by the increased revenue of intensification, and retain a higher NRP ahead of any allocation regime.
73. Impacts of PC1 will also be dis-proportional when comparing different sectors to each other. Preliminary estimates of nitrate leaching using Overseer looking at different farm systems estimated that the average amount of N leached per hectare per year was 3kgs/ha/yr for extensive sheep and beef farms, 13kgs/ha/yr for intensive sheep and beef farms, 27kgs for dairy, 36kgs for arable farms, and an average of 103kgs/ha/yr for vegetable production.³⁰

³⁰ *Sustainable Nutrient Management in New Zealand Agriculture* – A course used for accreditation of advisors responsible for safe and effective nutrient management, Massey University, p7.29.

74. Using these figures, rules requiring a 10% reduction in N discharge from commercial vegetable growers would see their discharge drop to an average of 90kgs/ha/yr, still more than three times the average dairy farmer. Meanwhile, those dairy farmers in the 75th percentile must come down to below the 75th percentile, which for some will be a potential drop of much more than 10%. After doing so, it is likely their actual discharge will still be much less than that from the average commercial vegetable grower.
75. On a similar vein, if we look at another contaminant – sediment – the disproportionality of some Rules becomes even more stark. The stock exclusion rule means many pastoral farmers – in the main extensive sheep and beef farmers - will face large costs, whereas commercial vegetable producers obviously have no stock, and face no additional costs. However, individual commercial vegetable growers contribute, on average, vastly more sediment than other land uses.
76. Research conducted by the WRC would suggest that commercial vegetable growing shows average soil loss, depending on slope, at between 7-30t/ha/yr, and that in the Franklin district, where commercial vegetable production has taken place, virtually all topsoil has now gone: “present topsoil is mainly derived from subsoil, crop residues and heavy additions of fertiliser.”³¹ Thus data suggests that, even when it is at its best and ‘only’ losing soil at a rate of 7t/ha/yr, commercial vegetable production adds at least 1400% more sediment than the average hectare of hill country pasture.³² However, whereas the average sheep and beef farmer will be required to address sediment via the medium of the stock exclusion rule, at least in the PC1 timeframes commercial vegetable growers will not have to address sediment unless explicitly stated in their FEP.
77. One of the counter-arguments to this is that proportionality requires those discharging more need to make greater reductions. Commercial vegetable growers, as an example, would say the data shows they only contribute 3% of the total N that enters waterways. Similarly, point sources only contribute 7% of the N total. Surely this means other sectors need to make greater reductions?
78. We would argue that this is the danger of using sector totals when trying to determine proportionality, and why it is also necessary to have individual entities assessed using the same framework across all sectors. Let’s assume that to meet the target of the Vision and Strategy, we need to remove 20% of the N entering the waterway. On the face of it, the easy method might be to simply demand that each individual sector reduce their N discharge by 20%.
79. But the trouble with this method is it ignores the principle that those discharging more must make greater reductions, both within sectors and between sectors. Take point sources as an example. As a sector, this group are very heavy dischargers of N – adding 7% of the total N contamination in the Rivers despite taking up less than 2% of the land area. If all sectors were required to provide an

³¹ www.waikatoregion.govt.nz/Environment/natural-resources/land-and-soil/land-use-in-the-waikato/soil-management-in-the-franklin-district

³² According to Horticulture New Zealand, hill country pasture loses 0.5t/ha/yr of sediment, *Statement of Evidence by Michelle Sands for Horticulture New Zealand*, Plan Change 1 Block 2, 10 May 2019.

NRP, point source sector NRPs would be 350% higher than the average. To put this another way, if all agricultural sectors, forestry, and native blocks put as much N into the waterways as point source dischargers, there would be at least 350% more N in the River systems as there is now.

80. However, within the sector, there are bound to be entities who's individual NRP is higher than the rest, and some whose NRP is lower than the rest. To demand that each individual reduce by 20% is not proportional. Similarly, when you look between sectors, point sources' average NRP will be much higher than the sheep and beef sector. Thus, asking the sheep and beef sector to reduce N discharge by 20% is also not proportional. The only way to ensure proportionality – to ensure that those discharging more make greater reductions – is to start by working out exactly how much individual entities are currently discharging, then to work out how much the reduction needs to be, and then to design a method that ensures high dischargers reduce proportionally more.
81. The rules of PC1 allow some of the heaviest polluters on an individual basis – point source dischargers – to continue on as they are until their consents are due for renewal (and even then, there is no guarantee their discharge allowances will change). Vegetable growers have to reduce their N by 10%, but this will still leave them discharging, on average, three times more than the average dairy farmer. Meanwhile the lightest polluters – sheep and beef farms – are being asked to pay the heaviest burden from a cost perspective. Even without individual data, it is difficult to see how anyone could consider this as a system whereby reductions are required to be proportionate to the impact of the application on the catchment.

Subsidies and sacred cows

82. Our evidence began with a discussion about externalities and trade-offs. We must properly value both positive and negative externalities to get the true value of an activity. Similarly, if we don't truly understand the trade-offs being proposed we risk sub-optimal outcomes. Unfortunately for the community, PC1 has not linked these two ideas together to provide the community with a coherent, readily understandable commentary of the costs and benefits not just of the Provisions chosen for PC1, but why other methods or practices have not been chosen. We don't fully understand the values, costs, or benefits of what is proposed, just as we don't fully understand who is doing what, and by how much, in the catchment.
83. We can, however, make the following observation: the lack of quality information and/or coherent analysis has influenced the way the Policies and Rules of PC1 have been written. And the combination of these make it virtually a certainty that some sectors will subsidise others in the catchment, that some individuals will subsidise other individuals within the same sector, and that the agricultural sector as a group will effectively subsidise the community throughout the life of this Plan Change.
84. Simply put, if one individual polluter doesn't pay in proportion to the amount of contaminants they add, then effectively this means this individual is subsidised by others that do. In the same manner, if an individual does reduce their discharge, but the residual amount remains higher than the rest, this too counts as an effective subsidy. And should an individual or sector provide others with items that these

others value, but this individual or sector receives no recompense for, then this too is a subsidy.

85. Any form of subsidy is inevitably market-distorting, and usually lead to inefficiencies and sub-optimal resource use. As an example, because we haven't priced water quality until now, effectively the community has been subsidising all entities within the catchment that have helped cause the decline of water quality (remembering though that we also haven't been charging the community for the ecosystem services provided by some of these entities), with the result that water quality is in its current condition. What would the Waikato catchment look like now if these costs and benefits had been priced in from our earliest days here?
86. Plan Change 1 was never going to solve all the issues, but it has helped make us aware of issues that it does not try to solve. Ahead of the next Plan Change, as a community we need to get a much better and clearer picture of the true costs and benefits of various activities. We require a much better understanding of the price of positive and negative externalities, and the trade-offs that come with various policy choices.
87. We would also reiterate what we stated in our Block 2 Evidence - in this process there can be no sacred cows. Our goal is clear, but our path to that goal is not. If as a community we demand that certain activities are to be held sacrosanct, then so be it, but this cannot be done without a very clear idea of what the results of this decision will be.

Our position

88. This paper discussed whether PC1 would achieve the goals that were set for it, and examined the fairness, equitability, and proportionality of the chosen Policies and Rules. We believe there is a reasonably probability that, as written, PC1 will achieve the goal of a 10% improvement in water quality. We also believe the Plan will go part, but certainly not all, of the way towards preparing for future requirements. We think that implementation and monitoring of the plan by the WRC is manageable, given appropriate resources. We consider that the Plan may optimise environmental outcomes (depending how you look at things), but would fail to optimise social and economic outcomes.
89. We are also of the view, for reasons expressed earlier in this paper, that the Policies and Rules chosen for PC1 will not achieve fairness or equitability – either between individuals within the same sector, or between sectors. We believe that the Provisions do not fulfil the principle of proportionality, and that the impacts of the Plan will fall very unevenly.
90. Because we don't know the size of the contaminant bucket, or who is contributing what to the bucket, or what these need to be reduced by, or the true costs of the trade-offs that will be involved, we can only hope that whatever the final version is of PC1, that this does not lead to harmful outcomes that are irreversible.
91. But we are also of the opinion that we cannot simply stand still. Despite our concerns we also believe we must improve water quality throughout the region, and this Plan Change is the start of that process – deeply flawed though we believe it to be. We believe water quality will begin to improve. We believe that the

commitment to using FEPs as the basis for on-farm management and infrastructure change is incredibly positive. Knowledge is power, and improved knowledge about more sustainable farming practices is, we believe, as important as any rule or provision. Choosing to take a tailored approach to the issue of water quality via individual FEPs will be critical as we begin the long haul to achieving the Vision and Strategy. The S32 couldn't have put it any better when it said:

The policy option of a tailored, property-specific set of mitigations actions to hold and reduce the four contaminants, means that each landowner will make choices for their property based on a different set of assumptions. Rather than choosing least-cost for the catchment as a whole, a tailored property plan approach will see a set of mitigations chosen for each farm that are best suited to the individual property and its farming operations.³³

92. If no change was made in the Policies and Rules from the original version, we could live with that – all of them with one exception. The rules regarding stock exclusion. Regardless of what the final version looks like, we believe this rule has no place in PC1.
93. Stock exclusion may be a mitigation chosen based on an assessment of critical source areas within an individual FEP, but it should not be included as a hard-and-fast rule, for all the reasons we discussed in this and previous submissions and evidence. In some instances, particularly large, extensive sheep and beef farms, this rule threatens people's very livelihoods, at the same time that the WRC have no real idea: 1) what the impact will be in terms of contaminant reduction; 2) what impact an individual farm currently has in terms of what contaminants it adds to the river systems and whether this farm even needs to do any mitigation to be under the targets; and 3) the knowledge that other, more effective mitigations are able to be used, potentially at a fraction of the cost.
94. The Good Farming Practice Principles say this about stock exclusion:
Exclude stock from water bodies to the extent that is compatible with land form, stock class and stock intensity. Where exclusion is not possible, mitigate impacts on waterways.
This is exactly the sort of tailored approach we have advocated throughout the PC1 process. However, this runs counter to the 'minimum standard' approach currently in the Provisions – where the s42A authors have recommended Schedule C contain the requirement to fence every waterway, even ephemeral or intermittently flowing streams and springs.
95. Stock exclusion notwithstanding, and effectively regardless of what the final PC1 involves, the WRC still has much to do to prepare for PC2. Aside from those areas already covered here³⁴, the WRC must clearly signal what the targets mean in individual on-farm terms. If limits will be set in PC2 the earlier it can signal the likely levels, the earlier individuals can begin planning for these limits. It also has a huge job educating and advising farmers about potential mitigations that will be the most effective on their individual properties.

³³ *Waikato Regional Plan Change 1 – Waikato and Waipa River Catchments Section 32 Evaluation Report*, Waikato Regional Council, 2016, p161.

³⁴ See paragraphs 44-46.

96. *“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”.*³⁵
97. Looking ahead to PC2, our view is that, using the above quotation from the economic modelling done for PC1 as a foundation, as a community we must start from the following position:
- the most appropriate mitigation actions are those that will be water quality-effective and cost-effective, both socially and economically
 - the most effective actions should target the highest polluters first, and these entities will be expected to make the greatest reductions over time

GFPs and FEPs

98. We have only recently become aware of the debate around GFPs as they relate to FEPs, and are aware that there is a push from some quarters to make GFPs the key inputs to a FEP. While broadly supportive, we believe that GFPs provide a coherent framework for FEPs, we do not believe that these should be used as the basis for the implementation or monitoring compliance against the FEP.
99. GFPs are principles, but do not form the basis of a monitorable FEP. What the WRC requires are instead specific, measurable outcomes with timelines. As an example, one of the three GFP Principles that relate to waterways says:
- Locate and manage farm tracks, gateways, water troughs, self-feeding areas, stock camps, wallows and other sources of run-off to minimise risks to water quality.*
100. The above tells farmers that they need to manage certain farm areas to minimise risks to water quality. It alerts farmers to potential critical source areas and the issue to be aware of (run-off in this case). It also suggests a farmer needs to ‘manage’ these areas to minimise risk. Up to this point, all good. However, it would be virtually impossible for a WRC staff member (or anyone else for that matter), to assess compliance of this principle. What is being measured? How will it be measured?
101. Instead, FEPs should use GFPs as the foundation upon which to build a specific, measurable plan. This is outlined in Section 3 and 4 (pg 75 of s42A report – Block 3), it provides the detail of what is required for each objective and principle in section 3 and is the core of the FEP. There does appear to be some duplication between section 3 and 4 (pg 73 and 75) and these sections could be combined into one section.
102. But how much is enough in terms of actions? Are there minimums? And how do you know if an action is timely? This then relies on CFEP’s being consistent and the review process?

³⁵ *Evaluation of scenarios for water-quality improvement in the Waikato and Waipa River catchments*, p7. Emphasis added.