Before an Independent Hearings Panel

The Proposed Waikato Regional Plan Change 1

IN THE MATTER OF the Resource Management Act 1991 (**RMA**)

IN THE MATTER OF the Proposed Waikato Regional Plan Change 1, Block 1 hearings, Topic B1

PRIMARY EVIDENCE OF DR MARK STEPHEN PAINE ON BEHALF OF MIRAKA LIMITED

(Farm Practice Change)

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1. EXECUTIVE SUMMARY

1.1 My full name is Dr Mark Stephen Paine. I am an independent consultant with innovation and change management expertise within the primary sector.

1.2 My evidence will discuss the principles of practice change and how practice change can occur on farm. This evidence links with the evidence provided by Dr Gavin Sheath who applies the principles to Plan Change 1 and Miraka's submission.

1.3 My evidence focuses on practice change, particularly on the opportunity to make progress on short term targets through changes to farming practice. However, such changes cannot be addressed in isolation, as gearing up for long term change will have demands and profound impacts on other stakeholders. As outlined in my evidence, practice change will need to span farming practices, community action and policy setting.

2. INTRODUCTION

2.1 My full name is Dr Mark Stephen Paine. I have a Bachelor of Horticultural Science, Masters of Horticultural Systems and PhD (Innovation and Communication). I am currently an independent consultant with innovation and change management expertise within the primary sector.

2.2 I am a member of the Primary Sector Council which performs a strategic advisory function to the government. I was the Strategy and Investment Leader for People and Business at DairyNZ (10 years), overseeing the strategy for dairy education from apprenticeships through to post graduate scholarships and extension.

2.3 I was formerly the Dairy Australia Principal Research Fellow (Innovation and Change Management) at the University of Melbourne (nine years). My research investigated how farmers make decisions with a focus on improving information services. This required an understanding of how to improve the way agricultural researchers and farmers worked together. It also required an appreciation of the learning processes that farmers use when adapting their management practices. I have formed strong working partnerships with advisors and rural professionals to conduct this research using a co-development approach.

2.4 My evidence is given in support of the submission made by Miraka Limited (**Miraka**) on the Waikato Regional Plan Change 1 and Variation 1 (**Plan Change 1** or **Healthy Rivers**).

2.5 I have read the Environment Court's Code of Conduct for Expert Witnesses, and I agree to comply with it. My qualifications as an expert are set out above. I confirm that the issues addressed in this brief of evidence are within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

3. SCOPE OF EVIDENCE

3.1 My evidence is provided on behalf of Miraka to address how farm practice change can support its aspirations to improve the health of the Waikato and Waipa rivers in the context of Plan Change 1. I understand that farm practice change is relevant to Miraka's requested changes to Plan Change 1, including:

(a) Seeking the creation of Freshwater Management /Sub-catchment Units at an aggregated sub-catchment level;

(b) Achieving real change through effective sub-catchment planning that unites communities;

(c) Addressing all four contaminants in the same manner, rather than adopting a separate approach just for nitrogen;

(d) Applying the Farm Environment Plan (**FEP**) regime to all farms and ensuring all farms reduce their discharges rather than just current high dischargers; and

(e) Amending some of the content of FEPs to ensure effective practice change occurs.

3.2 The following topics are addressed in my evidence:

(a) What is farm practice change?

(b) Plan Change 1 and practice change;

(c) The farm system in the context of the catchment; and

(d) Achieving practice change.

3.3 In preparing this statement of evidence I have relied upon the materials set out in **Appendix 1**.

3.4 My evidence should be read alongside that of:

(a) Grant Jackson;

(b) Dr Gavin Sheath;

(c) Jude Addenbrooke; and

(d) Kim Hardy.

4. FARM PRACTICE CHANGE

4.1 In summary, practice change is an overarching term for the practical means by which farm businesses and communities adapt to achieve certain outcomes. In relation to Plan Change 1 practice change refers to how farmers can contribute to healthy water targets. For the purposes of Plan Change 1 practice change involves three main components:

(a) Co-development approaches using the knowledge and experience of farm teams, advisers and researchers ensures fit-for-purpose solutions;

(b) Actively managing the co-development process is also a practice that needs to operate effectively; and

(c) Catchments are comprised of communities which must intentionally work together for better outcomes – the practice of social learning.

4.2 These three levels of practice change must be supported with appropriate policy instruments and market signals if the health of rivers is to improve.

4.3 In addition to the three main components of practice change identified above, a practice change programme that applies across the farms in the Waikato and Waipa catchments:

(a) Needs to ensure policy and plan provisions support agreed Good Management Practices for farming enterprises to implement;

(b) Integrates programmes of change (such as different extension programmes operating in each agricultural industry) when designing solutions at a catchment scale;

(c) Includes the development of farmers' monitoring and decision-making skills to support the change process. Programmes and monitoring approaches need to allow enough time to achieve enduring change;

(d) Recognises that communities are powerful agents of change, and therefore aligning the boundaries of sub-catchments with communities will accelerate practice change. Agricultural industries and rural communities are generally intolerant of recidivist behaviours that threaten river health – good policy will fully mobilise the peer pressure in a community to drive out poor practice;

(e) Needs to be explicit about the limits to current Good Management Practice guidelines. Co-governance practices will evolve over the life of a programme - this requires a style of policy implementation that learns and adapts as new practices and scientific knowledge emerges; and

(f) Appreciates the economic incentives that support good practice and ensure proposed changes are aligned with these incentives if long term outcomes are to be achieved.

5. PLAN CHANGE 1 AND PRACTICE CHANGE

5.1 Plan Change 1 Healthy Rivers is grappling with the human impact on catchments and their ecosystems. This issue is broader than agricultural land-use, as activities like hydroelectric power generation and direct discharges from urban communities and commercial entities also have a significant impact on the health of the rivers.

Miraka's position and the role of practice change

5.2 Miraka's position is that the scope of inquiry into river health must encompass catchment nutrient loading in the context of multiple demands for water extraction, use and reuse. I have addressed how farms implement practice change in this context below.

5.3 Plan Change 1 has a staged approach to reducing contaminants to the rivers which Miraka supports. During the first ten years (Stage 1) Miraka strongly advocates that emphasis is placed on **practice change to reduce all four contaminants**, and that any regulations that allocate contaminants to enterprises be introduced for Stage 2. In this context, practice change refers to the actions taken by users of land and water resources.

5.4 Miraka seeks the universal use of best practice to minimise human impact on catchments and ecosystems. This approach allows land users, communities and policy makers to be better informed, resourced and prepared for the significant changes that will ultimately be required. For the reasons outlined in this evidence I agree with this approach.

5.5 I consider that change in the context of Healthy Rivers will involve short and long-term environmental, economic and social challenges. In the short- term, communities and businesses will benefit when best practice is agreed and documented and the gap between current and best practice is reduced. In this context, I support the emphasis that Plan Change 1 places on Farm Environment Plans that embody agreed best management practices. In the longer term, the scale of change may

require the use of complementary policy steps such as rules governing water quality or biodiversity thresholds. Policies focused on outcomes are typically more effective than those that regulate inputs, or stipulate land uses (Booth, 2009).

5.6 My evidence focuses on practice change, particularly on the opportunity to make progress on short term targets through changes to farming practice. However, such changes cannot be addressed in isolation, as gearing up for long term change will have demands and profound impacts on other stakeholders. As outlined in my evidence, practice change will need to span farming practices, community action and policy setting.

6. THE FARM SYSTEM IN THE CONTEXT OF THE CATCHMENT

6.1 Farm entities are the most effective unit for achieving practice change in the short term as this is where decisions on management practices are made. Management practices operate within the constraints of infrastructure and capital available to the farm business. The skills and knowledge of the farm team (i.e., land managers and farm staff), which I discuss below, determines the adaptive capacity of the business, subject to accessing natural resources like land and water. Changing the rules that govern access to these resources can have a profound impact on future farm management practices.

6.2 Farm teams (c.f. farmers) refer to the employers and employees managing farming operations. Family members employed in farming are part of the farm team. Skill levels will vary between members of the team. This point will be discussed further in my evidence under the heading 'adaptive management practices' below. Common representations of the ‘kiwi farmer’ as a rugged individualist implies that farm practice decisions are based on values of independence and self-sufficiency. The reality for many farmers is that practices are determined as business decisions in the context of debt burdens, economic viability, price volatility, stringent market specification and increasing environmental regulations. Changing farming practices is, therefore, not self-determined, but set within a constrained operating environment.

6.3 To support effective environmental change, farm businesses must have access to good management practice guidelines for:

(a) Nutrient management;

(b) Effluent management;

(c) Stock exclusion from waterways;

(d) Riparian management;

(e) Use of wetlands and management of runoff; and

(f) Water use efficiency and irrigation management.

6.4 Agreement between land managers and policy managers on these management practices provides the first step in effective environmental practice change process for farmers. They enable the farm team to adapt their farm system to achieve farm and catchment targets. In my experience, practice change is most likely to be successful when the targets for farm and catchment are highly aligned, and well developed and settled management practice guidelines are key to achieving this.

6.5 When statements of good practice are contested, farm teams experience confusion and may resist change. If farm and catchment targets conflict there is a greater challenge to achieve community level change. I will elaborate on the issue of contested knowledge and practice change in sections 7.12 - 7.14.

6.6 The implications for a change programme from these factors are:

(a) A programme needs to ensure policy regulations support agreed Good Management Practices;

(b) A programme needs to be explicit about the limits to current guidelines. Policy can learn and adapt as new knowledge emerges; and

(c) When Good Management Practice is not agreed a process is required to ensure convergence on agreed practices over time.

7. ACHIEVING PRACTICE CHANGE

7.1 I consider that three levels of practice change are required to work in unison if the Healthy Rivers initiative is to succeed:

(a) Farming practice (enterprise level);

(b) Adaptive management (the practice of managing the change process); and

(c) Catchment practice (community practice change).

7.2 I have based this view on my experience of a number of projects, including:

(a) North Waikato Catchment Management involving soil and effluent management;

(b) Smart Approach to Managing Mastitis (SAMM) Plan for the NZ dairy industry; and

(c) “Dairy Moving Forward” involving deregulation and drought in the Australian dairy industry.

Farming practice

7.3 Agricultural industries vary in the way they facilitate change.

7.4 Dairy provides an extensive network of farmer discussion groups that meet regularly to address agreed topics in farming practice. These groups are supported with technical resources including publications, models and benchmarking tools. Key elements to facilitating practice change in this approach include:

(a) Farmer to farmer learning is fully utilised;

(b) A consistent approach is used, including the use of targets (based on a gap analysis comparing current performance with desired performance);

(c) Preparation of plans to achieve the target(s);

(d) Monitoring progress against the plan; and

(e) Use of farm management consultants in one-on-one interventions (often involving modelling exercises) when specific issues arise that challenge the achievement of the target.

7.5 The meat industry has less resources to support extension and practice change relative to dairy. It therefore places more emphasis on farmer to farmer learning. Farmers set priorities and co-develop programmes with relevant specialists on a region by region basis.

7.6 Forestry is characterised by several large businesses, so change is managed by processes internal to the corporation. Where forestry is a small part of an integrated farming business change is supported by farm forestry group activities.

7.7 Horticultural industries use product specifications and pricing signals to reward the adoption of good farming practices.

7.8 Facilitating change across these four agricultural industries that operate in the Healthy Rivers catchment will require an appreciation of the merits of each industries’ approach. I have discussed this further under the heading 'catchment management' below.

7.9 Many decisions made in farming have implications for several seasons, particularly in livestock and perennial horticultural systems. Motivating change is more challenging

as the time lag extends between changing a practice and reaping the rewards of the change. Achieving enduring change in farming practices is therefore challenging. A practice change endures when it becomes the norm for the farm team. Team members will say, 'this is the way it is done here'. For example, managing soil fertility will have norms that include how targets are set, how plans are developed and implemented, and how the progress is monitored. Evidence of improved river health should emerge when the whole farm team embodies norms that are consistent with agreed best practice.

7.10 The implications for a change programme arising from these factors are

(a) An effective programme will use the strength of each agricultural industry to implement practice change;

(b) Integrating programmes of change, across agricultural industries, is required when designing integrated catchment solutions; and

(c) Monitoring of change needs to allow for the timeframe required to achieve enduring change.

Adaptive management

7.11 Adaptive management is the second major component of practice change. In this context I mean the practice of managing the change process. Adult learning is a key part of adaptive management. Adult learning is the process that enables change in the farm team. Learning is a skill that is amenable to improvement. Experience based learning is common in farming and catchment management. People vary in terms of their observation skills. They vary in their ability to interpret or comprehend what they observe. For instance, monitoring changes in yield and quality of crops over time can be interpreted differently, resulting in divergent responses to problems. In order to be successful, Healthy Rivers will depend on a high degree of adaptive management skills in farm teams because there is currently no blueprint for success.

7.12 When well established rules are shared in teams for practices such as managing effluent or riparian areas, then experienced members of the team help 'novices' acquire the level of skill that is the norm for the team. Experience provides the grist for the mill of learning. Errors in practice provide learning opportunities for the team to adapt and improve. Effective teams will periodically reflect on their performance (debrief) with a view to improving their overall approach to learning and change.

7.13 A third party (e.g., a consultant or agribusiness adviser) is often used as the 'critical friend' to provide insights, independent of the farm team. Some farm teams actively

invest in structured learning programmes to fast-track the acquisition of skills. Unfortunately, these investments tend to limit their focus to practical skills training to 'get the job done'. The Healthy Rivers challenge involves many unknowns that will require more than just practical skills – it will require critical thinking and problem-solving skills.

7.14 Research, science and technology play an important role in adaptive management practice. Take the example of nutrient management. Farm teams may be fully competent when operating under rules that state nutrient loads of 40kgN/ha leached are sustainable. When the rules change to 25kgN/ha leached the team must search for solutions that maintain productivity and profitability.

7.15 Adaptive management is dependent on well-developed monitoring skills. Observation, accurate data collection and timely decisions will improve the chances of achieving new targets arising from changes in policy. However, in some cases even these skills will be insufficient to achieve the target. Research and development teams will need to co-develop with farm teams so that a combination of research methods and experience from the field combine to create new options. This co-development is most effective when critical thinking skills are shared across research, extension and farm teams.

7.16 The implications for a change programme arising from these factors are:

(a) Effective programmes support farm teams to acquire and share the skills required to achieve new targets arising from changes in regulation, such as the Healthy Rivers plan change;

(b) The use of research and farm management expertise should focus on co-development opportunities with farm businesses; and

(c) An emphasis on the development of monitoring and decision-making skills will support the change process.

Catchment management

7.17 Practice change at the level of catchment management (or sub-catchment management in the case of Plan Change 1) is largely a community endeavour. Co-governance is a cornerstone for Healthy Rivers. The community is on a learning curve to more effectively manage water resources in a way that respects spiritual values, improves environmental outcomes and achieves greater economic efficiencies.

7.18 Communities provide their members with a sense of identity and belonging. Communities of practice share a worldview of the catchment. They implicitly concur on participation and negotiation processes that build an understanding of catchment behaviour. Practices to improve the health of rivers emerge out of this style of negotiation, decision making and co-governance.

7.19 Achieving healthy river outcomes requires several communities to combine their skills and strategies for mutual benefit. A form of social learning is necessary, whereby each community retains (enhances) their identity as they contribute their unique perspectives towards a greater co-owned solution to river health. This can only be achieved under conditions of mutual respect, trust in the intent of other communities and an acknowledgement of co-dependence to achieve the scale of change required.

7.20 Experiences in the Rerewhakaaitu sub-catchment found that successful change was achieved when farmers knew each other (sub-catchment boundaries align with community identity) and they had time and processes to develop trust with other stakeholders.

7.21 In the discussion of farming practices, I have made reference to the diverse approaches that each agricultural industry takes to facilitate change. Each industry is a type of community. When they operate independently, they will achieve partial solutions to the problem of river health. A social learning approach assists communities to build integrated solutions based on the combined know-how of each industry (dairy, dry-stock, forestry and horticulture). This approach of social learning will be important to facilitating short term changes and more importantly provide an effective platform to address longer-term challenges of contaminant and land-use allocation during Stage 2 of Plan Change 1.

7.22 The implications for a change programme arising from these factors are:

(a) Co-governance practices will evolve over the life of a programme - this requires a style of policy implementation that can incorporate lessons as they emerge;

(b) Communities are powerful agents of change, aligning sub-catchment boundaries with communities will accelerate practice change; and

(c) Lessons from success in other sub-catchments provide valuable insights but the challenge remains one of adaptation as multiple sub-catchments and several agricultural industries seek aligned solutions to river health at the scale of the Waikato and Waipa catchments.

8. INCENTIVES, LIMITS AND PENALTIES

8.1 Economic incentives which reward practices that are consistent with healthy rivers will stimulate businesses and communities to change. A change in practice is more likely to occur when market signals offer new possibilities for the farm business while meeting the needs of the community. Market signals can focus on rewarding product attributes like food quality and product storage (e.g. Zespri). They can also incentivise a comprehensive range of environmental, employment and animal welfare standards (e.g. Miraka's Te Ara Miraka and Synlait's Lead with Pride programme).

8.2 Changing practice does not occur in an historical or cultural vacuum and there are several factors that can disrupt practice change to the detriment of farming businesses, industries and communities. I have previously referred to these factors with respect to the need for trust and mutual respect between communities. Inequality in power relations, a litany of behaviours that undermine the development of trust between communities, or conflicting worldviews can separately, or together, negate the best efforts to achieve change.

8.3 Clarifying power asymmetries between communities, assessing initial levels of trust and being explicit about the diversity of worldviews are prerequisites to gearing up for practice change at a community level. Too often a failure to formally address these issues, before undertaking a programme of change, results in wasted time, money and effort. Even when some changes are achieved, these are rarely locked in for the long term if trust issues are left unresolved. Numerous tools are available to galvanise practice change in catchment communities. For example, Clark and Timms document 50 different techniques in their 'Better Practices Process' manual.'

8.4 It will be vital for the sub-catchment management processes in Stage 2 of Healthy Rivers address these issues.

8.5 As discussed above in relation to farm systems, the extent to which practice change can deliver the solutions needed for healthy rivers will be determined in part by the infrastructure and capital available to teams implementing change. When new technological solutions emerge, supported with access to sufficient capital and co-developed change programmes, there is a high chance of success.

8.6 It is beyond the scope of my evidence to discuss policy settings necessary to correct recidivist behaviour that threatens the health of rivers for future generations. Suffice to say failure to provide adequate policy support will increase the likelihood that inappropriate power relations and distrust issues will undermine practice change.

8.7 The implications for a change programme arising from these factors are:

(a) Programmes need to appreciate the economic incentives that support good practice and ensure proposed changes are aligned with these incentives if long term outcomes are to be achieved;

(b) Formal identification of the factors responsible for the development of mistrust and power asymmetries will inform the design of better change programmes in future;

(c) New technological solutions are likely to emerge over the life of a programme. Supportive policy will accommodate the co-development required to successfully implement these solutions;

(d) Most agricultural industries and rural communities are intolerant of recidivist behaviours that threaten river health – good policy will fully mobilise the peer pressure in a community to drive out poor practice; and

(e) Policy needs to be clear about who pays for what when all the gains from adopting best practice have been captured, even when catchment targets are still not being achieved.

9. CONCLUSION

9.1 In my view, my evidence has outlined that:

(a) Practice change will be a necessary part of achieving the healthy waters objectives in the short and long term, regardless of what the provisions of Plan Change 1;

(b) Practice change will only be effective if a number of factors are taken into account including farm systems, co-development and adaptive management; and

(c) Alignment of sub catchments with communities will be the most effective means of developing, implementing and monitoring the sub-catchment plans to reduce discharges and improve water quality.

Dr Mark Paine

15 February 2019

Appendix 1

References

Booth, Kay (2009), Applying the Beneficial Outcomes Approach (BOA) to protected area management planning on Stewart Island/Rakiura, New Zealand. Science for conservation 296, Dept. of Conservation, Wellington.

Clark, R. Timms, J. (2001) Continuous Improvement and Innovation: The Better Practices Process, focussed action for impact on performance. Queensland Dept. Primary Industries, Brisbane.